UG EC S2 01

(DSC/DSE)

FOUR YEAR BACHELOR'S DEGREE COURSE

(CBCS in Accordance with NEP 2020)

SEMESTER - II

INTRODUCTION TO ECONOMIC THEORY-II

ECONOMICS

Surya Kumar Bhuyan School of Social Sciences

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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First Edition: July, 2017. Revised and Reprint: January, 2024.

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Printed and published by Registrar on behalf of the Krishna Kanta Handiqui State Open University.

The University acknowledges with thanks the financial support provided by the **Distance Education Bureau, UGC** for the preparation of this study material.

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COURSE INTRODUCTION

This is the second course in Economics of the BA programme of this University. This course has been entitled as “Introduction to Economic Theory-II”. This course comprises 15 units. The *first unit* of the course is on the theories of distribution. As a reward of contribution towards the production process, different categories of factors of production receive different categoris of income in the form of wages, rent, interest and profit. This is known as functional distribution of income. In this unit, other than the functional distribution, the concpets of factor productivity and factor cost, marginal physical product, marginal revenue product, value of marginal product, average factor cost, marginal factor cost have been discussed. The *second unit* of the course deals with wages. Theories of wage determination, viz, the marginal productivity theory and the Modern Theory have been discussed. The concept of collective bargaining and its role in wage determination has also been discussed in this unit. The *third* unit discusses what is rent in Econmics; its relation with price; the concept of Quasi-rent. The *fourth* unit of this course discusses profit - the reward earned by the entepreneur. It discusses important theories, like: Innovation Theory and the Uncertainty Bearing Theory. The last unit of this block is on the Classical Theory of Output and Employment. In this unit, the basic foundation of the Classical theory has been discussed. And last but not the least, Keynes’ reaction to the Classical theory has been discussed.

The *sixth unit* of the course is actually a continuation of the fifth unit, i.e., the last unit of the previous block. In this unit, the Keynesian approach to employment has been discussed. Thus, in this unit, the Keynesian concepts of aggregate demand and aggregate supply functions has been discussed. Similarly, the basic framework of Keynesian theory, particularly, the Principle of Effective Demand has been discussed. Finally, the determination of equilibrium level of national income has been discussed. The *seventh unit* is on the Keynesian approach to determination of interest rate. In this unit, the Keynesian approach to demand for money, particularly the concepts of transaction demand for money, precautionary demand for money, speculative demand for money has been discussed. Apart from these, the concepts of bulls and bears and the liquidity preference theory of determination of interest rate have also been discussed. The *eighth unit* is on the Keynesian consumption function. In this unit, the relationship between income and consumption has been discussed. Apart from this, one of the foundations of the Keynesian approach, i.e., the Fundamental Psychological Law of Consumption, the concepts of average propensity to consume and marginal propensity to consume, their significance and relationships have been discussed. Finally, the factors that affect the consumption function has been dealth with. The *ninth unit* deliberates on the concept of multiplier and the derivation of investment multiplier. In this unit, the concept of multiplier and the algebraic derivation of the investment multiplier have been discussed. Similarly, the

working of the multiplier, its assumptions and leakages, and its importance and relevance in the under-developed countries have also been discussed. The last unit of the block is on investment function and and MEC. In this unit, basic concepts of investment, viz., its meaning, distinctions between gross investment and net investment, and induced Investment and autonomous investment have been dicussed. Other than that, the factors affecting the investment function, particularly, marginal efficiency of capital (MEC), rate of interest, marginal efficiency of investment (MEI) have also been dealt with. Finally, the distinction between MEC and MEI and the relation between rate of interest, MEC and the volume of investment have been discussed.

In the eleventh unit, the concept of IS-LM has been discussed. In this unit, concepts like the meaning of both IS and LM, their derivation, slopes and shifts have been discussed. Apart from those, the interaction of IS-LM curve has also been discussed. In the twelfth unit, concept of accelerator has been discussed. Thus, the principle of acceleration, operation of the accelerator, its assumptions and criticisms have been discussed. In the thirteenth unit, the concept of business cycles has been discussed. Thus, the meaning and definition of business cycles, different phases of business cycles and their significance, causes of business cycles and a few remedial measures have been discussed. In the next unit, two important theories in the study of business cycles, viz., Samuelson's theory and Hicks' theory have been discussed. In the last unit of the block, which also happens to be last unit of the course, deliberates upon Welfare Economics. In this unit, concept of welfare, concepts of individual and social welfare, role of value judgement in Welfare Economics have been discussed. Apart from that, two important theories, viz., Pigou and Pareto's theories have been discussed.

In a nutshell, the undergoing of this course, along with the previous semester's course would familiarise you with the fundamental concepts of Economics.

In some of the Units, you may find along-side boxes to help you know some of the difficult, unseen terms. Some "ACTIVITY' have been included to help you apply your own thoughts. 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.

UNIT 1: THEORY OF DISTRIBUTION

UNIT STRUCTURE

1.1 Learning Objectives

1.2 Introduction

1.3 Personal Distribution

1.4 Functional Distribution

1.5 Concepts of Factor Productivity and Factor Cost

- 1.5.1 Marginal Physical Product
- 1.5.2 Marginal Revenue Product
- 1.5.3 Value of Marginal Product
- 1.5.4 Average Factor cost
- 1.5.5 Marginal Factor cost

1.6 Let Us Sum Up

1.7 Further Reading

1.8 Answers to Check Your Progress

1.9 Model Questions

1.1 LEARNING OBJECTIVES

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

- derive the meaning of Personal distribution and Functional distribution
- state the difference between Personal distribution and Functional distribution
- discuss the concept of Marginal Physical product
- describe the concept of Marginal revenue product and value of marginal product
- explain the concepts of Average factor cost and marginal factor cost.

1.2 INTRODUCTION

Traditionally, Economic theory has been divided into four parts: Production, Consumption, Exchange and Distribution. Economist studied

these four parts separately. In the fourth part 'Distribution', the pricing of 'factors of production' was often discussed as distinct from the pricing of 'product' because it was believed that the pricing of factors was something quite different from product pricing. Thus, the part of economic theory dealing with pricing of commodities was called 'Price theory' while the one concerning factor pricing was known as 'Distribution'. In short, the theory of factor prices is popularly known as *the theory of distribution*. The distribution may be functional or personal. The concept of functional distribution should be carefully distinguished from that personal distribution. In this unit we shall try to discuss the concepts of functional and personal distribution, factor productivity and factor cost.

1.3 PERSONAL DISTRIBUTION

By personal distribution we mean the distribution of income and wealth among various individuals, no matter from which sources it is derived. We all know that national income is not equally distributed among various individuals in the country. Some are rich while others are poor. In fact, there are great inequalities of income between various individuals. The theory of Personal distribution studies how personal incomes of individuals are determined and how the inequalities of income emerge .Under personal distribution, we study the pattern of the distribution of national income and the shares received by different sections of people.

In the words of *Professor Jan Pen*, "Personal Distribution (or the size distribution of income) relates to individuals persons and their incomes. The way in which that income was acquired often remains in the background. What matters is how much someone earns, not so much whether that income consists of wages, interest, profit, pension or whatever."

1.4 FUNCTIONAL DISTRIBUTION

Functional Distribution of income refers to the distinct shares of national income which people receive as compensation for the unique function which their services or service of their property perform in the process of production. In other words, it relates to the distribution of rewards

for the services of factors of production. Rent ,wages , interest and profits are the reward for the services of land , labour, capital and organization respectively. Algebraically it can be stated as: P=f(A,B,C,D)

where total output(P) is a function of Land(A), Labour(B), Capital(C), organization (D).

Thus, functional distribution studies the forces underlying the determination of the prices and shares of the various factors of production.

In the words of *Professor Jan Pen*, "In functional distribution we are no longer concerned with individuals and their individual income, but with factors of production: land, labour, capital and something else that may perhaps best be called entrepreneurial activity. The price of a unit of labour, a unit of capital, a unit of land and being an extension of price theory, it is sometimes called the theory of factor prices."

Personal Distribution Vs Functional Distribution: The distribution theory with which we are concerned in this unit is the *theory of functional distribution*. The concept of functional distribution should be carefully distinguished from that of personal distribution. Personal distribution of national income or what is known as 'size distribution of incomes' means the distribution of national income among various individuals or persons in a society. As you know that national income is not equally distributed among various individuals in the country. Some are rich, while others are poor. In fact, there are large inequalities of income between various individuals. The theory of personal distribution studies how personal incomes of individuals are determined and how the inequalities of income emerge. On the other hand, in the theory of functional distribution we study how the various factors of production are rewarded for their services or functions performed in the production process. Factors of production have been classified by economists under four major heads, viz., land, labour, capital and organization. Thus, in the theory of functional distribution we study how the relative prices of these factors of production are determined. The prices of land, labour, capital and entrepreneurship are called rent, wages, interest and profit respectively. Thus, in the theory of functional distribution we also

discuss how the rent of land, wages of labour, interest on capital and profits of entrepreneur are determined.

The question that now arises is: Is it not the functional distribution that determines the personal distribution of national income. Personal distribution of income only partly depends upon functional distribution. How much income an individual will be able to get depends not only on the price of a particular factor he has but also on the amount of that factor he owns as well as the prices and amounts of other productive factors which he may possess.

Thus, the personal income of a landlord depends not only on the rent but also on the amount of land he owns. Given the rent per acre, the greater quantity of land he owns, the greater will be his income. Further, the landlord may have lent some money to others for which he may be earning interest.

Despite these differences between personal and functional distribution, there is a close relation between the two. The personal distribution in a country is ultimately affected by its functional distribution of income. If the rewards to the factors of production are just and equitable, the distribution of personal income is also just and equitable. As a result individual incomes are high. There is great demand for products and services leading to more investment, more employment which increases production and national income. Higher personal income means higher standard of living and greater efficiency in production. On the other hand, if the functional distribution of income is unjust and based on the exploitation of factors of production, the personal distribution of income is also unjust and inequitable. As a result, the majority of the people will be poor. There will be diminution of economic and social welfare, and loss of peace and prosperity in the country due to a continuous struggle between the rich and the poor.



CHECK YOUR PROGRESS

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

(i) The theory of factor prices is popularly

known as the theory of distribution. (T/F)

(ii) Functional distribution in a country is ultimately affected by its Personal distribution of income. (T/F)

Q 2: Define Functional Distribution. (Answer in about 40 words)

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Q 3: Define Personal Distribution. (Answer in about 40 words)

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1.5 CONCEPTS OF FACTOR PRODUCTIVITY AND FACTOR COST

Before turning to the detailed study of how prices of factors of production are determined under different market conditions, it is essential to know the different concepts of factor productivity and factor cost. In the following we shall explain some of the important concepts relating to factor productivity and factor cost.

1.5.1 Marginal Physical Product (MPP)

Marginal Physical Product (MPP) of a factor is the increase in total output caused by employing an additional unit of the factor, quantity of other factors remaining fixed. In other words, MPP is the addition made to total output by employing an additional unit of a variable factor. It is defined as:

$MPP = TPP_n - TPP_{n-1}$

Where MPP is the Marginal Physical Product, TPP_n is 0the total Physical Product of nth unit, TPP_{n-1} is the total Physical Product of $(n-1)^{th}$ unit.

Example: Suppose in a particular cotton factory 25 workers produce 900 meters of cloth. An additional worker is added to it. Now cloth production becomes 926 meters. In this case, the additional 26 meters will be the marginal physical product.

i.e. MPP = TPP_{26} -TPP_{25}

= (926-900) meters.

= 26 meters.

1.5.2 Marginal Revenue Product (MRP)

Marginal Revenue Product (MRP) is the increment in the total value of the product caused by employing an additional unit of a factor, the expenditure on other factors remaining unchanged. MRP is the marginal physical product of the factor multiplied by marginal revenue. It is defined as:

MRP=MPP X MR.

Where MRP is the Marginal Revenue Product, MPP is the Marginal physical Product, and MR is the marginal revenue.

The above equation can also be defined as:

MRP= TRP_n-$TRP_{(n-1)}$

Where TRP_n and $TRP_{(n-1)}$ is the Total renenue product of n and (n-1) unit respectively.

Example 1: Suppose in a cotton factory 10 workers produce 1000 meters of cloth. An additional worker is added to it. Now the production of cloth in the factory becomes 1100 meters. If the marginal revenue of 11^{th} unit of cloth is 100 then the Marginal Revenue Product(MRP) will be

Marginal Revenue Product (MRP) = (1100-1000) X 100

=100 X 100 =10000

Example 2: Suppose the TRP of 10^{th} worker is Rs30,000/- and that of 11^{th} worker is Rs 35,000/-then the MRP of 11^{th} worker is

MRP=Rs (35,000-30,000)

=Rs 5,000

1.5.3 Value Of Marginal Product (VMP)

Value of Marginal Product (VMP) is the money value of the addition to the physical product by the use of one more unit of a factor input. Thus, it is the money value of MPP. It can be measured as :

VMP= MPP X P

Where, VMP is the Value of Marginal Product, MPP is the Marginal physical product and P is the Market Price.

Example: Suppose in a cotton factory, 30 workers produce 900 meters of cloth and 31 workers produces 925 meters of cloth, then MPP of 31st worker is 925-900=25 meters.

If the market price is Rs 60 then VMP will be

VMP= 25X60

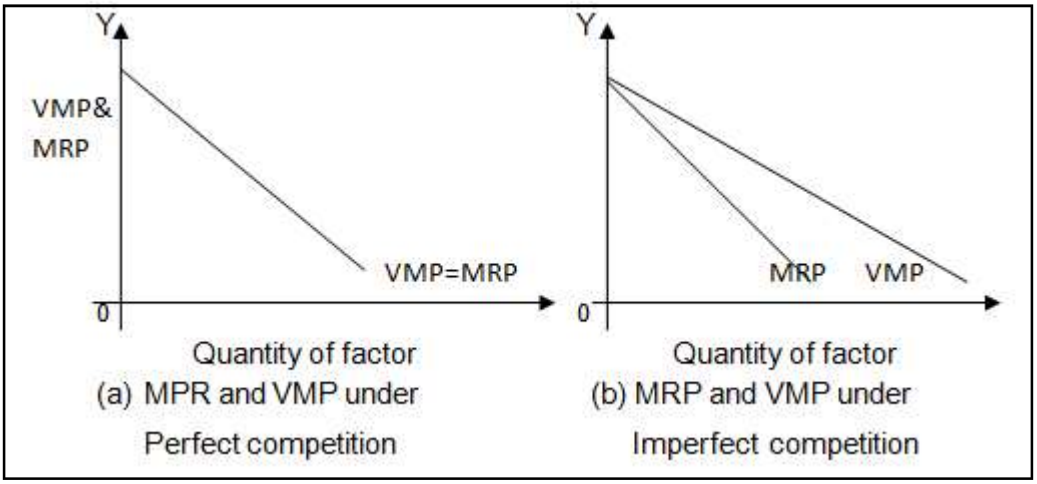
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Relationship between MRP & VMP: Under pure and perfect competition, MRP is same as VMP because the firm can sell any amount of its output at the given and constant price. This means, when MR = P,

MRP = MPP x MR = MPP x P = VMP.

But in case of imperfect competition, difference between MRP and VMP emerges. This is because in this case, the additional output obtained through the employment of one more unit of a factor input will have to be sold at a price lower than the one on which previous output was sold. The VMP and MRP curves in the two market conditions have been shown in Figure 1.1.

Figure 1.1: VMP and MRP Curves under different market conditions



1.5.4 Average Factor Cost (AFC)

Average factor cost (AFC) is the per unit cost of the Variable factor employed by a firm. It is obtained by dividing total factor cost by the units of factor employed,

i.e. AFC= TFC / Units of factor employed, where TFC is the total factor cost.

Example: Suppose the TFC is 20 in the 4th unit of employment of labour, then in that case AFC will be: AFC = 20/4 = 5

1.5.5 Marginal Factor Cost (MFC)

Marginal factor cost (MFC) is the addition to the total factor cost by hiring or purchasing one extra unit of that factor. This is also called marginal input cost or marginal expense (ME) of a factor. It can be defined as

$$MFC = TFC_n - TFC_{(n-1)}$$

Where TFC_n and $TFC_{(n-1)}$ is the total factor cost of nth and (n-1)th unit respectively.

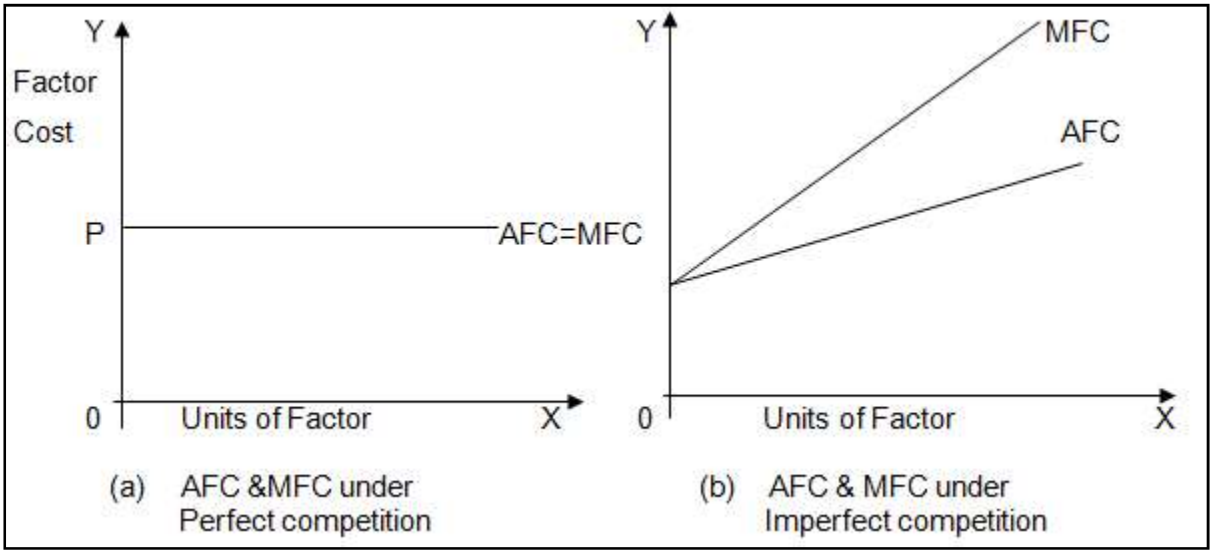
Example: Suppose if the TFC of 10 units of a factor is 120 and 11th units is 150, then MFC will be: MFC= 150-120

=30

Relation between AFC & MFC: The relation between AFC and MFC is different in a perfectly competitive factor market and imperfect factor market. In a perfectly competitive factor market , the price of a factor is determined by its demand and supply. The price of that factor is given for the firm at which it buys as many units as are required, Therefore, the supply of the factor is perfectly elastic at the given price and the supply curve of the factor is a straight line parallel to the X- axis. As the price of the factor is assumed to be given and constant therefore, AFC=MFC=Price of the factor.

But in a imperfectly competitive market, factor supply curve (AFC) is upward slopping to the right and MFC curve is above the AFC curve. It means that if the firm wants to employ more units of that factor, it will have to spend more on each additional unit of the factor. Consequently, MFC of that factor will be more than it AFC. Therefore, the MFC will be above the AFC curve. This has been shown with the help of Figure 1.2.

Fig:1.2 : AFC &MFC under different market condition





CHECK YOUR PROGRESS

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

(i) Under imperfect competition MRP=VMP. (T/F).

(ii) AFC and MFC curve under perfect competition is horizontal. (T/F).

Q 5: Explain the relationship between AFC and MFC under perfect competition. (Answer in about 40 words)

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Q 6: Define MPP. (Answer in about 40 words)

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1.6 LET US SUM UP

- The theory of factor prices is popularly known as the theory of distribution.
- The distribution may be functional or personal.
- By personal distribution we mean that distribution of income and wealth among various individuals no matter from which sources they are derived.
- Functional Distribution of income refers to the distinct shares of national income which people receive as compensation for the unique function which their services or service that their property performs in the process of production.
- Despite the differences between personal and functional distribution, there is a close relation between the two. The personal distribution in a country is affected by its functional distribution of income.
- Marginal Physical Product (MPP) of a factor is the increase in total output caused by employing an additional unit of the factor, quantity of other factors remaining fixed.

- Marginal Revenue Product (MRP) is the increment in the total value of the product caused by employing an additional unit of a factor, the expenditure on other factors remaining unchanged.
- Value of Marginal Product (VMP) is the money value of the addition to the physical product by the use of one more unit of a factor input
- Average factor cost (AFC) is the per unit cost of the variable factor employed by a firm. It is obtained by dividing total factor cost by the unit of factor employed.
- Marginal factor cost (MFC) is the addition to the total factor cost by hiring or purchasing extra unit of that factor. This is also called marginal input cost or marginal expense (ME) of a factor.
- Under perfect competition AFC=MFC=Price of the factor and Under imperfect competition (AFC) is upward slopping to the right and MFC curve is above the AFC curve.



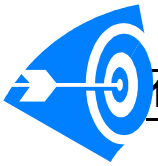
1.7 FURTHER READING

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1.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: (i) True (ii) False

Ans to Q No 2: Functional Distribution of income refers to the distinct shares of national income which people receive as compensation for the unique function which their services or service of their property

perform in the process of production. In other words, it relates to the distribution of rewards for the services of factors of production.

Ans to Q No 3: Personal distribution is the distribution of income and wealth among various individuals no matter from which sources they are derived. The theory of Personal distribution studies how personal incomes of individuals are determined and how the inequalities of income emerge.

Ans to Q No 4: (i) False (ii) True

Ans to Q No 5: Under perfect competition, MFC equals AFC. This is because in this market the price of the factor is given to the firm. It can employ as many factors as it wants at this given price. The every additional unit of factor will receive the same factor price.

Ans to Q No 6: Marginal Physical Product (MPP)of a factor is the increase in total output caused by employing an additional unit of the factor, quantity of other factors remaining fixed. In other words MPP is the addition made to total output by employing an additional unit of a variable factor.



1.9 MODEL QUESTIONS

Short Questions (Answer each question in about 150 words)

Q 1: Distinguish between personal distribution and functional distribution.

Q 2: Diagrammatically show MRP and VMP under perfect competition and imperfect competition.

Q 3: Diagrammatically show the relationship between AFC and MFC

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

Q 1: Discuss the different concepts of factor productivity and factor cost.

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UNIT 2: WAGES

UNIT STRUCTURE

2.1 Learning Objectives
2.2 Introduction
2.3 Basic Concepts of Wages
2.3.1 Meaning of Wages
2.3.2 Nominal wages vs Real Wages
2.4 Marginal Productivity Theory of Determination of Factor Prices
2.5 Wages and Collective Bargaining
2.6 Let Us Sum Up
2.7 Further Reading
2.8 Answers to Check Your Progress
2.9 Model Questions

2.1 LEARNING OBJECTIVES

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

- define wages and make a distinction between nominal wages and real wages
- discuss the Marginal Productivity Theory of Determination of factor prices
- aquire the concept of collective bargaining and its role in wage determination.

2.2 INTRODUCTION

For the contribution towards economic activities, the factors of production earn reward. Wage is such a reward obtained by labour. In this unit, you will be able to get acquainted with the concept of wages and the differnece between nominal wages and real wages. At the end of the unit, you will also be able to discuss an important theory in Economics, viz., the Marginal Productivity Theory of Determination of Factor Prices. Apart from that, you will also be able to acquire knowledge about the concept

of collective bargaining and its role in wage determination.

2.3 BASIC CONCEPTS OF WAGES

In this section, we shall basically deal with the meaning of wages and the differences between nominal and real wages.

2.3.1 Meaning of Wages

The term 'wages' means payment received by the provider of services of labour. Wage is the reward obtained by labour for its economic activities towards the production process. According to Benham, *"A wage may be defined as a sum of money paid under contract by an employer to a worker for services rendered."*

It is worth mentioning here that many criticize the view of considering labour as a commodity. There is no doubt that labour has many features (emotion, feeling, individual differences, etc.) which set it apart from other factors of production viz., land and/ or capital. However, in Economic theory, labour is also considered a commodity. Like a commodity, it is bought and sold in the market. Thus, a labour participates in an exchange process: it provides labour (productive capacity) and time and gets reward in the form of wage.

2.3.2 Nominal Wages vs Real Wages

Nominal wages refer to the price paid in monetary terms to a labour for his services. Thus, if a peon in an office receives Rs. 2000 per month, then this is his nominal wage per month for his service. Nominal wages are also called as *money wages*.

Sometimes, a labour gets other facilities, besides his money wage. Such additional facilities may include: festival bonus, incentives, medical re-imbursement, house rent (or free accommodation), vehicle allowance, study allowance for children etc. Thus, real wage of the labour includes his money wage plus all other goods and services he receives from the organisation.

There is another interpretation of real wage. According to this, the amount of goods and services a labour can buy out of his given money wage at any particular point of time is called the real wage. Thus, real wage is the amount of purchasing power received by a worker through the money wage. In this case, real wage depends on two factors: first, amount of money wage and second, the price level of the economy. Thus, real wage can be measured as:

$$R = \frac{W}{P}$$ where, R = Real wage, W = Money wage and P = Price level.

This means that the standard of living of a labour is determined by the real wage and not by the money wage he receives.

Determinants of Real Wage: Real wage is determined by the following factors:

- **Price Level of the Economy:** It is true that price level determines the purchasing power of money.
- **Money Wage:** Money wage also directly determines the real wage. This is because more goods and services can be bought when money wage is more.
- **Working Condition:** The working condition in which labours work also determines their real wage. Let us consider an example. Two workers get the same monthly salary, say Rs. 6000/-. But the first worker works in an office while the second worker works in a coal mine. Definitely, the first worker is much better in terms of working environment. So, we can very easily say that the real wage of the first worker is above that of the second worker.
- **Nature of the Job:** Nature of the job – whether permanent or temporary – also determines the real wage. Let us consider another example of two labourers. The first labourer working in a woolen factory earns Rs 5000/-. Another labourer working in a handloom factory earns Rs 4000/-. The first worker gets

employment only for 4 months during the winter season only, while the second worker gets his employment throughout the year. Thus, even when the first labourer earns more money wage, but his real wage is less as his employment is temporary.

- **Social Status:** The real wage is also determined by the social status assigned to a job. A teacher of a High School and a clerk of a bank may draw the same monthly salary. But in our society the teacher is bestowed with more respect than the bank clerk. Hence, the real wage of the teacher is considered more than that of the bank clerk.
- **Future Prospects:** The future job prospect also determines the real wage. Some reputed Public Sector Undertaking (PSU)s provide better job prospect than others. Thus, the real wage of a worker in such a reputed PSU will be more than that of another worker working in an ordinary organization.
- **Extra Benefits:** The real wage of the workers will be considered more if they get some other extra benefits.



CHECK YOUR PROGRESS

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

(a) Economic theory does not consider labour as a commodity as it is vastly different from other factors of production. (T/F)

(b) Another name of real wage is nominal wage. (T/F)

Q 2: What is real wage? How can you measure it? (Answer in about 50words).....

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Q 3: Mention at least four determinants of real wage. (Answer in

about30words).....

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2.4 MARGINAL PRODUCTIVITY THEORY OF DETERMINATION OF FACTOR PRICES

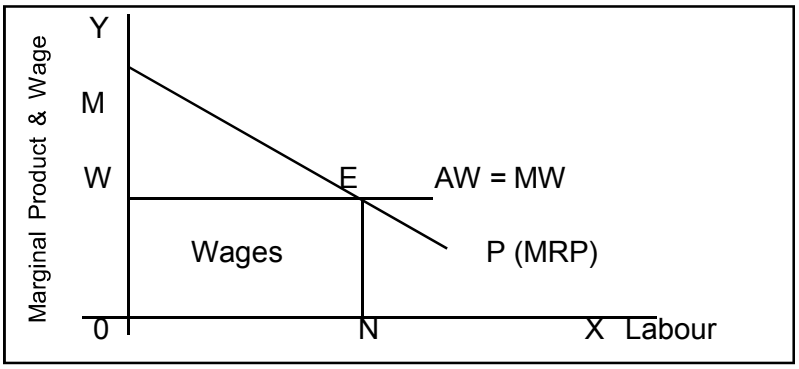
Marginal Productivity Theory was initially used by Ricardo and West in the determination of rent on land. Later, economists like J.B. Clark, Jevons, Wicksteed and others contributed to it. Among these economists, J.B. Clark was the pioneer in using this theory in wage determination.

Assumptions: Clark's Marginal Productivity Theory rests on the following assumptions:

- Clark assumes a completely static economy. Thus, changes in the form of economic growth, increase in population, technology of production, changes in stock of capital are ruled out.
- There prevails perfect competition both product and factor markets.
- Labour and capital are perfectly mobile. Labour is homogeneous.
- Form of capital can be varied at will. Thus, capital equipment of production can be adapted to varying quantities and abilities of available labour.
- The law of diminishing returns prevails.
- Profit maximisation is the goal of the firm employing labour.

Considering the above assumptions, it can be said that a rational employer will hire maximum units of labour so as to utilize his existing capital equipment to the fullest extent. It can be easily interpreted that given fixed stock of capital equipment as the firm increases labour units, its marginal productivity will decline. In fact, he will go on hiring additional units of labour as long as addition to tatal revenue made by the marginal units of labour is above the wage he has to pay for it. Thus, the employer will reach equilibrium at the position where marginal revenue product of labour is equal to the wage rate.This can be shown with the help of the Figure 2.1.

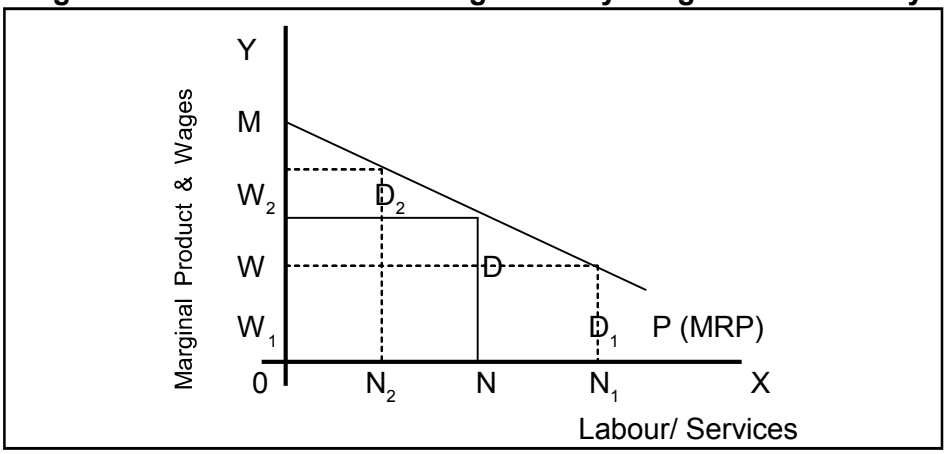
Figure 2.1 : Relation between Wage Rate and Marginal Product of Labour



In Figure 2.1, the MRP is downward sloping, as MPP declines and MR is constant due to perfect competition in the product market. The cost of the firm comes in the form of wage. Since there is perfect competition in the labour market, MW = AW. Being a profit maximiser, the firm will reach equilibrium when MRP = MW. Hence E will be the equilibrium point. Correspondingly, we get ON level of employment and OW level of equilibrium wage.

Now, we shall discuss the application of the above theory in the determination of the wage rate. Clark points out that when there is unemployment in the society, the unemployed labour will compete among themselves to get employment. This will reduce the prevailing wage rate. On the other hand, the employers will bid the wage rate up if the prevailing wage rate is lower than the marginal product of available labour force. This happens because when the wage rate is lower than the marginal product of labour, the employers' demand for labour force will be more than the available labour force. In this situation, the employer finds it more profitable to employ more labour units at lower cost. Thus, given the labour supply in the economy, there will be competition among the employers to get more labour units to its firm. Thus, the increased demand for labour will push up the wage rate. This has been explained with the help of Figure 2.2.

Figure 2.2: Determination of Wage Rate by Marginal Productivity



From figure 2.2 it can be seen that that ON amount of labour is available in the whole economy. Corresponding to this quantity of labour ON, the marginal revenue product of labour is ND. As we have already discussed, the equilibrium wage rate is determined by the marginal revenue product of labour. Thus, corresponding to the level of marginal revenue product ND, the equilibrium wage rate is OW.

Now, at a wage rate higher than OW, say OW_2, the labour force employed will be ON_2. This is lower than the full employment level ON; hence, there will be competition among the unemployed labour force (NN_2), and consequently, it will bring the wage rate down to OW.

Similarly, at a wage rate lower than OW, say OW_1, employer will find it profitable to employ more units of labour as wage rate (OW_1) is below the marginal product of labour (OW or ND). Thus, the demand for labour will be ON_1, against the total supply of labour ON. This will propel competition among the employers, and given the labour supply, the wage rate will increase to OW.



CHECK YOUR PROGRESS

Q 4: What are the assumptions of Clark's version of the Marginal Productivity theory of Distribution? (Answer in about 50 words)

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Q 5: Why does an employer tend to increase its labour employment when the wage rate is below the marginal productivity curve of labour? What is the consequence? (Answer within 50 words)

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2.5 WAGES AND COLLECTIVE BARGAINING

Meaning of Collective Bargaining: Some modern economists discuss determination of wage as a process of collective bargaining. It is obvious that an individual worker is unlikely to affect the determination of wage rate offered to him. However, if the workers are organized and they form a trade union, the bargaining power of the workers increases and they can affect the prevailing wage rate. Thus, *collective bargaining may be defined as the process in which conditions of employment are determined by the mutual agreement between the representative of the trade union on the one hand, and representative of the employers (or employers' association) on the other*.

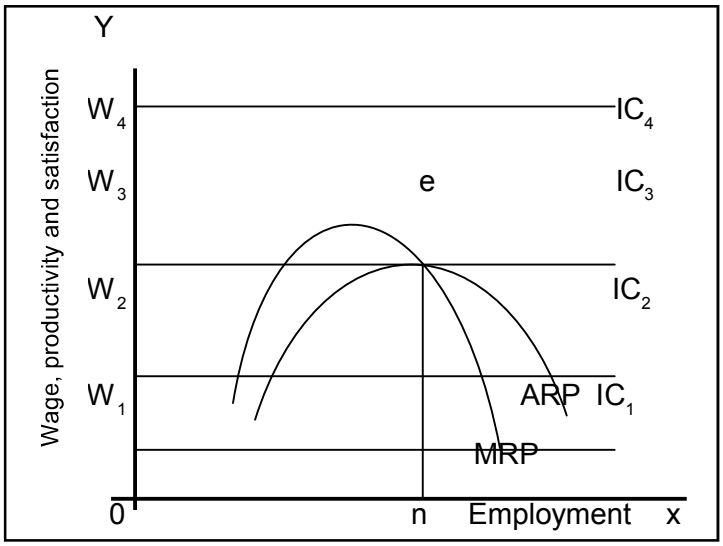
Collective Bargaining and Wage Rate Determination: Based on different market conditions, there are a number of theories regarding collective bargaining and its effect on determination of the wage rate. In this unit, we shall discuss about William Fellner's model of collective bargaining.

The model of Fellner assumes the market structure of bilateral monopoly. The model discusses wage determination through collective bargaining in two situations: first, the trade union tries to achieve maximum possible wage rate and are indifferent about the effect of such wage rate on employment generation; second, the union seeks to achieve a certain optimum combination between wage rate and employment generation.

Both the models use the tools of indifference curve and ARP and MRP curves.

Situation I: Trade Union Tries to Achieve Maximum Possible Wage Regardless of Its Effect on Employment: In this case, the shape of an indifference curve is a horizontal straight line. And, higher indifference curves from the x-axis indicate higher levels of satisfaction of the trade union. The process of collective bargaining and wage rate determination has been shown with the help of Figure 2.3.

Figure 2.3: Wage Determination under Collective Bargaining (when the Trade Union is Indifferent to the Effect of Wage Rate on Employment Generation)



From figure 2.3 it can be seen from the above figure that the successive indifferences curves are located at successively higher positions from its previous indifference curve. This means that as we move from IC_1 to IC_2, from IC_2 to IC_3 and from IC_3 to IC_4, the distance between these successive indifference curves increases. Thus, $W_1W_2 > 0W_1$; $W_3W_2 > W_1W_2$ and so on. This happens because, as we move towards higher satisfaction levels, larger increments in wage rate are required to yield a constant rise in satisfaction. This is in fact a basic human nature.

Now, when we have said that the union tries to achieve the maximum possible wage rate, it implies that the trade union will actually

face a certain limit with regard to the wage rate. Thus, there is a maximum possible limit and a minimum limit to the wage rate. It is unlikely that the employer will pay wage rate above the maximum level of ARP. Because, the employer will have to suffer losses, as cost (i.e., wage) will be above average revenue (i.e., ARP); better he may opt to close down his firm. This will leave all the workers jobless. Therefore, the trade union will try to achieve the wage rate which is equal to or is near the maximum ARP. Thus, the wage rate which is set at the tangential point of the ARP curve at its maximum point and the indifference curve is the maximum possible wage rate the trade union will be able to achieve. In the above figure, OW_3 is such a wage rate. This is because the ***ARP, MRP*** and the IC_3 curves intersect at point e corresponding to this wage rate.

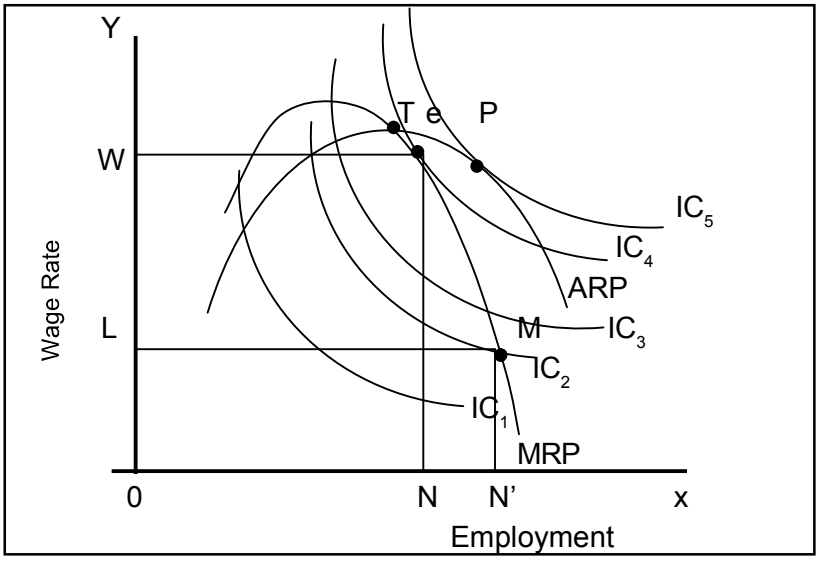


MRP and ***ARP:*** please refer to the 'Conceptual Note' at the end of this unit.

Contrary to this maximum possible wage rate, the lower limit below which the trade union will not work or will go on to strike can not be exactly determined. However, though it cannot be determined precisely, yet it can be understood that practically there will be a lower limit to the wage rate below which the trade union will decline to work. This is because the trade unions are formed to bargain for better wage rates. If this can not be achieved, members of the trade union will find it futile to be part of the union, and as a result, it will break down. So, the trade union will always try to bargain a wage rate above this minimum level and equal to or near the maximum possible wage rate. The lower limit of the wage rate depends on the factors like: a) average revenue productivity, b) the relative strength of the union or the employees, c) the business condition of the economy, d) nature of the demand of the product, e) elasticity of substitution between labour and capital, f) prevailing wage rate, g) cost of living, etc.

Situation II: Trade Union Tries to Achieve a Balance between Wage and Employment Generation: The above situation holds good only in the case of an individual firm. But, when the industrial trade union (larger than an individual firm's trade union) negotiates with the employers' association, the union will have to take into account the effect of wage rate on employment generation. This becomes necessary, because it is

Figure 2.4: Wage Determination under Collective Bargaining (when the Trade Union Seeks a Balance between Wage Rate & Employment Generation)



possible that the firms are operating under differential cost conditions, and as a result, certain firms may have to close down owing to losses in operation. This will make the workers of that particular firm jobless. So, unless there is scope of employment in other firms, the workers may find it difficult to earn their livelihood. This has been discussed with the help of Figure 2.4.

