**NATIONAL OPEN UNIVERSITY OF NIGERIA**


**FACULTY OF SOCIAL SCIENCES**


**ADVANCED MACROECONOMICS
ECO 442**


**COURSE GUIDE**


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## INTRODUCTION

*Advanced Macroeconomics* is a compulsory course which carries two- credit units. It is available for fourth year Economics students in the School of Arts and Social Sciences at the National Open University of Nigeria (NOUN). It is prepared and made available to all undergraduate students in the B.Sc. Economics programme. The course is very useful to you in your academic pursuit and will help you to gain an in-depth knowledge of macroeconomics. This course is aimed at exposing you to aggregates covering the entire economy, such as total employment, national income, national output, total investment, total consumption, total savings, aggregate supply, aggregate demand, and general price level, wage level and cost structure with particular reference to Nigeria.

This Course Guide introduces you to what macroeconomics entails. It also provides you with the necessary information about the course, the nature of the materials you will be using and how to make the best use of them towards ensuring adequate success in your programme. Also included in this Course Guide are instructions on how to make use of your time and instructions on how to tackle the tutor-marked assignments (TMA). There will be tutorial session during which your facilitator will take you through your difficult are as and at the same time have meaningful interactions with your fellow learners.

## COURSE COMPETENCES

The course is made up of 18 units, covering as:

- Macroeconomic modelling in closed and open economy
- Consumption, saving and income determination
- Investment function
- The IS-LM framework
- Inflation and unemployment; and
- Economic growth analysis and growth theories/models.

## COURSE OBJECTIVES

There are 18 study units in the course and each unit has its own objectives. You should read the objectives of each unit and assimilate them. In addition to the objectives of each unit, the main objective of the course is to equip you with (a) an appreciation of the analytical skills needed in macroeconomics and (b) adequate and quantitative analytical skills needed to pursue careers in both public and private sectors. It should be noted that this course also provides an adequate background to students who intend to pursue post-graduate studies in economics, business administration, finance, accounting and management.

At the end of this course, you should be able to:

- explain the circular flow of income and expenditure in the simplest economy made up of two sector, three sector and four sector economy respectively; the importance of the

circular flow of income/spending

- explain the concepts of consumption and savings; the basic consumption and saving functions; the consumption hypothesis and the various theories of consumption function
- define investment and capital; the accelerator theory of investment; the marginal efficiency hypothesis, marginal efficiency of capital (MEC), marginal efficiency of investment (MEI) and the relationships between MEC and MEI
- explain equilibrium in the goods or product market, equilibrium in the money market, general equilibrium or the IS–LM framework and explain changes in general equilibrium due to changes in fiscal policy and monetary policy
- define inflation, types, causes, measurements, effects and measures that can be used to curb inflation
- analyse unemployment, types of unemployment, measurements as well as the causes of unemployment with reference to Nigerian economy and policy measures to fight unemployment
- discuss the concept of the Philips curve and the basic tenets of the Philips curve
- explain the concepts of economic growth, economic growth and inequality, economic growth in developed and developing economies, growth rate and environmental quality as well as growth theories.

**WORKING THROUGH THE COURSE**

To successfully complete this course, you are required to read the study units, referenced books and other materials on the course. Each unit contains self-assessment exercises. At some points in the course, you will be required to submit assignments for assessment purposes. At the end of the course there is a final examination. This course should take about 15 weeks to complete and some components of the course are outlined under the course material subsections.

**STUDY UNITS**

There are six modules broken into 18 units in this course, which should be studied carefully. These are:

**Module 1    Macroeconomic Measurements/macroeconomic modelling in closed and open Economy**

Unit 1        National income accounting: Two-sector economy
Unit 2        National income accounting: Three-sector economy
Unit 3        National income accounting: Four-sector economy

**Module 2    Consumption, Saving and Income Determination**

Unit 1        Concepts of consumption and saving
Unit 2        The basic consumption and saving functions
Unit 3        Theories/hypotheses of consumption

**Module 3          Investment Function**

Unit 1          Investment and capital
Unit 2          Theories of investment
Unit 3          Investment demand: The rate of interest and the role of finance


**Module 4          IS-LM Framework**

Unit 1          The product market equilibrium and the IS curve
Unit 2          The money market equilibrium and the LM curve
Unit 3          General equilibrium analysis of product and money markets


**Module 5          Inflation and Unemployment**

Unit 1          Inflation
Unit 2          Unemployment
Unit 3          The Phillips curve (Inflation-unemployment trade-off)


**Module 6          Economic Growth Analysis and Growth Theories**

Unit 1          Economic growth analysis
Unit 2          Economic growth, income distribution and environmental quality
Unit 3          Growth theories/models


**References/Reading Materials**

Every unit contains a list of references and further readings. Try to get as many as possible of those listed textbooks and materials. The textbooks and materials are meant to deepen your knowledge of the course. It is advisable that you have at least two of the following textbooks:

Anyanwu, J.C. & Oaikhenan, H.E. (1995). *Modern macroeconomics: Theory and applications in Nigeria.* Onitsha-Nigeria: Joanee Educational Publishers Limited.
Branson, W. H. & Litvack, J. M. (1981). *Macroeconomics* (2nd ed.). Harper International Edition.
Dornbusch, R., Stanley, F. & Startz, R. (1985). *Macroeconomics: Concepts, theories and policies*. New York: McGraw-Hill, Book Company.
Ekpo A.H. (2000). Fiscal and monetary policy during structural adjustment in Nigeria, Nigerian Economic Society, Ibadan.
Harrod, R.F. (1948). *Towards a dynamic economics*. Macmillan.
Jhinghan, M.L. (2003). *Macroeconomics theory.* (11ᵗʰ Ed.). VRINDA Publications Limited
Mailafia, D.I. (2010). *Understanding economies: An introduction to economic theories, principles and applications.* (2ⁿᵈed.). Ikeja, Lagos: Data Quest Publishers.
Olofin, S. O. & Salisu, A. A. (2015). An introduction to Macroeconomics, 1st Edition. Lagos: Evans Publishers.
Olofin S. (2000). An introduction to macroeconomics, Malthouse Press Ltd, Ibadan. William H.
Parkin, M. (1982). *Modern macroeconomics.* Ontario: Prentice Hall, Canada Inc.

Philips, A.W. (1958). "The relation between unemployment and the rate of change of money wage rate in the UK 1861-1957." *Economics*, Vol. 15.

Sloman, J. (2007). *Essentials of Economics* (4th Ed.). United Kingdom: Prentice Hall.

**HOW TO GET THE BEST FROM THIS COURSE**

In distance learning, the study units replace the lecturers. This is one of the great advantages of distance learning; you can read and work through specially designed study materials at your own pace and at a time and place that suit you best. Think of it as reading the lecture instead of listening to a lecturer. In the same way that a lecturer might set you some readings to do, the study units tell you when to read your books or other materials, and when to embark on discussion with your colleagues. Just as a lecturer might give you an in-class exercise, your study units provide exercises for you to do at appropriate points in time.

Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit and how a particular unit is integrated with the other units and the course as a whole. Next is a set of learning outcomes. The learning outcomes make you know what you should be able to do by the time you have completed the unit. You should use the objectives to guide your study. When you have finished the unit, you must go back and check whether you have achieved the objectives. If you make a habit of doing this you will significantly improve your chances of passing the course and getting the best grade.

The main body of the unit guides you through the required readings from other sources. This will usually be either from your text books or from a readings section. Self-assessments are interspersed throughout the units, and answers are given at the ends of the units. Working through the tests will help you to achieve the objectives of the units and prepare you for the assignments and the examination. You should do each self-assessment exercises as you come to the study units.

If you run into any trouble, consult your tutor. Remember that your tutor's job is to help you. When you need help, do not hesitate to call and ask your tutor to provide the help. The following is a practical strategy for working through the course:

1.    Read this course guide thoroughly.
2.    Organise a study schedule. Refer to the `course overview' for more details. Note the time you are expected to spend on each unit and the related assignments to the units. Important information, e.g. details of your tutorials, and the date of the first day of the semester is available at study centre.
3.    Once you have created your own study schedule, do everything you can to stick to it. The major reason that students fail is that they lag behind in their course work. If you get into difficulties with your schedule, please let your tutor know before it is too late for help.
4.    Work through the units. The content of the units has been arranged to provide a sequence for you to follow. Use the units to guide your reading.
5.    Up-to-date course information will be continuously delivered to you at the study centre.
6.    Work before the relevant due dates. Keep in mind that you will learn a lot by doing the assignments carefully. They have been designed to help you meet the

objectives of the course and, therefore, will help you pass the examination. Submit all assignments not later than the due dates.

7. Review the objectives of each study unit to confirm that you have achieved them. If you feel unsure about any of the objectives, review the study materials or consult your tutor.

8. When you are confident that you have achieved a unit's objectives, you can then start on the next unit. Proceed unit by unit through the course and try to space your study so that you keep yourself on schedule.

9. When you have submitted an assignment to your tutor for marking, do not wait for its return `before starting on the next units. Keep to your schedule. When the assignment is returned, pay particular attention to your tutor's comments, both on the tutor-marked assignment form and those written on the assignments. Consult your tutor as soon as possible if you have any questions or problems.

10. After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit objectives (listed at the beginning of each unit) and the course objectives (listed in this course guide).

## ONLINE FACILITATION/TUTORIALS

### SUMMARY
On successful completion of the course, you would have developed critical thinking and analytical skills (from the materials) for efficient and effective discussion of advanced macroeconomics. We wish you success in the course and hope that you will find it interesting and useful.

### Course Information

Course Code: ECO 442
Course Title: Advanced Macroeconomics
Course Unit: 2

Course Status: Compulsory
Course Blub:

Semester: Second Semester
Course Duration: Fifteen Lecture Weeks

Required Hours for Study: Two Hours for each unit

### Course Team

Course Developer: NOUN
Course Writer:

Content Editor:

Instructional Designer:

Learning Technologists:

Copy Editor

**MODULE ONE: MACROECONOMIC MEASUREMENTS/MODELLING IN CLOSED AND OPEN ECONOMIES**

**UNIT 1          NATIONAL INCOME ACCOUNTING: TWO- SECTOR ECONOMY**

## 1.1     Introduction

Macroeconomicaccountingandmacroeconomictheorydeallargelywiththesamevariables,   a number of which, such as income, output, and employment, will be encountered in this module. However, macroeconomic accounting deals with the accounting relationship, as opposed to the theoretical or functional relationship, that may be established among these variables. An accounting relationship is an identity, a relationship that is true by definition.

For example, the balance sheet identity is:

Assets = Liabilities + Net worth.

A functional relationship in contrast, is devised for explanatory purposes and may therefore be an oversimplification that is, at best, only approximately true. For example, for any specified time period, personal saving is equal to disposable personal income less personal expenditures. In contrast, there can be only approximate validity in a functional relationship that asserts that, for any specified time period, personal savings "depends on" or "is determined by" or "is a function of" that period's disposable income. The functional relationship may or may not be true; whether or not it should be rejected as false can be decided only by empirical testing.

In this and the following three units, we will be concerned almost exclusively with accounting relationship among variables. The relationship we will consider are specifically those that make up national income accounting, the national economic accounting systems that is relevant to our later analysis. The importance of the accounting relationships and the framework that is built from them will become more apparent in the next module, which discusses functional relationship among the same variables. Suffice it to say at this stage that national income accounting provides a valuable foundation for the study of macroeconomic theory. This is especially true in light of the development of a comprehensive national income accounting framework which gives a systematic picture of the economic structure and process in terms of the interrelated flows of income and product, the basic variables of the economic process itself. In fact, one can learn a good deal about the economic process by studying this comprehensive accounting framework, even though it is essentially neutral in terms of macroeconomic theory.

## 1.2 Learning Outcomes

At the end of this unit, you should be able to:

- Explain the circular flow of income and expenditure in the simplest economy made up of only two sectors
- Discuss the two economic agents and their relationships in the circular flow of income and spending
- Describe diagrammatically, the circular flow of income and expenditures.

## 1.3 Definitions

## 1.3.1 National Income and Circular Flow of Income

National income simply is the income earned by a country's citizens, including labour and capital investment. It is the monetary value of all income in a nation (wages and profits and interest and rents and pension payments) during a given period (usually one

year). It is the total of all incomes accruing over a specified period to residents of a country and consisting of wages, salaries, profits, rent and interest. It can also be defined as the total value of newly created material production, or the corresponding portion of gross national product, computed annually. If all material expenditures incurred during the year are subtracted from gross national product (the total yield of material production during a given year, what remains is the newly created value for the year, that is, national income. In physical terms, annual national income is the sum of all consumer goods and means of production used during the year.

The circular flow of income is a neoclassical economic model depicting how money flows in the economy. In the simplest version, the economy is modelled as consisting only of households and firms. Money flows to workers in the form of wages, and money flows back to firms in exchange for products. This simplistic model suggests the old economic adage, "supply creates its own demand." Circular flow of income describes a model that indicates how money moves through out an economy between businesses and individuals. Individuals spend their income by consuming goods and services from businesses, paying taxes and investing in the stock market. Businesses use the money spent by individuals while consuming and the money raised from selling stock to pay for capital to run their businesses, purchase materials to manufacture products and to pay employees. All the expenditures from the individuals become the income of the businesses, and the expenditures of businesses become the income of the individuals. Therefore, circular flow of income is the interdependence of goods market and factor market. The model is a continuous and often complex one that can give insight into how interdependent industries and economic factors is in a particular region. Diagrammatical exposition will be shown in the subsequent sub-units.

**Self-Assessment Exercise 1**

1. Define national income.
2. Describe circular flow of income in an economy.

### 1.3.2 The Circular Flow of Income and Spending/Expenditure in the Simplest Economy

We will begin by considering the simplest of all possible. The accounting framework made up only of relationship among businesses/firms and households. Such an economy may be described as a two-sector economy, since it is composed of only a business sector and a household sector. In the next unit, we shall consider how government is admitted into the economy to produce a three-sector economy (businesses/firms, households and government). Finally, in unit 3, the relationships between each of the sectors and other economies are admitted to produce the complete four sector economy: households, businesses/firms, government, and the rest of the world.

Starting with the simplest economy without external transactions and government, we visualise the economy as made up of two kinds of economic agents or institutions: households and businesses/firms. A household is an economic agent which owns factors of production and buys all final consumer goods. A firm hires factors of production from households to produce goods, sells the goods which it produces to households, and pays wages to households. This relationship is illustrated in the circular flow of income's diagram below
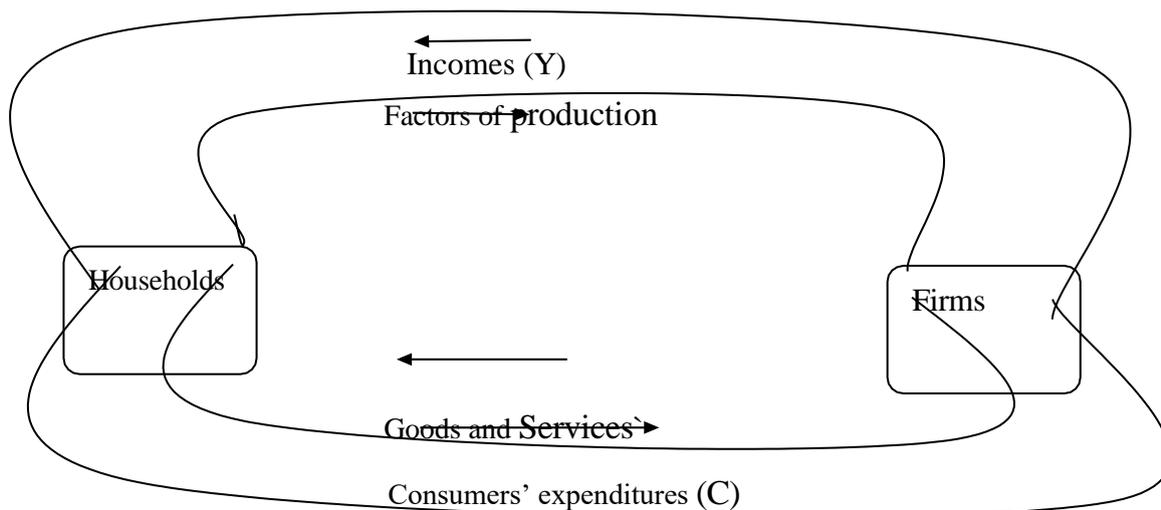
**Fig. 1.1: Circular flow of Income and Spending in a Two-Sector Economy**