From Figure 2.4 it can be seen that the union attains the best combination of highest satisfaction and employment generation while being on the indifference curve IC_4, as this is the highest indifference curve which is tangent to the MRP curve at point e. Thus, while being on point e, the union attains OW level of wages and ON level of employment. The point e is in fact near the highest point of the ARP curve T. The union cannot achieve this level, as this point can not be tangent to an indifference curve given its present shape. The employers' association, on the other hand, will try to move to a lower point than e along the MRP curve. This is because this will reduce the cost of production and increase its profitability. So, the bargaining will continue between the industry trade union and the employers' association regarding the combination of wage rate and employment. The decisive factor, however, is the superior strength of the two parties among other factors, we have discussed in the previous

situation. As we have already said in the previous situation, there is a certain lower limit, below which the union will not come down along this MRP curve. Let us assume that point M is such a point, where indifference curve IC_2 is tangent to the MRP curve. At this point, the wage rate is OL and the employment generation is OM. Thus, the industry union will try to set wage rate above this minimum level OL and near or on the level of OW. The actual wage rate however will be determined by the relative strength of the two parties. If the bargaining power of the industry union is more, the actual wage rate will be on or near OW. Similarly, if the bargaining power of the employers' association is more, the actual wage rate will be determined above or on OL.



CHECK YOUR PROGRESS

Q 6: State whether the following statements are true (T) or false (F).

(a) The modern theory of determination of wages as determined as a process of collective bargaining has been put forward by Alfred Marshall. (T/F).

(b) The modern theory of wage determination as discussed by WilliamFelner contains three parties: a) the labour union, b) the employers and c) mediators between the two. (T/F).

Q 7: How is the actual wage rate determined in the bargaining process between the employer and the labour union? (Answer in about 60 words)

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Q 8: Mention the factors which affect the lower limit of the wage rate? (Answer in about 40 words).

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2.6 LET US SUM UP

- Clark points out that when there is unemployment in the society, the unemployed labour will compete themselves to get employment. This will reduce the prevailing wage rate.
- When wage rate is lower than marginal revenue product of labour, the employer finds it more profitable to employ more labour units at lower cost, and hence, given the labour supply in the economy, there will be competition among the employers to get more labour units to its firm. This increased demand for labour will bid up the wage rate.
- Collective bargaining may be defined as the process in which conditions of employment are determined by the mutual agreement between the representative of the trade union on the one hand, and representative of the employers (or employers' association) on the other.
- The lower limit of the wage rate depends upon several factors.



2.7 FURTHER READING

1) Ahuja, H. L. (2007). *Advanced Economic Theory: Microeconomic Analysis*. New Delhi: S.Chand & Company Ltd.

2) Chopra, P. N. (2008). *Micro Economics*. Ludhiana: Kalyani Publishers.

3) Dewett, K. K. (2005). *Modern Economic Theory*. New Delhi: S.Chand & Sons.

4) Sundharam, K. P. M., & Vaish, M. C. (1997). *Microeconomic Theory*.

New Delhi: S. Chand.



2.8 ANSWERS TO CHECK YOUR PROGRESS

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

Ans to Q No 2: Real wage may be defined as the amount of purchasing power received by a worker through the money wage. Thus, real wage depends on two factors: first, amount of money wage and second, the price level of the economy. Thus, real wage can be measured as:

$$R = \frac{W}{P}$$ where, R = Real wage, W = Money wage and P = Price level.

Ans to Q No 3: Among the determinants of real wages, important ones are:

- Price Level of the Economy,
- Money Wage,
- Working Condition, and
- Future Prospect of the Job.

Ans to Q No 4: The underlying assumptions of Clark's version of Marginal Productivity Theory of Distribution are:

- There prevails a completely static economy.
- There is perfect competition in the factor market.
- Labour and capital are perfectly mobile. Labour is homogeneous.
- Form of capital can be varied at will.

Ans to Q No 5: When wage rate is lower than marginal revenue product of labour, the employer finds it more profitable to employ more labour units at lower cost, and hence, given the labour supply in the economy, there will be competition among the employers to get more labour units to its firm. This increased demand for labour will bid up the wage rate.

Ans to Q No 6: (a) False (b) False.

Ans to Q No 7: The actual wage rate is determined by the relative strength of the two parties. If the bargaining power of the industry union is more, the actual wage rate will be on or near the maximum possible upper limit of the wage. Similarly, if the bargaining power of the employer's association more, the actual wage rate will be determined above or on the lower limit below which the union will not work.

Ans to Q No 8: The lower limit of the wage rate depends on the following major factors:

- average revenue productivity,
- the relative strength of the union or the employee,
- the business condition of the economy,
- elasticity of substitution between labour and capital,
- prevailing wage rate.



2.9 MODEL QUESTIONS

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

Q 1: Write short notes on:

(a) Wage in modern economic theory

(b) Collective Bargaining

Q 2: Show the relation between collective bargaining and wage rate determination.

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

Q 1: Discuss Clark's version of Marginal Productivity Theory of Wage determination.

Q 2: Discuss the concept of collective bargaining. How does a labour union arrive at a balance between wage rate and employment generation in a process of collective bargaining.

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UNIT 3: RENT

UNIT STRUCTURE

3.1 Learning Objectives

3.2 Introduction

3.3 Basic Concepts of Rent

3.4 The Ricardian Theory of Rent

3.5 Marshallian Concept of Producer's Surplus

3.6 Quasi-Rent

3.7 Relation between Rent and Price

3.8 Let Us Sum Up

3.9 Further Reading

3.10 Answers to Check Your Progress

3.11 Model Questions

3.1 LEARNING OBJECTIVES

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

- discuss some of the basic concepts in Rent, viz., its meaning, differences between economic rent and contract rent and rent as a surplus,
- explain the Ricardian Theory of Rent,
- discuss the Marshallian concept of producer's surplus,
- define what is Quasi-Rent and its importance, and
- discuss the relation between rent & price.

3.2 INTRODUCTION

This unit discusses rent, i.e., the reward that is accrued to land. In general, the term ‘rent’ is used in a wide sense - to mean a hiring charge. Thus, we use this term to denote the rent for a house, for a machine etc. But in Economics, the term ‘rent’ has a special use. In Economics, the term has been widely used in the sense of a surplus. This unit discusses in detail such basic concepts of rent. Apart from these, the unit also discusses the Ricardian Theory of Rent. At the end

of this unit, you will be able to discuss the concepts of Quasi-Rent and the relation between rent and price as well.

3.3 BASIC CONCEPTS OF RENT

Before we discuss rent in detail, it will be helpful for us to discuss the meaning of rent and other relevant basic concepts.

We have already said that, in general, the term 'rent' is used in a wide sense - to mean a hiring charge. Thus, we use this term to denote the rent for a house, for a machine etc. But in Economics, the term 'rent' has a special use. Originally, the term was used to mean the price paid to land for its use. But now, the term is also used for the surplus earnings of any factor of production in excess of the cost incurred to obtain its service. In the modern economic theory, the term rent is used in the following senses:

- *First,* the term refers to the rental made for the use of fixed factors of production whose existence is not dependent on any human effort or sacrifice. We know that land is one such factor, because land is a free gift of nature and its supply can not be increased. Hence, modern economics includes land rent as a part of rent.
- The *second* type of rent relates to economic rent. Economic rent means the surplus earned by a unit of factor of production over and above the minimum earnings necessary to induce it to stay in the present use, industry or occupation.
- *Third*, Marshall used the concept of rent to cover the short-run earnings (net of depreciation and interest charges) of fixed capital equipment. This is because, just like land, supply of fixed capital equipment is also inelastic during the short-run. However, since the captial equipment is not permanently in fixed supply like land, and as their supply is elastic in the long-run (which is not the case with land), hence Marshall preferred to call the short-run earnings from fixed capital equipment

as Quasi Rent rather than rent. (We shall later discuss about Quasi Rent in section 3.6 of this unit).

3.4 THE RICARDIAN THEORY OF RENT

David Ricardo's theory of rent known as "Ricardian Theory of Rent" occupies a distinct place in economic theory. Ricardo said that rent is a 'surplus' which accrues to the owner of the land by virtue of relative advantages of fertility or situation or both which a particular plot of land enjoys over less productive plots. He has defined rent in these words: *"Rent is that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil'*. Thus, rent is the price for the use of land.

From the above discussion, we can say that rent arises due to two factors:

- differences in the productivity of various plots of lands and
- situational differences

Assumptions of the Theory: The Ricardian Theory of Rent rests on the following assumptions:

- **Fixed supply of land:** Ricardo assumes that the supply of land is fixed; it can neither be increased nor decreased. Thus, it is a free, fixed gift of nature.
- **Original Powers:** Ricardo also assumes that the fertility quality of the soil is original. It means that the fertility of land is gifted by God, it cannot be affected by human effort.
- **Indestructible Powers:** Further, the theory assumes that the original fertility quality of land is indestructible. This means that the original fertility quality of a plot of land will remain intact forever, it will never diminish.
- **Cultivation in Order of Fertility:** It is also assumed that the different plots of lands are utilized according to their grade of quality. Thus, higher grade of land is utilized prior the lower grade of lands.
- **Law of Diminishing Returns:** Ricardo also assumes that the law of diminishing returns or increasing costs operates in agricultural field.

- **Differences in Fertility:** Another assumption of the theory is that different plots of land have differences in their fertility. Thus, some plots are more fertile than others.
- **Free Gift:** Land is a free gift of nature. It does not have any supply price.
- **Perfect Competition:** There is perfect competition in the market.
- **Long-run:** The theory is applicable in the long-run as well.
- **Marginal Land:** According to Ricardo, there is a 'no-rent land'. This is the lowest grade of land and the return from this plot of land just covers its cost. This plot of land is also called 'marginal land'.
- **Different Situations:** Different plots of land exist in different conditions. Some are nearer a market place, while others are distant from a market place. Thus, the producer nearer a market can save a lot of transport costs.

Explanation of the Theory: Ricardo explained his theory with the help of an example of colonization. Let us assume that there are three grades of land in a deserted colony. If some people go and settle down in that colony, first they will cultivate the best lands. If more people go and settle down, the demand for land will increase and they will cultivate the second-grade lands. As a result, the cost of production will go up. So the price of grain in the market must cover the cost of cultivation. In this case, the first grade land will get rent. After some time, if there is increase in population, even third grade lands will be cultivated. Now, even second grade lands will get rent and first grade lands will get more rent but the third grade land will not get any rent.

The theory has been explained with the help of Table 3.1

Table 3.1: Rent

Grades of land	Production (Quintal per acre)	Rent or Surplus Production (Quintal per acre)
A	24	24 – 14 = 10
B	19	19 – 14 = 5
C	14	14 – 14 = 0

From Table 3.1 it can be seen that at the first stage, when the first

batch of people migrated to the new colony, they fulfilled their demand of food production while utilizing in the best grade land. Thus, in A grade land, they were able to get a production of 24 quintals of rice per acre of land. In this situation, the A grade land would command no rent. It would be like a free gift of nature.

Now, suppose population in the colony increases (owing to migration or internal increase in population). This will necessitate increasing the area under cultivation. Thus, in addition to the A grade land, the second quality land (B grade land) is also used. This B grade land yields 19 quintal of rice per acre of land. Now, the A grade land will yield a rent equivalent to the difference in the production of the B grade land. Thus, the rent earned by A grade land at this stage is 5 (24 – 19) quintals of rice per acre of land. The B grade land being the marginal land in this case, does not earn any rent.

But the population continues to increase further. This will necessitate utilizing the remaining lowest grade (grade C) land as well. The C grade land yields 14 quintals of rice per acre of land. In this situation, both the A grade and the B grade lands will earn rent equal to the respective differences with this C grade land. Thus, A grade will earn 10 (24 – 14) quintals of rice as rent per acre of land. Similarly, B grade land will earn 5 (19-14) quintals of rice as rent per acre of land. It is to be noted that the grade C land does not get rent and hence is termed as marginal land or no-rent land.

Diagrammatic Explanation of Ricardian Theory of Rent: The Ricardian Theory of Rent has been presented with the help of Figure 3.1:

Figure 3.1: Diagrammatic representation of the Ricardian Theory of Rent

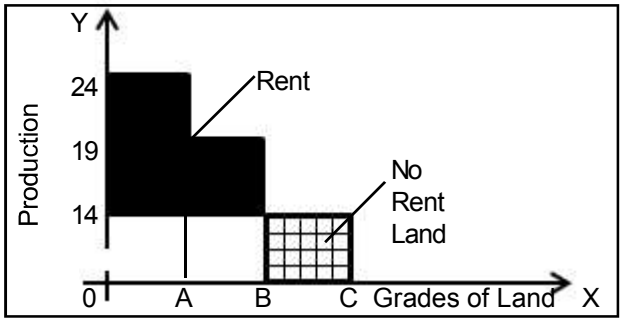


Table 3.1 has been represented with the help of Figure 3.1. You will notice from the figure that A grade land being of higher quality earns more revenue than B grade land. C grade land does not earn any rent.

Criticisms of the Ricardian Theory of Rent: Ricardian Theory of Rent has been criticized on the following grounds:

- Ricardo tells that only the best lands are cultivated first. There is no historical proof for this.
- According to Ricardo, land has "original and indestructible powers". But the fertility of land may decline after some time because of continuous cultivation.
- Ricardo believed that rent is peculiar to land alone. But many modern economists argue that the rent aspect can be seen in other factors like labour and capital. Rent arises whenever the supply of a factor is inelastic in relation to the demand for it.
- Ricardo is of the view that rent does not enter the price of the commodity produced in it. But rent enters the price from the point of view of a single firm.
- Ricardian theory does not take note of scarcity rent.
- It is based on perfect competition. Only under perfect competition, will there be one price for a good. But in the real world, we have imperfect competition.
- Though there are some criticisms against the Ricardian theory, we may note that it tells us that because of increasing pressure on land, we have to cultivate inferior lands.



CHECK YOUR PROGRESS

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

(a) The Ricardian Theory of Rent is applicable in imperfect competition as well. (T/F)

(b) Ricardo acknowledged that fertility of land may decline over time. (T/F)

Q 2 : What is no-rent land, according to Ricardo? (Answer in about 50 words)

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3.5 MARSHALLIAN CONCEPT OF PRODUCER'S SURPLUS

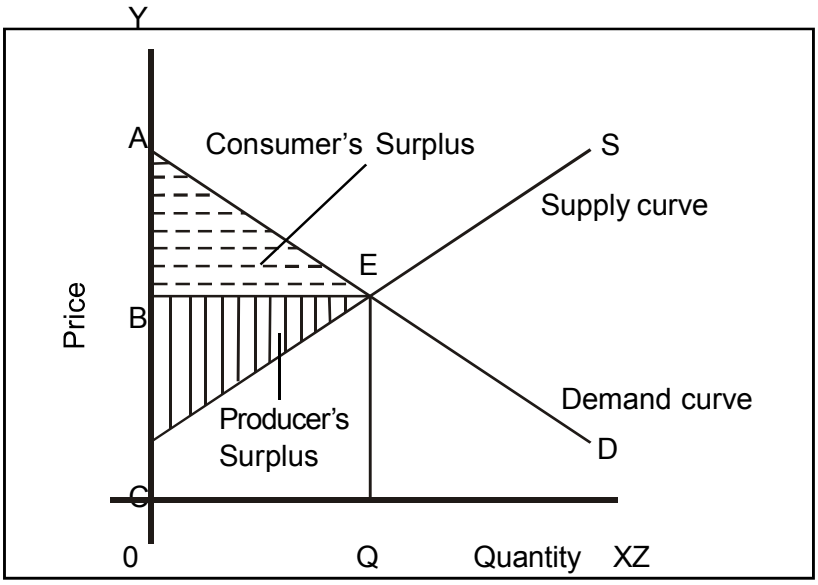
The concept of producer's surplus as well as consumer's surplus was introduced by Alfred Marshall. We have already discussed the concept of consumer's surplus in Unit 4 of the first semester course. In that context, we discussed that consumer's surplus is the amount that consumers benefit by being able to purchase a product for a price that is less than what they would be willing to pay. Let us now discuss the concept of producer's surplus.

Producer's Surplus: The producer's surplus is the amount that producers benefit by selling at a rnarket price that is higher than what they would be willing to sell for that quantity of goods. It is to be noted here that producers surplus flows through to the owners of the factors of production, unlike economic profit which is zero under perfect competition**.** If the markets for factors are perfectly competitive as well, producer's surplus ultimately ends up as economic rent to the owners of scarce inputs such as land. A surplus accruing to the owners of factors of production owing to an individual generally receiving something which has greater direct or indirect utility to him than the utility of what he gives up. The traditional measure of Producer's surplus is the area above the product supply curve and below the price as shown in Figure 3.2.

Marshall used the concept of of producer's surplus to measure the change in well-being from government policies, such as taxation. Now, if the government intervenes by implementing, for example, a ***tax*** or a ***subsidy*** then the graph of supply and demand becomes more complicated and will

also include an area that represents government surplus. In Figure 3.2, we have not considered government surplus.

Figure 3.2: Consumer's Surplus & Producer's Surplus



The consumer's surplus, the producer surplus, and the governmert surplus (if present) when combined together make up the social surplus or the total surplus.

Total surplus is the primary measure used in ***Welfare Economics*** to evaluate the efficiency of a proposed policy. Now, In the above Figure 3.2, AD represents the demand curve, CS represents the supply curve. The equilibrium price is OB or QE. In the figure, portion ABE represents consumer's surplus, while protion BEC represents the producer's surplus. It is to be noted that ABE is the consumer's surplus because, the consumer is ready to pay OAEQ for OQ amount of quantities at OB price; but he actually pays OBEQ. Thus, ABE (OAEQ – OBEQ) is the consumer's surplus. Similarly, the producer is paying OCEQ, while he is getting OBEQ. Thus, he gets an excess of BEC (OBEQ–OCEQ). BEC represents producer's surplus.

3.6 QUASI-RENT

Marshall introduced the concept of 'Quasi-rent' in Economics.

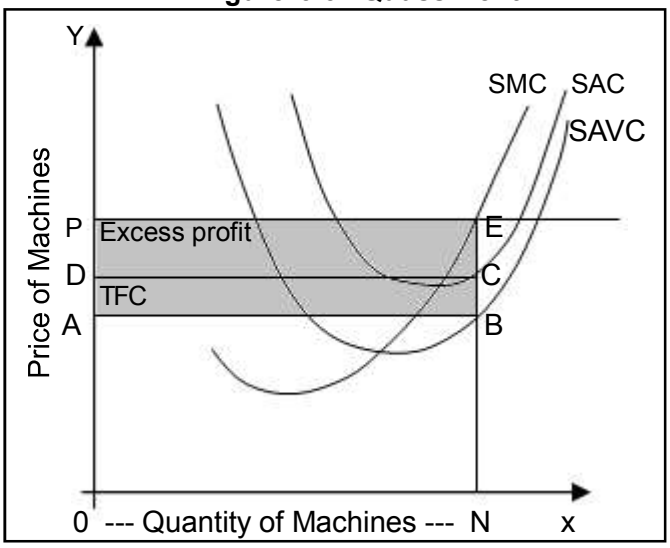
According to Marshall, '*Quasi-rent is the income derived from machines and other appliances for production by man*". There are some machines and other man-made appliances (e.g. boats) whose supply may be inelastic in the short run in relation to the demand for them. For example, when there is large increase in demand for fish during a season, the demand for boats will increase. But they can not be supplied over night. So they will earn some extra income over and above the normal income they receive. Marshall has termed this as 'Quasi-rent'. Quasi-rent will disappear, when the supply of boats increases.

Quasi-rent has also been defined as the excess of total revenue earned in the short-run over and above the total variable costs. Thus,

Quasi-rent = Total Revenue – Total Variable Cost

The concept of Quasi-rent has been explained with the help of Figure 3.3.

Figure 3.3: Quassi-rent



In the figure, P represents price. The firm maximises profit while it produces ON unit of output with 0PEN amount of total revenue. Now, the firm pays 0NBA amount of variable cost to the variable factor. This means that the residual of the total income, i.e., ABEP is the quasi-rent which goes to the fixed factor.

It is to be noted that the theory assumes that the firm operates under perfect competition. The quassi-rent can be divided into two parts. This has been shown with the help of Figure 3.3. In the figure, the area

ABCD represents the total fixed cost, while PECD represents the excess (or pure) profit.

Thus,

Quasi-rent = TFC + excess profit.

Or, Excess profit = Quasi-rent - TFC.

In the long run, as supply increases, Quasi-rent becomes zero and the firm is in equilibrium, earning just normal profit.

CHECK YOUR PROGRESS



Q 3 : State whether the following statements are true (T) or false (F).

(a) Quasi-rent is not same as profit. (T/F).

(b) Quasi-rent applies both in the short-run and in the long-run. (T/F)

Q 2 : What do you mean by Quasi-rent? (Answer in about 50 words)

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Q 3 : Why is it said that Quasi-rent appears in the short-run only and it disappears in the long-run? (Answer in about 50 words).

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3.7 RELATION BETWEEN RENT AND PRICE

Rent is price determined: Ricardian View: According to Ricardo, rent is price determined and not price determining. This means, according

to him, rent is not included in price. The modern theory of rent, however, differs from that of Ricardo. Ricardo argued that rent did not enter into the cost of production of the produce and hence is not included into its price. Rent rises because of the rise in price and not the vice versa.

While discussing the Ricardian theory of Rent, we have discussed that rent is surplus over cost. Price is determined by the margin where there is no rent. Hence, rent does not enter into price.

It is true that the differential aspect of land is not a cause of price. Say, there are two plots of land A and B. If land A gives more valuable service than land B, the extra payment yielded by land A would not affect the price of the produce.

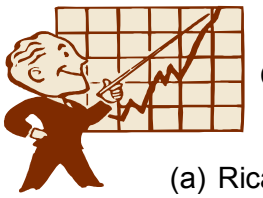
Another argument for rent not being a part of price is that land is a free gift of nature. No payment is necessary to maintain the total supply of land. In this sense, rent is not a part of the supply price of land and consequently of the products of land. Since the supply of land is inelastic, it will always work for whatever it fetches under competition value (.i.e, price) of the product, and not vice versa.

Again, it may also happen that land is specific and it can be put to only one use and to none else. A particular area of land has been allotted for specific use/industry. This means, that particular area of land can not be used in any other purpose. It is thus, a case of inelastic supply to that particular industry. So, it is immaterial regarding the price of land; it will work for whatever it gets. Thus, in this case as well, rent will be price-determined and not price determining.

Rent is price determining: Modern View: Modern economists differ with Ricardian theory. According to them, in certain cases, rent does enter into price. These cases are:

- **When land is under control**: Under perfect competition, rent does not enter into price. But if land is owned and controlled by a few landlords, they may compel the farmers to pay rent even on ‘marginal land’. In such cases, the farmers add rent (as a cost) to the price of the produce.

- **Over dependence on land**: In situations where over dependence on land leads to its over demand, the owners of land may take advantage of the situation. Thus, they may increase rents. In such cases, actual rent is higher than the economic rent; and rent enters into price.
- **Different productivity in different uses**: In some cases, productivity may vary with respect to varieties of crops. For example, it may happen that a particular plot of land yields better produce of rice than jute. Thus, certain surplus is earned while cultivating rice on that plot of land. But if the land is used in the cultivation of jute, it will yield less, but farmer will have to pay rent as applicable to rice. Hence, rent as a surplus will be included in the cost of jute. So, rent enters into price.
- **Scarcity of Fertile Land**: Fertile land is scarce. When a particular plot of land is used for some particular purpose, its availability for alternative uses is negated. Therefore, the relative scarcity of the prime land determines its price. In fact, in such situations, the rent paid by the users of prime land affects its price. Hence, indirectly, rent affects price.



CHECK YOUR PROGRESS

Q 6: State whether the following statements are true (T) or false (F).

(a) Ricardo accepted the view that rent enter into price. (T/F).

(b) According to Ricardo, rent is a part of cost of production. (T/F)

(c) According to modern economists, variability in production may result in the emergence of rent. (T/F)

Q 7: Mention any two arguments in favour of rent affecting the price of land. (Answer in about 50 words)

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3.8 LET US SUM UP

- The term 'rent' was originally used to mean the price paid to land for its use. But now, the term is also used for the surplus earnings of any factor of production in excess of the cost incurred to obtain its service.
- According to the Ricardian Theory Rent, rent is a 'surplus' which accrues to the owner of the land by virtue of relative advantages of fertility or situation or both which a particular plot of land enjoys over less productive plots.
- Ricardian Theory of Rent has been criticized on various grounds.
- The concept of Quasi-rent was introduced by Marshall.

  The concept is applicable only in the short-run.

  Quasi-rent disappears in the long-run.

  Quasi-rent is calculated as: Quasi-rent = Total Revenue – Total Variable Cost.

  The firm may earn Quasi-rent while earning profit or incurring losses.
- According to Ricardo, rent is price determined and not price determining. This means, according to him, rent is not included in price.
- Price is determined by the margin where there is no rent. Hence, rent does not enter into price.
- Land is a free gift of nature. No payment is necessary to maintain the total supply of land.
- Again in cases, where land is specific and it can be put to only one use and to none else a particular area of land has been allotted for specific use/industry, rent does not enter into price.
- According to the modern economists, in certain cases, rent does enter into price.
- When there is absence of perfect competition and land is owned and controlled by a few landlords, they may compel the farmers to pay rent even on 'marginal land'. Hence, rent enters into price.
- In situations where over dependence on land leads to its over demand,

the owners of land may take advantage of the situation. Rent may enter into price of land in such case as well.

- In some cases, productivity may vary with respect to varieties of crops. This may result in the emergence of rent and rent may be included as a cost in the price of the lower productive use.
- The relative scarcity of the prime land determines its price. In fact, in such situations, the rent paid by the users of prime land affects its price.



3.9 FURTHER READING

1) Ahuja, H. L. (2007). *Advanced Economic Theory: Microeconomic Analysis*. New Delhi: S.Chand & Company Ltd.
2) Chopra, P. N. (2008). *Micro Economics*. Ludhiana: Kalyani Publishers.
3) Dewett, K. K. (2005). *Modern Economic Theory*. New Delhi: S.Chand & Sons.



3.10 ANSWERS TO CHECK YOUR PROGRESS

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

Ans to Q No. 2: According to Ricardo, rent arises due to difference in the productivity of different grades of land. Thus, a high grade (quality) of land will yield more produce that a low grade land. Rent arises in the higher grade land. The marginal (the lowest quality) plot of land will thus, yield no rent, and hence has been termed as 'no rent' land by Ricardo.

Ans to Q No. 3: (a) True (b) False

Ans to Q No. 4: If there is large increase in demand for fish during a season, the demand for boats will increase. But they can not be supplied over night. So they will earn some extra income over and above the normal income they receive. Marshall has termed this as 'Quasi-rent'.

Ans to Q No. 5: Quasi-rent appears only in the short-run as a result of

sudden rise in demand for a machinery, supply of which can not be fulfilled over night. Due to shortage in supply, the existing machineries earn extra income. This is the Quasi-rent. But, such earning will disappear in the long-run, when supply of that machinery increases.

Ans to Q No. 6: (a) False (b) False (c) True

Ans to Q No. 7: Rent may enter into price in situations like:

- Over dependence on land leads to its over demand, the owners of land may take advantage of the situation. Rent may enter into price of land in such case, and secondly,
- The relative scarcity of the prime land determines its price. In fact, in such situations as well, the rent paid by the users of prime land affects its price.



3.11 MODEL QUESTIONS

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

Q 1: Write short notes on:

(a) Rent in modern economic theory (b) Quasi-rent

Q 2: Show the differences between Rent and Quasi-rent.

Q 3: Mention similarities between Rent and Quasi-rent.

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

Q 1: Critically discuss the Ricardian Theory of Rent.

Q 2: Explain the concept of Quasi-rent. *'A firm can earn Quasi-rent regardless of earning of profit or incurring of losses.'* Explain the above statement.

*** ***** ***

UNIT 4 : PROFIT

UNIT STRUCTURE

4.1 Learning Objectives

4.2 Introduction

4.3 Basic Concepts in Profit

4.3.1 Meaning of Profit

4.3.2 Gross Profit

4.3.3 Net Profit

4.3.4 Differences between Gross Profit and Net Profit

4.3.5 Nature of Profit

4.4 Theories of Profit

4.4.1 Uncertainty Bearing Theory of Profit

4.4.2 Innovation Theory of Profit

4.5 Let Us Sum Up

4.6 Further Readings

4.7 Answers to Check Your Progress

4.8 Model Questions

4.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

- put forward the definition of profit
- distinguish between net profit and gross profit
- discuss the nature of profit
- discuss the Innovation Theory of Profit
- explain Uncertainty Bearing Theory of Profit.

4.2 INTRODUCTION

We have already discussed that the four factors of production viz., land, labour, capital and entrepreneur get rewards for their contribution to production. Land gets rent and labour gets wages as rewards for their

services. Similarly, capital gets reward for its services which is termed as interest. This unit discusses the other such reward, i.e., profit.

Profit is the factor income of the entrepreneur. It is the difference between the income of the business and all its costs/expenses. It is normally measured over a period of time. Profit is called the reward to the owners of the business. They have taken risks with their money and time. If there were no profit, then there would be little point in starting up or putting more money into the business; they might as well put the money into a bank and earn interest on the deposit.

4.3 BASIC CONCEPTS IN PROFIT

Before we discuss profit in detail, it will be helpful for us to discuss the meaning and nature of the term 'profit', and the concepts of gross profit and net profit.

4.3.1 Meaning & Nature of Profit

We have already stated that profit is the factor income of the entrepreneur. The entrepreneur collects the three factors of production – land, labour and capital and coordinates their activities and undertakes risks of production. Profit is the difference between the income of the business and all its costs/expenses. It is normally measured over a period of time.

The nature of income earned by the entrepreneur is different from that earned by the other factors of production. The important differences are:

- First, rent, wages and interest are known beforehand; profit is unknown.
- Secondly, rent, wages and interest cannot be zero, far less negative; profit may be zero or even negative as well (loss).
- Thirdly, incomes earned by the other factors of production are not residual income, but profit is what remains after making payment to the other factors of production. Thus, profit is a residual income.

4.3.2 Gross Profit

Gross profit is the difference between the revenue earned from the sales of products and the total ***explicit costs*** incurred by the entrepreneur. Thus, costs of purchasing factors of production from the factor markets are excluded from gross profit.



Explicit Cost : Cost paid to those factors of production, which are hired from utside sources.

Thus, Gross profit = Total revenue – Total Explicit Cost

Gross profit is used as a performance indicator to help the business make decisions over its pricing policies and use of materials.

Gross profit is composed of a number of elements. These elements are:

- **Wages of Management:** When the entrepreneur himself manages the business, his gross profits will include wages for his management. In reality, wages are not a part of his profits because he can earn them even if he work in some other firm as a manager. That is why wages for his self management of the business is included in his gross profit; however, the same will be subtracted to derive the net profit.
- **Rent on entrepreneur's own land:** The entrepreneur may start his business on his own land. For utilisation of his land in the business purpose, he is paid rent. Just like wages, rent is also not a part of his profits because he can earn them even if he leases out that piece of land to other entrepreneur as well. That is why rent on entrepreneur's own land for business is a part of gross profit; however, the same will be subtracted to derive the net profit.
- **Interest on his own capital:** When the entrepreneur invests his own capital in the business, he earns interests on them. Just like the above two, interest is also not a part of his profits because he can earn them even if he lends his capital to other businesses. That is why, interest on his own capital is included in his gross profit; however, the same will be subtracted to derive the net profit.

- **Windfall profit:** The un-expected rise in the price of the commodity produced generates larger profit for the entrepreneur. This additional profit will be included in gross profit.
- **Monopoly profit:** The entrepreneur who enjoys copyright and patent right and who enjoys monopoly right over the quantity and price of the commodity produced will be enjoying a higher income. This income will be a part of gross profit.
- **Production differentiation:** Advertisement, customer service like home delivery of goods and such other factors cause product differentiation. It may lead to an increase in the demand for the commodity and add to the profits of the entrepreneur. This profit will be included in gross profit.

4.3.3 Net Profit

It is to be noted that there is no unanimous agreement among the economists regarding the components of gross profit and net profit. While some include the elements of windfall profit, monopoly profit, profits arising out of entrepreneur's abilities to bear risk and uncertainties, innovative spirit and product differentiation as parts of gross profit, some include them as part of net profit. However, it has been observed that modern economists often tend to accept the American view of profit as being the reward for purely entrepreneurial functions, i.e., functions which cannot be performed by paid employees. Thus, entrepreneurial abilities viz., risk bearing, uncertainty bearing, bargaining skill, innovation, etc. result in his net profit.



Implicit Cost : Cost paid to those factors of production, which come from within the firm.

In terms of ***explici***t and ***implicit costs***, net profit can be shown as:

Net Profit = Gross profit – Implicit costs of production – Depreciation.

Net profit consists of a number of elements. These are:

- **Bearing risks and uncertainties:** The entrepreneur starts production of a commodity in anticipation of its future demand.

The future demand may fall or may not rise up to the desired level. For undertaking this risk and uncertainty, the entrepreneur will earn an income which will be a part of his net profit.

- **Gains as superior bargainer:** The entrepreneur may also gain from bargaining with labourers, capitalists, landlords, suppliers of raw materials and consumers. These gains arise because of his superior skill in bargaining.
- **Innovation:** According to Schumpeter, the innovator entrepreneur will earn a higher income than the ordinary entrepreneur. This extra income will be a part of net profit.

It is noteworthy that the joint stock company earns pure profit as the share-holders are the owners of this company and they do not supply land, labour and capital to the company.

4.3.4 Differences between Gross Profit and Net Profit

We have already stated that there is no unanimous agreement regarding the components of gross profit and net profit. Hence, clear cut differentiation between the two is not always beyond criticism. However, based on our above discussion, the following distinctions between the two have been shown in Table 4.1.

Table 4.1: Distinction between Gross Profit and Net Profit

Sl	Gross Profit	Net Profit
(1)	(2)	(3)
1	Gross profit is a wider concept	NP is in fact a part of gross profit
2	Gross profit excludes only explicit costs	NP excludes both explicit and implicit costs
3	*Formula*: GP = TR – Explicit costs	*Formula*: NP = TR – TC



TR = Total Revenue
TC = Total Cost
GP = Gross Profit
NP = Net Profit

4.3.5 Nature of Profit

We have already discussed profit as the difference between total revenue (total value of sales, or sale proceeds) and total cost

(total cost of inputs). It should be remembered here that revenue or sale proceeds are determined by the demand conditions in the market (i.e., physical volume of sales and price of the products), while cost is determined by the supply conditions in the market (supply of inputs). When we say, profit is a surplus, we must also remember that profit is credited to the owner/ entrepreneur and is calculated at the last (as a residue), after payment to all other factors of production are paid.

While discussing the nature of profit, the following points must be kept in mind:

- Profit is a residual income, and hence its size varies. However, other factors of production get contractual income and are thus fixed.
- At times, profit may be zero or even negative. Wages, interest and rent are however always positive.
- Profits depend on the level of business activities. Innovations and continuous upgradation brings more profit to the business. On the contrary, profits would be low if there is a lack of innovation. In loose terms, profit may be viewed as a performance indicator of the business.
- In a free market economy profit plays a significant role. It serves as an incentive to undertake risks and entrepreneurial activities.
- Profits also serve as a guiding principle in undertaking business activities in the most efficient ways.



CHECK YOUR PROGRESS

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

(a) The nature of income earned by the entrepreneur is different from that earned by the other factors of production. (T/ F)

(b) Rent, wages and interest are known beforehand; profit

is unknown. (T/F)

(c) Net profit does not exclude explicit and implicit costs. (T/F)

Q 2: Mention any two differences between profit and other factors of production? (Answer in about 30 words)

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Q 3: Why is profit called the reward to the owner of the business? (Answer in about 30 words)

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4.4 THEORIES OF PROFIT

There are many theories of profit – rent theory of profit, wages theory of profit, dynamic theory, innovation theory, marginal productivity theory, risk theory, uncertainty bearing theory and the like. Out of these, we shall discuss here two theories, viz.: the Uncertainty Bearing Theory of Profit and the Innovation Theory of Profit.

4.4.1 Uncertainty Bearing Theory of Profit

Prof. Frank Knight explains the uncertainty bearing theory of profit in his book *"Risk, Uncertainty and Profit"*. Knight has made strict distinction between risks and uncertainty. According to him, risks are those which are foreseeable and which can be insured. Thus, the risks like: death, fire and sinking of ships can be mitigated through opting for insurance for them. The payment of insurance premium in such cases is included in the cost of production. Thus, risks on such cases, does not lie on the entrepreneur; rather, they rest with the respective insurance companies. Therefore, he has argued that a business does not earn profit for mitigating such insurable risks. But, uncertainties associated with the factors like:

marketability of the product (e.g., change in demand due to change in customers' tastes and preferences, etc.) can not be foreseen and insured. According to Knight, an entrepreneur earns profit precisely for bearing such uncertainties in business.

Knight has gone further to include undertaking of uncertainty as a factor of production. According to him, like other factors of production, uncertainty-bearing has a supply price; i.e., unless certain returns are expected, no entrepreneur will be motivated to face uncertainty. The extent of such motivations, however depend on a) temperament of the entrepreneur, b) total resources he possesses and c) the proportion of these resources he is inclined to expose to uncertainty..



LET US KNOW

Uncertainty may arise because of a number of factors. These factors are:

- The industry may be taken by the government particularly when it enjoys monopoly power and the price charged by it is generally considered to be high.
- The introduction of a new technology may cause a loss to the industries using the old technique of production. This uncertainty is also non-measurable.
- Competition thrown up by the entry of new firms into the industry may also eat into the profits of the existing firms and expose them to uncertainties.
- Cyclical fluctuations also introduce an element of uncertainty and affect the amount of profit.

Criticisms of the Uncertainty Theory of Profit: Knight's theory of uncertainty bearing has been criticised on the following grounds:

- Knight has raised uncertainty bearing almost to the status of

an independent factor of production. Actually, uncertainty bearing is a part of the real cost of production.

- Uncertainty bearing is one of the elements of profit but not the only element. Other elements like monopoly price, product differentiation etc. can also generate profit.
- Knight has overlooked the distinction between the proprietorship and the share-holders who are the owners of the unit and they therefore bear the uncertainties. Thus, although Knight's theory marks an improvement over Hawley's theory, yet it is not free from the defects as mentioned above.

4.4.2 Innovation Theory of Profit

We have already stated that innovation is one of the important elements of profit. This theory is associated with Joseph Schumpeter. According to him, innovation plays a special role in the earning of profit. It is the innovative spirit of the entrepreneur which can yield the highest profit. Schumpeter has considered innovation to be the principal function of the entrepreneur.

Schumpeter has laid a very wide meaning to the term 'innovation'. According to him, innovations refer to any of these:

- introduction of a new product,
- introduction of a new technique of production,
- discovery of a new source of raw materials, and
- discovery of a new market.

Schumpeter points out two types of innovations: *First*, those which bring changes in the production function and, as a result, reduce the cost of production. Innovations in this type include: introduction of new machinery, improved production techniques or processes, exploration of new source or type of raw materials, etc.

Second, those innovations, which change the demand or utility function by increasing the demand for the product. Innovation in this type include: introduction of new product or a new variety of old product, new and more effective mode of advertisement, entry into new markets, etc.

Effective innovation in any of the above earns more profit, because through innovation either the cost of production is reduced or the product brings a better price. It is to be noted that profits owing to innovations are temporary. Because, introduction of similar product/technology by competing brands may wipe out the advantages of the initial innovator. However, if the innovation gets patented, the gain remains for a considerable period of time. Thus, the superior entrepreneurs in a dynamic economy gain through innovations.

Another important consideration here is that profit is both the cause and effect of innovation. Prospecting profit serves as an incentive of innovation; hence, profit is the cause of innovation. Again, profit is resulted out of successful innovations; hence profit is also the effect of innovation.

Criticism of the Innovation Theory of Profit: The innovation theory of profit has been criticised on the following grounds:

- The innovation theory of profit ignores uncertainty as a source of profit.
- The role of bearing risk in profit has also been ignored.



CHECK YOUR PROGRESS

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

(a) F.B. Hawley is associated with the Uncertainty-bearing Theory of Profit. (T/F)

(b) According to Knight, an entrepreneur earns profit for bearing unpredictable uncertainties, and not for undertaking insurable risks. (T/F)

Q 5: How does an innovation bring profit to the entrepreneur? (Answer within 30 words)

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4.5 LET US SUM UP

- Profit is the income of the entrepreneur.
- Profit is a residual income.
- Net profit is a part of gross profit.
- When the total explicit cost of the entrepreneur is deducted from total revenue, we get gross profit.
- Similarly, when the total cost (explicit cost and implicit cost) is deducted from total revenue, we get net profit.
- Effective innovation earns more profit, because through innovation either the cost of production is reduced or the product brings a better price.
- Profits owing to innovations are temporary. Because, introduction of similar product/technology by competing brands may wipe out the advantages of the initial innovator.
- However, if the innovation is patented, the gain remains for a considerable period of time. Thus, the superior entrepreneur in a dynamic economy gains through innovations.
- Another important consideration here is that, profits are both the cause and effect of innovations. Prospective profits serve as an incentive of innovation; hence, profit is the cause of innovation. Again, profit is the result of successful innovations; hence profit is also the effect of innovation.
- Uncertainty, on the other hand, is associated with the factors like marketability of the product (e.g., change in demand due to change in customers' tastes and preferences, etc.) which can not be foreseen and insured.
- According to Knight, an entrepreneur earns profit precisely for bearing

such uncertainties in business.

- Knight has gone further to include undertaking of uncertainty as a factor of production. According to him, like other factors of production, uncertainty-bearing has a supply price; i.e., unless certain returns are expected, no entrepreneur will be motivated to face uncertainty.



4.6 FURTHER READINGS

1) Ahuja, H. L. (2007). *Advanced Economic Theory: Microeconomic Analysis*. New Delhi: S.Chand & Company Ltd.

2) Chopra, P. N. (2008). *Micro Economics*. Ludhiana: Kalyani Publishers.

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4) Sundharam, K. P. M., & Vaish, M. C. (1997). *Microeconomic Theory*. New Delhi: S. Chand.



4.7 ANSWERS TO CHECK YOUR PROGRESS

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

Ans to Q No 2: The nature of income earned by the entrepreneur is different from that earned by the other factors of production. The important differences are:

- First, rent, wages and interest are known beforehand; profit is unknown.
- Secondly, rent, wages and interest cannot be zero, far less negative; profit may be negative as well (loss).

Ans to Q No 3: Profit is called the reward to the owners of the business. They have taken risks with their money and time. If there is no profit, then there would be little point in starting up or putting more money into the business; they might as well put the money into a

bank and earn interest on the deposit.

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

Ans to Q No 5: Effective innovation brings higher profit to the entrepreneur, because through innovation either the cost of production is reduced or the product brings a better price.



4.8 MODEL QUESTIONS

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

Q 1: Write short notes on:

(a) Gross profit & Net profit (b) Innovation & earning of profit

Q 2: Show the differences between gross profit and net profit

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

Q 1: Critically discuss the Innovation Theory of Profit.

Q 2: Discuss the Uncertainty-bearing theory of profit. Why has the theory been criticised?

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UNIT 5: OUTPUT AND EMPLOYMENT: CLASSICAL THEORY

UNIT STRUCTURE

5.1 Learning Objectives

5.2 Introduction

5.3 Basic Foundation and Assumptions of the Classical Theory

5.4 Classical Theory of Employment

5.5 Keynes' Criticisms of the Classical Theory

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:

- acquire a clear idea of J.B.Say's famous Law of the Markets
- grasp the implications of the law to macro economy and policy making
- discuss the Classical Theory of Employment and the Keynesian objections to Classical Economics.

5.2 INTRODUCTION

In this unit, we shall discuss the Classical Theory of Income, Output and Employment. The Classical theory is primarly based on the Say's Law of Marrket put forward by Jean-Baptiste Say (1767-1832).

In this unit we shall briefly discuss the Say's Law of Market, the basic assumptions and the theory itself with suitable diagrammatic explanations. We shall also discuss the criticisms raised by Keynes against it.

5.3 BASIC FOUNDATION AND ASSUMPTIONS OF THE CLASSICAL THEORY

Before we discuss the basic assumptions of the Classical Theory of Income, Output and Employment, let us briefly discuss the Say's Law of Market, the very foundation of the theory. As we have already noted, the law attributed to J.B.Say is one of the pillar stones of Classical economics. According to this law, '*products exchange for products'*, which has been popularly interpreted as '*supply creates its own demand'*. The justification behind this law is that whenever something is produced and brought to the market, it only implies that the supplier wants to exchange his product for something useful which he needs. Therefore, a supplier while bringing goods to the market also brings his own demand along. Based on this observation it is claimed that in a free market economy production can be expanded as long as there are unutilized resources in the economy and it can be sold as this will also generate an equivalent amount of demand. This leads to the conclusion that as long as free market conditions exist, there can be full employment equilibrium and full employment could be the norm. This, however, does not deny the possibility of temporary over production in some sectors or items. Misdirected production may result in such over production. But this will be only a temporary phenomenon as entrepreneurs will shift from the production of goods they can not sell at a profit to goods they can sell at a profit. Thus Say's law of the markets denies any possibility of general over production or general deficiency of aggregate demand.



Barter economy: The economic system where goods are exchanged for goods.

The above is quite logical in a ***barter economy***. In a barter economy the supply of a product always means an equivalent demand for some other product. This is quite obvious as a barter system requires double coincidence of wants. But this does not seem to be necessary in case of a monetary economy. In a monetary economy, the suppliers get paid in money which they use to buy other products which they need. But it is not at all necessary that they will spend their entire sale proceeds on buying other products. But the classical writers deny this by maintaining that money is only a medium of exchange and nothing else. It is demanded for what it

does and not for what it is. There is no reason why people should hold on to money in idle form.

It is, of course, admitted that people do save out of their income and saving creates a gap between supply and demand. But this possibility is ruled out by the classical writers by maintaining that saving is always invested. Thus, while saving is seen as an increasing function of rate of interest, the investment is seen as a decreasing function of rate of interest. The equilibrium rate of interest is determined when saving equals investment. This equality is brought about by the flexible rate of interest. Therefore, the flexible interest rate mechanism brings about saving investment equality and justifies Say's law even in a money economy.



Great Depression: the world economic crisis of 1929-33.

The historical experience during the ***Great Depression*** of 1930s belied Say's law. There was massive over production or under consumption. We know that Say had categorically ruled out any general overproduction or under consumption. The Depression proved him wrong. But classical writers led by A.C.Pigou put the blame not on the market but on the organized work force that prevented a downward mobility of the wage rate. They maintained that workers were demanding a wage rate that makes their employment unprofitable from the entrepreneurs point of view. Therefore, according to them, it was wage rigidity that prevented employment and created the problem of demand deficiency. They argued that if wages and thereby prices are flexible downwards, full employment will still be the norm in a free market economy.

Implications of the Say's Law and the Basic Assumptions of the Classical Theory of Income, Output and Employment: Let us now summarise the basic implications of the Say's Law of Market and the basic assumptions of the Classical framework :

- **Absence of general over production:** Since supply always creates its own demand, there can never be over production of goods and services. Whatever is produced will be consumed.
- **No general unemployment:** As long as there are unutilized resources, production can be increased by mobilizing these resources without any fear of anything remaining unsold. Hence, there can never be the

problem of general unemployment.

- **Market Mechanism:** The free forces of market demand and supply will always correct any distortion in the production. Sectoral over production will be corrected by reallocation of resources from surplus sectors to deficit sectors. Thus, unemployment, if any, will only be a short run/temporary phenomenon.
- **No government intervention:** Since, in general, under consumption or unemployment is ruled out, there is no need for government intervention in the market. Free forces of the market are capable of correcting any short run, temporary problem. In the long-run, full employment equilibrium will be the norm even without conscious government effort in a free market economy.



CHECK YOUR PROGRESS

Q 1: The observation 'products exchange for products' of J.B.Say is popularly interpreted as …….. (Fill in the blanks)

Q 2: Pick up the correct option from the underlined words/options.

(a) The Say's law is unambiguously true in case of money/barter/ mixed economy.

(b) Say's law of the market implies state activism/ laissez faire

(c) According to Say's law there can be no temporary or long run unemployment/ temporary unemployment but no long run unemployment

(d) In the world of Say products can be increased as long as there are - unutilized resources/buyers in the market.

(e) Say's law is defended in a money economy with saving on the basis of: i) Quantity theory of money ii) Flexible rate of interest iii) Flexible wage rate and price iv) All of the above.

5.4 CLASSICAL THEORY OF EMPLOYMENT

The classical theory of employment may be attributed to the economists who adopted and perfected the economics of David Ricardo,

including J.S. Mill, Alfred Marshall, and A.C. Pigou, among others. The theory consists of Say's law of the markets, quantity theory of money, flexibility of rate of interest, wage-price flexibility, and a production function with unchanged technology. The classical theory of employment may be seen as a model of income and output determination in a free market economy. It involves the following relationships :

(i) Ns (W/P) = Nd(W/P)……(Labour market equilibrium)

(ii) Y = f (N,K)…… ..(Production Function)

(iii) M = kPY ……(Money market equilibrium)

(iv) S(r) = I (r) ……..(Goods market equilibrium)

where, Ns: Supply of labour; Nd: Demand for labour; W: money wage rate; P: General price level; Y: National income or output; K: Stock of capital; M: Quantity of money; k: Portion of income held in cash; S: Saving; I: Investment and r: market rate of interest.

The above *labour market equilibrium* (equation (i)) implies that both the demand for labour and the supply of labour are functions of real wage. While supply is a direct function, demand is an inverse function of real wage.

The *production function* indicates that with fixed techniques of production and fixed capital stock, output becomes a function of employment in the short run.

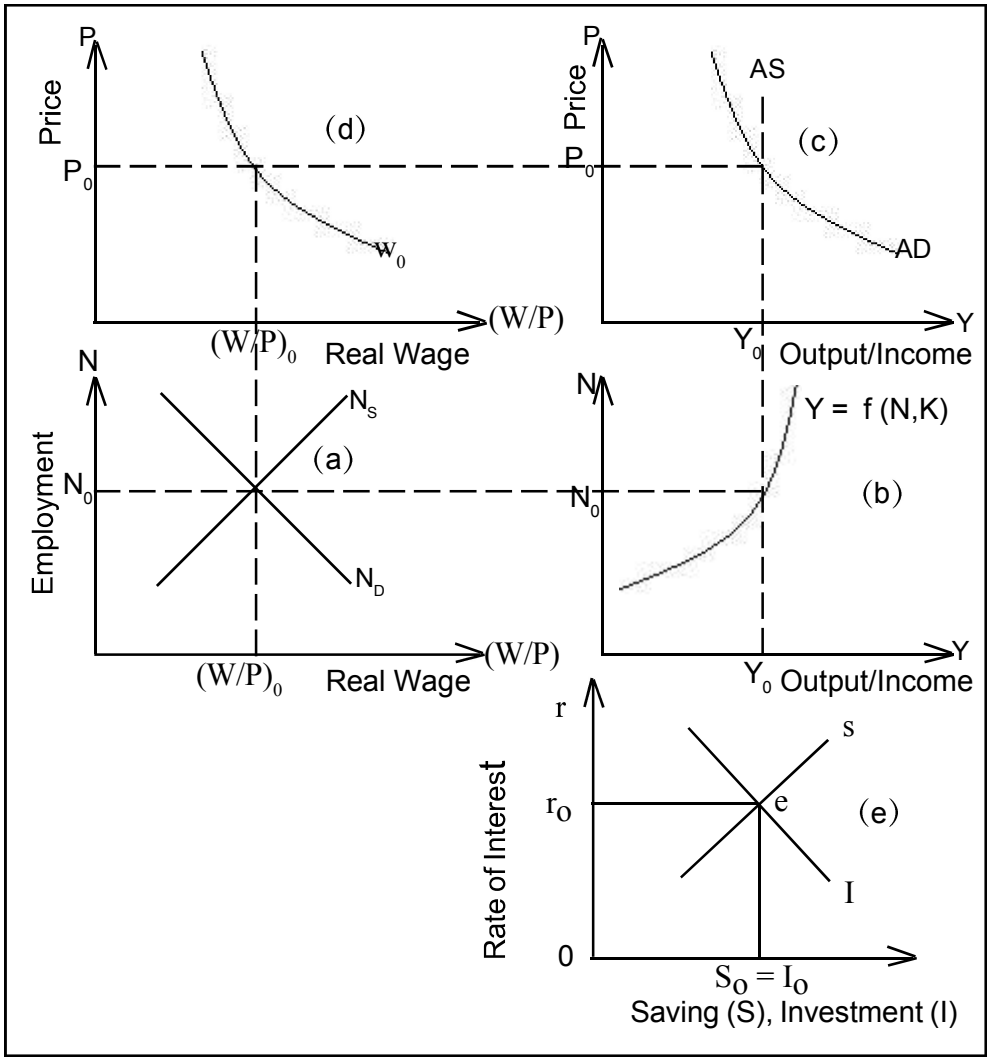
The *money market equilibrium* asserts the classical position that money is just a medium of exchange and it determines the general price level. The money wage adjusts to the equilibrium price level to produce the real wage required for full employment equilibrium.

The *goods market equilibrium* is indicated by the saving investment equality. While saving is a direct function of rate of interest, investment is an inverse function of the latter. The equilibrium interest rate is determined by the interaction of the saving and investment functions. It determines how real income is allocated between saving and consumption as well as how production is allocated between consumption goods and capital goods.

The above stated proposition not only specifies the levels of employment, output, consumption, saving, interest rate, price level, and

money wage rate but also something much more. They show that the employment level is uniquely determined at the full employment position. The price level will fall if the existing level of output can not be sold at the prevailing price. Similarly, the money wage will fall if there appears unemployment. With flexible wage and price, automatic full employment follows logically. It also follows that output will be that which can be produced with a fully employed labour force and the price level will be that at which the money supply will purchase this full employment level of output. The money wage will also be so related to the price level so as to make it profitable for the entrepreneurs to produce the full employment level of output. The entire system can be illustrated with the help of the panels of Figure 5.1.

Figure 5.1: Determination of Employment, Income etc.



In panel (a) of the Figure 5.1 the demand for and supply of labour determines the level of employment and the real wage rate. Both the demand for and supply of labour are functions of the real wage. While demand curve ($N_{D)}$ slopes downward because of the diminishing return, the supply curve ($N_{S)}$ is upward sloping as more labour is offered only at a higher wage. The intersection of the demand and supply curves determines both the real wage $(W/P)_0$ and the level of employment N_0, which is the full employment level. Given the production function, this level of employment determines the level of income or output at Y_0 in the economy as shown in panel (b). This income constitutes the aggregate supply (AS) for the economy. At the full employment level of income Y_0, the aggregate supply curve becomes perfectly inelastic. Given this perfectly inelastic supply curve, the aggregate demand curve AD, determined by the quantity of money decides the general price level P_0 which is shown in panel (c). This price level finally determines the real wage rate where the money wage is depicted by the downward sloping curve in panel (d). The money wage W_0 adjusts to the equilibrium price level to produce the real wage required for full employment equilibrium. With $(W/P)_0$ as equilibrium real wage rate and the equilibrium price level at Po, the required money wage determined is W_0. The goods market equilibrium brought about by the flexible rate of interest is shown separately at panel (e). With upward sloping saving curve (S) and downward sloping investment curve (I), the equilibrium rate of interest r_0 is determined by the intersection of the two curves. It determines how real income is distributed between saving and consumption. It also determines how production is allocated between consumption goods and capital goods.



CHECK YOUR PROGRESS

Q 3: Choose the correct one from the underlined options.

(a) According to the classical theory, saving is a function of income / rate of interest / both income and rate of interest.

(b) The aggregate supply (AS) curve in a situation of full employment is perfectly elastic/highly elastic/perfectly inelastic.

(c) The aggregate demand (AD) curve is downward sloping because of the diminishing return / wage rigidity / falling price.

Q 4: $N_S(W/P) = N_D(W/P)$. What does this equation mean in the Classical Theory of employment? (Answer in about 30 words)

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Q 5: How is the equilibrium rate of interest determined in the Classical Theory of Employment?(Answer in about 30 words)

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5.5 KEYNES' CRITICISMS OF THE CLASSICAL THEORY

The classical conclusion that the economy has an automatic tendency to move towards full employment equilibrium is not widely accepted today. However, the most scathing criticism of the classical theory of employment came from J.M.Keynes. These are briefly outlined below:

- The long run analysis of the classicists was rejected by Keynes as being impractical. In this regard he observed, "in the long run we are all dead".
- Keynes also questioned the realism of the policy of flexible wage. In a world, where trade unions have become a part of life, it is highly unrealistic to expect that workers will agree to a reduction in their wages with the hope that this will give employment to their unemployed colleagues.
- Even if wage is reduced, this is not going to have any positive impact on the entrepreneurs ability as reduced wage will mean reduced cost of production , reduced price and hence, unchanged real wage.

- Reduced wages will also bring down the aggregate demand and thereby further aggravate the problem of demand deficiency. This is because workers constitute a huge section of the society and bulk of the consumption demand emanates from them.
- Keynes also regarded under or unemployment as the norm and full employment as a 'fortuitous' accident in a free market economy. He blamed this on the forces operating in the market and saw no logical reason why they should take the economy to a situation of full employment equilibrium.
- As regards consumption expenditure, Keynes put forward his 'fundamental psychological law of consumption'. According to this law, when people's income increases, their consumption expenditure also increases but less than proportionately to the increase in income. Consequently, overtime a gap appears between income and consumption indicating positive saving and implying violation of Say's law of the market.
- There is no reason to believe that this gap will be exactly bridged by investment expenditure as savers and investors are two different groups of people.
- The saving investment equality is thought to be brought about by the classicists with a flexible rate of interest. But Keynes believed that saving is a function of income and not of interest.
- Even if investment depends on rate of interest, the rate is not fully flexible. Keynes maintains that there is a floor rate of interest at which demand for money becomes perfectly elastic and the rate of interest can not fall further. This is what is known as the 'liquidity trap'.
- Another factor that influences investment is the expectation that belongs to the realm of human psychology. Naturally, this makes private investment uncertain, erratic, and unreliable. Unfortunately the classicists overlooked the role of expectation altogether.
- A fundamental objection of Keynes is that classical writers denied the store of value function of money. According to him, money is not just a veil but much more than that. It is the link between the present and the

future and money is demanded not only for what it does but also for what it is.

- There is a water tight compartmentalization between the goods market and the money market in the classical analysis. This is known as the 'classical dichotomy'. Keynes regards this to be wrong and provides an analysis where these two markets are integrated through the rate of interest.
- The classical world is a world of certainty. But Keynes regards this as unrealistic and irrational. For him, a capitalist economy is a world of uncertainty. Individuals try to be rational by holding on to the only perfectly liquid financial asset- money, in an otherwise irrational world.
- The classical analysis and position logically leads to a free market economy based on the ***laissez-faire*** doctrine. Keynes rejects this doctrine outright. Through his path breaking analysis he shows that intervention of the state becomes a necessity to save the system of capitalism. Because of this the fiscal policy of the government emerges as a powerful weapon in Keynes, while the classical economists depended on the monetary policy.



Laissez-faire: the economic system without any kind of government intervention.

CHECK YOUR PROGRESS

Q 6: Pick up the correct option from the underlined options.

(a) The statement 'in the long run we are all dead' is attributed to- J.B.Say/ J.M.Keynes/ A.C.Pigou.

(b) J.M.Keynes highlighted the medium of exchange function of money/ store of value function of money/ means of payment function of money.

Q 7: What does 'classical dichotomy' refers to? (Answer in about 40 words)

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5.6 LET US SUM UP

- The Classical Theory of Income, Output and Employment was primarily based on the Say's law of the market. It asserts that supply always creates its own demand. As a result, there can never be over production or under consumption in the economy.
- The later day classical writers defended the Say's law, which is logically true in a barter economy, even in a money economy with saving by leaning on the quantity theory of money, flexibility of rate of interest, and the flexibility of the wage and general price level.
- The classical theory of employment may be attributed to the economists who adopted and perfected the economics of David Ricardo, including J.S.Mill, Alfred Marshall, and A.C. Pigou among others.
- The Classical theory involves the labour market, the production function with unchanged technology, money market, and the goods market.
- The demand for and supply of labour determines the level of employment and the real wage rate. Both the demand for and supply of labour are functions of the real wage.
- The Classical propositions not only specify the levels of employment, output, consumption, saving, interest rate, price level, and money wage rate but something much more. They show that the employment level is uniquely determined at the full employment position.
- The most severe criticism of the classical theory of employment came from J.M. Keynes. Keynes objected to the classical theory because of its unrealistic assumptions, as well as wrong policy prescriptions.
- Keynes also pointed out that a capitalist economy is full of uncertainty and human expectations play a crucial role in economic decision making. This makes the economy inherently unstable and erratic.



5.7 FURTHER READING

1) Jhingan, M. L. (2014). *Advanced Economic Theory. New Delhi:* Vrinda Publication Pvt. Limited

2) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*. Jalandhar: Vishal Publications.

3) Shapiro, E. (2013). *Macroeconomic Analysis*. New Delhi: Galgotia Publications Pvt. Ltd..



5.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q 1 : 'Supply creates its own demand'.

Ans to Q 2 : (a) Barter Economy

(b) Laissez faire

(c) Temporary unemployment but no long-run unemployment

(d) Unutilised resources

(e) (iv) All of the above

Ans to Q 3 : (a) Rate of interest

(b) Perfectly inelastic

(c) Diminishing return

Ans to Q 4 : In the Classical Theory of Employment the equation Ns (W/P) = Nd (W/P) means that the labour market is in equilibrium.

Ans to Q 5 : The equilibrium interest rate is determined by the interaction of the saving and investment functions.

Ans to Q 6 : (a) J.M.Keynes

(b) Store of value function of money.

Ans to Q 7 : 'Classical dichotomy' refers to the watertight compartmentalisation of the goods market and the money market. Saving investment equality establishes the goods market equilibrium and demand- supply equality of money marks the money market equilibrium with no link between the two markets.



5.9 MODEL QUESTIONS

Short Questions (Answer each question in about 150 words)

Q 1: Write a short note on the implications of the Say's Law of Markets.

Q 2: Write a short note on Keynes' objections to the Classical Theory of Employment.

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

Q 1: State and explain the Say's law of the markets. What are the criticisms against the law?

Q 2: Give a brief outline of the Classical theory of employment.

Q 3: On what grounds Keynes objected to the Classical theory of employment?

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UNIT 6 : THE KEYNESIAN THEORY OF EMPLOYMENT

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Aggregate Demand and Aggregate Supply Functions

6.4 Basic Framework of Keynesian Theory

6.5 The Principle of Effective Demand

6.6 Determination of Equilibrium Level of National Income

6.7 Aggregate Expenditure - Aggregate Output Identity

6.8 Let Us Sum Up

6.9 Further Reading

6.10 Answers to Check Your Progress

6.11 Model Questions

6.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

- acquire the concepts of aggregate demand and aggregate supply functions and will be able to draw the Aggregate Demand and Aggregate Supply curves.
- describe the principle of effective demand and how it determines the equilibrium level of employment in the Keynesian analysis.
- to explain how equilibrium income is determined in a two sector closed economy by fulfilling the basic conditions of equilibrium income.

6.2 INTRODUCTION

The Keynesian theory of employment is based on the principle of effective demand i.e., demand which is actually backed by the ability to pay. The effective demand has been defined in terms of aggregate demand and aggregate supply curves. In this section we will be elaborating the concepts

of aggregate demand and aggregate supply functions and draw the aggregate demand curve (ADC) and aggregate supply curve (ASC). Then we will show how equilibrium level of employment is determined using these two curves which may not necessarily be the full employment level of output. Then we will move on to explain the Keynesian equilibrium income determination using the Keynesian short-run non-proportional consumption function and the two basic conditions of equilibrium income. For this we will be using both numerical illustration and diagrammatic depiction.

6.3 AGGREGATE DEMAND AND AGGREGATE SUPPLY FUNCTIONS

In order to discuss the concepts of aggregate demand and aggregate supply functions, we need to be clear about the related concepts of aggregate demand and aggregate supply price. Aggregate demand price refers to the maximum sale proceeds expected by the entrepreneurs from the products produced by a given volume of employment. For instance, if by employing 100 units of labour the entrepreneurs expect a maximum sale proceeds of Rs.10,000/ by selling the products produced by this 100 units of labour, then the aggregate demand price will be Rs.10,000/ . The aggregate demand function captures this relationship between a particular volume of employment and the expected maximum sale proceeds from the products produced by that volume of employment. The graphical depiction of this functional relationship gives us the ADC. As the expected sale proceeds increase with the volume of employment, the aggregate demand curve is positively sloped in a two dimensional diagram where employment is measured along the horizontal axis and the sale proceeds are measured along the vertical axis.

Aggregate supply price, on the other hand, refers to the minimum sale proceeds required by the entrepreneurs from the sale of the products produced by a given volume of employment against that volume of employment. Thus if entrepreneurs require at least Rs.6000/ from the sale of products produced by 100 units of labour in order to be able to employ those 100 units of labour then the minimum supply price will be Rs.6000/ against those 100 units of labour. The relationship between the minimum required sale proceeds against a particular volume of employment and that

volume of employment is captured by the aggregate supply function. The graphical depiction of this aggregate supply function gives us the aggregate supply curve. As the minimum required sale proceeds increase with the volume of employment, the aggregate supply curve is positively sloped in a two dimensional diagram where employment is measured along the horizontal axis and the sale proceeds are measured along the vertical axis.



CHECK YOUR PROGRESS

Q 1: What do you mean by Aggregate Demand function? (Answer in about 40 words)

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Q 2: What relationship is captured by the Aggregate Supply Function? (Answer in about 40 words)

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Q 3: Why are the ADC and ASC positively sloped? (Answer in about 40 words) .....

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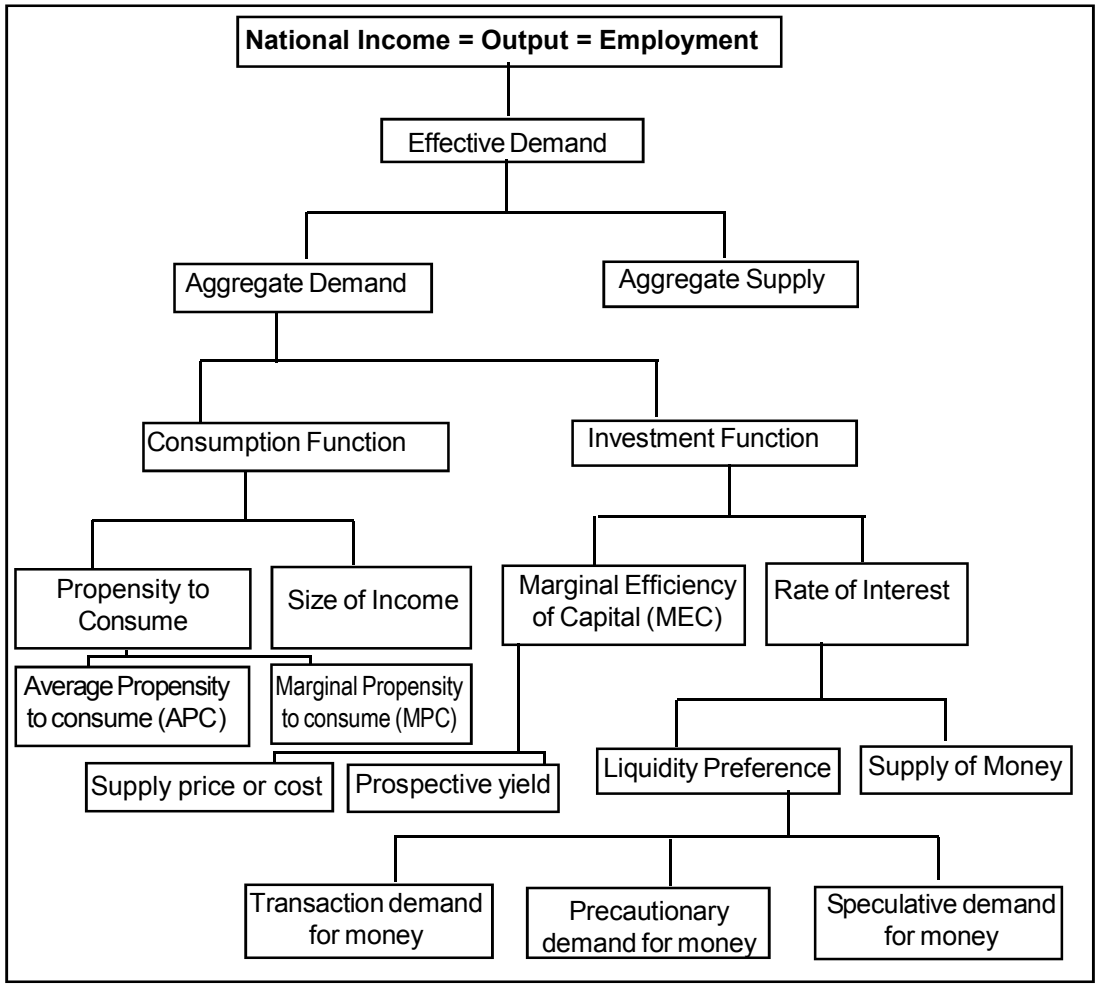
6.4 BASIC FRAMEWORK OF KEYNESIAN THEORY

Keynes occupies an undisputable prominency in the field of modern Economics in general, and the field of Macroeconomics in particular. In fact, in 1936, with the publication of the book General Theory, Keynes establilshed a distinct branch of Macroeconomic thinking, i.e., Keynesian Economics. The theory of employment is central to Keynesian Economics.

However, before going to discuss the Keynesian theory of employment, let us discuss a basic outline of the Keynesian economic thought and the assumptions on which the principle of effective demand, the basic foundation of the theory of employment rests upon.

The basic framework of the Keynesian theory of output, employment and income has been explained with the help of Figure 6.1.

Figure 6.1: Basic Framework of Keynesian theory of Output, Employment and Income



In Figure 6.1, it can be seen that in the Keynesian theoretical framework national income equals output and employment. National income, on the other hand depends on effective demand. Effective demand depends upon the consumption function and the investment function. Now, the consumption function further depends upon propensity to consume (MPC) and the size of income. On the other hand, investment function depends upon marginal efficiency of capital (MEC) and rate of interest. Now, MEC

depends upon supply price or cost of capital and the prospective yields from capital. On the other hand, rate of interest depends upon liquidity preference and supply money.

Please note that we shall study the above concepts in detail in the subsequent units of the course.

Now, let us first discuss the principle of effective demand.

6.5 THE PRINCIPLE OF EFFECTIVE DEMAND

The point of effective demand refers to the point of intersection of the aggregate demand and aggregate supply curves. It is the point at which the aggregate demand price equals the aggregate supply price. It is that level of aggregate demand for goods and services which is backed up with the resources to acquire them. This is also the aggregate demand in the economy which is met by the corresponding supply.

Effective demand manifests itself in the flow of total expenditure in the economy. From our unit on National Income we know that the value of aggregate expenditure in the economy equals the value of output which in turn equals national income of the country. Now the aggregate expenditure in an economy represents the aggregate demand for goods and services which consist of total consumption and investment expenditure. Thus, we can write,

Effective Demand (ED) = Aggregate Expenditure = Expenditure on consumption goods(C) + Expenditure on investment goods (I)

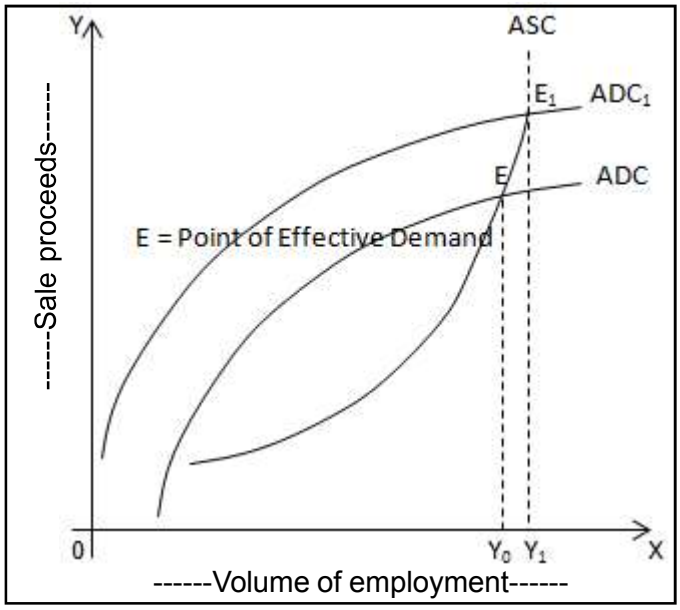
Or, ED = C + I

Determination of the point of effective demand: As we have already noted, the point of effective demand is established by the point of intersection of the aggregate demand and aggregate supply curves. This is shown in the following Figure 6.2.

In Figure 6.2, the aggregate demand price or proceeds is represented along the Y-axis, and the quantity of employment along the X-axis. The aggregate demand (AD) curve slopes upward to the right indicating that demand increases with employment. This is because as more labour is

employed, more output is produced, and total proceeds are greater. In other words, aggregate demand price increases as the amount of employment increases and vice versa. The aggregate supply (AS) curve also slopes upward as the amount of employment increases. This is because as the amount of proceeds increases, a greater amount of employment will be offered to workers by employers.

Figure 6.2: Determination of Effective Demand



Although both the AD and AS curves slope upward, they do not follow the same course. There will be some amount of employment for which the proceeds expected will exceed the proceeds necessary to induce a given volume of employment. There will also be some amounts of employment for which proceeds expected will not be sufficient to induce that amount of employment. In between there will be some amount of employment for which the expected proceeds will just equal the necessary proceeds to make the employment profitable to entrepreneurs. At this point the AD and AS curves intersect and the point of intersection determines the actual amount of employment at any time. In our diagram, the point of intersection is E which is the point of Effective Demand. Thus, it is the point of effective demand that determines the volume of employment at any time in the economy. This is the principle of effective demand and the essence of the Keynesian theory of employment. As we can see in our diagram, the equilibrium level of employment is established at Y_0.

We may also note that the point E not only determines the equilibrium level of employment, but also the point of profit maximization for the employment giving entrepreneurs. At this point, entrepreneurs maximize their profit. We observe that at any point to the left of E, the sale proceeds expected are greater than the minimum requirement. Therefore, for profit maximizing entrepreneurs it makes sense to increase the volume of employment. Again, at any point to the right of E, the minimum requirement is more than the maximum sale proceeds expected. Naturally, it means loss to the entrepreneurs and there is no sense in going beyond the point E. Thus, it is only at Y_0 level of employment that entrepreneurs will be in equilibrium enjoying maximization of profit.

We should also note that the point of effective demand does not necessarily correspond to the level of full employment. The economy is said to be fully employed only at the point where the aggregate supply curve becomes perfectly inelastic. In our diagram, Y_1 level of employment corresponds to the point where AS curve has become perfectly inelastic. Thus, Y_1 refers to the volume of full employment. Therefore, at our point of effective demand E, we have an unemployment level of Y_0Y_1.

It can be easily observed in the diagram that full employment can be obtained simply by shifting upward the aggregate demand curve ADC to ADC_1, so that the point of effective demand becomes E_1, which corresponds to the point of full employment. But Keynes sees no reason why aggregate demand curve will be shifted upward by the automatic forces of the market. We know that the constituents of the aggregate demand are: - Consumption Expenditure and Investment Expenditure. Consumption is subjected to the Fundamental Psychological Law of Consumption that makes consumption lag behind income. Investment, on the other hand, is erratic, uncertain, and unreliable because of the strong influence of speculation and expectation. Given this, there is every possibility that the aggregate demand curve (ADC) will intersect the aggregate supply curve (ASC) normally at less than full employment level. The situation can be saved, however, by the intervention by the government with its own fiscal expenditure. The government is in a

position to do so, as its actions are independent of any profit motive and it can give a definite push to the consumption expenditure of the general public. This is the reason why J.M.Keynes advocated so strongly for the intervention of the State in a demand deficient capitalist economy.



CHECK YOUR PROGRESS

Q 4: What do you mean by the term 'effective demand'? (Answer in about 30 words)

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Q 5: What are the two components of effective demand? (Answer in about 40 words) .....

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Q 6: Why is the point of effective demand is also the point of profit maximization? (Answer in about 30 words)

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6.6 DETERMINATION OF EQUILIBRIUM LEVEL OF NATIONAL INCOME

Equilibrium level of income occurs when the planned aggregate expenditure in the economy equals the value of output or the planned saving in the economy equals planned investment. In other words, for the determination of equilibrium national income two conditions need to be fulfilled. These are:

- Aggregate Expenditure = Aggregate Value of Output, i.e. Y = C + I.
- Planned Saving = Planned Investment, i.e. Ex-ante S = Ex-ante I.

Using the standard Keynesian consumption function we can show that equilibrium national income is determined both with numerical example

and a graphical presentation.

We know that the standard Keynesian consumption function takes the form: C = Ca + bY

where, C: consumption expenditure; Ca: autonomous consumption; Y: income (here, income equals disposable income under the assumption that there is no state intervention in the economy); b: marginal propensity to consume (given by the ratio of change in consumption to a change in income).

Now let us suppose that in an economy, Ca = 500, b = 0.8 and I = 1000. Given this information the equilibrium national income can be obtained as follows:

$$Y = C + I$$
$$Y = (Ca + bY) + I$$
$$Y = 500 + 0.8\,Y + 1000$$
$$Y - 0.8Y = 1500$$
$$0.2Y = 1500$$

Thus, $Y = 7500$

Again, $S = I$

$Y - C = I$ (Saving = Income - Consumption)

$$Y-(500+0.8Y) = 1000$$
$$Y - 0.8Y = 1000+500$$
$$0.2\,Y = 1500$$

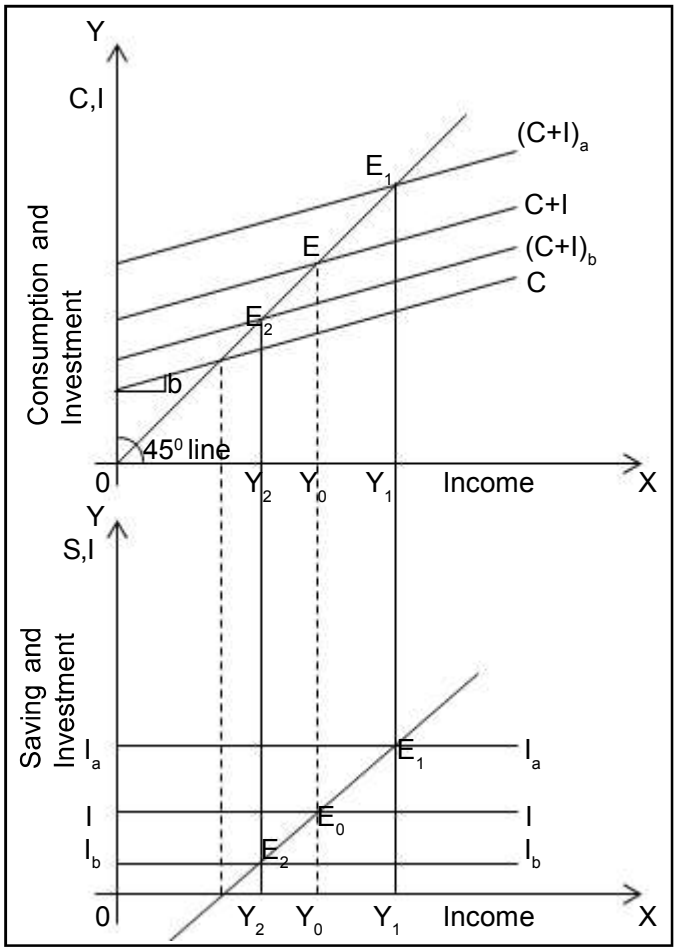
Thus, $Y = 7500$

Thus, following the condition of equilibrium national income we arrive at the same figure of 7500 for equilibrium income. This has been shown graphically in Figure 6.3.

In Figure 6.3, the line C represents consumption expenditure, which is based on the Keynesian linear non-proportional consumption function. The slope of the line b is the marginal propensity to consume (mpc).The aggregate expenditure is represented by the line C+I. The gap between C and C+I is defined by the autonomous investment expenditure I. The 45 degree line is the income expenditure identity line. Along this line aggregate expenditure equals income. In the diagram we observe that the aggregate expenditure line (C+I) intersects the 45 degree line at E. Therefore, at point

E, aggregate expenditure equals the total income and hence, E is the point of equilibrium. Correspondingly, we get Y_0 as the equilibrium income.