The production and sale of final products and the generation of income that accompanies the activities are processes that take place on a continuous, day to day basis. The diagrammatic presentation focuses attention on basic features of the economy - the circular nature of the flow of payments from households to firms. Thus, the upper loop of the figures shows a physical flow of productive services from households in exchange for a monetary flow of income from business in payment for the services, the lower loop, at the same time, shows a physical flow of consumer goods and services from firms in exchange for a monetary flow of expenditure from households. The two flows may also be viewed as one circular flow in real terms and one in monetary terms. The former is a clockwise flow of real productive services from households to firms and real goods and services from firms to households, the latter is an anti-clockwise flow of monetary income from firms to households and monetary expenditure from households to firms. Thus, the aggregate income payment(Y) is equal to the aggregate expenditure (C).

Expenditure =Income =Value of Output................................................ (1.1)

The relation (1.1) shows that spending on goods is in the simple case where there is no government and no foreign trade, equal to gross national product (GNP) and also equal to the income of households. The diagram shows the key relation: Output is equal to income, equal to spending/expenditure.

However, there are three features of the real world which are not captured in the two-sector economy as shown in figure 1.1, they are:
(a)    Households typically do not spend all their incomes on consumer goods – they also save some of their incomes;
(b)    Governments are large institutions in the modern world which tax individual incomes and use their tax proceeds to buy large quantities of goods and services from firms, and
(c)    Economic activity is not restricted to trading with other domestic residents. International trade, travel and capital movements are common in real life.

**Self-Assessment Exercise 2**

> 1. Outline the three features of the real world that is not captured in a simple economy.

Households typically do not spend all their incomes on consumer-goods, they save some of their income as denoted by S, in Figure 1.2. Also, in the economy there are two kinds of firms: capital-goods (plants, equipment, other durables, buildings) producing f i r m s and consumers-goods producing firms.

Households make consumer expenditures (C) which represent flows of money from households to consumer goods producers and consumer goods producers (investment expenditure, I) by paying money to capital-goods producers in exchange for the capital-goods supplied. The household savings (S) are flows out of households.

Thus, incomes (Y) paid out by firms must equal to the expenditure by households on consumer goods and expenditure by firms in investment goods, that is:

$$Y=C +I \dotfill (1.2)$$

Equation (1.2) depicts that income received by households equals to the expenditure by households and their savings, that is:

$$Y=C +S \dotfill (1.3)$$

If

$$Y=C+I \text{ and } Y= C+S \text{ then}$$
$$C+I=C+S \dotfill (1.4)$$

At equilibrium savings must be equal to investment
$$S=I \dotfill (1.5)$$

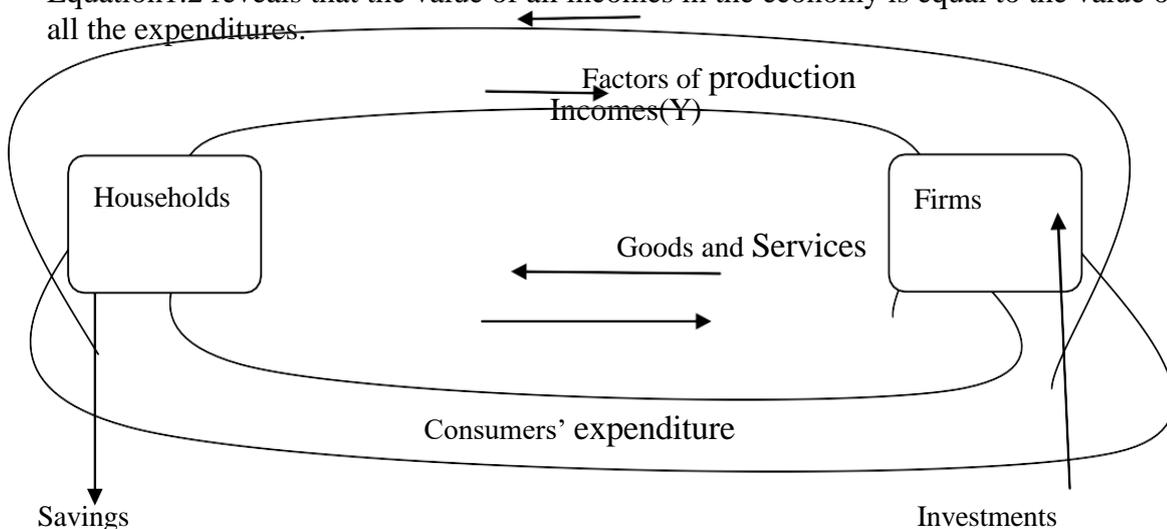Equation1.2 reveals that the value of all incomes in the economy is equal to the value of all the expenditures.

**Fig. 1.2:      Circular flow of Income and Spending in a Two-Sector Economy
with Investment and Savings**

## 1.4 Measures of Aggregate Income

### 1.4.1 Gross Domestic Product (GDP)

The GDP is the market value of final goods and services produced within the country at a particular period, usually a year. Unlike GNP, GDP is earned domestically rather than abroad (hence the appellate, domestic). Thus, when GNP exceeds GDP, residents of the country are earning more abroad than foreigners earning in the country.

### 1.4.2 Gross National Product (GNP)

The GNP is the total money or market value of all financial goods and services produced by the nationals of an economy irrespective of where they reside during any accounting period, usually a year. The insistence on final goods and services is to make sure that we do not double count. This means that the value of intermediate goods and services (e.g. components of a car sold to car manufacturer) are not included. Thus, to eliminate double counting, we use the value-added approach where only the value added to the good at each stage of production is included in the GNP. Such value added is the increase in the value to a good at a stage of production (hence, value added).

### 1.4.3 Net National Product (NNP)

The NNP is the net market value of a nation's produced goods and services. It deducts from GNP the depreciation of the existing capital stock over the course of the accounting period. The production of GNP causes wear and tear on the existing capital stock, e.g., machines wear out as they are used. Therefore, depreciation is a measure of the part of GNP that has to be set aside to maintain the productive capacity of the economy, and we subtract that from GNP to obtain NNP.

NNP=GNP–Depreciation…..................................................................... (1.6)

### 1.4.4 National Income (NI)

The national income (NI) is the net value of a nation's income measured at factor cost. It is the value of output at factor cost rather than market prices. It equals NNP plus subsidies, less business transfer payments and indirect taxes. Thus, national income is computed as shown below:

GDP–Depreciation=NNP–Indirect taxes +Subsidies= NI… (1.7)

### 1.4.5 Personal Income

Personal income is the amount of income effectively received by the household sector. It can be derived from national income by (a) adding elements of income received but not earned, and (b) deducting elements of income earned but not received. Thus personal income is:

Personal Income=National Income

Less: Corporate profits tax liability, corporate inventory valuation adjustment, contributions for social insurance/security, wage accruals disbursement

Plus: Government transfer payments to persons, interest paid by government (net) and by consumers' business transfer payments.