Figure 6.3: Determination of Equilibrium Level of National Income



Now coming to the second condition of equilibrium, we have drawn the Saving-Investment (S-I) line in the lower diagram. As consumption is positively sloped, S is also positively sloped and its slope is given by (1-b). The saving line has a negative segment as long as consumption line is above the 45 degree line. Once the 45 degree line crosses the consumption line saving becomes positive. The line I represents the autonomous investment. It is independent of income and therefore, parallel to the income axis. We see that I is intersected by S at point E. Therefore, E is the point of equality between saving and investment and hence E is the point of equilibrium. Consequently, we get Y_0 as the equilibrium income.

We may know that when there is an increase in autonomous

investment leading to an increase in aggregate expenditure, the equilibrium national income will rise. In our diagram, this is indicated by the upward shift of I to I_a. and that of (C+I) to $(C+I)_a$. Consequently, the point of equilibrium changes from E to E_1 and equilibrium income changes from Y_0 to Y_1. Clearly, $Y_1 > Y_0$. Similarly, when there is a decrease in autonomous investment the equilibrium income experiences a fall. In our diagram, it is indicated by shift of I to I_b and that of (C+I) to $(C + I)_b$. Consequently , the equilibrium point changes to E_2 and we have new equilibrium income at Y_2. Clearly, $Y_2 < Y_0$.

The above analysis is based on the standard Keynesian assumptions and therefore, this model of determining national income is also referred to as the Keynesian Cross Model.



CHECK YOUR PROGRESS

Q 7: Fill in the blank.

Aggregate Value of Output = ...

Q 8: Why does the investment line (I) become parallel to the income axis? (Answer in about 30 words).

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Q 9: Why does the saving line rise upward? (Answer in about 40 words)

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Q 10: What does happen when there is a fall in the autonomous investment? (Answer in about 20 words)

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6.7 AGGREGATE EXPENDITURE - AGGREGATE OUTPUT IDENTITY

In *General Theory*, Keynes has systematically analysed the relationship between changes in aggregate expenditure and changes in GDP. As we have already discussed, according to his analysis, in any particular year, the level of GDP is determined mainly by the level of aggregate expenditure.

Keynes identified that aggregate expenditure consists of four components :

- Consumption (C): Consumption consists of the spending of the households on goods and services.
- Planned Investment (I): Planned investments include planned spending by firms on capital goods and households, planned investment on new homes.
- Government purchases (G): This includes the spending of local, state and federal governments on goods and services.
- Net Export (NX): This includes spending by foreign firms and households on goods and services produced in the home country (say, India) less the spending by firms and residents of the home country (i.e., Indian firms and households) made on goods and services in other countries.

Macroeconomic Equilibrium: The economy attains macroeconomic equilibrium at the point where total spending, or aggregate expenditure equals total production, or total output or GDP. The analysis of macroeconomic equilibrium is same as we have already discussed in section 6.6.

LET US KNOW



We have discussed above that the relationship between aggregate expenditure and aggregate output is explained with the help of Keynesian cross. The Keynesian cross is nothing but the 45^0 equality line, on which the point of macroeconomic equilibrium lies.

It should be noted here that even when all points on the 45^0 line represents equilibrium points, in actuality there will be only one macroeconomic equilibrium point. Macroeconomic equilibrium is reached at the point where the aggregate expenditure line crosses the 45^0 line. Please refer to Figure 6.3.



CHECK YOUR PROGRESS

Q 11: When does an economy attain macro economic equilibrium? (Answer in about 30 words).

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Q 12: What is Keynesian cross? What is its significance? (Answer in about 40 words)

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6.8 LET US SUM UP

- Aggregate demand price refers to the maximum sale proceeds expected by the entrepreneurs from the products produced by a given volume of employment.
- The aggregate demand function captures this relationship between a particular volume of employment and the expected maximum sale proceeds from the products produced by that volume of employment. The graphical depiction of this functional relationship gives us the Aggregate Demand Curve (ADC) .
- The graphical depiction of this functional relationship gives us the ADC. As the expected sale proceeds increase with the volume of employment, the aggregate demand curve is positively sloped in a two dimensional

diagram where employment is measured along the horizontal axis and the sale proceeds are measured along the vertical axis.

- Aggregate supply price refers to the minimum sale proceeds required by the entrepreneurs from the sale of the products produced by a given volume of employment against that volume of employment.
- The relationship between the minimum required sale proceeds against a particular volume of employment and that volume of employment is captured by the aggregate supply function. The graphical depiction of this aggregate supply function gives us the aggregate supply curve (ASC).
- The point of effective demand refers to the point of intersection of the aggregate demand and aggregate supply curves. It is the point at which the aggregate demand price equals the aggregate supply price.
- Effective demand manifests itself in the flow of total expenditure in the economy. The aggregate expenditure in an economy represents the aggregate demand for goods and services which consist of total consumption and investment expenditure.
- It is the point of effective demand that determines the volume of employment at any time in the economy. This is the principle of effective demand and the essence of the Keynesian theory of employment.
- Equilibrium level of income occurs when the planned aggregate expenditure in the economy equals the value of output or the planned saving in the economy equals planned investment. In other words, for the determination of equilibrium national income two conditions need to be fulfilled. These are:
  - Aggregate Expenditure = Aggregate Value of Output, i.e. Y = C + I.
  - Planned Saving = Planned Investment, i.e. Ex-ante S = Ex-ante I.



6.9 FURTHER READING

1) Jhingan, M. L. (2014). *Advanced Economic Theory. New Delhi:* Vrinda Publication Pvt. Limited

2) Gupta, R.D., & Rana, A.S. (2009). *Keynes and Post-Keynesian Economics*, Jalandhar: Kalyani Publisher.

3) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*, Jalandhar: Vishal Publications.

6.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: The aggregate demand function captures the relationship between a particular volume of employment and the expected maximum sale proceeds from the products produced by that volume of employment.

Ans to Q No 2: The relationship between the minimum required sale proceeds against a particular volume of employment is captured by the aggregate supply function.

Ans to Q No 3: As the expected sale proceeds increase with the volume of employment, the ADC is positively sloped in a two dimensional diagram. Similarly, as the minimum required sale proceeds increase with the volume of employment the ASC is positively sloped in a two dimensional diagram.

Ans to Q No 4: The point of effective demand refers to the point of intersection of the aggregate demand and aggregate supply curves. It is the point at which the aggregate demand price equals the aggregate supply price.

Ans to Q No 5: Effective demand manifests itself in the flow of total expenditure in the economy. The aggregate expenditure in an economy represents the aggregate demand for goods and services which consist of total consumption and investment expenditure. Thus, aggregate consumption and aggregate investment are the two components of effective demand.

Ans to Q No 6: At any point to the left of the point of effective demand, the sale proceeds expected are greater than minimum requirement.

Again, any point to the right of the point of effective demand means loss to the entrepreneurs. Thus, it is only at the point of effective demand the entrepreneurs will be in equilibrium enjoying maximization of profit.

Ans to Q No 7: Aggregate Value of Output = Aggregate Expenditure.

Ans to Q No 8: The investment line becomes parallel to the income axis because Keynesian investment is autonomous and hence independent of income.

Ans to Q No 9: The saving line is derived from the consumption line as a residue of income from consumption. Since consumption increases as income increases but less than proportionately, saving also increases with income. Hence the saving line is upward sloping.

Ans to Q No 10: When there is a fall in the autonomous investment, the aggregate expenditure falls. This will bring down the equilibrium income in the economy.

Ans to Q No 11: The economy attains macroeconomic equilibrium at the point where total spending, or aggregate expenditure equals total production, or total output or GDP.

Ans to Q No 12: The Keynesian cross is nothing but the 45^0 equality line. This equality line exhibits the relationship between aggregate expenditure and aggregate output, which must remain equal al all levels. Along this line the point of macroeconomic equilibrium lies.



6.11 MODEL QUESTIONS

Short Questions (Answer each question in about 150 words)

Q 1: Explain briefly the concept of aggregate demand function.

Q 2: Explain briefly the concept of aggregate supply function.

Q 3: Write a short note on the concept of effective demand.

Q 4: Write a short note on aggregate expenditure-aggregate output identity.

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

Q 1: Explain diagrammatically the determination of the point of effective demand.

Q 2: Discuss the Keynesian principle of effective demand.

Q 3: What are the two conditions of equilibrium national income? Use the Keynesian cross model to explain the determination of equilibrium national income of a country.

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UNIT 7: DETERMINATION OF INTEREST RATE: KEYNESIAN APPROACH

UNIT STRUCTURE

7.1 Learning Objectives

7.2 Introduction

7.3 Keynesian Approach to Demand for Money

- 7.3.1 Transaction Demand for Money
- 7.3.2 Precautionary Demand for Money
- 7.3.3 Speculative Demand for Money
- 7.3.4 Bulls and Bears

7.4 Liquidity Preference Theory of Determination of Interest Rate

7.5 Let Us Sum Up

7.6 Answers to Check Your Progress

7.7 Further Reading

7.8 Model Questions

7.1 LEARNING OBJECTIVES

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

- derive the meaning of interest rate
- discuss the determination of Interest rate as a monetary phenomenon
- explain the concept of demand for money including transaction demand for money, precautionary demand for money and speculative demand for money
- briefly define the concepts of 'bulls' and 'bears'
- explain the liquidity preference theory of interest.

7.2 INTRODUCTION

This unit is intended to familiarsing you with some basic concepts about interest rate, determination of the interest rate as a monetary phenomenon, transaction demand for money, precautionary demand for

money, speculative demand for money and liquidity preference theory of determination of interest rate.

In ordinary language, interest is the price for the use of capital. Beginning from the classical economist such as Adam Smith, David Ricardo, there has been a vast literature explaining the nature and determination of the interest rate.

The transaction demand for money is the money required by the community for carrying out day to day transactions

The precautionary demand for money is the money required for emergencies and unforeseen contingencies like illness, accidents, unemployment and any other economic misfortune as well as money kept to take advantage of unforeseen opportunities.

The speculative motive for holding money relates to taking advantage of future market movements.

The terms bulls and bears are used to describe general actions and attitudes of participants in a stock market. A bear market refers to a decline in prices, usually for a period of a few months, in a single security or asset, group of securities or the securities market as a whole. A market is said to be bull market is when prices of securities or assets are rising.

Liquidity preference theory of determination of interest rate is one of the important theory of determination of interest rate. According to this theory, interest is reward for parting with liquidity for a specified period.

7.3 KEYNESIAN APPROACH TO DEMAND FOR MONEY

John Maynard Keynes explained the theory of demand for money in his famous book, *The General Theory of Employment, Interest and Money,* which was published in 1936. Keynes made the demand for money a function of two variables, namely, income and rate of interest. Keynes explained that people demand money basically for three motives, namely, transaction, precautionary and speculative demand for money. The significant element of the Keynes theory of demand for money is the component called of the speculative demand for money. Detailed discussion

of these three elements of the demand for money is presented in the next sections of the unit.

7.3.1 Transaction Demand for Money

The transaction demand for money is the money required by the community for carrying out day to day transactions. A household has to make purchases of articles which are to be ordinarily used by the household. A producer has to purchase different materials and services for carrying on the productive activities. The significance of the transaction demand for money arises from the fact that there is always a time lag between receipt of money income and expenditure on purchase of different goods and services. The time lag is different for different sections of people. Some people like to spend a major proportion of their income in the first week of the month while others may evenly distribute spending over the four weeks etc. An individual, household, or business firm must hold some amount of their income to bridge this gap. The planned level of real expenditure in the community depends upon the real income. The demand for transaction balances, must, therefore depend upon the real income. There is a direct functional relationship between transaction demand for money and level of income or receipt. The relation between transaction demand for money and level of income may be expressed as:

$$MD_T = f(Y)$$

where MD_T is transaction demand for money and Y is income.

Now, if we assume a linear and proportionate relationship as given in the above equation, the relation will be stated as:

$$MD_T = KY$$

Now, As K increases or decreases the demand function will shift to the right or to the left.

7.3.2 Precautionary Demand for Money

Along with transaction demand for money, most of the people hold some amount of cash in excess of the minimum required to meet the day to day transactions. The surplus amount is kept to meet the unforeseen emergencies like sickness, accidents etc. The economist W.W.Haines pointed out that precautionary demand for money is influenced by the factors such as size of assets, availability of insurance, expectation of future income or receipts, availability of credit. There is a direct relation between the size of the asset and holding of cash for precautionary purposes. The proper availability of insurance facilities reduces the necessity of maintaining cash reserves. If a person is certain that sufficient provision will be made by the insurance company for his family in the event of his death, he will not feel any necessity of keeping large precautionary balances. Some surplus cash is also kept to avail the opportunities that may arise unexpectedly. For example, while shopping for commodities, you may find a good bargain you had not planned for.

7.3.3 Speculative Demand for Money

We all know that wealth can be held in the form of landed property, bonds, money, bullion, etc. For the sake of simplicity, we can classify all other forms of assets except money, as a single entity called bonds. In fact, Keynes himself categorised assets into two types, viz., money and bonds.

A rational economic agent always tries to maximise his/her gains or earnings. Now, how to make best use of the two types of wealth, viz., money and bonds one has. Let us consider the fact that if we deposit cash in saving bank account, we earn interest and if we purchase bonds, we get monetary return on it. People often compare rate of return on bond with rate of interest on bank deposits. Thus, it is ‘speculation’ about future changes (rise/fall) in interest rate and bond prices that the resulting demand for money is called

'speculative demand for money'. This is the reason why the speculative demand for money has also been explained as ''Securing profit from knowing better than the market what the future will bring forth". The basic idea is to make money (monetary gain) out of money.

Now, to discuss how a person can maximise his/her gains from the two types of wealth, let us consider the relationship between bond price and interest rate and the relationship between rate of interest and speculative demand for money.

Price of a bond is inversely related to market rate of interest. To explain this, let us consider an example. Suppose, Rs 1,000 bond yields fixed return of 10% per annum. This means the bond has fixed annual Income of Rs 100. Now, let us assume that the rate of interest in saving bank account falls from the existing 10% per annum to 8% per annum. The question is how much money kept in bank will fetch interest of Rs 100 (equal to return from bond) after one year at the interest rate of 8%?

Let us suppose, X is the amount, then the amount will be 8% of X = 100, or X = [100 x (100/8)]. In our case, the amount would be Rs 1,250. Clearly, Rs 1,250 kept in saving bank account will give the same return (i.e., Rs 100) as Rs 1,000 invested in bond. Naturally, people will prefer to buy bond than to deposit cash in bank. Thus, we can say that with a fall in the market rate of interest (i.e., bank deposit interest) price of bond rises and vice versa. In other words, price of bond is inversely related to market rate of interest. In fact, such speculation about changes (rise/fall) in interest rate and bond prices gives rise to speculative demand for money.

Now, let us consider the relationship between speculative demand for money and the rate of interest. Speculative demand for money is inversely related to the rate of interest, i.e., higher the rate of Interest, smaller will be speculative demand for money and vice versa.

7.3.4 Bulls and Bears

As discussed in the introductory section, the terms bulls and bears are used to describe general actions and attitudes, or sentiment, either of an individual or the market. These terms are more often used in stock market to explain the behaviour of a participant. A bear market refers to a decline in prices, usually for a period of a few months, in a single security or asset, group of securities or the securities market as a whole. A bull market is when prices are rising. The terms “bear” and “bull” are derived from the way in which each animal attacks its opponents. While a bear will swipe down its opponents, a bull will thrust its horns up into the air. These actions were then related metaphorically to explain the movement of a market. If the action of a broker leads to increase in stock prices, he is considered to be a bull. On the other hand, if the action of the broker results in fall in stock prices, he is considered to be bear and the market is known as bear market.

In our previous discussion we have mentioned that speculative demand for money arises out of anticipated change (rise/ fall) in interest rates and bond prices. People, as speculators, can be broadly classified into two categories: bulls and bears. Bulls are those who expect the bond prices to rise in the future. On the contrary, bears expect the bond prices to fall. In Keynesian analysis, these expectations are assumed to be held with certainty. Bulls, then, are assumed to invest all their idle cash into bonds. On the contrary, bears will move out of bonds into cash if their expected capital losses on bonds exceed interest income from bond-holding. In this way, they would try to minimise their losses. Thus, the speculative demand for money arises only from the bears. Thus, in this sense, speculative demand for money is the demand for bearish hoards. These bears build up their cash balances to move into bonds when either bond prices have fallen as expected or when they come to expect that bond prices will rise in future.



ACTIVITY 7.1

Explain the transaction and precautionary demand for money with the help of a hypothetical example.....

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CHECK YOUR PROGRESS

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

(a) Transaction demand for money is a function of income. (T/F)

(b) The theory of rate of interest, according to the classical economist, is determined by the supply and demand for capital (T/F)

Q 2: What do you mean by demand for money? (Answer in about 40 words).....

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7.4 LIQUIDITY PREFERENCE THEORY OF DETERMINATION OF INTEREST RATE

The liquidity preference theory of determination of interest rate was put forward by the economist John Maynard Keynes. Keynes defines the rate of interest as the reward for parting with liquidity for the specified period. According to Keynes, it is not the price which brings into equilibrium the demand for resources to invest with the readiness to abstain from consumption. It is the price which equilibrates the desire to hold wealth in the form of cash with the available quantity of cash. The rate of interest,

according to Keynes, is determined by the demand for and supply of money. Of all the two determinants of the rate of interest, the supply of money refers to the total quantity of money for all purposes at all time. Though the supply of money is a function of the rate of interest, it is considered to be fixed by the monetary authorities. As a result, the supply curve of money is taken as perfectly inelastic.

For the second determinant of the demand for money, Keynes used a new term "liquidity preference" for which this theory we discussed is known as liquidity preference theory of money. The rate of interest can be explained as the premium which has to be offered to induce people to part with cash. The higher the liquidity preference, the higher will be rate of interest that will have to paid to the holder of cash to induce them to part with their liquid asset. As a result, the lower the liquidity preference, the lower will be the rate of interest that will be paid to the cash-holders. As discussed above, there are three motives behind holding cash by the people such as transaction motive, the precautionary motive and speculative motive. The transaction motive relates to the need of cash for current transactions for business and personal exchanges. It can be further divided into income and business purposes. As discussed in our previous section, income motive is meant to bridge the gap between receipt of income by an individual and its disbursements. The business motive of an individual can be explained as the interval between the expenditure incurred and receipt of income. Along with transaction demand for money, there is another motive for which people want to keep cash in hand which is known as precautionary demand for money. The precautionary motive relates to the desire of the people to keep cash in hand for unforeseen expenditure.

According to Keynes, the transaction and precautionary demand for money are comparatively highly income elastic and interest inelastic. The money held under these two motives is a function of the level of income. It can be explained as:

$M_1 = L_1 (Y)$

where M_1 represents transaction and precautionary demand for money, Y represents income.

Keynes is of the view that speculative motive is an attempt to gain by knowing better than the market what the future will bring forth. If the people have fund after meeting transaction and precautionary demand for money, they like to gain by investing in financial assets. According to Keynes, it is expectation about changes in asset prices or in the current rate of interest that determines the speculative demand for money. The speculative demand for money is a decreasing function of rate of interest. The higher the rate of interest, the lower is the speculative demand for money. On the other hand, the lower the rate of interest, the higher is the speculative demand for money. Algebraically, the speculative demand for money can be explained as:

$M_2 = L_2(r)$,

where, M_2 is the speculative demand for money, r is the rate of interest.

The curve for speculative demand for money is a smooth curve which slopes downward from left to right. At a very low rate of interest, the speculative demand for money is perfectly elastic. The portion of the curve where it is perfectly elastic is known as the liquidity trap.

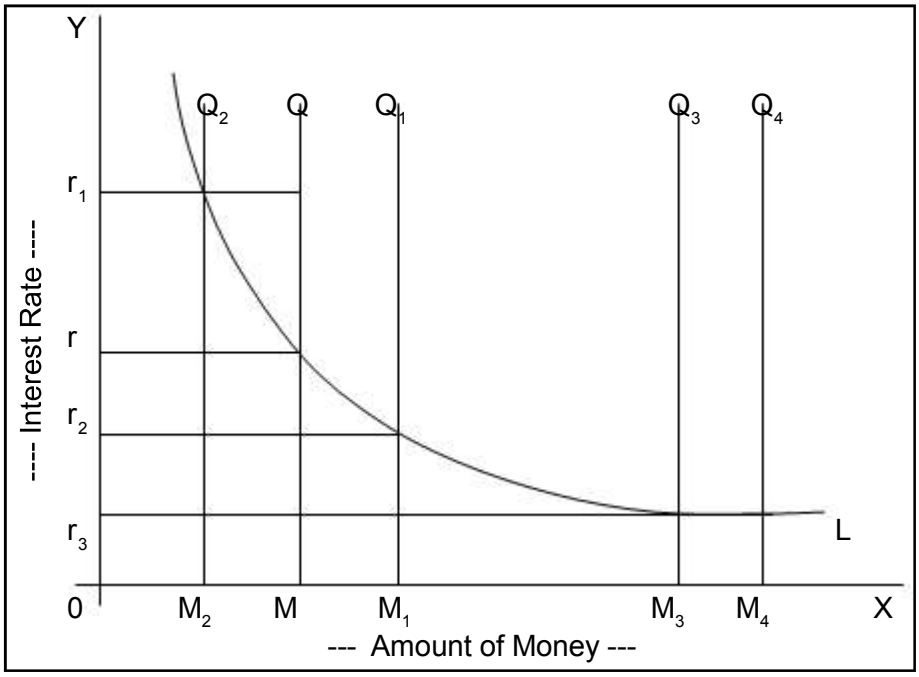
Now, if the total liquid money is expressed as M and transaction plus precautionary demand for money as M_1 and speculative demand for money as $M_{2,}$ then M is nothing but the summation of M_1 and $M_{2.}$ Now, total demand for money can be expressed as:

$$M = M_1 + M_2$$

$$M= L(Y, r)$$

We have discussed the demand and supply of money. Now, we will examine how demand and supply of money determine the rate of interest. The rate of interest is determined at a level where demand for money is equal the supply of money. It can be explained with the help of a suitable diagram represented by figure 7.1.

Figure 7.1: Determination of Interest Rate



In the above figure, the vertical lines represent supply of money which is considered to be fixed at any point of time. If the supply of money is increased by the monetary authorities, as the liquidity preference curve L remains the same, the rate of interest will fall. As supply of money has increased from Q_2M_2 to QM, the rate of interest has fallen from r_1 to r. Similarly, as the supply of money has increased from QM to Q_1M_1, the rate of interest has fallen from r to r_2. But any further increase of supply of money from the point Q_3M_3 has no effect on the rate of interest because the liquidity preference curve is perfectly elastic at r_3 rate of interest. The perfectly elastic portion of the liquidity preference curve is known as liquidity trap where the L curve is parallel to the X axis. Thus, the theory explains that the rate of interest is determined at the point where liquidity preference curve equals the supply of money curve.



CHECK YOUR PROGRESS

Q 3: State whether the following statements are true (T) or false (F).

(a) Speculative demand for money is a function of rate of interest. (T/F)

(b) The supply of money at any particular point of time (T/F)

Q 4: What do you mean by liquidity trap? (Answer in about 40 words)

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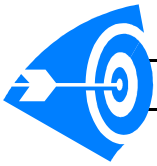
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7.5 LET US SUM UP

- There has been a vast literature explaining the nature and determination of the interest rate. Generally, Interest is said to be the price to be paid for the use of capital.
- The transaction demand for money is nothing but the money required by the people for carrying out day to day transactions.
- The transaction demand for money is a function of income.
- The money required for emergencies and unforeseen contingencies like illness, accidents, unemployment etc. also to avail the unforeseen opportunities is known as precautionary demand for money.
- The speculative demand for money arises from the attempt to make a gain knowing better about the future.
- Liquidity preference theory of determination of interest rate is one of the significant contributions of Keynes towards the explanation of interest rate. According to this theory, interest is a reward for parting with liquidity for the specified period.
- At a very low rate of interest, the Liquidity preference curve is parallel to the horizontal axis. That portion of the liquidity preference curve is known as 'liquidity trap'.



7.6 ANSWERS TO CHECK YOUR PROGRESS

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

Ans to Q No 2: Demand for money means people's desire to hold money for various purposes such as medium of exchange, money as unit of account, money as a standard of deferred payment, and money as a store of value.

Ans to Q No 3: (a) True (b) True

Ans to Q No 4: At a very low rate of interest, the liquidity preference curve is perfectly elastic. In other words, the L curve is parallel to the X axis. That portion of the curve is known as liquidity trap.



7.7 FURTHER READING

1) Jhingan, M. L. (2014). *Advanced Economic Theory. New Delhi:* Vrinda Publication Pvt. Limited

2) Gupta, R.D., & Rana, A.S. (2009). *Keynes and Post-Keynesian Economics*, Jalandhar: Kalyani Publisher.

3) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*, Jalandhar: Vishal Publications.



7.8 MODEL QUESTIONS

A) Answer each question in about 150 words.

Q 1: What do you mean by transaction demand for money?

Q 2: Discuss the factors which influence the speculative demand for money?

Q 3: What do you speculative demand for money? Explain in brief.

Q 4: What do you mean by bull and bear.

B) Answer each question in about 300-500 words.

Q 1: What do you mean by liquidity preference? How preference of the people towards liquidity helps in determination of interest rate?

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UNIT 8: KEYNESIAN CONSUMPTION FUNCTION

UNIT STRUCTURE

8.1 Learning Objectives

8.2 Introduction

8.3 Income-Consumption Relationship

8.4 Fundamental Psychological Law of Consumption

8.5 Average Propensity to Consume and Marginal Propensity to Consume

8.5.1 Significance of APC and MPC

8.5.2 Relation between APC and MPC

8.6 Factors affecting Consumption Spending

8.6.1 Subjective Factors affecting the Consumption Function

8.6.2 Objective Factors affecting the Consumption Function

8.7 Let Us Sum Up

8.8 Answers to Check Your Progress

8.9 Further Reading

8.10 Model Questions

8.1 LEARNING OBJECTIVES

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

- put forward the meaning of Keynesian Consumption function
- discuss the Fundamental Psychological Law of Consumption
- define the meaning of Average Propensity to Consume (APC) and Marginal Propensity to Consume
- discuss how to calculate APC and MPC
- explain the factors that affect the consumption function.

8.2 INTRODUCTION

This unit is concerned with familiarizing the student with some basic concepts about Keynesian consumption function, Fundamental psychological law of consumption, average propensity to consume and

marginal propensity to consume and factors affecting consumption function etc.

The Keynesian consumption function specifies the relationship between the income and consumption of an economy. It states that consumption expenditure is a function of the absolute current income. The consumption function explains the inter-relationship between consumption expenditure and level of income of consumers.

The Fundamental psychological law of consumption is an explanation of the psychological tendencies of the people with respect to consumption spending when there is change in income. It states that there is a tendency on the part of the people to spend on consumption but less than the full increment of income.

The average propensity to consume is defined as the ratio of the consumption expenditure to any particular level of income.

The marginal propensity to consume is nothing but the ratio of the change in the consumption with respect to change in income.

There are different factors which affect consumption spending such as change in the wage level, windfall gains and losses, changes in fiscal policy of the government, changes in consumer attitudes and expectations, the distribution of income, stock of consumer durables, relative prices of goods, change in the rate of interest, and financial policies of the government and corporations etc.

Detailed discussion of these topics is presented in the sections below.

8.3 INCOME-CONSUMPTION RELATIONSHIP

As discussed in the previous section, consumption function specifies the relationship between consumption expenditure and level of income. There are different economists around the world who explain this inter-relationship between these two variables. The classical economist Adam Smith also mentioned about consumption function. Another economist, Ernst Engle, on the basis of family budget studies in 1857, formulated the law of consumption which specified the changes in the consumption behavior of the people in response to the changes in their incomes. Prof Malthus and

Wicksell also mentioned about consumption function in business cycle literature. The classical economist Alfred Marshall also explicitly recognized the existence of a relationship between savings and aggregate income of the consumer. Marshall analyzed the relationship essentially from the viewpoint of long-run growth rather than short-run cyclical variations.

But, it was Keynes who actually demonstrates the theoretical significance of the consumption and income relationship in a more systematic manner. According to Keynes, consumption expenditure is the function of the absolute current income. We express this relationship in a functional form as given below:

$C = f(Y)$

Where, C is the consumption expenditure, and Y is the income of the consumer.

8.4 FUNDAMENTAL PSYCHOLOGICAL LAW OF CONSUMPTION

From the above discussion, we have learned about meaning and functional form of the consumption function. In this section of the chapter, a discussion is carried out regarding fundamental psychological law of consumption. Keynes propounded the fundamental psychological law of consumption which states that there is a tendency on the part of the people to spend on consumption less than the full increment of income. It tries to explain the psychological tendencies of the people with respect to consumption spending. Given the level of income and propensity to consume, this law explains how the people allocate their incomes between consumption and saving.

In the words of Keynes:

> "The Fundamental psychological law upon which we are entitled to depend with great confidence both a prior from our knowledge of human nature and from the detailed facts of experience, is that men are disposed as a rule and on the average to increase their consumption as their income increases but not as much as the increase in their income."

Let us discuss three proposition of Keynes psychological law of consumption.

The first proposition of Keynes psychological law of consumption states that when the aggregate income increases, consumption expenditure also increases but by a somewhat smaller amount. This proposition means

$$\partial c < \partial y$$

or $\frac{\partial C}{\partial Y} \langle 1$ and $\partial c > 0$.

Here, ∂c = Change in consumption expenditure.

∂d = Change in Income of the consumer.

In other words, Marginal propensity to consume is positive but less than unity in normal circumstances.

The second proposition of Keynes's law states that an increment in income will be divided in certain proportion between consumption spending and saving. The second proposition is nothing but the corollary of the first proposition. This proposition can be explained in terms of a equation as shown below.

$$\partial Y = \partial C + \partial S$$

where, ∂S = Change in Savings of the consumers

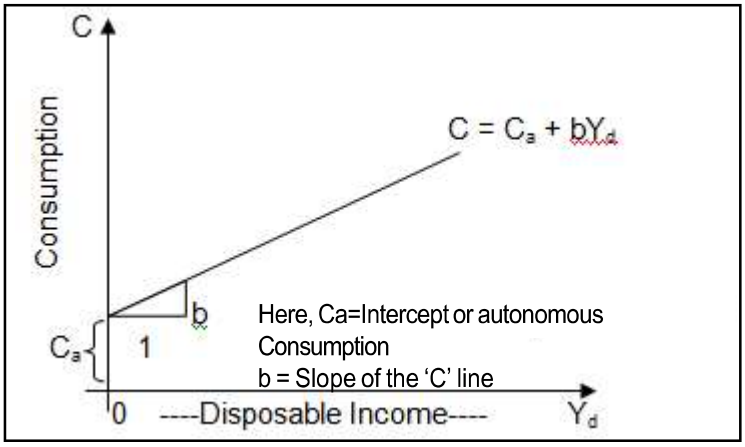
The third proposition states that an increment in income is unlikely to lead either to less saving or less spending than before. In other words, this proposition emphasizes the short run stability of the consumption function.

Thus, we can say that the Keynesian consumption function, which is based on the above psychological law of consumption, exhibits the relationship between consumption and current disposable income. It can be expressed in the form of an equation as $C = Ca + bY_d$, $0 < b < 1$.

Where, c = consumption, Ca= autonomous consumption, b= Marginal Propensity to consume, Y_d = disposable income.

The equation clearly indicates that the consumption function is non-proportional and linear. Non-proportional because of its autonomous component and linear because it gives rise to a straight line, due to constant MPC (b). The diagrammatic representation of this consumption function is given by Figure 8.1.

Figure 8.1: Keynesian Consumption Curve



These three propositions of the law can also be explained with the help of the hypothetical example as provided in table 8.1.

Table 8.1: Consumption and Income Schedule of the Consumers (In Rs. Crore)

Disposable Income (Y)	Consumption C = f(Y)	Savings (S = Y – C)
0	30	-30
70	80	-10
130	130	00
190	180	10
250	230	20
310	280	30
370	330	40

As shown in table 8.1, consumption expenditure is an increasing function of income. It can be seen from the table that when income of the consumers is zero, people spend out of their savings or taking credit from different sources. As income increases, consumption expenditure also increases, but at a decreasing rate. It can be seen from table 8.1 that as income increases by 60 crore, the consumption expenditure is also increases by 50 crore. The remaining Rs. 10 crore goes to savings.



CHECK YOUR PROGRESS

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

(a) Keynes propounded the Fundamental Psychological law of Consumption. (T/F)

(b) Consumption function is the ratio of consumption expenditure to income of the consumer. (T/F)

Q 2: What do you mean by consumption function? (Answer in about 30 words) .....

.....

.....

8.5 AVERAGE AND MARGINAL PROPENSITY TO CONSUME

From the above discussion, we have learned about Keynesian psychological law of consumption and its properties. In this section, a discussion is carried out on the technical attributes of the consumption function.

The consumption function has two technical attributes or properties.

- **The Average Propensity to consume:** The average propensity to consume is defined as the ratio of consumption expenditure to total income of the consumer. It is calculated as a consumption expenditure as a percentage of total income of the consumer. Average propesity to consume (APC) is always expressed as the percentage or proportion of income consumed. Symbolically, it can be expressed as:

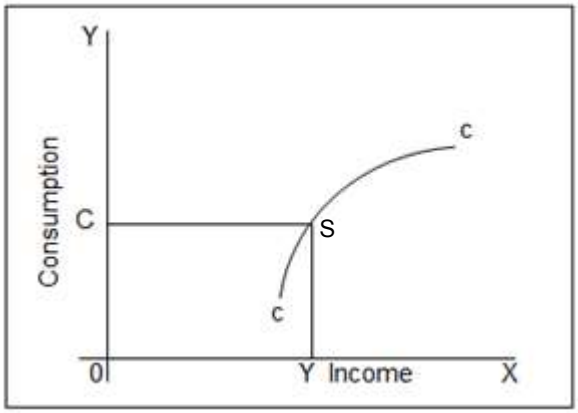
$$\textbf{Average Propensity to Consume } (\text{APC}) = \frac{C}{Y} \text{ ——— (1)}$$

Where, C = Consumption Expenditure, Y = Income of the consumer.

In general, the APC declines as income of the consumer increases. This is because the proportion of income spent on consumption expenditure decreases with increase in income.

We can also express the average propensity to consume with the help of a Figure 8.2.

Figure 8.2: Average Propensity to Consume



Now, from figure 8.2, we can compute the average propensity to consume at any point on the CC curve. For example, the average propensity to consume at point S is given by $\frac{SY}{OY}$

- **The Marginal Propensity to Consume:** Along with average propensity to consume, a discussion is made regarding marginal propensity to consume. The marginal propensity to consume is defined as the ratio of the change in consumption to the change in income. We can also express marginal propensity to consume as the change in the average propensity to consume as income changes. In other words, marginal propensity to consume is the rate of change in consumption spending.

$$\text{MPC} = \frac{\text{Change in Consumption } (C_1C_2)}{\text{Change in Income } (Y_1Y_2)}$$

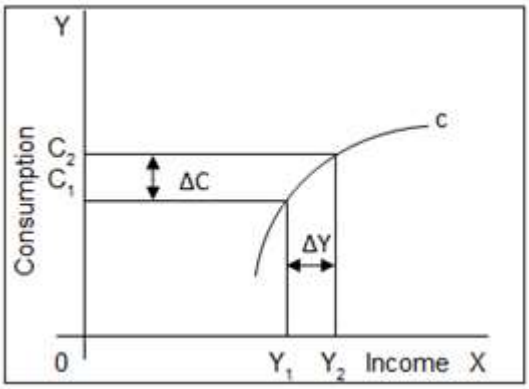
Symbolically, Marginal propensity to consume is expressed as:

$$\text{Marginal Propensity to Consume } (\text{MPC}) = \frac{\Delta C}{\Delta Y} \quad \text{.....(2)}$$

where, ΔC represent change in consumption and ΔY represents the change in income.

Like average propensity to consume, marginal propensity to consume can be shown with the help Figure 8.3.

Figure 8.3: Marginal Propensity to Consume



From figure 8.3, we can compute the marginal propensity to consume. As defined above, the marginal propensity to consume is the ratio of the change in consumption with respect to change in income. The change in income is depicted by Y_1Y_2. Similarly, the change in consumption is shown by C_1C_2. Now, we can calculate the marginal propensity to consume by dividing change in consumption (C_1C_2) by change in income (Y_1Y_2). Thus, marginal propensity to consume is

$$\text{MPC} = \frac{\text{Change in Consumption } (C_1C_2)}{\text{Change in Income } (Y_1Y_2)}$$

8.5.1 Significance of APC and MPC

In the above sub-section, we have discussed the meaning of Average and Marginal propensity to consume. We have also analyzed the method of calculation of APC and MPC. In this sub-section of the chapter, a discussion is carried out regarding significance of APC and MPC.

As discussed above, MPC is the rate of change in the APC. Generally, when income increases, the MPC falls but not more than the APC. On the contrary, when income falls, the MPC rises and APC also rises but also at a slower rate. John Maynard Keynes has emphasized on MPC in his psychological law of Consumption. This is due to that fact that Keynes gave importance on short run analysis

in his 'General Theory of Employment, Interest and Money'. In the short run analysis, MPC have more significance than APC. The Keynesian hypothesis that MPC lies between 0 and 1 ($0<\Delta C/\Delta Y<1$) has great analytical significance. It helps us to explain the theoretical possibility of general over-production or under-employment equilibrium. Again, the significance of MPC lies in the fact that it helps to explain the multiplier theory. The higher the value of MPC, the higher the multiplier and vice-versa. MPC also helps to explain the consumption behaviour of different sections of people. The MPC is generally found to be low in case of the richer section of the population and high in case of the poorer section of the population.

But the post-Keynesian economists are of the view that over the long run, APC and MPC are equal and approximate to 0.9.

8.5.2 Relation between APC and MPC

In the above sub-section of the chapter, we have discussed the significance of the technical attributes of the consumption function i.e.; APC and MPC. In this section of the chapter, a discussion is carried out about the relation between APC and MPC. As explained in earlier section, APC is the ratio of the consumption expenditure to any particular level of income. MPC is the ratio between the changes in consumption with respect to change in income.

Now, Let us explain the relationship between two technical attributes of consumption function i.e., the relation between APC and MPC. This can be explained with the help of a hypothetical example as shown in table 8.2. In this example, we have considered a stable consumption function where income increases by 60 crore and correspondingly consumption expenditure also increases by 50 crore.

Table 8.2: Relation between APC and MPC (Rs in crore)

Income	Consumption	APC = C/Y	APS=1-APC (S/Y)	MPC= $\Delta C/\Delta Y$	MPS = $\Delta S/\Delta Y$ (1-MPC)
(1)	(2)	(3)	(4)	(5)	(6)
150	150	150/150 = 1 or 100%	0	_____	_____
210	200	200/210 = 0.95 or 95%	0.05 (1-0.95)	50/60 = 0.83	0.17
270	250	250/270 = 0.93or 93%	0.07(1-0.93)	50/60 = 0.83	0.17
330	300	300/330 = 0.91or 91%	0.09(1-0.91)	50/60 = 0.83	0.17
390	350	350/390 = 0.90Or 90 %	0.10 (1-0.90)	50/60 = 0.83	0.17

Table 8.2 shows how APC and MPC are calculated and relation between APC and MPC. As shown above, column 2 and column 3 of the table shows change in income and change in consumption of the consumers. The APC of the table as shown in column 3 is the ratio of total consumption to total income. It can be clearly seen in table 2 that as income increases, the APC of the consumer gradually decreases. It decreases from 1 to 0.95 as income increases from Rs.150 crore to Rs.210 crore. Similarly, APC decreases from 0.95 to 0.93 as income increases from Rs.210 crore to Rs.270 crore. The Average propensity to Save (APS) as shown in column 4 is calculated from the relation as shown below:

APC + APS = 1.

APS = 1 - APC.

The MPC as shown in column 5 of the table is calculated as the ratio of the change in consumption to change in income. The MPS as shown in column 6 of the table is calculated based on the relation:

MPC + MPS =1.

MPS = 1 – MPC.

8.6 FACTORS AFFECTING CONSUMPTION SPENDING

From the above discussion, we have learned about psychological law of consumption and technical attributes of consumption function. In this section of the chapter, an attempt has been made to analyze the factors which affect the consumption spending.

We can broadly classify factors affecting consumption expenditure into two categories such as subjective factors and objective factors. At first, we will discuss about the subjective factors affecting the consumption spending of the consumers.

8.6.1 Subjective Factors affecting Consumption Spending

The subjective factors of the consumption function determine the slope and position of the consumption expenditure. These subjective factors are psychological characteristics of human beings, different social practices and behavior of the business concern. There are different individual motives of the consumers which refrains them from spending their income such as the desire to save for unforeseen contingencies, the urge to provide for anticipated future needs such as old age, sickness etc, the speculative behavior of the consumer, the desire to enjoy the sense of independence etc.