## 1.4.6 GDP at Factor Cost and Market Price

There is one important difference that arises when calculating the level of GDP from the spending side of the economy rather than summing the values added in production. This difference arises because the price paid by consumers for many goods and services is not the same as the sales revenue received by the producer. There are taxes that have to be paid, which place a wedge between what consumers pay and producers receive.

Taxes attached to the transactions are known as indirect taxes. Thus, if a consumer pays ₦100 for a meal in a restaurant the owner may receive only ₦85.10; the remaining ₦14.90 will go to the government in the form of value added tax (VAT).

The term factor cost or basic price is used in the national accounts to refer to the prices of products as received by producers. Market prices are the prices paid by consumers. Thus, factor cost or basic prices are equal to market prices minus taxes on products plus subsidies on products.

The concept of GDP at basic prices differs from the concept of GDP at factor costs in that the former includes net indirect taxes (indirect taxes less subsidies) attached to factors of production. For example, property taxes, capital taxes and payroll taxes were not included in the valuation of GDP at factor costs, they are included in the valuation of GDP at basic prices. These production expenses are included in GDP at basic prices, subtracting from them any subsidies attached to factors of production, such as subsidies allocated for job creation and training.

## 1.4.7 Gross National Product at Market Price (GNP at MP) and Gross National Product at Factor Cost (GNP at FC)

Gross national product includes total value of goods and services produced within or outside the country by its citizens. Gross national product at market price is the aggregate money value of all the final goods and services produced annually in a country plus net factor income from abroad. In other words, GNP at market price means the total incomes earned from both internal and external territories. Thus, GNP is a broader and comprehensive concept than GDP. In short it is the aggregate values of GDP + Factor incomes from abroad. Net factor income can be arrived at by deducting the factor incomes earned by the foreigners from our country from the factor income earned by our residents from abroad. Thus, Gross national product at market price = Gross domestic product at market price + Net factor income from abroad.

Gross National Product at factor cost is calculated by adding net factor income from abroad to the gross domestic product of factory cost. Gross domestic product at factor cost is the amount that includes both net domestic product at factor, cost and depreciation. Thus, GNP at factor cost = Gross domestic product at factor cost + Net factor income from abroad.

## 1.4.8 Personal Disposable Income and Expenditure

Personal disposable income is the amount of income available to the household for spending and saving after taxes have been paid. It is computed by subtracting personal tax and nontax payments (e.g. license fees, etc.) from personal income. Personal disposable income can be allocated to personal spending (such as personal consumption expenditures, interest paid by consumers, transfer to foreigners) and/or personal savings. Thus, personal disposable income less personal spending equals personal savings (a residual). Personal consumption expenditure or spending on currently produced goods and services is therefore personal disposable income less personal savings, personal interest by consumers and transfers to foreigners.

## 1.5 Methods of Measuring National Income

National income can be measured in three different ways:

We could look at the **total level of expenditure** on goods and services being produced by firms. This would include consumer expenditure (C), investment expenditure (I), government expenditure (G) and net exports pending(X-M) i.e. C+ I+G +(X-M).

Alternatively, we could look at the **total level of income** generated. This would include all factor incomes - wages, profit, rent and interest. A final possibility is to measure the **total level of output** produced by firms.

The following are the three methods of calculating national income:

- Total expenditure
- Total income; and
- Total output

Theoretically, the three methods give the same result because they measure essentially the same thing; i.e. a flow of income over a period of time. The logic of this is that, for the economy as a whole, the value of all output equals what is spent on the output, and what is spent on the output becomes income to those who have produced the output.

Thus, **National Income** =National Output =National Expenditure

## 1.5.1 Output approach

The output approach focuses on finding the total output of a nation by directly finding the total value of all goods and services a nation produces. As a result of the complication of the multiple stages in the production of a good or service, only the final value of a good or service is included in the total output. This avoids an issue often called "double counting" wherein the total value of a good is included several times in national output, by counting it repeatedly in several stages of production. In the example of meat production, the value of the good from the farm may be ₦10, then ₦30 from the butchers, and then ₦60 from the supermarket. The value that should be included in the final national output should be ₦60, not the sum of all those numbers (₦90). The values added at each stage of production over the previous stage are respectively ₦10, ₦20, and ₦30. The summation gives an alternative way of calculating the value of the final output.

- **Formulae**:

GDP (gross domestic product) at market price = value of output in an economy in the

particular year- intermediate consumption at factor cost
= GDP at market price - depreciation + NFIA *(net factor income from abroad)* - net indirect taxes.

## 1.5.2 Income approach

The income approach equates the total output of a nation to the total factor income received by residents or citizens of the nation. The main types of factor income are:

- Employee compensation (cost of fringe benefits, including unemployment, health, and retirement benefits);
- Interest received net of interest paid;
- Rental income (mainly for the use of real estate) net of expenses of landlords;
- Royalties paid for the use of intellectual property and extractable natural resources.

All remaining value added generated by firms is called the *residual* or profit. If a firm has stockholders, they own the residual, some of which they receive as dividends. Profit includes the income of the entrepreneur (the businessman who combines factor inputs to produce a good or service).

- **Formulae**

GDP at factor cost = Compensation of employees + Net interest +Rental & royalty income + Profit of incorporated and unincorporated NDP at factor cost

## 1.5.3 Expenditure approach

The expenditure approach is basically an output accounting method. It focuses on finding the total output of a nation by finding the total amount of money spent. The basic formula for domestic output takes all the different areas in which money is spent within the region, and then combines them to find the total output.

$$GDP = C + I + G + (X - M) \quad \text{.................................} \quad (1.8)$$

Where:
**C**=household consumption expenditures/personal consumption expenditures
**I**=gross private domestic investment
**G**=government consumption and gross investment expenditures
**X**=gross exports of goods and services
**M**=gross imports of goods and services

Note: (**X**-**M**) is often written as **NX**, standing for "net exports".

**Self-Assessment Exercise 3**

> 1. List the three methods of measuring national income.

## 1.6 Difficulties in Measurement of National Income

There are many difficulties when it comes to measuring national income; however, these can be grouped into conceptual difficulties and practical difficulties:

### 1.6.1 Conceptual difficulties

- Inclusion of services: There has been some debate about whether to include services in the counting of national income, and if it counts as output. Marxian economists are of the belief that services should be excluded from national income; most other economists though are in agreement that services should be included.
- Identifying intermediate goods: The basic concept of national income is to only include final goods, intermediate goods are never included, but in reality, it is very hard to draw a clear-cut line as to what intermediate goods are. Many goods can be justified as intermediate as well as final goods depending on their uses.
- Identifying factor incomes: Separating factor incomes and non- factor incomes is also a huge problem. Factor incomes are those paid in exchange for factor services like wages, rent, interest etc. Non-factor incomes are sale of shares, old cars, property etc., but these are made to look like factor incomes and hence are mistakenly included in national income.
- Services of housewives and other similar services: National income includes those goods and services for which payment has been made, but there are scores of jobs, for which money as such is not paid, also there are jobs which people do themselves like maintaining personal gardens etc., but if someone else is hired to do the work for them, then national income would increase, the argument then is why are these acts not accounted for? However, the bigger issue would be how to keep a track of these activities and include them in national income?

### 1.6.2 Practical difficulties

- Unreported illegal income: Sometimes, people do not provide all the right information about their incomes to evade taxes so this obviously causes disparities in the counting of national income.
- Non-monetised sector: In many developing nations, there is the issue that goods and services are traded through barter, i.e. without any money. Such goods and services should be included in accounting of national income, but the absence of data makes this inclusion difficult.