There are also different business motives which affect the consumption spending of the consumer. Keynes lists four motives such as:

- **Enterprise:** This implies the desire to do big things and to expand.
- **Liquidity:** This motive implies the desire to meet emergencies and difficulties successfully.

- **Increase in Income:** This business motive implies the desire of the consumers to secure large income for successful management of their business.
- **Financial Prudence:** This implies the desire to provide adequate financial resources against depreciation and obsolescence.

8.6.2 Objective Factors affecting Consumption Spending

The objective factors which resulted marked shift in the consumption function are as follows:

- **Windfall Gains and Losses:** The consumption function shifts upward and downward due to unexpected windfall gains and losses. For example, unexpected changes in the stock market leading to gains or losses tend to shift the consumption function.
- **Changes in the Fiscal Policy:** Changes in the fiscal policy in the form of collection of revenue through tax and non-tax measures and public expenditure affect the consumption spending. High rate of commodity taxation adversely affect the consumption function by reducing the disposable income of the people. On the other hand, the policy of progressive taxation along with that of public expenditure on welfare programme helps to shift the consumption function upward by altering the distribution of income.
- **Change in Wages and Salaries:** The change in wages and salaries may shift the consumption function upward and downward. If the workers have the tendency to spend more out of the increased income, it tends to shift the consumption curve upward. But if the increase in income is accompanied by a more than proportionate increase in the price level, then it may lead to shift in consumption curve downward.
- **Change in the Rate of Interest:** Rate of interest is another is another important factor which affects the consumption spending of consumers. Significant changes in the market rate of interest may influence the consumption function indirectly.

The rise in the rate of interest will lead to fall in the price of bonds, thereby tending to discourage the propensity to save of the consumers. Rate of interest may also have the effect of substituting one type of asset for another.

- **Financial Policies of the Corporations:** The financial policies of the different corporation and companies with regard to income retention, dividend payments, and reinvestments tend to affect the consumption function of the consumer. For example, if the corporation keeps more money in the form of reserves, dividends payments to the shareholders will be less, this will have the effect of reducing the income of the shareholders and the consumption function will shift downward.
- **Behaviour of the people towards Savings:** The peoples' attitudes towards savings also affect consumption spending. If the consumers value future consumption more than present consumption, they will tend to save more and vice-versa. This tendency is further contributed by the life insurance scheme, provident fund and other social insurance scheme etc. In general, in an economy where MPS is high, the consumption function is comparatively low.
- **Pattern of Distribution of Income:** The pattern of distribution of income is an important variable affecting the consumption function. If the community has large income inequalities, the consumption function is low because rich people have low propensity to save and the poor with a very low income are unable to spend more on consumption. If the Government through different progressive measures reduces the inequalities of income and wealth of the people, the consumption function will shift upward.
- **Duesenberry Hypothesis:** James Duesenberry also explains the consumption behavior of the people. Duesenberry has propounded the relative income hypothesis. In this hypothesis, he mentioned about the impact of demonstration effect on the

consumption function. The demonstration effect explains the tendency of the people to emulate the consumption pattern of one's rich neighbours. In such cases, consumption preferences are inter-dependent.



CHECK YOUR PROGRESS

Q 3: State whether the following statements are true (T) or false (F).

(a) The average propensity to save and average propensity to consumption can be explained by the relation APC + APS = 1. (T/F)

(b) The distribution of income is an important factors affecting consumption spending of the consumer. (T/F)

Q 4: Mention any one difference between APC and MPC. (Answer in about 30 words). .....

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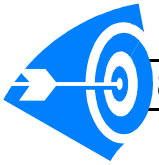
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8.7 LET US SUM UP

- Consumption function exhibits the relationship between consumption and income of the consumer.
- The Keynes psychological law of consumption states that when income increases, consumption expenditure also increases, but by a smaller amount. The increased income will be divided in some proportion between consumption expenditure and savings.
- There are two technical attributes of consumption function known as average propensity to consume and marginal propensity to consume.
- The average propensity to consume is defined as the ratio between the consumption expenditure to any particular level of income.
- The marginal propensity to consume is the ratio of the change in consumption expenditure to change in income.

- There are different factors which affect the consumption spending of the consumer. These factors can be broadly classified into two categories such as subjective and objective factors.



8.8 ANSWERS TO CHECK YOUR PROGRESS

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

Ans to Q No 2: APC is the ratio of the consumption expenditure to a particular level of income. MPC is nothing but the change in consumption spending to change in income.

Ans to Q No 3: (a) True (b) True

Ans to Q No 4: One of the differences between APC and MPC is that the APC is the ratio between the consumption expenditure to any particular level of income whereas MPC is change in APC as income changes.



8.9 FURTHER READING

1) Jhingan, M. L. (2014). *Advanced Economic Theory. New Delhi:* Vrinda Publication Pvt. Limited

2) Gupta, R.D., & Rana, A.S. (2009). *Keynes and Post-Keynesian Economics*, Jalandhar: Kalyani Publisher.

3) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*, Jalandhar: Vishal Publications.



8.10 MODEL QUESTIONS

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

Q 1: Briefly disucs the concept of Marginal propensity to consume.

Q 2: What is a Consumption Function? Explain briefly.

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

Q 1: Discuss the factors which lead to change in Consumption Spending of a consumer?

Q 2: Explain the Fundamental Psychological law of Consumption.

Q 3: What are the technical attributes of the consumption function? Explain it with the help of a suitable diagram.

Q 4: Explain the relation between APC and MPC with the help of a hypothetical example.

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UNIT 9: CONCEPT OF MULTIPLIER AND DERIVATION OF INVESTMENT MULTIPLIER

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Concept of Multiplier

9.4 Algebraic Derivation of the Investment Multiplier

9.5 Working of the Multiplier

9.6 Assumptions of Multiplier

9.7 Leakages of Multiplier

9.8 Criticisms of Multiplier and Its Importance

9.9 Relevance of Multiplier in Under-developed Countries

9.10 Let Us Sum Up

9.11 Further Reading

9.12 Answers to Check Your Progress

9.13 Model Questions

9.1 LEARNING OBJECTIVES

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

- acquire an in depth knowledge about investment multiplier and its working process,
- know the assumptions on which multiplier theory rests upon,
- state the criticisms raised against the theory of multiplier, and
- discuss the relevence of multiplier in developing countries.

9.2 INTRODUCTION

We know that level of income, output and employment in an economy depends upon effective demand, which in turn depends upon expenditure on consumption and investment goods. To put symbolically:

Y=C+I, where Y stands for income, C for consumption and I for investment. We have already discussed that consumption depends upon propensity to consume, which during the short period remains more or less stable . So the main determinant of income is investment. Or we can say, the fluctuations in effective demand or income are to be traced through fluctuations in investment (consumption being stable). Investment increases income and production. Increased income leads to more investment that results in economic growth. However, the question arises how much income will increase as a result of initial increment in investment. Is the increased income exactly equal to the investment or more than that? The answer to these questions can be given by introducing the concept of multiplier or investment multiplier. Briefly multiplier is the number, which, when multiplied with initial increment in investment gives you the final increase in income.

9.3 CONCEPT OF MULTIPLIER

Multiplier or investment multiplier is one of the Keynes' pathbreaking contributions in the field of economic theory. However, the idea of multiplier was first introduced by R.F. Kahn, though the multiplier he told about was employment multiplier. J.M. Keynes, used the concept of multiplier in the field of investment. Investment multiplier is defined as the ratio of change in income to change in investment and is denoted by K

$$K = \frac{\Delta Y}{\Delta I}$$

Where $K \rightarrow$ multiplier

$\Delta Y \rightarrow$ Change in income

$\Delta I \rightarrow$ Change in investment

Thus, multiplier tells us how much change in income occurs as a result of initial change in investment.

For instance, if the initial increment in investment is ₹100 crore and as a result of it, the income in the economy increases by ₹400 crore, than the multipler is 4.



ACTIVITY 9. 1

In an economy, the investment in public sector increased by ₹50 crore. If the multiplier is 3, Find out the final increase in income.

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LET US KNOW

Whenever an investment is made in the economy, the effect is to increase total income not only by the amount of original investment but also by a multiple of it. The reason is that, the investment not only expands the income in the industries where the investment is originally made but also in other industries whose products are demanded by the people employed in the industries where investment is made.

You may be surprised to know that multiplier can decrease the income in multiplier times if initial investment decreases. This is known as the backward or reverse working of multiplier. The former, where income increases multipler times the original investment is known as forward working of the multiplier.



CHECK YOUR PROGRESS

Q 1: Define multiplier. (Answer in about 30 words)

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Q 2: What is forward working of multiplier? (Answer in about 30 words).....

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Q 3: Can multiplier work in backward direction? Answer in about 30 words. .....

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9.4 ALGEBRAIC DERIVATION OF THE INVESTMENT MULTIPLIER

Let us derive the multiplier from the following income- consumption and investment relationship.

We already have, $Y = C + I \quad \rightarrow \quad (1)$

We know that in order to maintain equilibrium level of income consumption expenditure and investment expenditure must equal to the total income.Now change in income is also equal to change in consumption plus change in investment.

So

$$\Delta Y = \Delta C + \Delta I \quad \rightarrow \quad (2) \quad [\Delta \rightarrow \text{change}]$$

$$\Rightarrow \Delta I = \Delta Y - \Delta C$$

Now deviding both sides by ΔY, we get

$$\frac{\Delta I}{\Delta Y} = \frac{\Delta Y}{\Delta Y} - \frac{\Delta C}{\Delta Y}$$

$$\Rightarrow \frac{\Delta I}{\Delta Y} = 1 - \frac{\Delta C}{\Delta Y}$$

Taking reciprocal in both sides,

$$\Rightarrow \frac{1}{\frac{\Delta I}{\Delta Y}} = \frac{1}{1 - \frac{\Delta C}{\Delta Y}}$$

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

$$\Rightarrow K = \frac{1}{1 - \frac{\Delta C}{\Delta Y}}$$

$$\Rightarrow K = \frac{1}{1 - MPC} = \frac{1}{MPS} \qquad \left[\because \frac{\Delta C}{\Delta Y} = MPC\right]$$

$$\rightarrow (3) \quad [1 - MPC = MPS \Rightarrow MPC + MPS = 1]$$

From equation (3) it is clear that the value of multiplier depends on marginal propensity to consume (MPC) or marginal propensity to save (MPS). Larger the value of MPC, large will be the multiplier and vice versa. Or you can say that multiplier is directly proportional to marginal propensity to consume.

In an economy where people spend more or MPC is high, the initial investment may lead to huge increase in final income as multiplier value is high.

On the other hand, multiplier is inversely proportional to MPS. This means that larger the value of MPS, small will be the multiplier and vice versa. So, in a society where people save more or MPS is high, multiplier value will be small and as a result initial investment may lead to small increase in income finally.



LET US KNOW

Marginal propensity to consume or mpc is related to consumption function. MPC is a ratio of change in consumption to change in income. We can also say that mpc is the addition to consumption as a result of incremental change in income. The value of mpc lies between 0 and 1.

Similarly, marginal propensity to save (MPS) is defined as a ratio of change in savings to change in income or else we say that MPS is the addition to savings as result of small change in income. The value of MPS also lies between zero and one. The relationship between MPC & MPS is opposite and MPC+MPS=1.



ACTIVITY 9.2

Complete the Chart:

MPC	MPS	multiplier
0	1	–
1	–	∞
$\frac{1}{2}$	–	–
$\frac{3}{4}$	–	–
$\frac{1}{4}$	–	–

Since value of MPC & MPS lies between zero and one so the value of multiplier lies between 1 and ∞ .

This is so, because if MPC=0.

$$K = \frac{1}{1-MPC} = \frac{1}{1-0} = \frac{1}{1} = 1$$

if MPC = 1,

$$K = \frac{1}{1=MPC} = \frac{1}{1-1} = \frac{1}{0} = \infty$$



LET US KNOW

In actual practice, MPC or MPS is neither equal to Zero, nor equal to one. Since consumption always increase with increased income, MPC never be equal to zero. So multiplier can not be equal to zero. Again, MPC in reality never be one. Because all the increased income is not spent on consumption, a part of it is saved. Therefore multiplier can not be equal to infinity.



CHECK YOUR PROGRESS

Q 4: High consumerism leads to higher income propagation. Justify (In around 30 words.)

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Q 5: Derive the mathematical relationship between marginal propensity to save and the multiplier. (Answer in about 30 words.)

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Q 6: Show that when MPC=0.5, the increased income due to increased investment is exactly double the initial investment.

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9.5 WORKING OF THE MULTIPLIER

As discussed in the previous section, multiplier works both in forward and backward direction. We shall however lay our emphasis on discussing the forward operaiton of the multiplier.

Let us now see the actual process whereby a multiple expansion of income is brought about by increased expenditure on consumption. The multiplier operation can be well explained with the help of an example. Let us suppose that an investment of ₹100 crore is made in the economy as public expenditure. Let us also suppose that marginal propensity to consume is 0.5. This implies that value of multiplier is:

$$K = \frac{1}{1-MPC} = \frac{1}{1-0.5} = \frac{1}{0.5} = 2$$

So can you tell, how much increase of income will occur as a result of initial investment of ₹100 crore? Yes, the answer is that initial investment of ₹100 crore will lead to multiplier times increase in income i.e. ₹200 crore (as K=2). This process of increased income through multiplier can be shown in the table given below.

Table 9.1 : Working of the Multiplier (₹in crore)

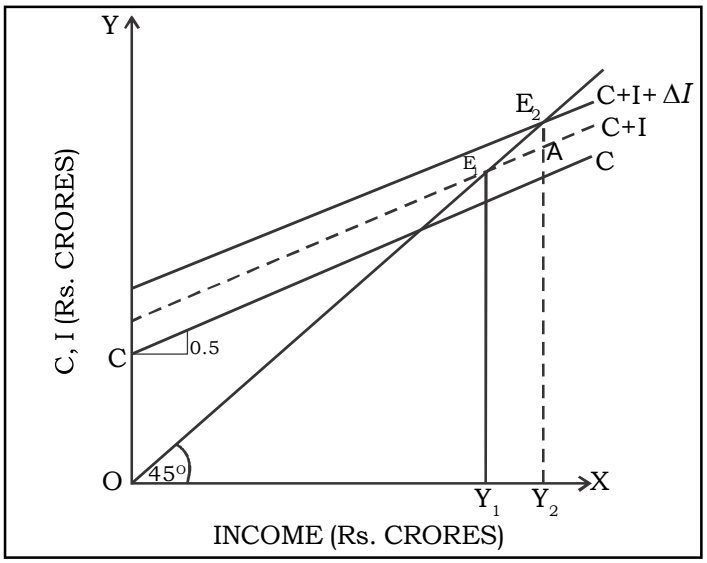
Round	ΔI	ΔY	ΔC	ΔS
0	0	---	---	---
1	100	100	50	50
2	.	50	25	25
3	.	25	12.5	12.5
4	.	12.5	6.25	6.25
5	.	6.25	3.125	3.125
.	.	.	.	.
.	.	.	.	.
		0	0	0
	100	200	100	100

In the first round, an increase in investment by ₹100 crore leads to an increased production which create income by ₹100 crore. Since marginal propensity to consume is 0.5, half of the increased income, i.e. ₹50 crore is spent on consumption and remaining ₹50 crore is saved. This increased consumption expenditure of ₹50 crore immediately increase the production

and income by same amount. Out of this newly increased ₹50 crores of income, ₹25 crore is spent on consumption goods and remaining ₹25 crore is saved. Again this consumption expenditure of ₹25 crore immediately increases the production and income by ₹25 crore and the process continues till no further increase in income and expenditure is possible. Finally the income increase by ₹200 crore as a result of initial increment in investment of ₹100 crore. So with a multiplier value equal to 2, an initial increment in investment of ₹100 crore leads to final increase in income which is exactly double the initial investment. This is the forward working of multiplier in a static framework with no time lag.

The process of income propagation as a result of increase in investment is shown with the Figure 9.1.

Figure 9.1: Working of the Multiplier



In Figure 9.1, in the X-axis we measure income and in Y axis we measure consumption and investment. Line C in the diagram represents consumption function and it is drawn on the assumption that MPC is 0.5. So the line C has a slope 0.5. C+I is the income curve which intersect 45^{O} line at point E_1 where equilibrium is established. The equilibrium level of income is OY_1. Now with increment in investment by ΔI, the income curve C+I shifts upward to C+I+ ΔI. This new income curve intersect 45^{O} line at point E_2. So the new equilibrium is established at E_2 and new equilibrium

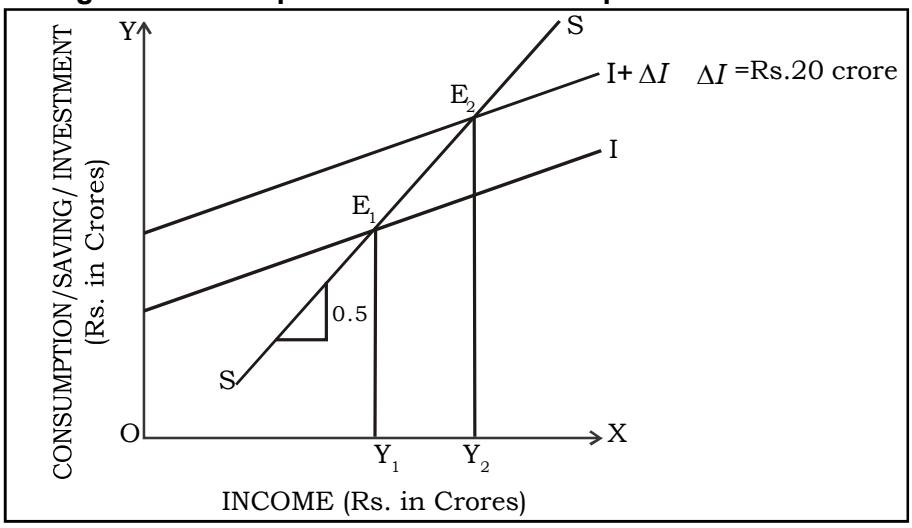
level of income is OY_2. Now the change in income, $Y_1Y_2=OY_2–OY_1$ is exactly double the initial change in investment E_2A.

i.e. $$Y_1Y_2 = 2E_2A$$
$$\Delta Y = 2\Delta I$$

With the MPC value half and multiplier value 2, an initial increase in investment leads to final increase in income by two times the initial change in investment.

With the help of savings function also, we can explain the process of income propagation via multiplier effect. This has been explained with the help of Figure 9.2.

Figure 9.2: Multiplier Effect with the help of MPS function



In the Figure 9.2, we measure income along X axis and investment and savings along Y axis. S is the saving curve which is drawn on the assumption that MPC is 0.5. The original investment curve is I which intersects the saving curve at point E_1 and the equilibrium is established. The equilibrium level of income is OY_1. Now with the increase in investment, the investment curve shifts upward and the new investment curve is I+ ΔI . The new investment curve intersect the savings curve at point E_2 where new equilibrium is established. Now the new equilibrium level of income is OY_2. From the figure, it is clear that, change in investment ΔI is exactly half of the change in income ΔY =$OY_2–OY_1=Y_1Y_2$. Or in other words change in income is exactly double of the change in investment. Since the value of

multiplier is 2, initial investment leads to two times (multiplier times) increase in final income.

9.6 ASSUMPTIONS OF MULTIPLIER

The multiplier theory is based on certain assumptions. It will operate to the full extent only when these assumptions are actually realised. Non fulfillment or partial fullfillment of these assumptions limits the working of multiplier. The assumptions are discussed below.

- **The marginal propensity to consume is constant:** In order to obtain the actual value of multiplier, it is assumed that there is no change in the marginal propensity to consume during the process of income propagation. This is because, if the mpc changes then the value of multiplier will also change.
- **There is no time lag in the multiplier process :** In order to realise the full value of multiplier, it is assumed that there are no time lags (or, time intervals) between the receipt of income and the spending of it. Thus, it is assumed that the consumers spend the income as soon as they recieve it.
- **There is net increase in investment** : This assumption means that the net investment in the economy increases . Thus, it also means that an act of investment in one sector should not be offset by an act of disinvestment in some other sector of the economy.
- **Consumer goods are available in response to effective demand for them :** The process of income propagation is subject to the availability of consumer goods. If the consumer goods are sufficiently available, the multiplier will continue to work and new incomes propagated.
- **Existence of excess capacity in consumer goods industry :** For proper working of multiplier, there should be excess capacity in consumer goods industries. This is because, when increased investment creates excess demand for consumer goods, this can be met by using unutilised capacity in consumer goods industries.



Autonomous investment : Investment which is independent of income. Eg: public investment

Induced investment : Investment induced by income. Eg: personal investment.

The concepts of autonomous investment and induced investment have been discussed in the next unit.

- **Existence of elastic supply of capital:** We know that an increase in investment would provide more employment to the workers (which results more spending and higher multiplier) only if there are no bottlenecks in the supply of capital, raw materials and other resources for the proposes of business expansion.

  This also means that the theory of multiplier is primarily more effective in an industrialised economy, rather than an agrarian economy.

- **There is a closed economy unaffected by foreign influence :** For smooth working of multiplier, it is assumed that the economy is a closed one. If the economy is not a closed one and having trade relations with other countires, then it may have export surplus or import surplus which may affect the actual value of multiplier.

- **There is a change in *autonomous investment* and that *induced investment* is absent**. This is so, because the accelerator effect of consumption on investment is ignored. Otherwise, the value of multiplier becomes far more than the usual.

- **There is less than full employment level in the economy :** So long as there is involuntary unemployment (or less than full employment in the economy, income, output and employment will continue to expand on account of the operation of multiplier. But the moment, full employment stage is reached, income output and employment will stop increasing, howsoever high the mpc may be. So less than full employment is essential for the working of the multiplier.



CHECK YOUR PROGRESS

Q 7: Why less than full employment is necessary for working of the multiplier? Answer in about 60 words.....

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Q 8: Multiplier can work smoothly in an industrialised economy. Justify the statement in about 60 words.

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9.7 LEAKAGES OF MULTIPLIER

We know that in reality multiplier is never equal to one or infinity. This means that whole of the increment in income is neither spent on consumption nor entirely saved. The main reason behind this is that there are several leakages from the income stream as a result of which the working of multiplier becomes limited and the process of income propagation is slowed down. The important leakages of multiplier are discussed below.

- **Saving:** Saving is an important leakage of multiplier which can reduce the multiplier effect of income propagation. If whole of the increment in income is spent on consumption (MPC=1) then multiplier become infinity times. But in reality, whole of the increased income is not spent but same part of it is saved, as a result we get a finite value of multiplier. In fact, when propensity to save is high, value of multiplier will become low. So saving is a leakage which limits the working of the multiplier.
- **Purchase of stock and securities :** Sometimes with newly created income people buy stocks and securties instead of spending on consumption. So it affects the working of multiplier and its value becomes smaller.
- **Debt Repayment :** Sometimes a part of income received by the people are used to pay the old debt. Since these incomes are not spent on consumption, the value of multiplier is reduced.
- **Liquidity Preference :** If the people of the society have strong liquidity preference then working of multiplier is limited. Thus, instead of spending

on consumption, people may want to hold idle cash in hand. In such situations, the process of income propagation via multiplier is affected.

- **Price inflation :** Due to price inflation, a large part of increased income may be spent on paying higher prices instead of promoting consumption, income and employment.
- **Import :** If the country imports more, than a large part of income goes out from the domestic country to foreign countries. As a result of which income spent on domestic consumption becomes limited and so the multiplier.
- **Taxes and Corporate Savings :** Both of these affect the propensity to consume of the people and have retarding affect on multiplier working.

9.8 CRITICISMS OF MULTIPLIER AND ITS IMPORTANCE

The main points of criticisms raised against the multiplier concept by Keynes are as follows:

- The concept of multiplier is based on some unrealistic assumptions like instantaneous relationship between income consumption and investment, constant marginal propensity to consume, absence of induced investment, presence of closed economy etc.
- Robertson, Goodwin and Lerner criticised the multiplier concept for ignoring induced investment. Keynes' multiplier takes into account the effect of change in consumption as a result of change in income but it doesnot take into consideration the effect of increased consumption on investment (induced investment).
- Keynes' multiplier tells us how increase in income incerases consumption. But actual studies show that the relationship between income and consumption is not that simple as presumed by Keynes nor consumption is a function of income alone.
- Multiplier is also criticised for its static nature. The static nature of multiplier is unsuited to the ever changing dynamic world. However economists like Harrod, Hansen and Samuelson have tried to deal with the criticisms and made the whole analysis dynamic.

Importance of Multiplier : Despite of the severe criticisms raised against the multiplier theory, one should not think that it has little or limited uses. Multiplier has great importance both in economic theory and policy. It has highlighted the crucial role of investment in economic development. Further it reveals the process of income propagation through initial increment in investment. On the side of practical economic policy, this is of utmost importance as it emphasised the role and importance of public expenditure or investment. The knowledge of multiplier is of vital importance during the course of business cycle studies and for its accurate forecasting and control. Moreover, it helps to follow suitable employment policy.

9.9 RELEVANCE OF MULTIPLIER IN UNDER-DEVELOPED COUNTRIES

We have alreay pointed out that in advanced and developed economics multiplier is the main tool for revival and has the power to bring the economy out of depression. It works untiringly until the economy reaches the full employment level. However, the case of the under-developed countries (UDCs) is much different. Despite of high MPC in these countries, multipler can not work smoothly in such economies due to some bottlenecks and structural imperfections. Involuntary unemployment, excess capacity in consumer goods industry, elastic supply of labour and capital etc. are important for smooth working of multiplier. But in UDCs, these conditions are rarely obtained. In these counties, the nature of unemployment is not involuntary rather it is a type of disguised unemployment. The workers are stuck to their family farms and apparently work in agricultural fields where most of the workers' contribution is marginally zero, but they cannot be removed through employment at the current wage rate. So higher wages along with other incentives are needed to remove them from their farms. Since additional labourers are not available at the current money wage rate, increase in employment cannot follow from an initial increase in investment and to that extent, the absence of involuntary umemployment reduces the magnitude of multiplier in the UDCs. Moreover, in an UDC, the secondary

and tertiary effects on income, output and employment do not follow as a result of initial increase in investment. It can only increase the income of the farmers in primary sector. Increased investment expenditures result in a contraction of the marketable surplus of the most essential consumables and generate a price spiral. Money incomes may multiply but real incomes do not increase much.

However in economies where the rate of growth is fast enough to generate capacity at the rate at which demand increase, multiplier operates well. These economies are nothing but developing economies in a state of transition.



9.10 LET US SUM UP

- Multiplier is the ratio of change in income to change in investment.
- Multiplier increases the income, multiplier times the original increment in investment. Multiplier value depends on MPC. Higher the value of MPC higher will be the multiplier and vice versa.
- The value of MPC lies between zero and one and the value of multiplier lies between one and infinity.
- There are several leakages from the income stream which reduces the value of the multiplier.
- The concept of multiplier has been severely criticised by many economists because it rests upon some unrealistic assumptions. However we cannot deny the importance of multiplier, particularly in the study of business cycle and forecasting.

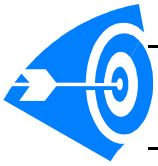


9.11 FURTHER READING

1) Chopra, P.N.(2008). *Micro Economics*. Ludhiana: Kalyani Publishers..

2) Jhingan, M. L. (2014). *Advanced Economic Theory. New Delhi:* Vrinda Publication Pvt. Limited

3) Shapiro, E. (2013), *Macroeconomic Analysis,* New Delhi: Galgotia Publications



9.12 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Multiplier is defined as the ratio of change in income to change in ivestment. Symbolically, $K = \frac{\Delta Y}{\Delta I}$, where K stands for multiplier, Y for income and I for investment.

Ans to Q No 2: Multiplier can increase the final income multiplier times the original increment in investment if the investment in the economy increases. This is forward working of multiplier.

Ans to Q No 3: Multiplier can work in backward direction if original investment decreases instead of increasing. Final income decreased by multipleir times the original decrease in investment in backward working of multiplier.

Ans to Q No 4: Higher consumerism means a society with higher propensity to consume. High MPC means higher value of multiplier. As a result, income propagation is high.

Ans to Q No 5: The relationship between MPS and multipleir is opposite. Higher the value of mps, lower will be the multiplier and vice versa. i.e. $K = \frac{1}{MPS}$

Ans to Q No 6: Given mpc = 0.5

$$\therefore K = \frac{1}{1-MPC} = \frac{1}{1-0.5} = \frac{1}{0.5} = 2$$

Since the value of multiplier is 2, increased income due to increment in investment is exactly double the initial increament in investment.

Ans to Q No 7: Multiplier can work properly in an economy where less than full employment situation prevails. Because in the presence of involuntary unemployment, increased investment will lead to increase in income, output and employment. But income and output ceases to rise when full employment situation is reached. So, multiplier works only when less than full employment prevails.

Ans to Q No 8: Multiplier can work smoothly in an industrialised economy because demand for industrialised consume goods is more in industrial economy than an agrarian one. So increase in investment will lead to more rapid expansion of income via multiplier. Moreover, agricultural output depends on natural factor like rainfall, climate etc. So, despite of increase in investment, output may not increase due to natural condition.



9.13 MODEL QUESTIONS

A. Very Short Questions. Answer in brief.

Q 1: Fill in the blanks

(a) $K = \frac{?}{\Delta I}$

(b) _____ is a leakage of multiplier.

Q 2: State whether the following statements are true (T) or false (F).

(a) Multiplier can work in reverse direction too. (T/F)

(b) For smooth working of multiplier, presence of involumtary unemployment is important. (T/F)

Q 3: What is the relationship between MPC and multiplier?

Q 4: If MPS is high, what happened when multiplier works in reverse direction?

B. Short Questions. (Answer each question in about 150 words).

Q 1: Why the presence of excess capacity in consumer goods industry is necessary for working of multiplier?

Q 2: Why in an agrarian economy, multiplier can not work properly?

Q 3: Show the relationship between MPC, MPS and the multiplier.

Q 4: Saving is an important leakage of multiplier, Explain.

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

Q 1: Explain the forward working of multiplier with the help of diagram.

Q 2: If initial investment in the economy is Rs.100 crore and MPC is 0.6. Explain the process of income propagation via multiplier.

Q 3: Discuss the importance of multiplier in UDCs.

Q 4: Explain the leakages of multiplier.

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UNIT 10: INVESTMENT FUNCTION AND MEC

UNIT STRUCTURE

10.1 Learning Objectives

10.2 Introduction

10.3 Investment: Basic Concepts

- 10.3.1 Meaning of Investment
- 10.3.2 Gross Investment vs Net Investment
- 10.3.3 Induced Investment vs Autonomous Investment

10.4 Factors affecting the Investment Function

- 10.4.1 Marginal Efficiency of Capital (MEC)
- 10.4.2 Rate of Interest
- 10.4.3 Marginal Efficiency of Investment (MEI)

10.5 Relation between Rate of Interest, MEC and Volume of Investment

10.6 Let Us Sum Up

10.7 Further Reading

10.8 Answers to Check Your Progress

10.9 Model Questions

10.1 LEARNING OBJECTIVES

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

- state the meaning of autonomous and induced investment
- describe the concept of marginal efficiency of capital (MEC)
- explain the relation between MEC and the rate of interest
- describe the concept of marginal efficiency of investment (MEI) and distinguish between MEC and MEI
- discuss the relation between rate of interest, MEC and the volume of investment.

10.2 INTRODUCTION

This unit is concerned with familiarising you with some basic concepts of investment. Thus, through this unit, you will be able to derive the meaning of investment and distinguish between autonomous and

induced investment.

Autonomous investment is independent of the change in income. That is why it is known as autonomous investment. Induced investment depends upon change in the level of income. When there is change in income, there is a change in induced investment. Most of the private investment is of induced type.

Marginal efficiency of capital (MEC) describes the rate of discount which would make the present value of expected income from fixed capital assets equal to the present supply price of the asset. Apart from this, the concept of marginal efficiency of investment (MEI) has been discussed and the distinctions between MEC and MEI have been made. The relation between MEC, rate of interest and volume of investment has been explained at the last section of the unit.

10.3 INVESTMENT: BASIC CONCEPTS

In this section, we shall basically discuss meaning of investment, differences between gross investment and net investment and also the differences between induced investment and autonomous investment. Let us start with meaning of investment.

10.3.1 Meaning of Investment

In Economics, investment typically refers to real investment which adds to the exisiting stock of capital in the economy. Such investment leads to increase in the levels of income and production by increasing the production and purchase of capital goods. Thus, in Economics, investment includes new plant and equipment, construction of public works like dams, roads, buildings etc. In the words of Joan Robinson, “By investment is meant an addition to capital, such as occurs when a new house is built or a new factory is built. Investment means making an addition to the stock of goods in existence.” The term capital here refers to the real assets like

factories, plants, equipmnment, and other inventories of finished and semi-finished goods. Capital also means any previously produced input that can be used in the process to produce other goods. The amount of capital available in the economy is nothing but the aggregate stock of capital in that economy. Thus, capital is a stock concept.

From the above discussion it follows that investment is the production or acquisition of real capital assets during any period of time. Say, for example, the capital assets of a company as on 31st March, 2011 is Rs.10,000 crores and it invests an amount of Rs.500 crores in the financial year of 2011-12. Thus, at the end of the financial year 2011-12 (i.e., on 31st March, 2012), the aggregate (i.e., gross) capital stock of the company will stand at Rs.10,500 crores. Symbolically, let *I* be the investment and *K* be the capital in year *t* (here, *t* is the current year, i.e., 2011-12), then $I_t = K_t - K_{t-1}$. Please note that t-1 denotes the previous year (i.e., 2010-11 ending on March, 31, 2011).

10.3.2 Gross Investment vs Net Investment

The inter-relationship between capital and investment is shown by net investment. In the above example, when we told about making an investment of Rs.500 crore during the year 2011-12, we told about gross investment. Thus, gross investment is the total amount of investment made on new capital asset in a particular year. It should be noted that some capital stock wears out every year and is used up as depreciation and obsolescence. To derive the net investment in a particular year, the amount of expenditure made as depreciation and obsolescence is deducted from the gross investment made in that particular year. When gross investment equals the cost of depreciation and obsolescence, net investment becomes zero, and there is no addition to the existing stock of capital in the economy. When gross investment is less than depreciation and obsolescence, there is disinvestment in the economy and the capital stock decreases. In this sense, for an increase in the real

capital stock in the economy, gross investment must exceed the cost of depreciation and obsolescence. This also implies that there is some net investment in the economy.

10.3.3 Induced Investment vs Automonous Investment

Investment may be categorised as induced or autonomous. Autonomous investment is independent of the level of income, output, and profit and sales of a business firm. Prof Alvin Hanson and some other economists are of the opinion that this type of investment is associated generally with the factors like the development of new resources, growth of population and labour force and technological innovations or invention like the introduction of new products into the market.

The investment expenditure which is related in some way with the current income, output and sales is termed as *induced investment*. If there is a change in income and output, it will result in change in induced investment. Since the incentive for such an investment is the direct consequence of the change in current income, output or demand.

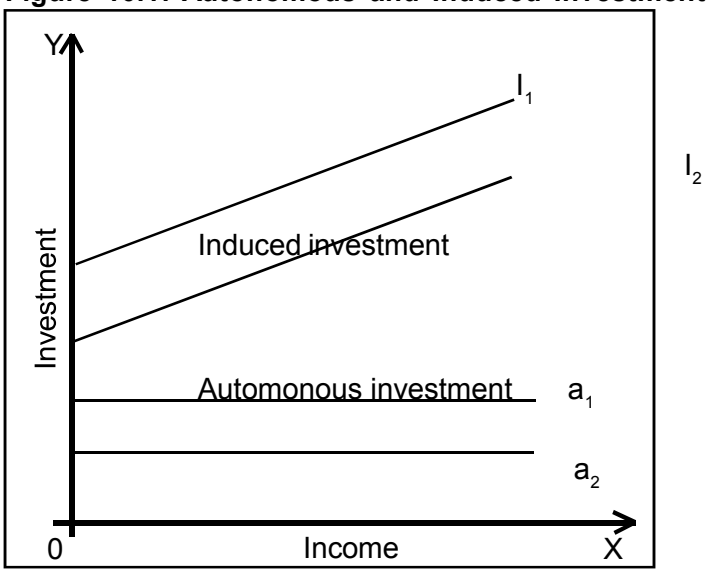
The autonomous investment is generally undertaken by the public authorities like Union, State or local governments. On the other hand, most of the induced investment is undertaken by private authorities. This is because people are driven by profit motive. Autonomous investment is generally not induced by profit, but induced investment is induced by profit.

From the above discussion, it seems like that there is no relation between induced and autonomous investment. They are totally different concepts. But autonomous investment and induced investment are related. It can be explained with the help of an example. Suppose there is increase in autonomous investment of 20 crores undertaken by the government. Assuming the multiplier coefficient is 2, it will automatically lead to an increase in income of

40 crores. This increase in income or output of 40 crores encourages the private investors to undertake induced investment. It implies that autonomous investment has its effect upon induced investment.

The distinction between autonomous and induced investment has been shown with the help of Figure 10.1. In the figure, a_1 and a_2 represent autonomous investment while I_1 and I_2 represent induced investment.

Figure 10.1: Autonomous and Induced Investment





CHECK YOUR PROGRESS

Q 1: State whether True or False

i) Induced investment is undertaken by the government authority.

ii) Autonomous investment is motivated by profit motive.

Q 2: Differentiate between induced investment and automonous investment. (Answer in about 30 words).

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Q 3: What do you mean by induced investment? (Answer in about 50 words).

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10.4 FACTORS AFFECTING THE INVESTMENT FUNCTION

As we have already mentioned, induced investment (or, private investment) is basiclly driven by the profit motive. As private entrepreneurs are driven by the profit motive, their inducement to invest in capital goods is driven by two basic objectives, either to replace the depreciated machineries or to expand the existing plant capacity. Private investment depends upon marginal efficiency of capital and the rate of interest. The marginal efficiency of capital (MEC), in turn, depends upon future expectations which may be very fluctuating. As such, private investment becomes very much undependable.

The marginal efficiency of capital along with the rate of interest determines the amount of new investment. As has been discussed in the earlier units, in the Keynesian equation Y = C + I, given the propensity to consume and hence consumption being stable in the short-run, volume of investment determines the volume of empoyment. Investment, thus, is an essential requirement for attaining full employment in a capitalist economy. In fact, not only net investment, but also an increasing rate of net investment is necessary to maintain full employment for a longer period of time.

10.4.1 Marginal Efficiency of Capital

Keynes defined marginal efficiency of capital as the highest rate of return over cost expected from an additional unit of a capital asset during its life time. Thus, marginal efficiency of a particular

type of capital asset is the highest rate of return over cost expected from an additional or marginal unit of that type of asset. In general, however it may be regarded as the highest rate of return over cost expected from producing an additional unit of the most profitable of all categories of the capital assets. Thus, the prospective yield (y) is the aggregate net return from an asset during its life-time, while supply price (Sp) is the cost of producing that asset. We can express MEC mathematically as:

$$Sp = \sum_{z=1}^{n} \frac{R}{(1+i)^z}$$

where i= marginal efficiency of capital, R= perspective yields of a capital asset per unit of time and Sp = supply price of the asset.

For example, if the annual yield of a capital asset is Rs.22,000 and the supply price of the capital asset is Rs.20,000, and the asset lasts for 1 year then

$$20{,}000 = \frac{22{,}000}{1+\mathrm{i}}$$
$$\Rightarrow 20.000 + 20{,}000\mathrm{i} = 22{,}000$$
$$\Rightarrow 20{,}000\mathrm{i} = 22{,}000 - 20{,}000$$
$$\Rightarrow 20{,}000\mathrm{i} = 2{,}000$$
$$\therefore \mathrm{i} = \frac{2{,}000}{20{,}000}$$
$$= \frac{2}{20}$$
$$= \frac{1}{10}$$
$$\therefore \mathrm{i} = 10\%$$

An increase in the supply price (Sp) of the capital assets given the expected annual yield will reduce the marginal efficiency of capital (i). Similarly, a decrease in the supply price of the capital asset given the annual expected yield will raise the marginal efficiency of capital. Thus, i is directly related to the rise in R and inversely to the supply price of the capital assets (Sp).

In a more generalized sense, Keynes has defined marginal efficiency of capital as *"the rate of discount which would make the present value of the series of annuities given by the returns expected from the capital asset during its life just equal the supply price"*.

Symbolically, it can be expressed as:

$$Sp = \frac{R_1}{1+i} + \frac{R_2}{(1+i)^2} + \frac{R_3}{(1+i)^3} + ... + \frac{R_n}{(1+i)^n}$$

where, Sp is the supply price or the cost of the capital asset, R_1, R_2…….and R_n are the prospective yields or the series of annuities given by the returns expected from the capital asset in the years 1,2…..upto n and i is marginal efficiency of capital.

The marginal efficiency of capital of a particular type of capital asset is the highest rate of return over cost expected from an additional, or marginal unit of that type of capital asset.

10.4.2 Rate of Interest

The first element affecting inducement to invest is in fact the rate of interest. The Keynesian theory dealing with determination of rate of interest is known as the Liquidity Preference Theory. According to Keynes, demand for money (liquidity preference) arises out of three basic motives, viz., *transaction motive, precautionary motive* and *speculative motive. Transaction motive* relates to the need of the people to hold money for purchasing goods and services to fulfill the daily necessities of life. Apart from fulfilling the transaction purposes, people also have to hold money to take proper precautions against unforeseen future contingencies like sickness, unemployment, accidents, old age etc. Holding of money for such precautions is called the *precautionary motive*. According to Keynes, people also keep cash in hand to take advantage of the rise and fall of prices of bonds and securities. Keynes called this as speculative demand for money. This speculative demand for money arises, as Keynes argued, on account of the uncertainty regading the future rate of interest.

All the three motives of holding money, i.e., transaction motive, precautionary motive and speculative motive when added give us the total demand for money. The liquidity preference (i.e.,

demand for money) for transaction motive and precautionary motive is more or less stable and is interest-inelastic. They basically depend on the level of income. On the other hand, holding of money under the speculative motive is very much sensitive to the changes in the market rate of interest. If the rate of interest in investment instruments, e.g., bond is higher, say 10%, people would choose to hold less amount of money in hand or more to invest in bond. On the contrary, if the rate of interest on bond is lower, say 2%, people would be reluctant to invest more in bonds; they would choose to hold money in cash.

Let us suppose, we represent the demand for money for transaction and precautionary motives by M_1 and the demand for speculative motive by M_2, then we can write:

$M = M_1 + M_2$,

where M stands for total demand for money.

As we have already stated, the demand for money for transaction and precautionary motives are interest-inelastic and the demand for speculative motive as interest elastic, we can write:

$M = M_1(Y) + M_2(r)$

where $M_1(Y)$ indicates that M_1 is a function of income (Y) and $M_2(r)$ indicates that M_2 is a funciton of the rate of interest (r).

According to Keynes, the equilibrium rate of interest is determined at the point where the demand for money equals the supply of money.

10.4.3 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.

10.5 RELATIONSHIP BETWEEN RATE OF INTEREST, MEC AND VOLUME OF INVESTMENT

As we have already mentioned, MEC and the rate of interest are the two important factors that affect the volume of investment. We know that the rate of interest is the price paid for loanable funds and is determined, like any other price, by the demand for and supply of loanable funds. A potential investor will go on comparing the MEC on new investment against the rate of interest. As long as MEC is more than the rate of interest, investment will continue to be made, till MEC and the rate of interest are equalled. Once MEC becomes equated to the rate of interest, equilibrium investment is determined.

The relationship of MEC and the rate of interest in the determination of inducement to invest has been shown with the help of Table 10.1.

Table 10.1: Relationship of MEC, Rate of Interest and Effect on Investment

Supply price	Annual return	MEC	Rate of interest	Effect on investment
Rs. 25,000/-	Rs. 1,000/-	4%	4%	Neutral
Rs. 20,000/-	Rs. 1,000/-	5%	4%	Favourable
Rs. 50,000/-	Rs. 1,000/-	2%	4%	Adverse

In above Table 10.1 it has been assumed that the new capital asset gives a constant return of Rs. 1,000/- annually. Now it can be seen that when the rate of MEC (4%) is equal to the rate of interest, the effect on investment is neutral. When the rate of MEC (5%) is higher than the rate of interest (4%), there is a favourable affect on investment. On the contrary, when the rate of MEC (2%) is less than the rate of interest (4%), the affect on investment is unfavourable.



CHECK YOUR PROGRESS

Q 4: Choose the correct alternative from below:

Marginal Efficiency of capital can be defined as the ratio of:

(a) Supply price of the capital asset and its prospective yield

(b) Prospective yield and the supply price (c) Others

Q 5: Mention the three important criteria a business firm considers in making investment. (Answer in about 40 words).

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10.6 LET US SUM UP

- Investment refers to real investment which adds to the existing stock of capital in the economy.
- For an increase in the real capital stock in the economy, gross investment must exceed the cost of depreciation and obsolescence.
- Investment may be autonomous or induced. Autonomous investment is not induced by profit motive, but induced investment depends on profit.
- MEC is the rate of discount which will make the present value of the capital assets over the years equal to its supply price.
- MEI may be defined as the modified MEC that takes into account the change in supply price of capital.
- Keynes made no distinction between MEC and MEI. However, later economists have acknowledged that MEI is a more realistic concept as capital is scarce and its supply is not perfectly elastic.



10.7 FURTHER READING

1) Dillard, D. (2005). *The Economics of John Maynard Keynes*: *The Theory of a Monetary Economy.* USA: Kessinger Publishing, LLC.

2) Gupta, R.D., & Rana, A.S. (2009). *Keynes and Post-Keynesian Economics*. Jalandhar: Kalyani Publisher.

3) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*. Jalandhar: Vishal Publications.



10.8 ANSWERS TO CHECK YOUR PROGRESS

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

Ans to Q No 2: Autonomous investment is independent of change of income, but induced investment depends on level of income.

Ans to Q No 3: The investment expenditure which is related in some way with the current income, output and sales is termed as *induced investment*. If there is a change in income and output, it will result in change in induced investment, since the incentive for such an investment is the direct consequences of the change in current income, output or demand.

Ans to Q No 4: (b)

Ans to Q No 5: The three criteria that a business firm take into consideration in making an investment decision are:

- the cost of the capital asset,
- the expected rate of return from it during the life time, and/or
- the market rate of interest.



10.9 MODEL QUESTIONS

Short Questions (Answer each question in about 150 words)

Q 1: Write a short note on marginal efficiency of capital.

Q 2: What do you mean by autonomous investment and induced investment? Differentiate between the two.

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

Q 1: What do you mean by marginal efficiency of capital? How does marginal efficiency relate to the rate of interest?

*** ***** ***

UNIT 11- IS-LM MODEL

UNIT STRUCTURE

11.1 Learning Objectives

11.2 Introduction

11.3 IS Curve

- 11.3.1 Derivation of IS Curve
- 11.3.2 Slope of IS Curve
- 11.3.3 Shift of IS Curve

11.4 LM Curve

- 11.4.1 Derivation of LM Curve
- 11.4.2 Slope of LM Curve
- 11.4.3 Shift of LM Curve

11.5 Interaction of IS-LM Curve : General Equilibrium

11.6 Let Us Sum Up

11.7 Further Reading

11.8 Answers to Check Your Progress

11.9 Model Questions

11.1 LEARNING OBJECTIVES

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

- discuss the term 'IS' and 'LM' in the context of goods market and money market equilibrium
- derive the IS curve from investment-saving equality along with rate of interest and level of income
- describe the shift of IS curve
- derive the LM curve from the equality of money demand and money supply along with rate of interest and level of income
- describe the shift of the LM curve
- explain the interaction between IS and LM curves.

11.2 INTRODUCTION

In the earlier unit, we have discussed about investment function and MEC. From that unit you have already known about the relationship between rate of interest and investment. In this unit we will deal with the investment-saving (IS) function and money demand –money supply (LM) function and their derivation with the help of rate of interest and level of Income. We shall also discuss the slope and shift of IS-LM and the General equilibrium of IS-LM Model.

The level of national income in simple Keynesian Model is determined by Goods market equilibrium and the rate of interest is determined by money market equilibrium. The Goods or real market is in a state of equilibrium when saving and investment are equal or Aggregate demand for goods just equals the Aggregate Supply. The Interaction between saving and Investment in Goods market is reflected in IS curve. Again Equilibrium in money market implies the equality between demand for money and supply of money. The interactions between them are reflected in LM curve.

11.3 IS CURVE

As we have already stated, IS curve reflects the interaction between saving and investment in the goods market. The term IS is the shorthand expression of the equality of Investment-Saving which represents the goods market equilibrium . IS curve is the locus of all the combinations of rate of interest and level of income at which saving and investment are equal. In other words, IS Curve is a curve which explains the relationship between a family of saving schedule and investment schedule.

11.3.1 Derivation of IS Curve

In the derivation of IS curve, we seek to find out the equilibrium level of national income as determined by equilibrium in Goods market by a level of investment determined by a given rate of interest. Thus, IS curve relates different equilibrium levels of national income with various rate of interest. As we know that saving is a

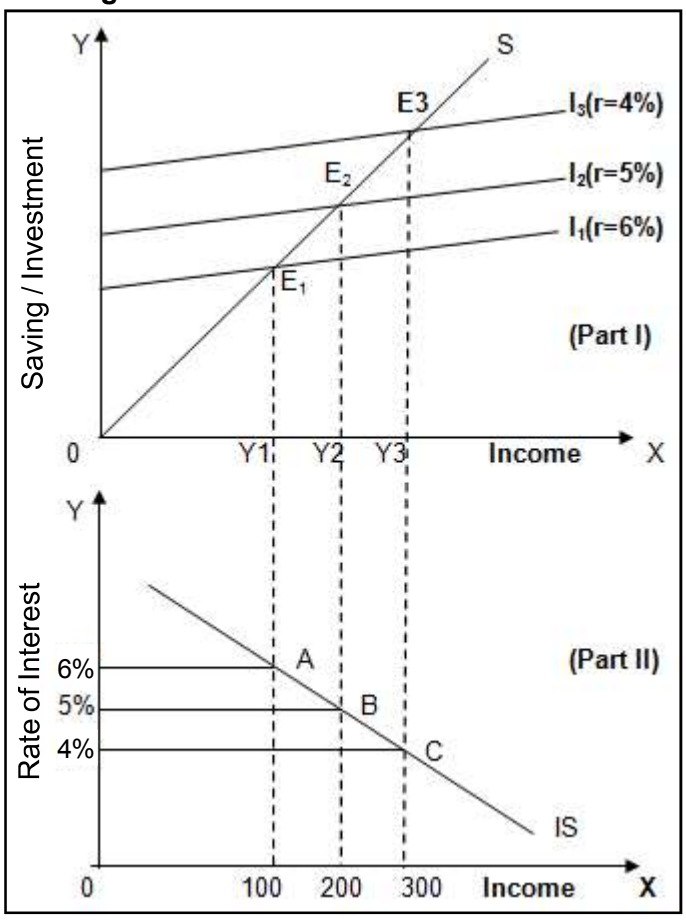
direct function of level of income and investment is a decreasing function of rate of interest.

i.e. S=f(Y) and I=f(r)

Thus, the goods market is in equilibrium when S=I at different levels of income and rate of interest which is reflected in IS curve. Thus IS curve shows all the combinations of rate of interest and level of income at which saving is equal to investment. It is also known as goods market or real market equilibrium.

The derivation of IS curve is depicted in Figure 11.1.

Figure 11.1: Derivation of IS Curve



In Part- I of the above figure, OS represent the Saving curve which shows saving as an increasing function of income. I_1, I_2 and I_3 represent the investment curve. Let us assume that at different rate of interest i.e. at 4% , 5% and 6%, the level of income is 100 crores, 200 crores and 300 crores respectively.

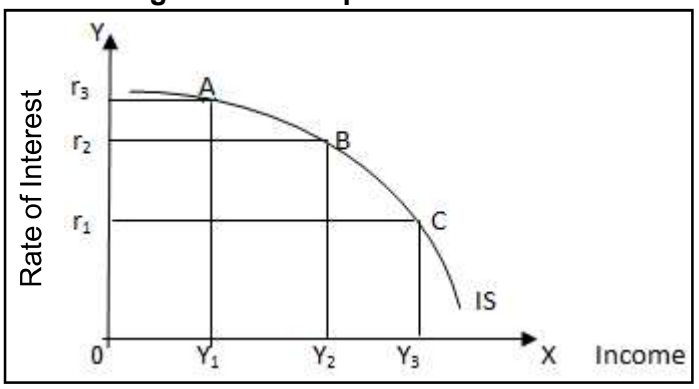
Now at 5% interest rate, saving-investment equality establishes at point E_2 where level of income is $0y_2$. If the rate of interest is reduced to 4%, the investment curve will shift upward to I_3 and the new equilibrium point is established at point E_3 where level of income is $0Y_3$. Similarly when interest rate rises to 6%, the investment curve will shift downward to I_1. Now a new equilibrium point is established at point E_1 where level of income is $0Y_1$.

In Part II of the above figure, IS curve is derived by making the level of income at various interest rates. Each point on the IS curve represents a level of income at which S=I at various interest rate. Thus by connecting the corresponding point of E_1, E_2 and E_3 i.e. A, B,C we have the IS curve. Thus IS curve slopes downward from left to the right because as interest rate falls, investment increases and thus income increases.

11.3.2 Slope of IS Curve

As seen above, a lower rate of interest is associated with higher level of national income and vice versa. This makes the IS curve to slope downward, which relates the level of income with rate of interest. The IS curve may be flat or steep depending on the sensitiveness of investment to changes in the rate of interest. If investment is very sensitive to the rate of interest, then IS curve will be very flat. Again if investment is not very sensitive to the rate of interest, then IS curve will be relatively steep. This is shown in Fig 11.2

Figure 11.2: Slope of IS Curve



In Figure 11.2, segment AB of IS curve is flat because a small fall in the rate of interest from r_1 to r_2 leads to a proportionately large change in income from Y_1 to Y_2. Again BC segment of IS curve is relatively steep, as a large fall in rate of interest from r_2 to r_3 leads to smaller change in income from Y_2 to Y_3. Any further fall in the rate of interest from r_3 will lead to no change in income because IS curve is vertical in that range. It is interest elastic.

The slope of the IS curve basically depends on two factors, viz., elasticy of investment curve and the size of the multiplier. If the size of the multiplier is large, income is more sensitive to changes in interest rate and thus the IS curve becomes flatter. On the other hand, smaller the value of multiplier, the smaller will be increase in the level of income given the investment caused by a given fall in the rate of interest. Thus in case of smaller size of multiplier IS curve will be more steep. Again, higher the investment elasticity, flatter will be the IS curve and lower is the elasticities, steeper will be the IS curve.



Fiscal policy is the means by which a government adjusts its spending level and tax rate to influence a nation's economy. The changes in fiscal policy includes govt. spending, taxes etc.

11.3.3 Shift of IS Curve

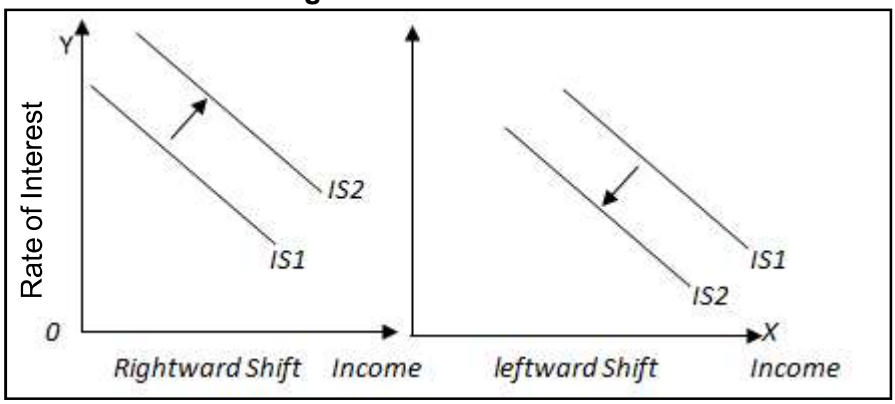
The position of IS curve depends upon the magnitude of investment and saving. The IS curve will have a shift to right if the investment function increases or saving function decreases. Such a shift can be possible if there are more and more inventions, discoveries, technological and other innovations and if there are better expectations of profit.

Similarly, the IS function is likely to shift to the left when saving function increases or investment function decreases. This shift in the IS function may be caused by changes in ***fiscal policy***. An expansionary fiscal policy will shift the IS curve to the right, and a contractionary fiscal policy will shift to the left.

The shift of IS function has been shown in the Figure 11.3.

income with various rate of interest. As we know that saving is a

Figure 11.3: Shift of IS curve





LET US KNOW

We should know about the term Goods Market, Saving & Investment. By goods market, we mean all the buying & selling of goods & services. The goods market determines income which depends on planned investment. Planned investment in turn depends on the interest rate.

In a Keynesian sense saving is whatever left over after income is spent on consumption of goods & services. Again investment is what is spent on goods & services that are not consumed but are durable.



CHECK YOUR PROGRESS

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

(i) IS is the shorthand expression of saving & income. (T/F)

(ii) The IS curve shift to the left due to the changes in fiscal policies. (T/F)

Q 2: Define IS curve. Why does the IS curve slope downward? (Answer in about 40 words)

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Q 3: Write about the factors responsible for the slope of IS curve. (Answer in about 40 words)

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11.4 LM CURVE

As we have already stated, LM curve reflects the interaction between demand for and supply of money in money market. In the term LM, 'L' denotes money demand and 'M' denotes money supply. Thus in equilibrium in money market L=M or $M_d=M_s$.

The demand for money $L=L_t+L_S$,where L_t is the transaction demand for money which is a direct function of level of income, i.e. $L_t=f(Y)$. Again L_s is the speculative demand for money which is a decreasing function of the rate of interest, i.e. $L_s=f(r)$. Thus in money market equilibrium $M= L_t(Y) + L_s(r)$.

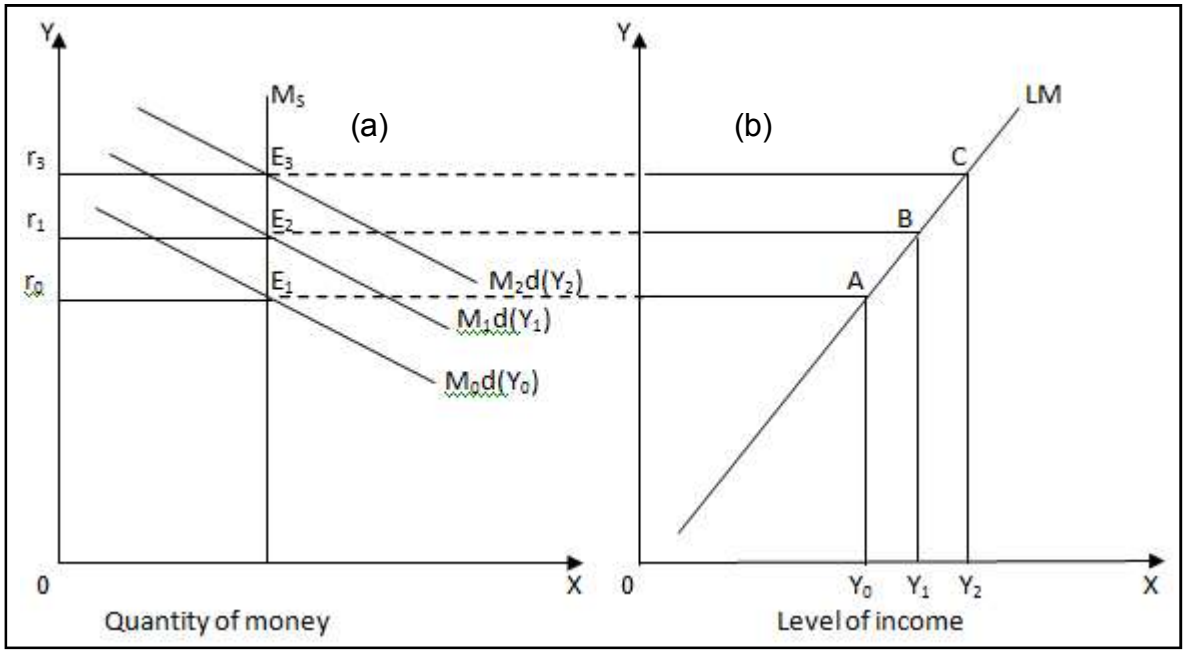
11.4.1 Derivation of LM Curve

The LM curve can be derived from the Keynesian theory from its analysis of money market equilibrium. The LM curve shows all the combinations of interest rate and levels of income at which the demand for and supply of money are equal. In other words, the LM schedule shows the combinations of interest rate and levels of income where the demand for money and supply of money are equal such that the money market is in equilibrium.

The LM tells what the various rate of interest (given the quantity of money and the family of demand curve for money) at different levels of income. But money demand curve alone cannot tell us what exactly the rate of interest will be. This has been explained with the help of Figure 11.4.

-Rate of Interest-

Figure 11.4: Derivation of LM Curve



In Figure 11.4(a) and (b) we have derived the LM curve from a family of demand curve for money. As income increases, money demand curve shift upward and therefore the rate of interest rises which equates the supply of money with demand for money.

In Figure 11.4(a) a family of demand curve is shown by M_0d, M_1d and M_2d at income levels Y_0,Y_1 and Y_2.These curve together with the perfectly inelastic money supply curve M_S give us the LM curve.

If the level of income is Y_0, the demand for money (M_0d) equals to supply of money at interest rate r_0. At Y_1 income level, the demand for money (M_1d) and supply of money are equal at r_1 rate of interest. Similarly at Y_2 income level, the demand for money (M_2d) is equal to supply of money at interest rate r_2. The Supply of money, the demand for money and the rate of interest provide data for LM curve as shown in Figure 11.4(b). Thus joining the corresponding points of E_1, E_2, and E_3, i.e. A,B and C we get the LM curve. This curve relates different income levels to various interest rates.

11.4.2 Slope of LM Curve

The slope of LM curve depends on two factors, viz., the responsiveness of demand for money to the change in income, and the responsiveness of demand for money to the change in rate of interest.

In Figure 11.4 (b), it can be noticed that the LM curve slopes upward to the right. This is because with higher level of income, demand curve for money (M) is higher , which in turn leads to higher rate of interest. This implies that rate of interest varies directly with income. There are two factors on which the slope of LM curve depends, first, the responsiveness of demand for money to the changes in income. The greater the extent to which demand for money for transaction motive increases with the increase in income, the higher the rise in the rate of interest and consequently steeper the LM curve.

The second factor which determines the slope of the LM curve is the elasticity or responsiveness of demand for money to the changes in the rate of interest. The lower the elasticity of demand for money for speculative motive with respect to the changes in the rate of interest, steeper will be the LM curve. On the other hand, if the elasticity of money demand to the changes in the rate of interest is high, the LM will be flatter or less steep.

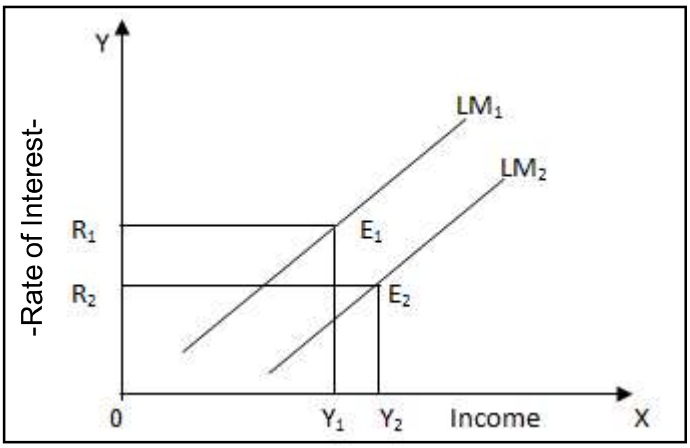
11.4.3 Shift LM Curve

The shift in the LM curve is brought about by the variations in the supply of money and the shift in money demand function. LM curve will shift to the right, if the supply of money is increased or the supply of money function shift to the right or alternatively, if the money demand function shift to the left.

A decrease in the demand for money means a reduction in the quantity of balance demanded at each level of income and interest rate. Such a decrease in the demand for money balance

creates an excess of the money supplied over money demanded. This is equivalent to an increase in money supply in the economy which has the effect of shifting LM curve to the right. This is depicted in the following Figure 11.5.

Figure 11.5: Shift of LM Curve



With the rise in the money supply the LM curve shifts to the right as LM_2 which moves the economy to a new equilibrium point E_2 . The increase in the money supply brings down the interest rate to R_2 in the money market. This, in turn , increases investment thereby raising the level of income to Y_2.

On the other hand, a decrease in the money supply or an increase in the demand for money will shift the LM curve to the left such that a new equilibrium is established at a higher interest rate and lower income level. This can be shown by assuming LM_2 as the original curve.



LET US KNOW

We Should Know about the essential features of LM curve:

- The LM curve is a schedule that describes the combinations of rate of interest and level of income at which money market is in equilibrium
- The LM curve slopes upward to the right.
- The LM curve is flatter if the interest elasticity of demand for the

money is high, on the contrary, the LM curve is steep if the interest elasticity of demand for the money is low.

- The LM curve shifts to the right when the stock of money supply is increased and it shifts to the left if the stock of money supply is reduced.
- The LM curve shifts to the left if there is an increase in the money demand function which raises the quantity of money demanded at a given interest rate and income level. On the other hand , the LM curve shifts to the right if there is an decrease in the money demand function which lowers the quantity of money demanded at a given interest rate and income level.



CHECK YOUR PROGRESS

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

(i) LM curve is derived from the intersection between demand for money and supply of money. (T/F).

(ii) LM Curve slopes downward. (T/F).

Q 5: Mention the factors that determines the slope of LM curve. (Answer in about 40 words)

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Q 6: Define LM curve. Write three characteristics of LM curve. (Answer in about 40 words)

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11.5 INTERSECTION IS-LM CURVE : GENERAL EQUILIBRIUM

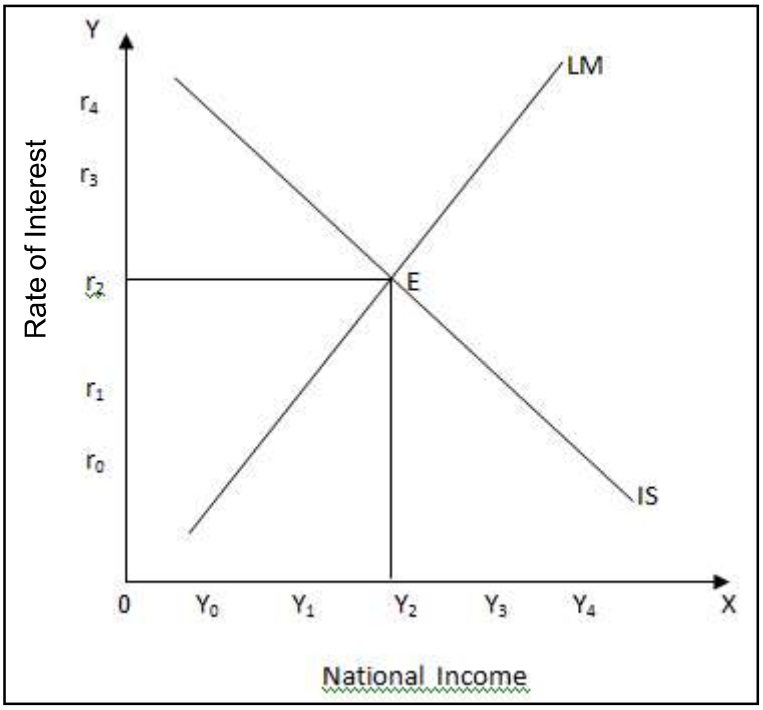
The goods market or real market equilibrium gives us the IS curve that depicts various combinations of income and rate of interest at which saving and investment are in equilibrium. Similarly, the money market equilibrium gives such combinations of rate of interest and income which brings demand for money and supply of money in equality. If there is a simultaneous equilibrium in both the markets, the entire system can be considered in equilibrium. This can be possible if:

(i) the saving and investment are in equilibrium (S=I), and

(ii)the demand for money is equal to the supply of money (MD=MS)

The IS and LM curves relate the two variables: (a) income and (b) the rate of interest. Income and the rate of interest are therefore determined together at the point of intersection of these two curves, i.e., E in Figure 11.6. The equilibrium rate of interest, thus determined is $0r_2$ and the level of income is $0y_2$. At this point, income and the rate of interest stand in relation to each other.

Figure 11.6: General Equilibrium





LET US KNOW

The IS-LM curve model is based on: (1) the investment-demand function, (2) the consumption function, (3) the money demand function, and (4) the quantity of money. We see, therefore, that according to IS-LM curve model both the real factors, namely, saving and investment, productivity of capital and propensity to consume and save, and the monetary factors, that is, the demand for money and supply of money play a part in the joint determination of the rate of interest and the level of income. Any changes in these factors will cause a shift in IS or LM curve and will therefore change the equilibrium levels of the rate of interest and income.



CHECK YOUR PROGRESS

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

(a) General equilibrium exists when there is simultaneous equilibrium in both money market and capital market.

(b) General equilibrium is that point where both IS and LM curve intersect each other.

Q 8: What are factors on which the IS-LM curve model is based on? (Answer in about 30 words).

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11.6 LET US SUM UP

- The level of national income in simple Keynesian Model is determined by Goods market equilibrium and the rate of interest is determined by money market equilibrium.

- The Goods or real market is in a state of equilibrium when saving and investment are equal or Aggregate demand for goods just equals the Aggregate Supply
- IS curve is the locus of all the combinations of rate of interest and level of income at which saving and investment are equal.
- Saving is a direct function of level of income and investment is a decreasing function of rate of interest.

  i.e. S=f(Y) and I=f(r)
- IS curve slopes downward from left to the right because as interest rate falls, investment increases and thus income increases.
- The IS curve may be flat or steep depending on the sensitiveness of investment to changes in the rate of interest. If investment is very sensitive to the rate of interest, then IS curve will be very flat. Again if investment is not very sensitive to the rate of interest, then IS curve will be relatively steep.
- The shape of IS curve also depends on the size of multiplier. If the size of the multiplier is large, income is more sensitive to changes in interest rate and thus the IS curve becomes flatter. On the other hand smaller the value of multiplier, the smaller will be increase in the level of income given the investment caused by a given fall in the rate of interest. Thus in case of smaller size of multiplier IS curve will be more steep.
- The position of IS curve depends upon the magnitude of investment and saving.
- The IS curve will have a shift to right if the investment function increases or saving function decreases.
- The IS function is likely to shift to the left when saving function increases or investment function decreases. This shift in the IS function may be caused by changes in *fiscal policy*
- The LM curve shows all the combinations of interest rate and levels of income at which the demand for and supply of money are equal.
- The LM Curve slopes upward to the right. This is because with higher level of income, demand curve for money(M^d) is higher , which in turn leads to higher rate of interest.

- There are two factors on which the slope of LM curve depends, first, the responsiveness of demand for money to the changes in income, and the second factor the responsiveness of demand for money to the change in interest rate.
- The shifts in the LM curve are brought about by the variations in the supply of money and the shift in money demand function.
- The intersection of IS and LM implies the equality between goods market and money market.
- The IS-LM curve model is based on: (1) the investment-demand function, (2) the consumption function, (3) the money demand function, and (4) the quantity of money

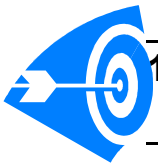


11.7 FURTHER READING

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2) Rana, K.C. & Verma, K.N. (2009). *Macroeconomic Analysis*. Jalandhar: Vishal Publications.

3) Shapiro, E. (2013). *Macroeconomic Analysis*. New Delhi: Galgotia Publications Pvt. Ltd..



11.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: (i) False (ii) True

Ans to Q No 2: IS curve is the locus of all the combinations of rate of interest and level of income at which saving and investment are equal. IS curve slopes downward from left to the right because as interest rate falls, investment increases and thus income increases.

Ans to Q No 3: Slope of IS curve mainly depends on two factors:

(a) Elasticity of investment curve, and (b) Size of the multiplier.

The IS curve may be flat or steep depending on the sensitiveness of investment to changes in the rate of interest. If investment is very sensitive to the rate of interest, then IS curve will be very flat and vice-versa. . If the size of the multiplier is large, income is more sensitive to changes in interest rate and thus the IS curve becomes flatter and vice-versa.

Ans to Q No 4: (i) True (ii) False

Ans to Q No 5: There are two factors on which the slope of LM curve depends, first, the responsiveness of demand for money to the changes in income. The greater the extent to which demand for money for transaction motive increases with the increase in income, the higher the rise in the rate of interest and consequently steeper the LM curve. The second factor which determined the slope of the LM curve is the elasticity or responsiveness of demand for money to the changes in the rate of interest.

Ans to Q No 6: The LM curve shows all the combinations of interest rate and levels of income at which the demand for and supply of money are equal.

The three characteristics of LM curve are as follows-

(i) The LM curve is a schedule that describes the combinations of rate of interest and level of income at which money market is in equilibrium

(ii) The LM curve slopes upward to the right

(iii) The LM curve is flatter if the interest elasticity of demand for the money is high, on the contrary, the LM curve is steep if the interest elasticity of demand for the money is low.

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

Ans to Q No 8: The IS-LM curve model is based on: (1) the investment-demand function, (2) the consumption function, (3) the money demand function, and (4) the quantity of money.



11.9 MODEL QUESTIONS

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

Q 1: Discuss the slope and shift of IS curve .

Q 2: Explain the slope and shift of LM curve

Q 3: Discuss the determination of general equilibrium.

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

Q 1: Define IS curve. Explain how can you derive the IS curve from the goods market.

Q 2: Define LM curve. Explain how can derive the LM curve from the money market.

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UNIT 12: ACCELERATION PRINCIPLE

UNIT STRUCTURE

12.1 Learning Objectives

12.2 Introduction

12.3 The Concept of Acceleration Principle

12.4 The Principle of Acceleration

12.5 Operation of the Accelerator

12.6 Assumptions and Criticisms of the Acceleration Principle

12.7 Let Us Sum Up

12.8 Further Reading

12.9 Answers to Check Your Progress

12.10 Model Questions

12.1 LEARNING OBJECTIVES

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

- define the concept of the accelerator
- discuss the principle of accelerator
- illustrate the operation of the accelerator
- state the assumptions of the acceleration principle and discuss its criticisms.

12.2 INTRODUCTION

This unit deliberates on the concept of accelarator. The concept of accelerator occupies an important place in the study of Macroeconomic theory. In an economy, investment spending and the changes in consumption spending are interrelated.

More specifically, the demand for capital goods depends upon demand for consumer goods because former helps to produce the later. However, the rate of change in demand for capital goods is always faster than the initial change in demand for consumption goods under all normal conditions. In this unit, we shall discuss the linkage between consumption

expenditure and investment, which is known as the acceleration principle.

12.3 THE CONCEPT OF ACCELERATION PRINCIPLE

We have already mentioned that in an economy, investment spending and the changes in consumption spending are interrelated. More specifically, the demand for capital goods depends upon demand for consumer goods because former helps to produce the later. However, the rate of change in demand for capital goods is always faster than the initial change in demand for consumption goods under all normal conditions.



LET US KNOW

- Capital is (a) the stock of equipments or structures used in production and (b) the funds to finance the accumulation of equipment and structure.
- The earliest study on the accelerator theory or principle was undertaken by J.M. Clark in "Business Accelerator and the Law of Demand", published in the Journal of Political Economy, March 1971, pp. 217-35.
- Cost of capital: the amount forgone by holding a unit of capital for one period, including interest, depreciation and the gain or loss from the change in the price of capital
- Investment spending: expenditure incurred on the purchases or goods by individuals and firms that add to their stock of capital.

In general, acceleration principle establishes the link between consumption spending and investment spending. It is defined as the process by which an increase (or decrease) in the consumption spending leads to a manifold increase (or decrease) in investment on capital goods. Symbolically, $v = \frac{\Delta I}{\Delta C}$ *or* $\Delta c \times v = \Delta I$, where "$v$" is the accelerator coefficient, "ΔI" is net change in investment and Δc is the net change in consumption expenditure. Numerically, if the increase in consumption expenditure of Rs. 10 lakhs leads to an increase in investment of Rs 30 lakh, the accelerator coefficient is 3.

In specific interpretation, accelerator is defined as the ratio which states that investment spending is proportional to the change in output and is not affected by the cost of capital. Here, the coefficient of accelerator is defined as $v = \frac{I_t}{\Delta Y}$ or the capital- output ratio, where I_t is net investment in time period "t", "Y" stands for national output and $\Delta Y = Y_t - Y_{t-1}$. Here, the guiding rule as Shapiro (2000) notes is the following:

> "an increase in productive capacity requires an expansion of the capital stock, which in turns calls for a higher rate of investment spending than would otherwise be needed. Accordingly, the rate of investment spending is made to depend on the changes in the level of national output." (Page. 398)

12.4 THE PRINCIPLE OF ACCELERATION

The fundamental relationship, as explained in section 12.1, between the changes in the level output and the volume of investment spending is known as the acceleration principle. The capital-output ratio "v" is known as the accelerator. To be precise, the theory of investment based on this relationship is known as the accelerator theory.

Let's explain this principle in terms of equations in the following manner:

If K stands for capital stock, Y stands for national output and *v* the capital-output ratio, then,

$K = vY$ ..... (1)

[Equation (1) states that if v is given as 2, then income (y) of Rs. 400/- is desired for the investment (or capital) of Rs. 200/-]

Since, the principle works under the assumption of constant or unchanging capital-output ratio, the capital stock, K in equation (1) will change over successive time periods only with changes in output, Y. If 't' stands for time period, taking time period into account, equation (1) can be expressed as,

$K_{t-1} = vY_{t-1}$ ..... (2)

Here, *t-1* is the preceding time period and *t* is the current or present

time period. If output rises from period *t-1* to *t* then the desired capital stock becomes,

$$K_t = vY_t \quad \text{..... (3)}$$

It is clear from equation (2) and (3), the increase in desired capital stock is K_t - K_{t-1}. In other words, to increase the capital stock from K_{t-1} to K_t, the net investment spending required is equal to the change in capital stock, i.e.

$$I_t = K_t - K_{t-1} \quad \text{..... (4)}$$

Here, I_t is net investment for period *t*. By definition net investment is obtained while we deduct depreciation of capital from gross investment. By substituting equation (3) in (4), we find:

$$I_t = vY_t - vY_{t-1}$$

$$\text{or, } I_t = v(Y_t - Y_{t-1}) \quad \text{..... (5)}$$

Equation (5) finally tells us that net investment depends upon the change in output from *t-1* to *t* multiplied by the capital-output ratio, *v*. If $Y_t > Y_{t-1}$, equation indicates that $I_t > 0$ and vice versa. Thus, for any given value of *v* and for any change in *Y* from *t-1* to *t*, the amount of net investment required (either positive or negative) depends upon change in level of output. If the economy is producing with no excess capacity and if capital-output ration is constant, any expansion of output requires an expansion of the capital stock. Further, if the value of accelerator is greater than one, the needed increase in capital stock must exceed the increase in output so that increase in investment spending is greater than the increase in output which causes it.

12.5 OPERATION OF THE ACCELERATOR

Having discussed the basics of acceleration principle, let us explain how acceleration principle works in practice. In order to know the working of the acceleration principle in an economy, we have to look at the changes in output and gross investments over a period of time. An arbitrary example relating to this is presented in Table 12.1 which is adapted here from the textbook *Macroeconomic Analysis* by E. Shaprio (2000).

Table 12.1:The Working of the Acceleration Principle

(here "v" is assumed to be 2)

Time period (in years)	Output (in units)	Desired Capital (in Rs Cr)	Actual Capital (in Rs Cr)	Repacement Investment (in Rs Cr)	Net Investment (in Rs Cr)	Gross Investment (in Rs Cr)
t	200	400	400	20	0	20
t + 1	210	420	420	20	20	40
t + 2	220	440	440	20	20	40
t + 3	250	500	500	20	60	80
t + 4	270	540	540	20	40	60
t + 5	260	520	520	20	-20	0
t + 6	256	512	512	20	-8	12
t + 7	250	500	500	20	-12	8
t + 8	230	460	480	20	- 40	20
t + 9	200	400	460	20	- 60	40
t + 10	190	380	440	20	- 20	0
t + 11	210	420	420	20	- 40	60
t + 12	220	440	440	20	20	40

In table 12.1, column-1 shows series of time periods, column-2 gives the assumed and given level of income or output in each time period. Capital-output ratio,, is assumed to be constant at 2. This capital-output ratio is used to calculate the desired capital stock which is presented in column-3. Desired capital stock is obtained by multiplying output/income level with the constant capital-output ratio. Since actual capital stock might be different from the desired capital stock, in column-5, actual capital stock is presented. Based on average life time of the capital, in each time period the replacement investment is assumed to be five percent of the initial capital stock i.e. the capital stock in time period one. Thus, the replacement investment is found to be Rs. 20 cr. per time period and remains fixed in each time period. In column-6, net investment is presented which is equal to times the change in output between that period and the preceding period. Finally, gross investment of column-7 is obtained by adding replacement and net investment.