**Self-Assessment Exercise 4**

1. Explain the problems of measuring national income in the Nigerian economy.



## 1.7 Summary

This unit has thrown light on the meaning of circular flow of income in a two-sector model made up of households and firms, excluding government interventions and external transactions. The diagrammatic exhibition also shows the relationship and the basic features of the economy where output is equal to income and equal to spending/expenditure. Finally, the unit discovered that households do not spend all their incomes but save some, whereas firms make investment by paying money to capital-goods producers. Thus, incomes paid out by firms must equal to the expenditure by households on consumer-goods and expenditure by firms on investment- goods or income received must be equal to consumption by households and their savings. The unit equally discussed the measures of aggregate

income, methods of measuring national income and difficulties in measuring national income such as inclusion of services, services of housewives and other similar services, unreported illegal income and non-monetised sector.

## 1.8 References/Further Readings

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## 1.9 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

✓ SAEs 1

1. National income is the monetary value of all income in a nation (wages and profits and interest and rents and pension payments) during a given period (usually one year).

2. The circular flow of income is a neoclassical economic model depicting how money flows in the Economy.

✓ SAEs 2

1. Households typically do not spend all their incomes on consumer goods – they also save some of their incomes;

2. Governments are large institutions in the modern world which tax individual incomes and use their tax proceeds to buy large quantities of goods and services from firms, and

3. Economic activity is not restricted to trading with other domestic residents. International trade, travel and capital movements are common in real life.

- ✓ SAEs 3
    - Inclusion of services: There has been some debate about whether to include services in the counting of national income, and if it counts as output. Marxian economists are of the belief that services should be excluded from national income, most other economists though are in agreement that services should be included.
    - Identifying intermediate goods: The basic concept of national income is to only include final goods, intermediate goods are never included, but in reality it is very hard to draw a clear cut line as to what intermediate goods are. Many goods can be justified as intermediate as well as final goods depending on their uses.
    - Identifying factor incomes: Separating factor incomes and non- factor incomes is also a huge problem. Factor incomes are those paid in exchange for factor services like wages, rent, interest etc. Non-factor incomes are sale of shares, old cars, property etc., but these are made to look like factor incomes and hence are mistakenly included in national income.
    - Services of housewives and other similar services: National income includes those goods and services for which payment has been made, but there are scores of jobs, for which money as such is not paid, also there are jobs which people do themselves.

**UNIT 2     NATIONAL INCOME ACCOUNTING: THREE- SECTOR ECONOMY**

**1.1 Introduction**

We first consider a two-sector economy in order to permit an analysis of the basic product and income, saving and investment relationship uncomplicated by government transactions. But an economy without government spending or taxation is a far cry from any real economy. In Nigeria today, every area of private sector of the economy feels the impact of government transactions. Over the past decades, some percentages of the Gross Domestic Product (GDP) consisted of government purchases of goods and services, and direct taxes on persons and corporations have amounted to some certain percentage of national income. With the addition of government transactions to our framework, all the identities developed earlier will have to be modified. None, however, need to be rejected. Therefore, you need to pay adequate attention for proper understanding.



**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

• explain the circular flow of income and spending in a three- sector economy
• discuss government receipts, expenditure and production as large institution in the modern world
• explain the fundamental identity and the budget.

## 1.3 Concepts

### 1.3.1 The Circular Flow of Income and Expenditure in a Three-Sector Economy

In addition to households and firms, we have government. Households receive incomes (Y) from firms and dispose these by buying consumer- goods (C), paying taxes or savings (S). Firms, on the other hand, receive household's consumption expenditure as well as investment expenditure (financed by various capital market operations). They also receive payment from government in exchange for its purchase of goods and services (G). The government, on its parts, receives taxes (net of any transfers to households) and makes expenditures on goods and services. Since firms have no ultimate ownership of resources, everything they receive is paid out to households hence:

$$Y = C + I + G \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \text{(1.8)}$$

On the other hand, households receive incomes and dispose of them in the activities of consuming (C), saving (S) and paying taxes (T) that is:
$$Y = C + S + T \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \text{(1.9)}$$
In this closed economy, expenditure is still equal to income but expenditure now incorporates consumer expenditures, firms' investment expenditures, and government expenditures on goods and services (Anynawu, 1995). This relationship is shown below:
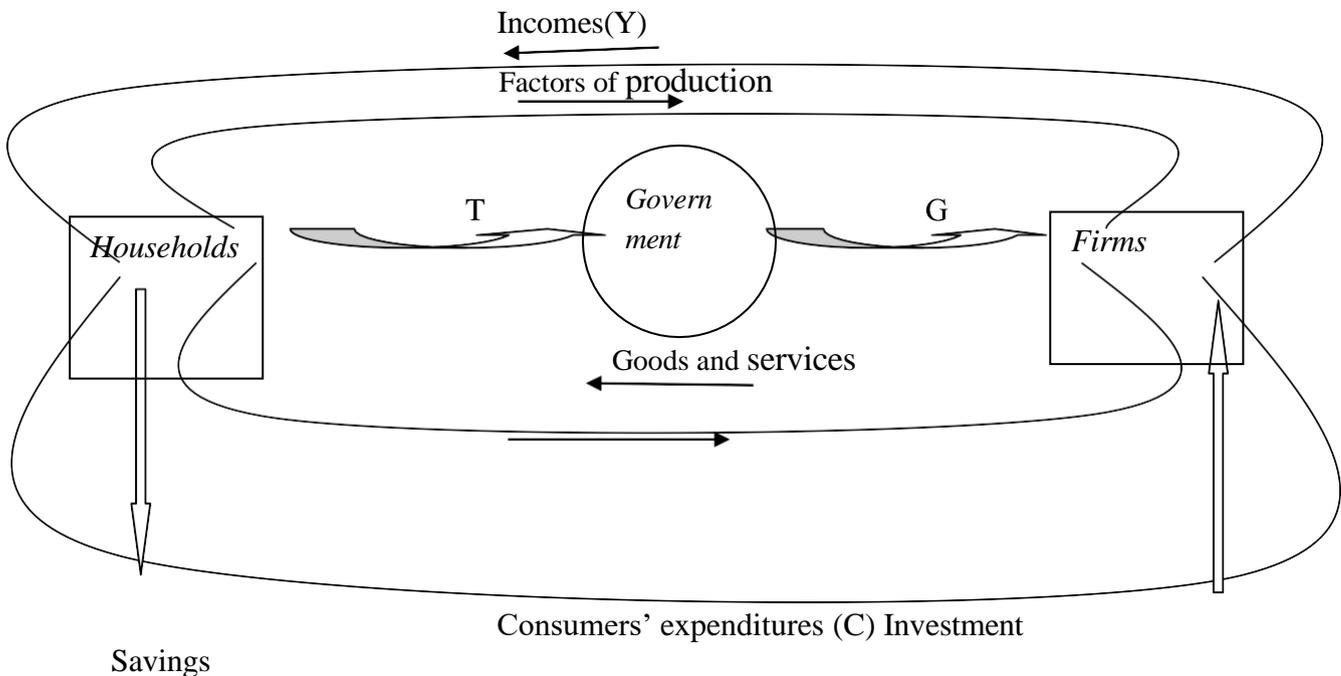


**Fig. 2.1:     Circular Flow of Income and Spending in a Three – Sector Economy**

The addition of government into the analysis only modified the analysis. This involves the addition of new entries in the various accounts as well as of entirely new accounts. One of the new accounts is a consolidated statement of government receipts and expenditures, consolidated for the thousands of government units – federal, state and local - that have the power to tax, spend, and incur debt inter-governmental transactions are cancelled out in the consolidation, so the totals reflect only the position of the government sector relative to each of the other sectors of the economy.

**Self-Assessment Exercise 1**

1. Explain the variables involve in a circular flow of income of a three sector economy.

### 1.3.2 Government Transactions in a Three-Sector Economy
These government transactions included in the models classified into three, thus: government receipts, government expenditure and government production.

### 1.3.2.1 Government receipts
All government receipts may be treated as tax receipts if we include among tax receipts social insurance corporations and incidental non-tax revenue such as fines and license fees. For present's purposes, tax receipts may best be classified as of four types: personal tax, corporate profits taxes, social insurance contributions, and indirect business taxes (including fines and license fees).

Each of these four types of taxes may be traced to the other sectors of the economy for which they are payments or allocations. Personal taxes are allocation of the households' sector; corporate profits taxes and indirect taxes are allocations of the business sector; and social insurance contributions are allocations of the business, government, and household sectors.

### 1.3.2.2 Government expenditure
While many classifications of government expenditure are possible, at this point the appropriate classification for national income purposes is simply (a) those expenditures for which government receives either goods or services (b) those expenditures for which government receives neither good nor services. Government expenditures matched by productive activity are composed of goods and services purchased from business and services of labour purchased directly from government own employees. The balance of government expenditure-those not matched by productive activity is composed of transfer payment, subsidies less current surplus of government enterprises and interest payment.

### 1.3.2.3 Government's production
In the two-sector economy, the question of production by government did not arise. All production originated in business firms. As a result, measuring gross and net national product and national income originating with business firm was the same as measuring gross and net national products and national income for the whole economy.
If government is now recognized as a producer, the measurement of income and product for the economy as a whole requires that income and product originating with government be added to that originating with business.

That government is a producer is readily seen if we include under government, the-many

business - type agencies, such as publicly owned local transit and water-supply systems, whose costs are covered at least to a substantial extent, by the sale of goods and services to their customers. These agencies, which are referred to as "government enterprises" in Nigeria income and product accounts, are treated as part of the business sector. Accordingly, the government sector is limited to those government agencies whose services are not or are only incidentally sold in the market place and whose expenses are covered almost entirely by taxes.

The government sector that emerges from these two is not the only type of government expenditures; there remain government expenditures in the form of wages and salaries paid to employees. These employees are paid for the labour services they provide to government and thus to the public. In adding government demand to gross national product, only that part of government expenditure that goes towards the purchase of goods and services is included. Therefore, in calculating gross national product, we exclude from government expenditure all transfer payment, interest payment, and subsidies minus current surplus of government enterprises. Since for every naira on the product side there must be a naira on the income side, we must summarily exclude from the income side an amount of taxes equal to these other government expenditures.

Thus, by taking taxes as net of these other government expenditures, we establish an identity between consumption (C) saving(S) and tax (T) on the income side and consumption (C), investment (I) and government purchases of goods and services(G) on the product side or

C+S+T=C+I+G… ...............................................................................(1.10)

**Self-Assessment Exercise 2**

> 1. Mention the three government expenditures in a three-sector economy.

**1.3.3 Fundamental Identity in the Three-Sector Economy and the Budget**

In any given time period, the amount of government purchases of goods and services on the product side, or G, may be equal to, greater than, or less than the amount of taxes, T, on the income side. In other words, the government may show, respectively, a balanced budget, a deficit, or a surplus. Let us examine how each of these three possibilities affects the fundamental identity.

**1.3.3.1 Balanced budget**
Assume the budget is balanced with total government expenditure of ₦69billion; purchases of goods and services are ₦50billion, other expenditures are ₦19billion, and total taxes are ₦69billion. Limiting expenditures to those for goods and services and adjusting taxes corresponding to a net basis gives us a budget balanced with G of ₦50billion and T of
₦50billion. Thus, the amount that government through its purchases of goods and services is exactly matched by the amount that it withdraws from the stream of income generated by the stream of spending on final goods and services. The fundamental identity including government is the repeated equation (1.10): C + S+ T=C + I +G. Since with a balanced budget T ≡ G, it follows that C+ S≡ C + I and, from this in turn, that S ≡ I. In other words, with a balanced budget, the identity between gross saving of the household and business sectors on the income side and gross investment of the business

sector on the product side is just as it was in the two-sector economy. For every naira of personal and business saving, S, there is a naira of gross investment, I.

### 1.3.3.2 Deficit budget

For this case, we can make use of some figures in which government shows a deficit budget. Here, total government expenditures of ₦70billion exceed total taxes of ₦69billion, producing a deficit of ₦1billion. Government purchases of goods and services, G, are ₦50billion, and taxes on a net basis, T, are ₦49billion. There thus, remains on the income side ₦1billion, which was put there by G but was not withdraw by T. This remaining ₦1billion on the income side is accounted for within the time period as ₦1billion of additional S, or saving by persons and firms. Thus, we have:

$$C+S+T \equiv C+I+G \ldots \qquad (1.11)$$
₦160+₦41+₦49 = ₦60+₦40+₦50, given that C = ₦60 billion

and

$$S+T= I+G \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1.12)$$
= ₦41+₦49 = ₦40+₦50

Note that, with an unbalanced budget, the sum of personal and gross business saving, S, no longer equals gross investment, I for S is ₦41 and I is ₦40. Yet it has been repeatedly emphasized that gross saving must equal gross investment as an unavoidable accounting identity, since investment is unconsumed product, saving is unconsumed income, and income equals the value of product. We must show that an unbalanced budget does not and cannot upset this fundamental identity.

Again, in terms of the present set of figures, the sum of personal consumption expenditures, C (₦160 billion), and "public consumption expenditures," G (₦50 billion), measures total consumption of output in the economy. Gross investment, I (₦40 billion), is the unconsumed output of the economy. For every naira of investment there must be a naira of saving. Yet we have ₦41billion of S and ₦40 billion of I. This extra naira of S matches the government deficit of ₦ 1 billion, and it is the deficit that produces this apparent inequality between saving and investment. Once the concept of government saving is introduced into our economy, we will see that the apparent inequality between saving and investment is just that – an apparent and not an actual inequality.

### 1.3.3.3 Surplus budget

In the case of a surplus, taxes withdraw from the stream of income generated by total spending on final product an amount greater than that which government purchases of goods and service contribute to this stream of income.

Let us assume an economy with a surplus of ₦1billion. Suppose government purchases of goods and services are ₦50billion as before and net taxes are now ₦51billion. The identity reads as:
C+S+ T=C+I+G = ₦160+₦39+₦51 = ₦160+₦40+₦50

The government surplus, or public saving, which is #1billion, is necessarily offset by private saving, which is ₦1billion less than it would otherwise be. For the economy, gross saving of ₦40 (₦39 private and ₦1 public) is matched by gross investment of ₦40.

Again, by dropping C from both sides and by rearranging the identity, we have:

S+ (T– G) = I………………………………………………………………… (1.13)

N39+ (N51 - N50) = N40

In this case, N1 more is withdrawn from the income side by government than is in effect placed on that side by government purchases of goods and services. This extra N1 is accounted for within the time period by a decrease of N1 in private saving. The economy's gross investment of N40 is matched naira for naira by gross saving. In this case of a surplus, part of the economy's saving (S) is necessarily less than investment by the amount of government saving.

**Self-Assessment Exercise 3**

Explain the following:
A) balanced budget,
B) deficit budget,
C) Surplus budget.

**1.4 Summary**

So far in our discussion of circular flow of income expenditure in a three-sector economy, the following facts can be inferred:

- In addition to households and firms we also have government as the third sector into the analysis.
- Firms do not have ultimate ownership of resources, everything they received, they paid to households hence Y = C + I + G.
- Households receive incomes and dispose of them in the activities of consumption, saving and paying taxes, that is Y = C + S + T.

**1.5 References/Further Readings**

Anyanwu, J.C. & Oaikhenan, H.E. (1995). *Modern Macroeconomics: Theory and Applications in Nigeria.* Onitsha-Nigeria: Joanee Educational Publishers Limited.

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**1.6 Possible Answers to SAEs**

These are the possible answers to the SAEs within the content.