From the table, we can simply explain the acceleration principle in the following manner:

When the demand for output increases by 10 units (from 200 units to 210 units) in period t+1, given v = 2, new investment requirement is: $I_t = v(Y_t - Y_{t-1})$, *i.e., 2(210-200) = 2 x 10 = Rs. 20 cr.*

Total expenditures for capital goods (which combine both replacement and net investment), have increased to 40 in period t+1 from 20 in the previous period t. Thus, with an accelerator of 2, the increase of 10 (equivalent to 5 percent) in expenditures for output produce an increase of 20 (equivalent to 100 percent) in expenditures for capital goods. This 100 percent increase in expenditure for capital goods due to 5 percent increase in output is mainly due to accelerator.

Let us consider another hypothetical example, presented in table 12.2, to illustrate the working of the acceleration principle.

Table 12.2:The Working of the Acceleration Principle

(here "v" is assumed to be 5)

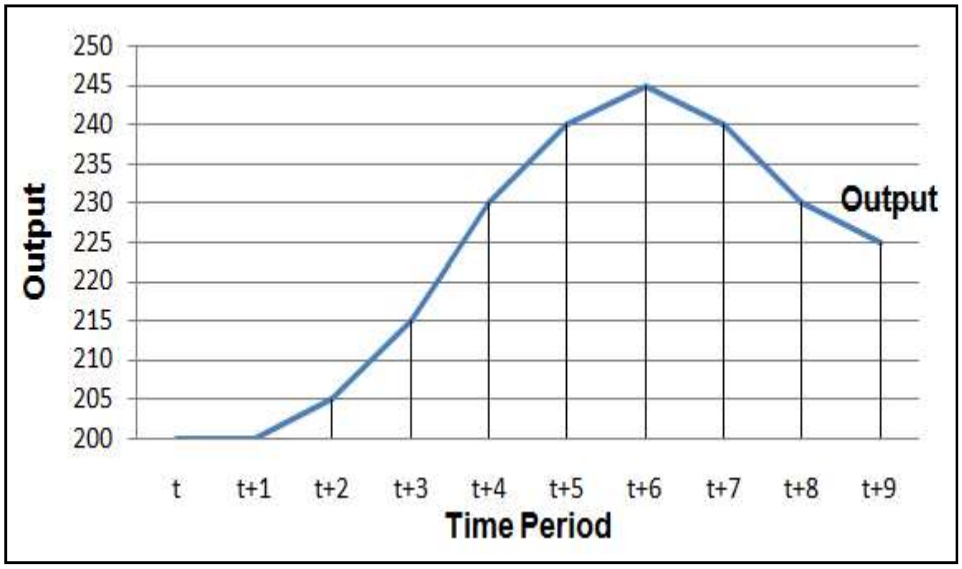
Time period (in years)	Output (in no. of units)	Desired Capital (In Rs Cr.)	Actual Capital (In Rs Cr.)	Repacement Investment (In Rs Cr.)	Net Investment (In Rs Cr.)	Gross Investment (In Rs Cr.)
t	200	1000	1000	50	0	50
t + 1	200	1000	1000	50	0	50
t + 2	205	1025	1025	50	25	75
t + 3	215	1075	1075	50	50	100
t + 4	230	1150	1150	50	75	125
t + 5	240	1200	1200	50	50	100
t + 6	245	1225	1225	50	25	75
t + 7	240	1200	1200	50	-25	25
t + 8	230	1150	1150	50	-50	0
t + 9	225	1125	1125	50	-25	25

Table 12.2 depicts changes in total output, capital stock, net investment and gross investment over ten years time period. The value of accelerator v (is assumed to be 5). Given $K_t = vY_t$, i.e. the required or desired capital stock in each period is 5 times the corresponding output of

that period as shown in column-3. The replacement investment is assumed to be 5 percent of initial capital in first year which is shown as 50 in each time period. Net investment in column-5 equals *v* times the change in output between one period and the preceding time period i.e. $I_t = v(Y_t - Y_{t-1})$. It is clear that net investment depends upon the change in total output gives the value of accelerator. So long as the demand for output rises, net investment is positive. Net investment turns out to be negative when change in output between two time periods is negative. In our table total output increases at an increasing rate up to time period *t+4* year and so does the net investment. Then it increases at diminishing rate from *t+5* year onwards and net investment has declined. From *t+6* year output has declined and net investment becomes negative.

The acceleration principle based on Table 12.2 has been illustrated diagrammatically in the following figures 12.1 and 12.2.

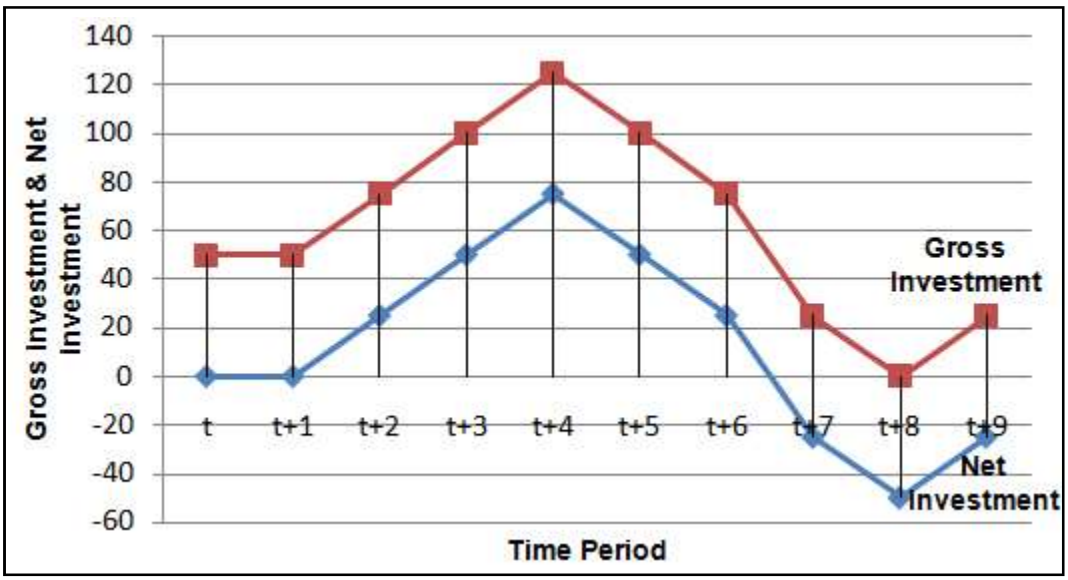
Figure 12.1: Acceration Principle: Output Curve



In Figure 12.1, total output curve is shown. It is clear from the figure that total output curve (Y) increases at an increasing rate up to time period t+4, then at a decreasing rate up to time period t+6, after this it starts declining.

Let us now view the net investment and gross investment cuves. These have been shown in Figure 12.2.

Figure 12.2: Acceleration Principle: Gross Investment & Net Investment Curves



The net investment curve in Figure 12.2 shows that the rising output leads to increase in net investment (due to accelerator) up to t+4 periods because output is increasing at an increasing rate. But when output increases at decreasing rate between t+4 and t+6 periods, net investment declines. When output has declined since t+7, net investment has become negative. It is also clear from figure 12.2 that gross investment curve has shown same behaviour as the net investment curve.



CHECK YOUR PROGRESS

Q 1: Why is the accelerator used? Answer in about 30 words.

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Q 2: Define accelerator principle. Answer in about 40 words.

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Q 3: Fill in the blanks: $I_t = v(Y_t$ - .....$)$

12.6 ASSUMPTIONS AND CRITICISMS OF THE ACCELERATION PRINCIPLE

The acceleration principle rests upon a few assumptions.

- The capital-output ratio is assumed to be remaining constant.
- The firms operate without excess capacity, i.e. firms can not expand output with decreasing average cost of production.
- The firms will increase its capacity to meet every increase in real spending. That is resources (especially supply of credit and capital) demanded by the firms are assumed to be elastic.
- There is no gap between desired/required capital and actual/real capital stock within a single time period.
- Increase in output immediately leads to a rise in net investment.

The acceleration principle has been criticised for its rigid assumptions. The following are its main limitations:

- **Capital-output ratio is not constant**: The acceleration principle is based on a constant capital-output ratio. But capital output does not remain constant for many reasons. For example, (a) rapid technological advancements in all economies (more so in the developing countries) improve marginal efficiency of capital which in turn lead to increase in output of any commodity per unit capital, (b) speculative behaviour of investors or traders with regard to prices, wages, interest affects future demand for a commodity which affects current output. High optimism in business causes capital-output ratio to go up and vice versa.
- **Resources are not elastic:** The underlying assumption that the resources should be elastic i.e. they are unemployed in the capital goods industries and can be used to expand the industries, is objected by economists. This resource elasticity is feasible when there is unemployment in the economy. But once the economy reaches the full employment level, the capital goods industries fail to expand due to the absolute as well as relative scarcity of resources. This limits the working of the acceleration principle. Therefore, when an economy undergoes recession this principle doesn't work.

- **There is possibility of idle/excess capacity in plants**: The acceleration theory assumes that there is no idle/unused capacity in plants. But it is obvious that many firms mostly in their infancy enjoy idle capacity. Under such circumstances, an increase in the demand for consumer goods will not lead to the increased demand for new capital goods. In such a situation, the acceleration principle becomes inoperative.
- **There is difference between required and real capital stock:** The acceleration theory assumes no difference between required and real capital stock. Even if it exists it ends in one period. But if industries are already producing capital goods at full capacity, it is not possible to end the difference in one period.



12.7 LET US SUM UP

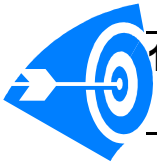
- In general, the ratio of the change in consumption expenditure to the change in net investment is known as the accelerator coefficient. Symbolically, . Where *I* stands for invest and C for consumption expenditure.
- In specific interpretation, accelerator is defined as the ratio which states that investment spending is proportional to the change in output and is not affected by the cost of capital.
- The Cost of capital is the amount forgone by holding a unit of capital for one period, including interest, depreciation and the gain or loss from the change in the price of capital.
- The earliest study on the accelerator theory or principle is the one done by J.M. Clark, “Business Accelerator and the Law of Demand”, published in the Journal of Political Economy, March 1971.
- The fundamental relationship between the changes in the level output and the volume of investment spending is known as the acceleration principle. The capital-output ratio is known as the accelerator.
- Net investment is the gross investment less depreciation cost of capital.

- Acceleration principle is based upon assumptions like, constant capital-output ratio, no excess capacity, presence of resource elasticity and the absence of difference between required capital stock and real capital stock.
- The principle is objected mainly for its underlying unrealistic or rigid assumptions.



12.8 FURTHER READING

1) Chopra, P.N.(2008). *Micro Economics*. Ludhiana: Kalyani Publishers..
2) Jhingan, M. L. (2014). *Advanced Economic Theory. New Delhi:* Vrinda Publication Pvt. Limited
3) Shapiro, E. (2013), *Macroeconomic Analysis.* New Delhi: Galgotia Publications



12.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No. 1: In general, acceleration principle establishes the link between consumption spending and investment spending.

Ans to Q No. 2: In specific interpretation, accelerator is defined as the ratio which states that investment spending is proportional to the change in output and is not affected by the cost of capital. Here, the coefficient of accelerator is defined as $v = \frac{I_t}{\Delta Y}$ or the capital-output ratio, where I_t is net investment in time period "t", "Y" stands for national output and $\Delta Y = Y_t - Y_{t-1}$.

Ans to Q No. 3 : $I_t = v(Y_t - Y_{t-1})$.



12.10 MODEL QUESTIONS

A) Very Short Questions:

Q 1: What is capital?

Q 2: What is investment?

Q 3: What is Gross investment?

Q 4: What is net investment?

Q 5: What do you mean by capital output ratio?

Q 6: What is acceleration principle?

Q 7: State Hick's accelerator coefficient.

Q 8: Does capital-output ratio of any economy remain constant?

Q 9: What do you understand by excess capacity of a firm?

Q 10: How is required capital obtained using acceleration principle?

Q 11: What do you understand by cost of capital?

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

Q 1: Give a suitable definition of acceleration principle?

Q 2: Derive the equation of acceleration principle?

Q 3: Define investment. State the distinction between gross investment and net investment.

Q 4: Define capital-output ratio. Explain under what conditions an economy's capital-output ratio doesn't remain constant.

Q 5: Explain what happens when accelerator coefficient is found to be greater than one.

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

Q 1: Define accelerator. Critically discuss the principle of acceleration.

Q 2: Explain with the help of a numerical example the operation of acceleration principle. Discuss the main limitations of acceleration principle.

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UNIT 13: BUSINESS CYCLES

UNIT STRUCTURE

13.1 Learning Objectives

13.2 Introduction

13.3 Business Cycles

- 13.3.1 Meaning and Definition
- 13.3.2 Features of Business Cycles
- 13.3.3 Different Phases
- 13.3.4 Significance of the Phases

13.4 Causes of Business Cycles

13.5 Control of Business Cycles

13.6 Let Us Sum Up

13.7 Further Reading

13.8 Answers to Check Your Progress

13.9 Model Questions

13.1 LEARNING OBJECTIVES

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

- describe the concept of business cycles and discuss the different phases of business cycles with their significance
- explain different features, causes and effects of business cycles
- put forward anti-cyclical measures.

13.2 INTRODUCTION

Economists have pointed out that a capitalist economy passes through certain phases. This means that even when a capitalist economy (for example economy of USA or the UK economy) experiences growth (growth in output, income and employment) over a longer period of time, there are some ups and downs in the economic activity of these economies. Interestingly, these ups and downs are recurring in nature;

more or less they occur at regular intervals; though the time period of their occurrence is not fixed.

Economists have termed such ups and downs as business cycles. Keynes used the term trade cycles instead of business cycles. The ups and downs have been divided into certain phases. This unit discusses meaning, definition, features and the various phases of this phenomenon. At the end of this unit, you will be able to forward some of the important anti-cyclical measures as well.

13.3 BUSINESS CYCLES

Business cycle is one of the complex phenomena that a capitalist economy faces. Economists have tried to explain this phenomenon from different perspectives. They seem to be divided equally while discussing the basic concepts like causes and phases as well. We shall however try to put forward the most common observations on the topic.

13.3.1 Meaning and Definition

Broadly speaking, business cycles are a kind of fluctuations which occur in business activities in an economy with a certain degree of regularity and which follows the different phases in certain sequence. Different economists have tried to define the term business cycles differently. In the following, we discuss some of the important definitions.

The definition put forward by Wesley C Mitchell and Arthur F Burns is considered to be the most comprehensive. According to them,

‘ Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises : a cycle consists of expansions occurring at about the same time in many economic activities followed by similarly general recessions, contractions and revivals which merge into the expansion phase of the next cycle; this sequence of change

is recurrent but not periodic in duration; business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles with amplitudes approximating their own.'

This definition highlights the following points:

- Business cycles emerge in organised capitalist economies.
- Cyclical fluctuations are important features of such economies led by private entrepreneurs.
- Business cycles refer to the fluctuations in aggregate economic activity.
- The phases of expansion, recession, contraction and revival occur and re-occur in a definite sequence.
- The cyclical fluctuations are recurrent but not periodic. This means that they re-occur. But their re-occurrence does not follow a definite time-frame.

Keynes has defined business cycles (he used the term trade cycles) as "*A trade cycle is composed of periods of good trade characterised by rising prices and low unemployment percentages altering with periods of bad trade characterised by falling prices and high unemployment percentage."*

Haberler defines the term in these simple words: *"The business cycle in the general sense may be defined as an alteration of periods of prosperity and depression of good and bad trade."*

13.3.2 Features of Business Cycles

Business cycles are very complex phenomena to explain. However, some of the common features may be explained. Some of the features of business cycles are as follows:

- **Affect the Whole Economy:** Business cycles affect the whole economy. Business cycles often emerge in regular intervals and it affects all the sectors of an economy. Temporary and

partial fluctuations are not considered as trade cycles or business cycles.

- **Different sectors are affected with different intensities:** Even when all the sectors of the economy are affected by business cycles, during the phases of depression and prosperity, but all sectors of the economy do not feel the same pressures. For example, capital goods producing industries suffer more.
- **Irregular Time Duration:** A business cycle may complete its phases in a period of 5 to 10 years. Sometimes, this period may extend to more than 10 years while it may also last less than 5 years.
- **International by Character:** In today's age of Globalisation, countries of the world are closely connected with each other through international trade. As a result, prosperity or depressionary shocks in one part of the world affects all the countries. As a result, if depression emerges in a big economy, its repercussions are felt in many other countries of the world.
- **Recovery is comparatively slower than recession:** The trough of depression phases, (we shall discuss these phases in detail in the next sub-section) contains the vital seeds for recovery while the boom of expansion contains the germs of recession. But international experiences suggest that usually recovery is slower than recession.
- **Complex in Nature:** Business cycles are very complex phenomena to explain. Their emergence are results of specific factors. This is the reason, why all trade cycles do not have uniform characteristic and causes. Due to this reason it is difficult to make accurate prediction of trade cycles before their occurrence.
- **An Overall Growth Trend across different Business Cycles:** Even when the economy suffers from business cycles from time to time, as the market economy grows over a long period of time, there seems to be overall growth trend. This means that

the peak level of every next trade cycle occurs at a higher level of national income than the previous trade cycle. We have explained this phenomenon graphically in the next sub-section of this Unit.

- **Business Cycles affect beyond the Economy:** The affects of business cycles are not limited to economic activities only. In fact, they cause serious social consequences as well. It affects behaviour of people, and also results in increase in social crimes etc.

13.3.3 Different Phases

Business cycles consist of four phases viz., expansion (also called upswing or prosperity); peak (also called turning point or boom); contraction (also called downswing, recession or depression) and trough (also called lower turning point). We shall now consider the following figures depicting different phases of business cycles as has been shown in Figure 13.1. Then, we shall briefly discuss the significance of each of the phases.

Figure 13.1: Four Phases of Business Cycles without Growth Trend

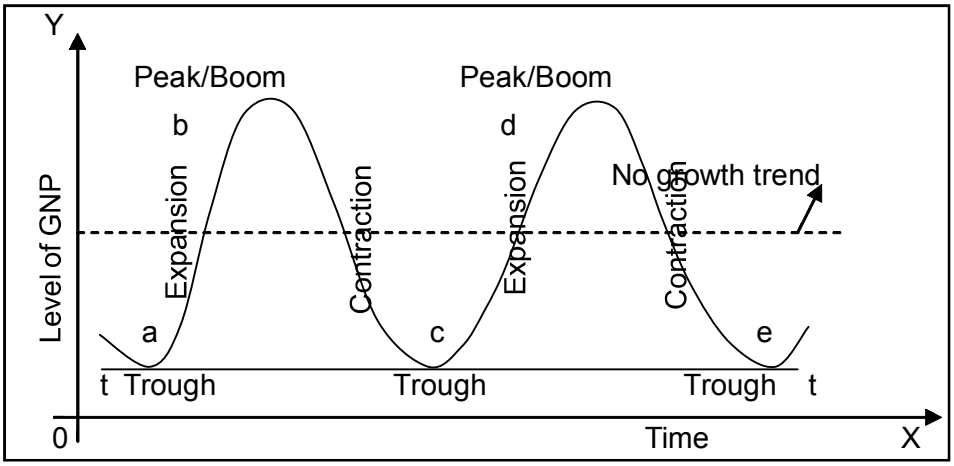


Figure 13.1 depicts the different phases of business cycles. From the figure it can be seen that the initial phase of the economy is at point a. This is termed as trough or depression. The economic activities (output, employment) are lowest at this level. With revival in the economy, the economy moves from a

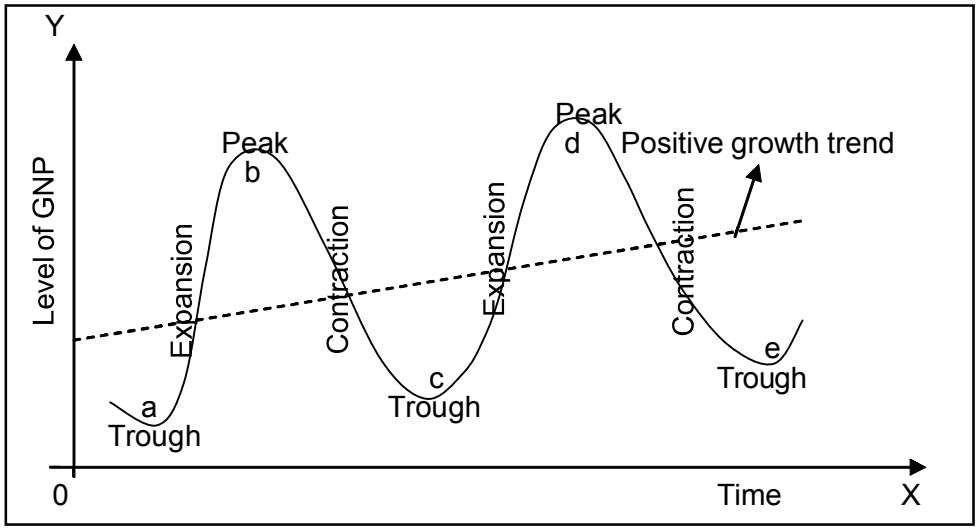
toward b. This is called expansion phase of business cycles. The economic activities prosper most during this phase. It reaches the peak level at point b. Level of output, employment and income all remain high at this stage. But the economic activities do not remain at such peak levels (we shall discuss its causes later while elaborating each of the phases) for all the time. The economy has to come down after some time. Thus, the economy activities gradually slow down and it moves from b to c. This phase (movement from b to c; i.e, until it reaches c) is called contraction. When the economy reaches its lowest level at c, it faces the stage of trough (or, depression) once again. This is just the repeat of the stage a. After the economy reaches the stage of depression, it gradually tends to recover and the business activities start to expand. Thus, the previous movement from a to b is repeated when the economy moves from c toward d. When it reaches the peak of the expansion phase at d, the economy grows to the highest level. After some time, it gradually starts to come down; which is simply the repeat of the previous stage from d to e. As it reaches point e, the depression phase of the economy is repeated once again.

Further, you will notice from the Figure 13.1 that as the economy passes though these phases, the overall economic activities have remained stagnant. This means that the level of output, employment and income has remained the same at each corresponding phases of the cycles. This can be found out from the fact that when the economy passes through the trough (depression) stages at different times viz., a, c and e, the level of economic activities has remained the same. This is obvious from the fact that all these points are tangent to the line tt parallel to the x-axis. This can be found out by drawing a parallel to the x-axis line through the mid-points of expansion and contraction phases of the business cycles as well. The dotted line in the figure thus, represents a dynamic stability i.e., no

growth trend over the years. No growth in output, employment and national income has been thus experienced over the period.

Contrary to this, economists like J R Hicks has pointed out even when the economy passes through these phases repeatedly, but they actually experience cyclical fluctuations rather than dynamic stability. This means, the level of economic activities do not remain the same over the years; thus, overall it grows. In such cases, when we depict a dotted through the mid-points of expansion and contraction phases, it will show positive growth in the economic activities. This has been shown with the help of Figure 13.2.

Figure 13.2: Four Phases of Business Cycles with Growth Trend



From the above figure 13.2 it is obvious that the economy passes through the same phases as it does in case of previous Figure 13.1. The only difference however in this case is that the dotted line drawn through the mid-points of expansion and contraction phases shows a positive growth trend. This means over the years, there is expansion in output, employment and income even when it passes through the same phases. Such movements of the business cycles thus depict cyclical fluctuations rather than dynamic stability.

LET US KNOW



It is to be noted that an economy may not follow each of the phases of business cycles in proper sequence as suggested by the curve of business cycles. Examples are available which show deviations from theoretical understanding of it. In 1929, the economy of England passed through Great Depression. Prior to the Great Depression, the depression phase of the England economy seemed to have stabled; thus, it should have actually moved towards expansion. But to the contrary, it moved towards the Great Depression. Again, the USA economy in 1937 once again moved towards recession (contraction phase) after it had recovered from the same phase.

Again, the time period of each of the phases is also not fixed. Sometimes, an economy may recover quickly, while at another instance it may require longer time to recover.

13.3.4 Significance of the Phases

Let us now discuss the significance of each of these phases in brief.

Expansion and Peak: During the phase of expansion, the economic activities start to expand. The level of output, income and employment rises. It gains the highest level of prosperity when it reaches the peak point of the business cycles. Economy reaches the highest level of national income. It means that there is no difference between the potential level of national income of the economy and the actual level. The demand for output (goods and services including durable consumer goods) reaches the highest level; it reaches the level of full employment as well.

However, the economy does not sustain at this level for good. It takes the turning point toward decline in economic activities. Economists differ regarding the possible causes for such down turn. Keynes has made falling MEC (decline in

expected rate of profit) responsible for this. ***Monetary economists*** point out that contraction in bank credit may be responsible for this.

Contraction: As stated above, the economic activities tend to decline. Thus, the level of employment, output and income declines. There exists large scale involuntary unemployment in the economy. The rate of interest also falls. As a result, people choose to hold cash in hand rather than keeping deposits in the bank. Industries accumulate a large volume of excess capacities as the level of production declines.

Trough or Depression: As the economy reaches the lowest level of economic activities, the economy reaches the phase of trough. The whole economy tends to break down during this phase. If sustained for a long time, it may lead to depression. The Great Depression of 1929-33 may be cited as an example which causes immense human suffering.

The depression phase of the economy will not however lead to prosperity automatically. If left at its own, the depression phase may sustain for an inordinately long period. The government must come to its rescue; it will have to undertake policies for the revival of the economy like stabilization policy, monetary measures like expansion of credit facility etc. such that the entrepreneurial spirit can be revived and promoted.



CHECK YOUR PROGRESS

Q 1: Match the following sets (A) with (B). Write the correct options in the alongside boxes.

Set (A)	Set (B)
(i) Expansion	(a) Turning point
(ii) Peak	(b) Boom
(iii) Contraction	(c) Lower turning point
(iv) Trough	(d) Recession

Q 2: Do you agree that the economy will automatically recover from the depression phase of business cycles? Give your arguments. (Answer in about 50 words)

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13.4 CAUSES OF BUSINESS CYCLES

We have already mentioned that business cycles are complex phenomena. It is very difficult to list out the causes of its emergence. Even then, economists and others operating in the market have tried to list a few causes to its emergence. Some have tried to categorise them as monetary and non-monetary factors while others have tried to attribute them to psychological factors. Samuelson has pointed out two sets of factors responsible for the emergence of business cycles: external and internal. Let us dicuss these factors in brief.

External factors: External causes of business cycles emerge outside the economy and may range from sunspots, enviornmental disturbances, wars, revolutions, political events, gold discoveries, growth rate of population, migration, industrial discoveries and innovations etc. For example, political instability in a big influential economy may adversely affect the economic environment of that country along with the other economies who are closely linked with that economy in terms of international trade etc. An innovation like the railroads, telecommunication brought unprecendented business opportunites to the economies. Economic activities like investment, consumption saw mainfold increase with such innovations. Similarly, situations like wars, famine, major earthquakes etc. in one part of the world adversely affect the economic activities in the rest of the world often causing chain reactions in the global economy.

Internal factors: The internal causes of business cycles emerge from within the economy. Haberler has broadly classified them as monetary and non-monetary factors. The monetary factors include bank credit, over-saving or under-consumption and over-investment.

Monetary economists like Hawtrey, Friedman and others have pointed out that cyclical fluctuations are caused by expansion and contraction of bank credit. Expansion of bank credit leads to higher demand of goods and services while contraction limits the demand. Thus, they argue that increase in money supply (expansion in bank credit) brings prosperity and a decrease leads to depression.

Economists like Hobson, Foster and Douglas argue that over-saving or under-consumption leads to depressionary phase of an economy. They argue that the rich section of the people do not spend their entire income on consumption. As a result, they tend to save and invest more. This leads to over-production of consumer goods. The poor section of the economy on the other hand, though have higher propensity to consume, lack sufficient income in their hand to purchase the consumer goods. Thus, there is a supply and demand gap in the economy. While supply is more, demand tends to be less. As a result, stocks of consumer goods pile up. This further leads to fall in prices of consumer goods and the income of the producers. The final consequence is that depression sets in the economy.

Economists like Hayek, Cassel and Robertson makes similar arguments. However, they have pointed out that rather than under-consumption, it is over-investment that leads an economy towards depression. According to them, due to availability of bank credits, over-investment is experienced in capital-goods industries compared to the consumer-goods industries. As a result, money supply exceeds the amount of voluntary savings. While increased money supply leads to a boom phase in the economy, due to lack of voluntary savings, banks remain unable to supply sufficient credits for a longer period of time. In this way, over-investment leads to a depression in the economy.

The important non-monetary factors that cause business cycles include: macro economic environment, competition, psychological causes, innovations etc.

When the local and global macro economic environments are stable and pass through a boom phase, there is a general positive sentiment across the world economy. As a result, businesses in most of the countries experience a high demand and go into a high growth cycle. On the contrary, when global economy passes through an economic slowdown with cyclical unemployment, the general business environment also experiences a recessionary phase. This also adversely affects the local economy of the country. On the other hand, if the local economy (particularly, the major economies of the world) experiences serious economic downturns, they are bound to adversely affect the local businesses, even if the rest of the global economy is going through a growth cycle.

Chapman points out that competition may also lead to over-production, which ultimately leads to a depressionary situation. Pigou pointed out that psychological factors like 'over optimism' and 'over pessimism' lead to depression. According to him, over optimism of the business class leads to over-production in the economy, while over-pessimism leads to under-production. Pigou points out that these psychological factors of the business class act like alternating waves, and as a result of these reversals, business cylces occur in an economy.

Schumpeter points out that innovations in an economy are the sources of business fluctuations. In this regard he puts 'the cause of depression is prosperity'. He argues that innovations in one field leads to innovations in other fields. Soon, over-production results in the economy which further leads to depression.

13.5 CONTROL OF BUSINESS CYCLES

Different economists put forward different versions of remedial measures based on their arguments of trade cycles. Economists however agree that it is not always possible to avoid cyclical fluctuations in the economy fully. So, they argue that two sets of measures should be

adopted. Preventive measures may delay the occurrence of such phenomenon while curative measures will help the economy revive from the crisis.

Remedial measures for prevention of economic crisis depend on diagnosis of the crisis. Certain factors like change in climates or monsoon, availability of raw materials are highly unpredictable and can not be controlled. Again, the economic environment in an agrarian economy is bound to be different from an industrial economy. An agrarian economy however can reduce its dependence on climate through provision of adequate irrigation facilities. However, certain phenomena like drought, earthquake and epidemics can not be predicted with certainty.

The important economic variables like change in demand, export and import, per capita income, cost of living index, movement of prices etc., however, can be predicted much accurately if there exists a sophisticated and up-to-date statistical system. This may help business community to forecast economic variables to a large extent and follow business decisions accordingly.

The corrective measures on the other hand, can be discussed under the following heads:

Monetary Measures: As you have already known, monetary measures relate to the banking and credit policy of a country. Thus, the central bank of a country has very important role to play in setting the right kind of banking and credit environment of the country. The important measures of a central bank will be discussed in detail in the next course. We just simply mention in this unit that bank rate and open market operations are such two instruments. Thus, in boom conditions, the central bank raises the bank rate with a view to contract the credit supply in the economy. Again, during depression, a policy of cheap money may help stimulate business investment and thus recover the economy. Again, the central bank may also adopt sector-specific credit policies to promote certain sectors of the economy.

Economists however differ regarding the effectiveness of monetary policies to tackle cyclical fluctuations in the economy.

Fiscal Measures: We shall discuss in detail the important fiscal measures adopted by the government in the next course. Fiscal policy, in a wider sense, consists of public spending and appropriate taxation. Keynes was prominent to acknowledge the role of government spending during the period of depression. During depression government should spend beyond its capacity of revenue earning. This means that deficit budget is an important tool during depression. Such government investments are expected to raise the level of employment in the economy. In the long-run, as the economy recovers, the government should undertake budget-balancing measures to offset any adverse effects on the economy. Such measures will help the economy to stabilise in the long-run.

Again, the similar taxation policies are suggested:

- Tax structure and tax rates should be designed such that the business firms are motivated to undertake investment decisions.
- Government should provide employment benefits to the employees. This will help in boosting up the domestic consumption levels.
- Monetary measures should be suggested such that credit availability is enhanced.
- An appropriate international economic policy should be followed so that the domestic export sector is promoted.

International Measures: Business cycle is an international phenomenon and the fluctuations in a country will also affect other countries as well (especially in the present era of globalisation). Three measures are suggested to control depression phase of the business cycles (viz., international production control, international ***buffer stocks*** and international investment control). International production control tries to control the prices and production of primary products. Buffer stocks go hand in hand with production and price control. Buffer stocks mean holding stocks of primary commodities as a measure to wipe out price fluctuations. Thus, buying buffer stocks during slump or low-price and releasing the same when prices are high can help the economy ease



Buffer Stocks : and international investment control). International production control tries to control the prices and production of primary products.

out. Similarly, international investment controls are adopted to promote economic development of the backward regions of the developed economies. Such efforts have long-run effects on raising the living standard as well as reducing economic inequalities among the under privileged people.



CHECK YOUR PROGRESS

Q 3: State whether the following statements are True (T) or False (F).

(a) Preventive measures help the economy revive from depression. (T/F)

(b) Keynes was critical of government investment during depression. (T/F)

Q 4: Why are the international measures important in controlling depression? What international measures are generally adopted? (Answer in about 50 words)

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13.6 LET US SUM UP

- Business cycle is one of the complex phenomena a capitalist economy faces.
- Business cycles consist of four phases viz., expansion (also called upswing or prosperity); peak (also called turning point/boom); contraction (also called downswing, recession or depression) and trough (also called lower turning point).
- It is to be noted that an economy may not follow each of the phases of business cycles in proper sequence as suggested by the curve

of business cycles. Again, the time period of each of the phases is also not fixed. Sometime, an economy may recover quickly, while at another instance it may require longer time to recover.

- Various measures are suggested for the prevention of and cure from cyclical fluctuations. Monetary measures like bank rate operations and credit control are important for the control of inflation. However, economists differ regarding the effectiveness of the monetary measures.
- Anti-cyclical fiscal measures consist of public spending and appropriate taxation. .



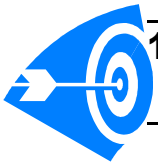
13.7 FURTHER READING

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13.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No. 1:

Set (A)	Set (B)
(i) Expansion	(b) Turning point
(ii) Peak	(a) Boom
(iii) Contraction	(d) Lower turning point
(iv) Trough	(c) Recession

Ans to Q No. 2: The depression phase of the economy will not automatically recover. If left at its own, the depression phase may sustain for an inordinately long period and this may ruin the whole economy. The government must come to its rescue, especially for the revival of the economy through adoption of stabilization policy, monetary measures etc.

Ans to Q No. 3: a) False b) False

Ans to Q No. 4: Business cycles is an international phenomenon and the fluctuations in a country will also affect other countries as well (especially in the present era of globalisation). This necessitates adoption of international measures for the control of business cycles.

Three measures are suggested to control depression. They are a)international production control b) international buffer stocks and c) international investment control.



13.9 MODEL QUESTIONS

Short Questions (Answer each question in about 150 words)

Q 1: What do you mean by business cycles? Briefly discuss its various phases.

Q 2: Discuss the various phases of business cycles.

Q 3: Enumerate the significances of various phases of business cycles.

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

Q 1: What do you mean by business cycles? Suggest important anti-cyclical measures.

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UNIT 14: BUSINESS CYCLES THEORY

UNIT STRUCTURE

14.1 learning Objectives

14.2 Introduction

14.3 Multiplier-Accelerator Interaction: Samuelson's Theory of Business Cycles

14.4 Hick's Theory of Bussiness Cycles

14.5 Let Us Sum Up

14.6 Further Reading

14.7 Answers to Check Your Progress

14.8 Model Questions

14.1 LEARNING OBJECTIVES

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

- describe the multiplier-accelerator theory of business cylces put fowrad by Samuelson
- explain Hick's theory of business cycles.

14.2 Introduction

We have already discussed business cycle in the previous unit. In this unit, we shall disucss two prominent theories of busines cycles. The first is the Samuelson's Theory of business cycles. In this theory, we shall discuss how Samuelson utilised the accelerator and multiplier interaction to explain the phenomenon of business cycle. The next is the Hick's theory of business cycles.

14.3 MULTIPLIER-ACCELERATOR INTERACTION: SAMUELSON'S THEORY OF BUSINESS CYCLES

In the previous unit, we have pointed out a few factors for the emergence of business cycles. J. M. Keynes also made significant contributions to the understanding of business cycles. He maintained that

business cycles are the results of ups and downs in investment demand. In Chapter 22 entitled 'Notes on the Trade Cycles' of his famous book "The General Theory of Employment, Interest and Money", Keynes argued that the problem of business cycle (Keynes used the term Trade cycle) in the economy was caused 'by a cyclical change in the marginal efficiency of capital, though complicated and often aggravated by associated changes in other significant short-period variables of the economic system.' Thus, according to Keynes, the prime factors of cyclical fluctuations in the economy stems from investment changes generated by the cyclical changes in the marginal efficiency of capital.

In his theory of business cycles, Keynes, with the help of the multiplier theory has shown the effect of increase and decrease in investment on output and employment get magnified when multiplier is working during either the upswing or downswing of a business cycle. However, he did not explain the cyclical and cumulative nature of the fluctuations in economic activity. This is because he did not lay any emphasis on utilising the accelerator in the explanation of business cycles.

Later economists tried to utilise both the multiplier and the interaction principles to explain economic phenomena including business cycles. Samuelson was among the pioneers. He showed that the interaction between the multiplier and accelerator caused cyclical fluctuations in economic activities.

The basic tenet of the Samuelson's model is that multiplier alone cannot adequately explain the cyclical and cumulative nature of the economic fluctuations. An autonomous increase in the level of investment raises income by a magnified amount depending upon the value of the multiplier. This increased income further acts as an inducement to increase investment through the acceleration effect. Thus, the increase in income raises aggregate demand for goods and services. To fulfil the increased demand of more goods, the economy would require more capital goods for which extra investment is needed. In this way, the relationship between investment and income is one of mutual interaction; investment affects

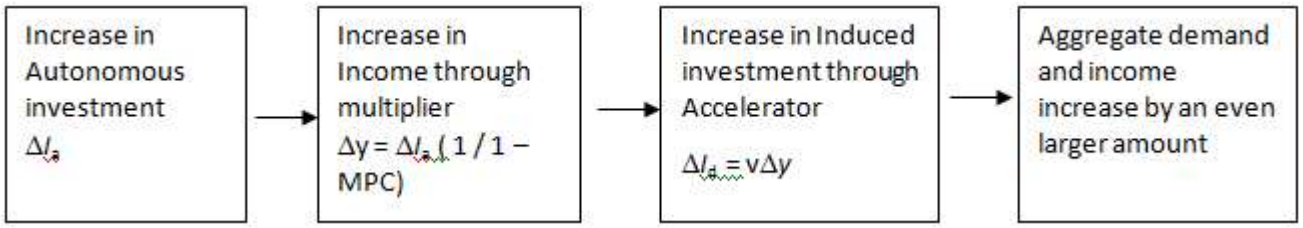
income which in turn affects investment demand and in this process income and employment fluctuate in a cyclical manner.

Samuelson's model rests on the following assumptions:

- Consumption spending in the current period is related to the change in income in the preceding period.
- Investment in the current period is related to the change in income with a lag of one period.
- There is also an additional factor in the form of exogenous (government) spending, which is constant.
- The model does not consider the determinants of this exogenous spending nor the effects of it's changes on the level of income.

Working of the Model: To explain the working of the Samuelson's model, let us first consider the following Figure 14.1 which explains with how income and output will increase by even larger amount when accelerator is combined with the Keynesian multiplier.