➤ SAEs 1

   1. consumers' expenditures

   2. firms' investment

   3. government's expenditure

➤ SAEs 2

   1. transfer payment

   2. interest payment

   3. subsidies

➤ SAEs 3

 1. Balanced budget: This is when expenditure equals income

 2. Deficit: Expenditure is greater than income

 3. Surplus: Income is greater than expenditure

**UNIT 3        NATIONALINCOMEACCOUNTING: FOUR- SECTOR ECONOMY**

## 1.1 Introduction

An economy whose foreign transactions are excluded from analysis is termed a "closed economy". By now including the transactions with the "rest-of-the-world", we will have an "open economy" that includes all four sectors found in any actual economy (Shapiro, 1974). Anyanwu (1995) puts it this way, "now, a final complication of the analysis opens the economy to external transactions (X-M), in addition to the activities of households, firms, and the government". This unit therefore needs adequate attention for a broader understanding of the analysis of the circular flow, typical of an actual economy or real economy because no economy is an island.



## 1.2 Learning Outcomes

At the end of this unit, you should be able to:

- describe the circular flow of income/expenditure in a four-sector economy
- explain the identity (fundamental)found in the four-sector model
- discuss the importance of the circular flow of income/spending.



## 1.3 Concepts

### 1.3.1 Circular Flow of Income/Spending in a Four-Sector Economy

The addition of the rest-of-the-world as the fourth and final sector now permits us to recognise that an actual economy's GNP is not necessarily equal to the total of the final

goods and services secured by domestic consumers (as measured by personal consumption expenditures), domestic government (as measured by government purchases of goods and services, and domestic business (as measured by gross private domestic investment). The additional activities included are imports and exports of goods and services. Foreigners purchase goods and services from the producers of goods in the domestic economy and there is a flow of money from the-rest-of-the-world to the domestic firms (X) for exports. Also, domestic citizens purchase goods and services from the- rest-of-the-world, transferring money to foreigners in exchange for those goods and services - imports (M). If an economy for any time period shows net export of goods and services, the amount of final goods and services secured by domestic consumers, government, and business is necessarily less than the amount domestically produced. If, however, the economy shows net imports, then domestic consumers, government, and business secure a total of final goods and services greater than that which were domestically produced during the time period. The latter situation has been much more common for Nigeria, although there have been years in which exports exceeded imports. It follows from this relationship that any change in the net export or import balance, other things being equal, produces an equal change in the economy's GNP for that period. If, during a given time period, the total amount of final goods and services secured by consumers, government, and business remains unchanged and the excess of imports over exports grows or shrinks, then GNP must also be smaller or larger than it was during the preceding period by the amount of this change. Thus, for the Nigerian economy, moving from a net export balance of N285Million in 1971 to a net import balance of N703.6Million in 1981 would itself mean a decrease in GNP from 1971 to 1981 on the assumptions that all other things remain equal. In the same way, the movement, from the net export balance of N479.5m in 1972 to the net export balance of N123.2million in 1973 meant a decrease in GNP of N356.3 million on the same assumption. On the other hand, the movement from a net export of N30770.8million in 1989 to the net export balance of N70114.9million in 1990 meant an increase in GNP of N39344.1million on the same assumption (CBN, 2009). The circular flow for an open economy is shown below:
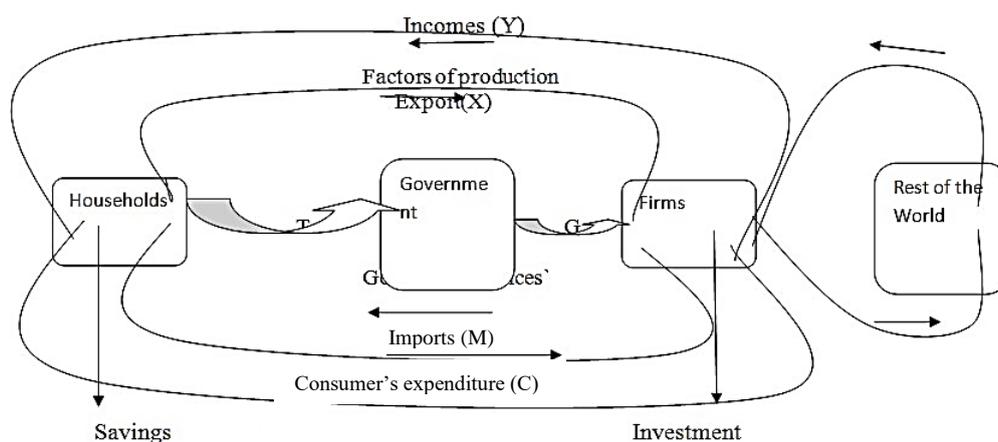


**Fig. 3.1:        Circular Flow of Income and Spending in a Four-Sector Economy**

The circular flow for an open economy shown in Figure 3.1 contains only a few modifications of Figure 2.1, the flow for a closed economy. In the upper part of Figure 3.1, under gross national product by sector of demand, the rest of the world appears as a

fourth sector, with its demand measured by net export (X-M); under gross national product sector of origin, the rest-of-the-world appears as a fourth sector, with income originating abroad measured by net factor income received by the domestic economy from the-rest-of-the-world.

**Self-Assessment Exercise 1**

1. Describe the circular flow of income/spending in a four-sector economy.

### 1.3.2 The Fundamental Identity in a Four-Sector Economy

Consider the circular flow in Figure 3.1., it is clear that:

$$Y = C + I + G + X - M \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1.14)$$

Whereas the items on the right-hand side of equation (1.14) is total expenditure on domestic output. Thus, the equality between income and expenditure is retained in the world picture in figure 1.4. This more realistic picture of the world also shows the gross national product identity thus: $I + G + X = S + T + M \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (1.15) Equation (1.15) shows that injection (I, G, X) equals to leakages (S, T, M). Indeed, if we deduct savings, taxes, and import from both sides of equation (1.15) and rearrange we have:

$$(I - S) + (G - T) + (X - M) = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1.16)$$

Here the term $(I - S)$ is the excess of investment over savings by the private sector of the economy; $(G - T)$ is the government's budget deficit or surplus; $(X - M)$ is net exports or surplus or deficit in the balance of trade with the rest of the world (Parkin, 1982).

**Self-Assessment Exercise 2**

1. Explain the variables found in a typical circular flow of income and expenditure in an open economy.

### 1.3.3 Importance of the Circular Flow

The concept of the circular flow gives a clear-cut picture of the economy. We can know whether the economy is working efficiently or whether there is any disturbance in its smooth functioning.

It is with the help of circular flow that the problems of disequilibrium and the restoration of equilibrium can be studied.

The role of leakages enables us to study their effects on the national economy. For example, imports are a leakage out of the circular flow of income because they are payments made to a foreign country. To stop this leakage, government should adopt

appropriate measures so as to increase exports and decrease imports.

Similarly, saving is a leakage out of the spending stream. This depresses the circular flow of income. On the other hand, consumption expenditures are inflows. If leakages exceed inflows, total spending is smaller than output. As a result, income and employment tend to decline over a period of time. On the other hand, if inflows exceed leakages, the spending stream is enlarged in the circular. This causes income and employment to rise in the next period.

The study of circular flow also highlights the importance of monetary policy to bring about the equality of saving and investment in the economy. The equality of saving and investment comes about through the credit or capital market. The credit market itself is controlled by the government through monetary policy. When saving exceeds investment or investment exceeds saving, money and credit policies help to stimulate or retard investment spending. This is how a fall or a rise in prices is also controlled.

Similarly, the circular flow of income and expenditure also points towards the importance of fiscal policy. For national income to be in equilibrium desired saving plus taxes (S + T) must equal desired investment plus government spending (I+G). S+T represent leakages from the spending stream which must be offset by injections of I + G into the income stream. If S + T exceed I+ G, government should adopt such fiscal measures as reduction in taxes and spending more itself. On the contrary, if I + G exceed S + T, the government should adjust its revenue and expenditure by encouraging saving and tax revenue. Thus, the circular flow of income and expenditure tells us about the importance of compensatory fiscal policy.