Figure 14.1: Combining Accelerator with Keynesian Multiplier



In Figure 14.1, I_a = Increase in Autonomous Investment, Y = Increase in Income, 1/ 1 –MPC = Size of Multiplier where MPC = Marginal Propensity to Consume, I_d = Increase in Induced Investment, v = Size of accelerator.

The model of interaction between multiplier and accelerator can be mathematically represented as under:

$$Y_t = C_t + I_t \quad \ldots(i)$$

$$C_t = C_a + c\,(Y_{t-1}) \quad \ldots(ii)$$

$$I_t = I_a + v\,(Y_{t-1} - Y_{t-2}) \quad \ldots.(iii)$$

Here Y_t, C_t and I_t stand for income, consumption and investment respectively for a period t, C_a stands for autonomous consumption, I_a for

autonomous investment, c for marginal pro-pensity to consume and v for the capital-output ratio or accelerator.

From the above three equations and from the assumptions of the model we have already discussed, it can be seen that consumption in a period t is a function of income of the previous period Y_{t-1}. Similarly, induced investment in period t is a function of the change in income in the previous period. This further implies that there is two periods gap for changes in income to determine induced investment (consider the second assumption of the model).

Now, in the equation (iii) above, induced investment equals v ($Y_{t-1} - Y_{t-2}$) or v (ΔY_{t-1}).

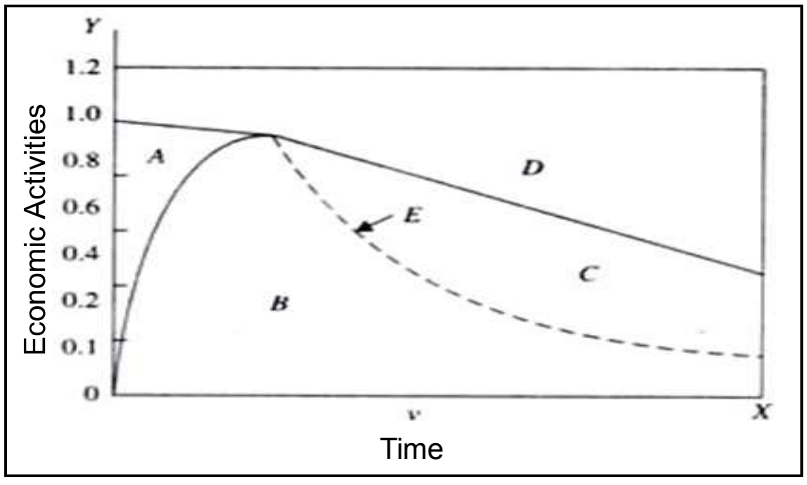
Substituting equations (ii) and (iii) in equation (i) we get the following income equation (iv).

$$Y_t = C_a + c\,(Y_{t-1}) + I_a + v\,(Y_{t-1} - Y_{t-2}) \quad \ldots(iv)$$

Equation (iv) explains how changes in income are dependent on the values of marginal propensity to consume (c) and capital-output ratio v (i.e., accelerator).

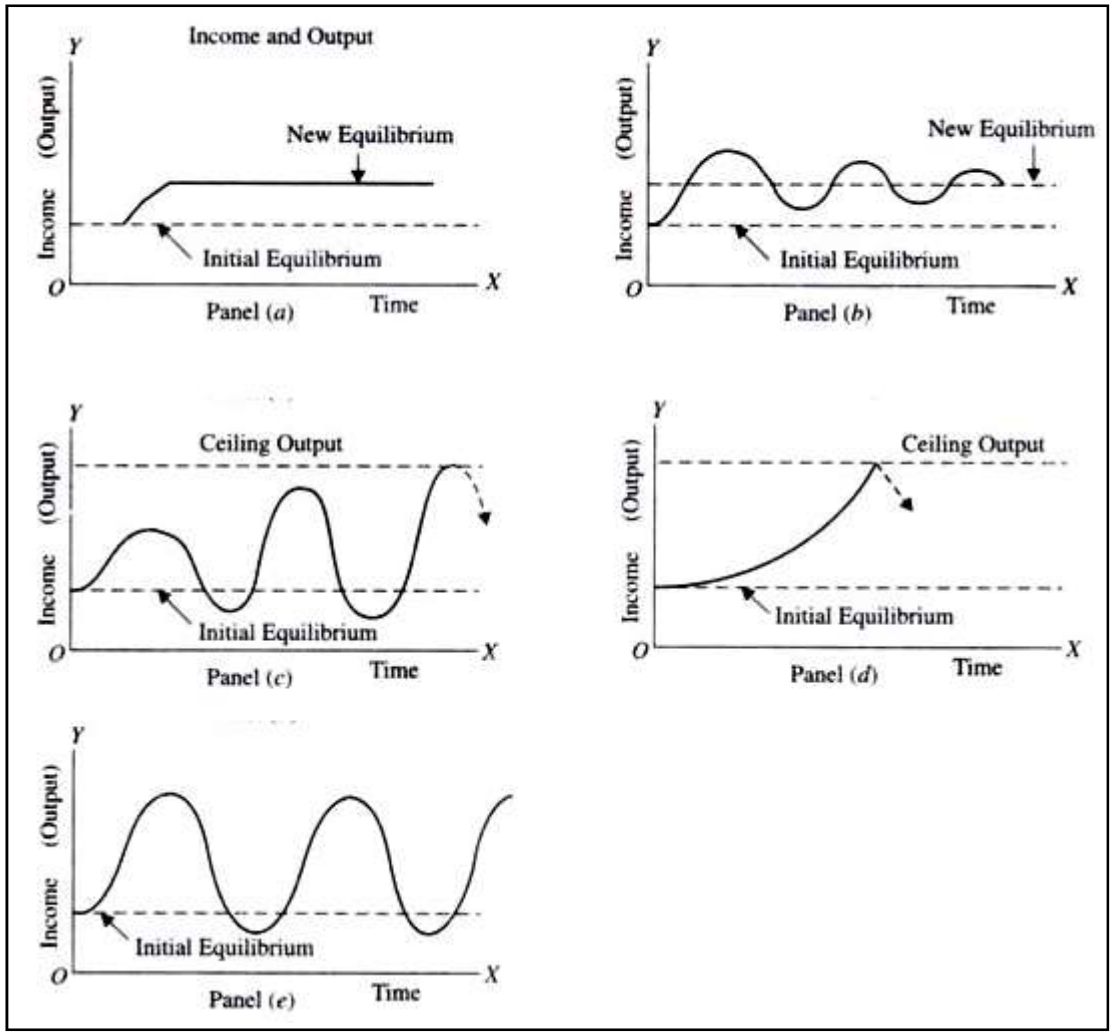
With the help of different combinations of the values of marginal propensity to consume (c) and capital-output ratio (v), Samuelson explained different paths which the economy will follow. The various combinations of the values of marginal propensity to consume and capital-output ratio (which respectively determine the magnitudes of multiplier and accelerator) have been shown with the help of Figure 14.2.

Figure 14.2: Combination of Multiplier and Accelerator



The above figure 14.2 though seem simple, is yet actually a combination of five distinct patters, marked by A to E. These paths or patterns of movements which the economic activity (as measured by gross national product or income) can have depending upon various combinations of the values of marginal propensity to consume (c) and capital-output ratio (v) have been explained with the help of Figure 14.3.

Figure 14.3 (panel a to e): Interaction between multiplier and accelerator (Different patterns of income (output) movements for various values of c and v,



Explanation of different panels of Figures 14.2 and 14.3: When the combinations of the value of marginal propensity to consume (c) and capital-output ratio (v) lie within the region marked A (in Figure 14.2), with a change in autonomous investment, the gross national product or income

moves upward or downward at a decreasing rate and finally reaches a new equilibrium as is shown in panel (a) of Figure 14.3.

Now, if the values of c and v are such that they lie in region B (in Figure 14.2), the change in autonomous investment or autonomous consumption will generate fluctuations in income which follow the pattern of a series of damped cycles whose amplitudes go on declining until the cycles disappear as is shown in panel (b) of Figure 14.3.

Similarly, region C in Figure 14.2 represents the combinations of c and v which are relatively high as compared to the region B and determine such values of multiplier and accelerator that bring about explosive cycles, that is, the fluctuations of income with successively greater explosive growth. This situation has been shown in panel (c) of Figure 14.3. In the figure it has been seen that the system tends to explode and diverges greatly from the equilibrium level.

The region D in Figure 14.2 provides the combinations of c and v which cause income to move upward or downward at an increasing rate which has somehow to be restrained if the cyclical movements are to occur. This has been explained in subsequent panel (d) of Figure 14.3. Like the values of multiplier and accelerator of region C, their values in region D cause the system to explode and diverge from the equilibrium state by an increasing amount.

In a special case when values of c and v (and therefore the magnitudes of multiplier and accelerator) lie in region E in Figure 14.2 , they produce fluctuations in income of constant amplitude as is shown in panel (e) of Figure 14.3.

Thus, we have seen the interaction of multiplier and accelerator in case of various values of marginal propensity to consume (c) and capital-output ratio (v). On the basis of the interaction of the multiplier and accelerator the two categories of business cycle theories have been put forward.

One category of these business cycle theories assumes the values of multiplier and accelerator which generate explosive cycles. For example, Hicks' theory of business cycles falls in this category. On the other hand,

Hansen has propounded a business cycle theory based on the interaction of multiplier with a weak accelerator which produces only damped oscillations. In the next section, we shall discuss Hicks' theory of business cycles.



CHECK YOUR PROGRESS

q 1: state whether the follwing statements are True (T) or False (F).

(a) Keynes utilised the multiplier-accelerator interaction technique to explain trade cycles. (T/F).

(b) Samuelson assumed consumption to be a factor of income of the preceding period (T/F)

Q 2: Mention the assumptions of the Samuelson's theory of business cycles. (Answer in about 50 words).

14.4 Hick's Theory of BUSINESS cycles

Hicks presented his theory of business cycles in his book 'A Contribution to the Theory of Trade Cycle' published in the year 1950. Even after more than 50 years of publication, his theory continues to remain prominent in the discussion of the theory of trade cycles. Hicks' theory of trade cycles is based on three important concepts, viz., J M Keynes' multiplier analysis, J M Clark's acceleration analysis and Harrod's growth analysis.

Assumptions of the Theory: Before discussing Hicks' theory of business cycles in detail, let us consider the assumptions on which the theory rests. These assumptions are:

- Hicks has assumed that the economy is in equilibrium initially.
- The economy is progressive in the sense that autonomous investment increases at a constant rate such that the economy over the period of

time does not remain static at one point. This means the economy faces the situation of dynamic equilibrium (please recall/review the discussion in the previous unit).

- Consumption in the current period is a function of income of the previous period. Symbolically, it can be represented by $C_t = f Y_{t-1}$; where C means consumption, Y means income and t represents time. This is different from Keynes analysis where he assumed consumption to be a function of current income.
- Induced investment in the current period is a function of change in output of the previous period. Symbolically, it can be represented by $I_t = f(Y_{t-1} - Y_{t-2})$; where I means investment, Y means income and t represents time.
- Values of multiplier and accelerator remain fixed.
- There exists a limit to upward limit of growth (Hicks used the term 'ceiling') of the economy. It cannot grow beyond the full employment level of output.
- There is no such direct constraint in the downward (i.e., contraction) movement of the economy. However, there exists indirect constraints. This is due to the fact that ***disinvestment*** can not exceed depreciation cost (termed as transformation of the accelerator) acts as the indirect constraint. Again, gross investment can not fall below zero. Thus, it means that just like as the upward limit, there also exists a downward limit (Hicks used the term 'floor') to fluctuations.



Disinvestment: Typically, disinvestment refers to no maintaining the existing stock fo capital, i.e., not compensating for depreciation. Disinvestment also refers to selling of capital assets. For example, public sector disinvestment is selling of shares of Public sector undertakings in the market.

'Leverage Effects' *: cause the economy to grow at cumulative rates.*

Distinctive Features of the Theory: Though Hicks' theory is based on three earlier concepts, his theory possesses certain distinctive features. Before explaining the theory, it will therefore be better to consider these distinctive features in brief.

- **Ceiling and floor limits to growth:** Hicks propagates that there exists a ceiling (i.e. upper limit) to growth. Thus, according to him, interaction between the accelerator and multiplier (termed as ***'leverage effects'***) cause the economy to grow at cumulative rates. Such growth continues till it reaches the level of full employment. In a dynamic economy however, due to rising ceiling, and hence it may take longer time (compared to a static economy) to reach the ceiling.

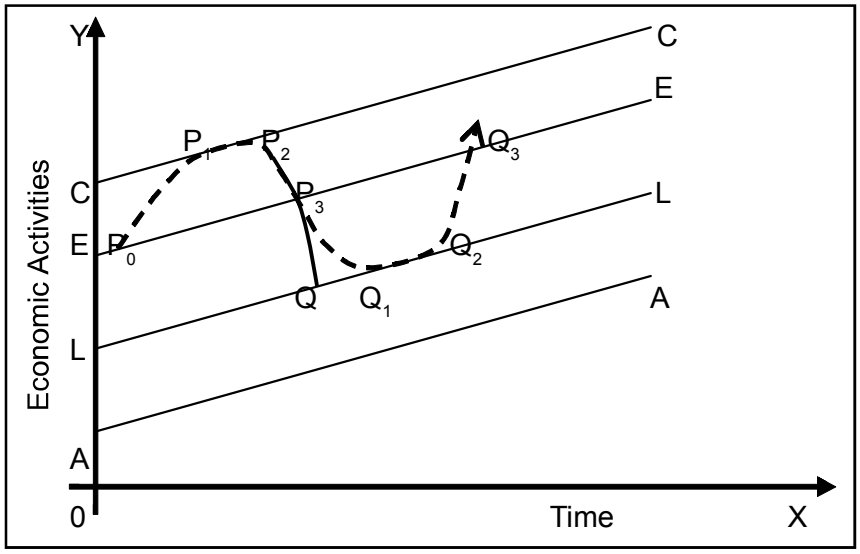
The economy starts to take downward swing after it reaches the ceiling. The downward turn however depends on the availability of resources viz., population, technology, capital stock etc. The economy in fact may not be able to reach the ceiling and take downward turn if the leverage effect (interaction between multiplier and accelerator) is not strong enough. In fact, the economy may sustain at ceiling and creep along this level for sometime (we shall discuss about this while explaining the theory).

It is to be remembered that according to Hicks, while both multiplier and accelerator tend to push up the economy toward ceiling, but its downturn depends only on the multiplier (as accelerator remains inoperative most of the times). This in fact, reduces the rate of decline in growth less as it could have been if both the multiplier and accelerator were in action. Again, according to Hicks, though there is no direct constraint in the downward movement of the economy, there exists indirect constraints as we stated earlier. These constraints are: *first,* gross investment can not fall below zero. *Secondly,* even at this lower level, some basic investment (or, disinvestment) takes place for replacing inventories and equipment. Again, autonomous investment starts increasing and is higher than the amount of disinvestment. Thus, increase in net investment causes an upturn of aggregate income and pushes the economy towards expansion phase.

- **Rising trend of cycle:** Another distinctive feature of Hicks theory of business cycles has been the rising trend of the cycles. Hicks has assumed that even the economy move through a growth path even when it faces the different phases of trade cycles (please recall/review the discussion of the previous unit). This assumption is quite realistic and matches the real working of an economy.

Explanation of the Theory: We shall explain Hicks theory in terms of the four phases of trade cycles we have discussed already. The theory can be explained with the help of the figure 14.4.

Figure 14.4: Hicks' Theory of Business Cycles



In figure 14.4, the line AA shows autonomous investment, which is assumed to be growing at a constant rate 'g'.

- EE shows the equilibrium path of output which depends upon the level of autonomous investment (AA). This equilibrium path is affected by the interaction of multiplier and accelerator.
- LL represents the lower equilibrium path of output.
- FF represents the highest level of full employment (i.e, the ceiling point). In general, it is above the equilibrium path EE and is assumed to grow at the same rate at which AA is growing.

The four phases of the trade cycle as have been shown with the help of the above figure are as follows.

- **prosperity:** As we have stated earlier, P_0 is the initial equilibrium point. Now, as autonomous investment is increased at the rate 'g' and the interaction of the multiplier and accelerator pushes the economy upward toward the ceiling path CC. CC represents the path of full employment equilibrium. Thus, the economy reaches the point of P_1. Now as we have discussed already, we are concerned with a dynamic economy which exhibits dynamic equilibrium. Hence, endowed with sufficient manpower, technology and other resources and the ***lagged relationship*** of induced investments actually tends to creep the economy to a higher level even after attainment of the level of full employment ceiling at point

Lagged relationship: It means the relationship between two sets of variables in which the current value of the dependent variable is related to the previous values of the one or more independent variables.

P_1. Thus, the economy creeps from point P_1 to P_2. It is important to note that according to Hicks, full employment ceiling is independent of the path of output. Thus, employment does not depend on output; rather it depends upon the factors like population growth, technological factors etc. Again, these factors have been assumed to grow at the same rate of growth of autonomous investment.

- **Downturn:** Now, the economy can not sustain at ceiling for all the time. It has to make a downturn. As we have discussed already, according to Hicks, the downward movement of the economy may start even before reaching the path of full employment equilibrium, i.e., before touching point P_1. It is interesting to note that while the economy is pushed by the combined forces of multiplier and accelerator, in its downturn the accelerator remains inoperative. As a result its rate of fall becomes less as it could have been if both the forces were to operate (in figure the line P_2P_3Q represents this path). However, as the multiplier is alone operative in the downturn of the economy and due to the indirect constraints we have already mentioned, the economy actually moves towards the path $P_2P_3Q_1$ and not along the path P_2P_3Q.
- **Depression:** You will notice from the figure that as the economy make downturn, it passes the initial equilibrium path EE at point P_3. So, will the economy be stable at this level and be in equilibrium again? The answer is negative. The reverse multiplier effects however pull the economy below EE. The lower limit however is determined by the indirect constraints discussed already. In our case, the line LL depicts that floor limit. The economy thus, reaches the floor limit Q_1.
- **Recovery:** After the economy reaches the floor limit at Q_1, it will not immediately move upward; but it creeps along and reaches a slightly higher floor limit at point Q_2. This movement from Q_1 to Q_2 is basically due to the existence of excess capacity in the economy. Such movement from Q_1 to Q_2 generates some growth in national income. Again, as autonomous investment is continuously being increased at the rate 'g', the interaction of multiplier and accelerator will once again move the economy upward towards the growth path Q_2Q_3.

Critical Evaluation: Hicksian theory of trade cycles possesses the following merits.

- Hicks has made distinct departure from earlier theories of trade cycles with the argument that the economy actually declines at a slower rate. His analysis that the accelerator remains inoperative during downturn of the economy is quite significant.
- The creeping movements both in case of ceiling and floor limits are also quite remarkable. Hicks has shown that the creeping effect at the ceiling point is caused by multiplier-accelerator interaction and the lagged response of investment. Again, the creeping effect at the floor point is caused by absorption of excess capacity. Both these are very sound arguments.
- Linking economic growth with trade cycles is another important milestone.

However, in spite of the above merits, Hicks theory has been criticised on the following grounds:

- The theory has been criticised for being too rigid. The acceleration principle has been utilized in too rigid form.
- Hicks has assumed fixed values for the multiplier and the accelerator. This is quite unrealistic.
- Hicks theory though does not neglect the role of autonomous investment in the economy, but it has been attached a passive role. The increase in autonomous at a constant rate has also been criticised.
- Hicks' argument that the full employment is independent of the path of output has also been criticised.

Despite the above criticisms Hicks theory of trade cycles is considered to be a major contribution in the field. Many critics acknowledge its merit. It is also worth mentioning that even after 50 years of its existence, the theory till today is considered as an important theory in the discussion of trade cycles.



CHECK YOUR PROGRESS

Q 3: State whether True (T) or False (F).

a) Hicks has assumed a static economy in his analysis. (T/F)

b) Hicks has assumed that the economy is initially in equilibrium. (T/F)

Q 4: How according to Hicks does the economy recover after it faces the situation of depression? (Answer in about 60 words)

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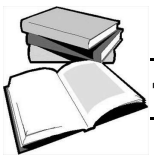
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14.5 Let Us Sum Up

- Samuelson was among the pioneers to use multiplier-accelarator interaction to explaion the phenomenon of business cycle. He showed that the interaction between the multiplier and accelerator caused cyclical fluctuations in economic activities.
- The basic tenet of the Samuelson's model is that multiplier alone cannot adequately explain the cyclical and cumulative nature of the economic fluctuations.
- Hicks theory of trade cycles is considered as a significant contribution in the field.



14.6 Further Reading

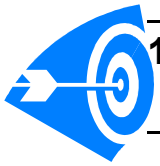
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14.7 Answers to Check Your Progress

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

Ans to Q No 2: Samuelson's model rests on the following assumptions:

- Consumption spending in the current period is related to the change in income in the preceding period.
- Investment in the current period is related to the change in income with a lag of one period.
- There is also an additional factor in the form of exogenous (government) spending, which is constant.
- The model does not consider the determinants of this exogenous spending nor the effects of its changes on the level of income.

Ans to Q No 3: a) False b) True

Ans to Q No 4: According to Hicks, the economy will not automatically recover from the floor limit of trade cycles. Rather it tends to creep along this floor limit and reaches a slightly higher point than this. This movement is basically due to the existence of excess capacity in the economy and it generates some growth in national income. Again, as autonomous investment is continuously being increased at a constant rate and the interaction of multiplier and accelerator will once again move the economy towards the growth path.



14.8 MODEL QUESTIONS

A. Answer the following question (in about 150 words.)

Q 1: Discuss major features of Hicks' theory of business cycles.

Q 2: Briefly discuss the the different phases of a business cycle in line with the Hicks' theory of business cycles..

B. Answer the following question (in about 300-500 words.)

Q 1: Discuss critically Hicks' theory of business cycles.

Q 2: Discuss the Samuelson's multiplier-accelerator interaction theory of business cycles.

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UNIT 15: WELFARE ECONOMICS

UNIT STRUCTURE

15.1 Learning Objectives

15.2 Introduction

15.3 Welfare and Welfare Economics

15.4 Individual Welfare and Social Welfare

15.5 Role of Value Judgment in Welfare Economics

15.6 Concept of Pigovian Utilitarian Analysis

15.7 Paretian Welfare Economics: Optimality Criterion

15.7.1 Efficiency in Exchange

15.7.2 Efficiency in Allocation of Factors among Producers

15.7.3 Efficiency in the Composition of Output

15.8 Let Us Sum Up

15.9 Further Reading

15.10 Answers to Check Your Progress

15.11 Model Questions

15.1 LEARNING OBJECTIVES

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

- discuss the concepts of welfare and welfare economics and analyse how the concept of value judgment is related to it
- acquire knowledge about the concepts of individual and social welfare and discuss how both are measured
- explain the theories of Pigovian and Paretian welfare.

15.2 INTRODUCTION

This unit is concerned with the familiarization of learners with some basic concepts of welfare economics. They include welfare economics and its evolution from classical economists like Adam Smith to Arrow. Controversy regarding the place of value judgment in economics and the discussion of concepts like Pigovian and Paretian welfare economics. By

the word welfare we mean the general wellbeing or satisfaction on the part of individual or aggregate level. Welfare economics deals with the allocation of resources in the society for the maximum satisfaction or maximum welfare. Welfare economics is a normative science which is mainly concerned with the basic questions of economics like what ought to be instead of why, what and how to produce.

15.3 WELFARE AND WELFARE ECONOMICS

Welfare economics is that branch of economics that focuses on the optimal and efficient allocation of resources and goods and how this affects the social welfare. By efficient allocation of resources we mean whether any state or situation regarding resource allocation maximizes social welfare. In welfare economics attempt is made to evaluate alternative economic situations from the view point of society's wellbeing. To be clearer, let us assume that total welfare of a country is W. But given the factor endowments and the state of technology, suppose that this welfare could be larger i.e. W*. So now the task of welfare economists are to prove that current state of welfare W is less than optimum state W* and to suggest ways to achieve the state W*. For this economists have to formulate and establish criteria or norms to judge the alternate economic state or policies from the view point of social welfare. These criteria or norms serve as a basis for recommending economic policies which will increase social welfare. According to Prof Lange, "Welfare economics establishes norms of behavior which satisfy the requirements of social rationality of economic activity. The norms of behavior established by welfare economics are supposed to guarantee the optimal allocation of economic resources of the society. Again Prof Baumol wrote "Welfare economics has concerned itself mostly with policy issues which arise out of the allocation of resources, with the distribution of inputs among the various commodities and the distribution of commodities among various consumers" and this definition also emphasized the optimal allocation of resources to maximize social welfare. We know that an interrelationship exists among various parts of the economy and certain particular change in one sector affects the resource

allocation in other sectors. Therefore, the central problem of welfare economics relates to whether a particular change in resource allocation will increase or decrease social welfare. But the difficulties underlying is that it is not possible to measure social welfare objectively as we know that welfare is a subjective thing and associated with the pleasure or satisfaction in the mind of people. Objective measurement of welfare involves making interpersonal comparison of utilities or welfare of different individuals of the society. Welfare economics has been a controversial subject in recent years because it involves value judgments about which there is a sharp difference of opinion among economists. Now-a-days, the establishment of welfare state is the fundamental goal of modern democratic government. So to achieve this objective the state has to satisfy wants of each and every individual of the society. According to Prof J.K Mehta, if we compare the two periods of time, then "a given man has greater welfare in that period in which a larger number of his wants have been satisfied. Conversely, we can say that the smaller the number of wants that remains unsatisfied, the greater is the welfare."



LET US KNOW

The term social rationality of economic activity is to be interpreted as that activity which ensures optimum allocation of resources and therefore guarantee maximum social welfare.

15.4 INDIVIDUAL WELFARE AND SOCIAL WELFARE

An individual welfare at any given time or during a period of time is measured by the amount of satisfaction that the individual enjoys at that time or during that period of time. The individual always tries his best to maximize his welfare. However it is difficult to measure welfare as it is a subjective thing and rather we can say it is a state of mind. So attempt has been made to link individual welfare with individual choice. In other words, a person's welfare map is assumed to be similar to his preference map. This means that when a person will be in his most preferred position, his welfare

will be maximized. For a better understanding let us explain it with an example. Let us suppose that a person chooses position A rather than position B. This means that A is his preferred position over B. So welfare at position A is higher than the welfare at position B. So his welfare will be maximized when he is in position A. Individual welfare is a function of both economic and non economic variables. Classical economists distinguished between general welfare and economic welfare. Economists generally agree that general welfare is determined by large number of economic and non economic factors and the non economic factors are exogenous in nature.



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Exogenous variables are those variables which are determined outside the system. In case of welfare economics non economic variables are treated as exogenous which means that they can influence the economic variables without being influenced by them.

Social welfare refers to the sum total of satisfaction of all the individuals of the society. The measurement of social welfare is a bit intricate because it is difficult to record exactly the pain and pleasure of different individuals of the society. The measurement of social welfare requires some ethical standard and interpersonal comparison of utilities, both of which involve subjective value judgement. According to classical economists like Adam Smith, growth of gross national product (GNP) should be viewed as the criterion of social welfare. He believed that economic growth leads to increased employment opportunity and goods available for consumption. On the other hand, cardinalists proposed the use of the law of diminishing marginal utility as a criterion of welfare. However this approach of measuring social welfare has a serious flaw as it assumes that all individuals have identical utility functions for money whether in reality individuals differ in their attitude towards money. Later the criterion based on economic efficiency was used to measure social welfare which was known as Pareto optimality. Interpersonal comparison of utility was made explicit in social welfare function to measure social welfare, and finally, Arrow advocated

majority rules and voting to determine social choice and measure social welfare.



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Cardinalists: The group of economists including Marshall who were of the opinion that utility could be measured cardinally or numerically.



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Pareto Optimality: Vilfredo Pareto evaluated the criterion to judge the welfare of society which was known as Pareto Optimality. According to this criterion, any change that makes at least one individual better off without making any other worse off is an improvement in social welfare. On the other hand, social welfare will decrease if a certain change makes no individual better off while it makes at least one individual worse off. So we can define Pareto optimality as the optimal economic state or situation in which allocation of resources is such that by any rearrangement of them it is not possible to make any individual better off without making anyone worse off.



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Social Welfare Function of Bergson and Samuelson: To measure social welfare Bergson and Samuelson suggested the use of explicit value judgement in the form of social welfare function. A social welfare function is similar to individual consumer's utility function. It provides a ranking of alternative states or situations in which different individuals enjoy different utility levels. This can be expressed with social indifference curve which is defined as the locus of combinations of utilities of A and B (let us suppose the society comprises of two individuals A and B) which yields same level of social welfare.

LET US KNOW



Prof Arrow in his work "Social Choice and Individual Values" tried to overcome the difficulties of Bergson Samuelson's social welfare function and put forward his famous impossibility theorem. According to Arrow, social choice will be determined by majority rules and can be achieved through voting.

15.5 ROLE OF VALUE JUDGMENT IN WELFARE ECONOMICS

Value judgments play a crucial role in welfare economics. We have known already that by value judgement or values we mean the conceptions of people regarding what is good or bad. These conceptions regarding values of the people are based on ethical, political, philosophical and religious beliefs of the people and not based on any scientific logic or laws. There is a great controversy regarding whether value judgement should have any role to play in welfare economics. L. Robbins and his followers were of the opinion that inclusion of value judgement would make welfare economics unscientific. Therefore according to them economists should refrain from making value judgements. They thought that making interpersonal comparison of utility is unscientific as utilities being subjective cannot be compared. So the concept of Pareto optimality criterion came in force to evaluate whether social welfare increase or decrease as a result of a specific change in economic state, situation or policy. However Pareto optimality cannot address that change in economic state or situation which makes some individuals better off and some other worse off. This is because such changes involve interpersonal comparison of utility which were ruled out by Pareto. To judge the welfare in such a situation, Kaldor and Hicks propounded a new welfare criterion which is known as compensation principle. According to them any change that make some people better off and some other worse off enhances social welfare if those who gain can compensate the loser and still be better off than before. Kaldor and Hicks claimed that their compensation principle is free from interpersonal comparison of utility and

value judgments. Their contribution was the basis for new welfare economics. Scitovsky and Little have also made significant contribution towards the development of new welfare economics which is free from value judgments. However Prof Baumol rightly pointed out that both Kaldor and Scitovsky test operates on the basis of implicit value judgements. The very idea that gainer could compensate the loser involves value judgements.

Later Bergson and Samuelson propounded social welfare function where they made value judgments explicit and with this social welfare function, the economists can judge the social desirability of certain economic reorganization and policy change. These value judgements according to Bergson "must be determined by its compatibility with the values prevailing in the community the welfare of which is being studied." Bergson-Samuelson's social welfare function is an ordinal index of the society's welfare and a function of utility level of all individuals constituting the society. However this concept was criticized on the ground that it is too individualistic and has limited practical significance. Followers of Bergson like Samuelson and I.M.D. Little are of the view that welfare economics cannot be separated from value judgements, because any statement about increase or decrease of social welfare necessarily involves value judgements. In support of Bergson's social welfare function, Prof Baumol writes, "Essentially the Bergson's criterion must be judged right, if not very helpful. To decide whether B is better than A, we must certainly employ some value judgements and unless these value judgements are explicit they must be treated with suspicion. According to Prof K.E. Boulding, one must admit that the task of making value judgements explicit is very important.

Thus, according to several modern economists like Bergson, Samuelson, Little, Boulding etc welfare economics cannot be free from value judgements. In fact the study of welfare economics has been developed to make policy recommendations to promote social welfare. For doing so economists cannot escape from introducing value judgement since the matter here is the happiness and satisfaction of the society. So we can conclude by the quote of Little that "Welfare economics and ethics cannot, then, be separated. They are inseparable because welfare terminology is a

value terminology… Getting rid of value judgement would be throwing the baby away with the bathwater."



ACTIVITY 15.1

Match the following Set A with Set B

Set A	Set B
1. Pareto criterion	a. Bergson- Samuelson
2. Compensation Principle	b. V. Pareto
3. New Welfare Economics	c. K.J.Arrow
4. Social Welfare Function	d. Scitovsky
5. Impossibility Theorem	e. Kaldor Hicks



CHECK YOUR PROGRESS

Q 1: Welfare economics is a _____ economics. (Fill in the blanks.)

Q 2: What do you mean by value judgments? (Answer in about 20 words).

.....

.....

Q 3: Social welfare is a sum total of _____ welfare. (Fill in the blanks.)

15.6 CONCEPT OF PIGOVIAN UTILITARIAN ANALYSIS

A.C. Pigou was considered as the founder of Welfare economics. In his books entitled *Wealth and Welfare* and *Economics of Welfare,* Pigou has discussed that welfare and good can be used interchangeably and he in fact defined good as well as welfare as the state of conscious life. So when an individual's desires are met welfare is said to occur. Social welfare is regarded as the aggregate of all individual welfares of society. According to Pigou, economic welfare was a part of general welfare which could be brought directly or indirectly into relation with measuring rod of money. Thus, economic welfare, in the Pigovian sense, implies the satisfaction of utility

derived by an individual from the use of goods and services which can be bought by money. The following are the conditions of Pigovian Welfare.

- The first condition states that increase in national income would lead to increase in welfare given the constant taste and preference
- The second condition emphasized distributional aspect. If national income remains constant then transfer of income from wealthy to poor increases welfare.

According to Pigou, the private product diverges from the social product due to the existence of external economies or diseconomies thereby leading to divergences between private and social costs and benefits. Externality is the spillover effect of production and consumption on third party. If this effect is positive then it is called positive externality and if it is negative then it is called negative externality. For example due to expansion of a firm in a particular area it may be possible to get inputs like labor, raw materials etc at low rates by some other firms in that area. It is an example of positive production externalities. In such cases social marginal benefits would exceed private marginal benefits and private costs would exceed social costs. For the expanding firm does not receive any remuneration for the costs incurred by it and benefits which it has conferred on others. Similarly, industry emitting smoke causes pollution in the nearby area and increase medical costs for the residents of the area which is an example of negative externalities of production. Prof Pigou introduced Pigovian Tax to correct such problems of externality. This is the tax which is applied to market activities that generates negative externalities. For example tax on alcohol, tax on contributing to pollution etc.

However, Pigou's analysis was criticized on the ground that it uses money as the measuring rod of economic welfare which is highly unstable. It assumes that all the people have same marginal utility for money which is not realistic. His welfare analysis based on cardinal utility analysis and involvement of interpersonal comparison of utility which many thought as unscientific. Moreover, Pigou was criticized for lack of originality in his ideas and analysis by O'Donnell.

15.7 PARETIAN WELFARE ECONOMICS: OPTIMALITY CRITERION

Pareto optimality criterion was one of the path breaking contribution to welfare economics. This criterion was put forward by famous Italian economist Vilfredo Pareto (1848-1923) who was considered as founder of modern welfare economics. Pareto's analysis was free from value judgments and interpersonal comparison of utility and based on ordinal utility analysis. According to this criterion, any change that makes at least one individual better off and no one worse off is an improvement in social welfare and conversely, a change that makes no one better off but at least one individual worse off is a decrease in social welfare. Pareto optimal is a situation in which it is impossible to make anyone better off without making someone worse off. So now the problem is that how to achieve Pareto optimum. To attain this situation three marginal conditions must be satisfied. These are as follows

- Efficiency in Exchange or efficiency in distribution of commodities among the consumer.
- Efficiency of Production or efficiency in allocation of factors among producers.
- Efficiency in product mix or efficiency in allocation of factors among commodities

15.7.1 Efficiency in Exchange

Exchange efficiency means that the distribution of a given output of goods between individuals in a society should be such that it should not be possible to make someone better off without making anyone else worse off. When such exchange efficiency is achieved there is no scope for exchange between individuals which makes all individuals better off or anyone better off without making someone worse off. Or in other words we can say that distribution of commodities X and Y between two consumers A and B is efficient if it is impossible to redistribute these goods to increase the utility of

one individual without reducing the utility of other. This situation is achieved when:

$$MRS^{A}_{X, Y} = MRS^{B}_{X, Y}$$

Therefore we can conclude that the marginal condition for a Pareto optimality or efficient distribution of Commodities requires that the MRS between two goods be equal for all the consumers.



LET US KNOW

MRS: Marginal rate of substitution between X and Y is the rate at which a consumer is ready to give up units of Y for one extra unit of X and maintain the same level of utility.MRS is nothing but the slope of indifference curve.

15.7.2 Efficiency in Allocation of Factors among Producers

The second condition for Pareto optimum requires that the available factors of production should be used by the society in the production of different goods in such a manner that it is impossible to increase the output of one good without decrease the output of another or to increase the output of both goods by any reallocation of factors of production. This situation would be achieved if the marginal rate of technical substitution between any pair of factors must be the same for any two firms product and using both the factors to produce the products. The fulfillment of this condition ensures optimum allocation of given amount of factors among products.

i.e $MRTS^{X}_{L,K} = MRTS^{Y}_{L,K}$

So the second marginal condition of Pareto optimality requires that the MRTS between labor and capital be equal for all the commodities produced by different firms.



LET US KNOW

MRTS: Marginal rate of technical substitution between two factors labour and capital is the rate at which a producer is ready to sacrifice units of capital for one

extra units of labour and maintain the same level of output. The MRTS is nothing but the slope of isoquant.

15.7.3 Efficiency in the Composition of Output

The third possible way of increasing social welfare is a change in the product mix. To explain the third marginal condition of Pareto optimality we use the production possibility curve (PPC). The slope of PPC is called the marginal rate of product transformation ($MRPT_{XY)}$ and it shows the amount of Y that must be sacrificed in order to obtain an additional unit of X. In other word the MRPT is the rate at which goods can be transformed into another. The marginal condition for a Pareto optimal or efficient composition of output requires that the MRPT between any two commodities be equal to the MRS between the same two goods. i.e.,

$MRPT_{XY}=MRS^{A}_{XY}=MRS^{B}_{XY}$

However, Paretian welfare economics cannot tell us what happens when some changes in economic policy make some individuals better off and some other worse off. Whether such changes will lead to increase in social welfare or not, cannot be judged by Pareto criterion. Moreover, it was also criticised for being static.



CHECK YOUR PROGRESS

Q 4: What is externality? (Answer in about 20 words.)

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Q 5: What do you mean by efficiency in exchange? (Answer in about 30 words.)

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15.8 LET US SUM UP

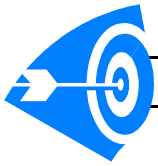
- Welfare means the general wellbeing, pleasure and satisfaction of individual or society.
- Welfare economics is a normative economics.
- Aggregate of individual welfare is social welfare.
- Value judgments have a role to play in welfare economics and value judgments and welfare economics are inseparable.
- Pigouvian welfare economics deals with both production and distribution aspect and viewed economic welfare from monetary side.
- Paretian welfare is free from value judgments and interpersonal comparison of utility and involves the concept of efficiency.
- Pareto optimum is a situation where it is impossible to make any one better off without making any one worse off. Three marginal conditions are required to fulfill Pareto optimum or Pareto efficiency.



15.9 FURTHER READING

1) Ahuja, H. L. (2006). *Modern Economics.* New Delhi: S. Chand & Co.

2) Koutsoyiannis, A. (1979). *Modern Microeconomics*. New Delhi: Macmillan India.



15.10 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: Normative economics

Ans to Q No 2: By value judgments or values we mean the conception of people regarding what is good or bad.

Ans to Q No 3: Individual welfare

Ans to Q No 4: Externality is the spillover effect of production or consumption on third party.

Ans to Q No 5: Exchange efficiency means that the distribution of a given output of goods between individuals in a society should be such that it should not be possible to make someone better off without making anyone else worse off.



15.11 MODEL QUESTIONS

A) Very Short Questions

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

a) Welfare economics is a branch of positive economics. (T/F)

b) Social welfare can be obtained from individual welfare. (T/F)

c) Pigovian welfare economics is free from value judgments. (T/F)

Q.2: Fill in the blanks

a) Pigovian tax is applied to market activities that generates _____externality.

b) Pareto criterion is free from _____.

c) Bergson Samuelson's social welfare function made _____ explicit.

Q 3: Define individual welfare.

Q 4: What is social welfare?

Q 5: What is Pareto optimality.

B) Short questions. (Answer each question in about 150 words.)

Q 1: Define welfare economics.

Q 2: What do you mean by externality? Give the example of positive and negative externality

Q 3: What is Pigovian tax? Give example.

Q 4: State the three marginal conditions of Pareto optimality.

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

Q 1: Discuss the role of value judgments in welfare economics.

Q 2: Explain the conditions of Pareto optimality.

Q 3: Discuss the concept individual and social welfare.

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