**Self-Assessment Exercise 3**

1. Describe the importance of circular flow of income and expenditure to the Nigerian economy.



**1.4 Summary**

The circular flow of income/expenditure was highlighted and discussed. The addition of the rest of the world, exports and import permits us to recognise that an actual economy GNP is not necessarily equal to the total of goods and services secured by domestic consumers, domestic government and domestic business but with the inclusion of imports and exports of goods and services. It also follows that in the open economy circular flow, any change in the net export or import balance, other things being equal, produces an equal change in the economy's GNP for that period. Following the relationship in the four-sector economy, the circular flow is: $Y = C + I + G + X - M$ whereas the gross national identity is: $C + I + X = S + T + M$.

## 1.5    References/Further Readings

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## 1.6 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

➢ SAEs 1

This is an open economy where households, firms and the government trade with other nations.

➢ SAEs 2

The following are the variables found in a four-sector economy:

a. household consumption

b. firm's investment

c. government expenditures

d. export

e. import

➢ SAEs 3

Circular flow of income/spending is important in the following ways:
1. It highlights the importance of monetary policy to bring about the equality of saving and investment in the economy.
2. The circular flow of income and expenditure also points towards the importance of fiscal policy.
3. It is with the help of circular flow that the problems of disequilibrium and the

restoration of equilibrium can be studied.

**MODULE 2        CONSUMPTION, SAVINGS AND INCOME
                    DETERMINATION**

**UNIT 1        CONCEPTS  OF        CONSUMPTION    AND SAVINGS**

**1.1 Introduction**

In any economy in which people have free choice, the total volume of personal consumption expenditure is determined primarily by the amount of disposable income that people receive. This proposition, simple in meaning and plausible in sound, is the corner stone of the theory of consumption demand. In order to concentrate at first on this single most important determinant of consumption demand, the other less important determinants may be put aside for later consideration. For this time being, we are assuring that personal consumption expenditures are determined exclusively by the level of disposable personal income.

Consumption and savings are two of the key macroeconomic aggregates in an economy. The third one is investment. The important of these variables derives from the fact that they are crucial in determining an economy's equilibrium level of employment and therefore, aggregate income.

Therefore, in this unit and subsequent ones, we examine various issues in consumption and savings; hence, needs your maximum attention.



**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

- Define the concepts of consumption and savings
- explain personal disposable income as the major factor that caused a movement

along the same consumption and savings curve, i.e. the single most important determinant of consumption and savings
- explain MPC and APC and their differences
- discuss MPS and APS and their differences.



## 1.3 Concepts

### 1.3.1 Concepts of Consumption Demand and Savings

Consumption can be defined as the act of using goods and services to satisfy human wants. It refers to household's expenditure on goods and services which yield utility in the current period. In macroeconomic analysis, consumption expenditure refers to expenditures by the household sector on current produced final goods and services. This definition effectively excludes expenditure on goods and services that were produced in a previous accounting period (Anyanwu, 1995). Consumption expenditure constitutes a key component of the aggregate expenditure used in national income determination which in its broadest form can be written for an open economy as:

$$Y = (C + I + G + X - M) \ldots \ldots \ldots \ldots \ldots (2.1)$$

In Keynesian economic analysis, saving represents the difference between income and consumption. The reasoning is that income is either consumed or saved.

Thus, saving is defined as the amount of income per time period that is not consumed by economic units. For the households, it represents that part of disposal income not spent on domestically produced or imported consumption goods and services. For the firm, it represents undistributed business profits irrespective of the business unit to which the analysis relates, it is pertinent to point out that saving is a flow variable, being measured over time.

An understanding of the meaning and behaviour of various concepts of consumption and savings is necessary for the understanding of national income determination. These concepts include marginal propensity to consume (MPC), average propensity to consume (APC), as well as marginal and average propensity to save (APS) and marginal propensity to save (MPS).

### Self-Assessment Exercise 1

1. Explain the concepts of consumption and savings.

### 1.3.2 Marginal Propensity to Consume (MPC)
The MPC refers to the fraction of additional disposable income that is consumed. The concept is central to Keynesian economic analysis. In fact, the concept owes its origin to Keynes (1936) assertion that, "men are disposed as a rule and on the average, to increase their consumption as their income increase but not by as much as the increase in their income".

The value of the marginal propensity to consume determines the size of the multiplier. The slope of the linear graph defines the marginal propensity to consume. In summary therefore, the marginal propensity to consume is the ratio of change in consumption to the change in income which symbolically can be written as:

$$MPC = \Delta C / \Delta Y \dots \tag{2.2}$$

It is the slope of the consumption function. The value of MPC normally lies between zero and one; greater than zero because individuals will consume out of their additional income but less than one because they, in line with what Keynes has described as "the fundamental psychological law" will not increase their consumption "by as much as the increase in their income". Thus, it can be stated symbolically as $0 < MPC < 1$.

According to Jhingan (2003), the MPC is constant at all levels of income. It is the MPC that tells us how much additional spending will be induced by each naira change in income. For each naira (₦1) of say, a tax reduction, economists expect consumption to rise by #1 times the MPC (Mailafia, 2010).

As an example, consider the following data on disposable income and consumption in XYZ country from 1983-1988

**Table 1.3.1: A Hypothetical Consumption and Income Pattern in XYZ Country**

| Year | Consumption C (#bn) | Disposable Income (#bn) | Marginal Propensity to Consume (MPC) |
|------|---------------------|-------------------------|--------------------------------------|
| 1983 | 1700 | 2000 | 0.8 |
| 1984 | 2100 | 2500 | 0.8 |
| 1985 | 2500 | 3000 | 0.8 |
| 1986 | 2900 | 3500 | 0.8 |
| 1987 | 3300 | 4000 | 0.8 |
| 1988 | 3700 | 4500 | 0.8 |

Consider the period between1983 and 1984 in Table 2.1

MPC = Change in consumption/Change in income = ₦400/₦500 = 0.8

Suppose there is a total income tax reduction of say ₦250, we will expect consumption to rise by a total of ₦250 (0.80) = ₦200

**1.3.3 Average Propensity to Consume (APC)**

Average propensity to consume refers to the proportion (fraction) of total income that is spent on consumption, being the ratio of total consumption to total income (disposable or national). It is derived by dividing total consumption expenditure by total income. The APC is equal to the slope of the ray from the origin drawn to a chosen point on a linear consumption function graph symbolically, it can be express as:

$$APC = C / Y \dots \tag{2.3}$$

The average consumption-function relationship is defined by the ratio C/Y for different levels of income (Y) (Shapiro, 1974).

Consider Table2.1 as an example of APC

At Y=2000, C=1700, APC=1700/2000=0.85
At Y=2500, C=2100, APC=2100/2500=0.84
At Y=3000, C=2500, APC=2500/3000=0.83
At Y=3500, C=2900, APC=2900/3500=0.82

The APC (C/Y) ratio could be computed for any other level of Y in similar fashion. However, from what is given, it is apparent that the ratio of C to Y in this consumption function decreases steadily as income increases, and vice versa. In other words, C increases less than proportionately with increase in Y, and vice versa. The C/Y ratio as one of the ratios that may be derived from the consumption function, is known as the average propensity to consume.

**Self-Assessment Exercise 2**

1. Differentiate between marginal propensity to consume (MPC) and average propensity to consume (APC).
2. State the reasons why MPC is constant for all levels of income.

**1.3.4. Marginal Propensity to Save (MPS)**

There is also a saving counterpart to MPC. If, instead of looking at the ratio of savings (S) to income at any level of income, we look at the ratio of the change in S to the change in Y for any change in Y, we have what is termed marginal propensity to save or the MPS. Given the change in Y, $\Delta Y$, the $\Delta S/\Delta Y$ is the ratio of the change in S to the change in Y, just as $\Delta C/\Delta Y$ is the ratio of the change in C to the change in Y. since $\Delta Y$ must be devoted to either $\Delta C$ or $\Delta S$, the two ratios $\Delta C/\Delta Y$ and $\Delta S/\Delta Y$ must add up to one.

If the MPC is positive but less than one and is the same for any change in income, then it follows by subtraction, since MPS = 1- MPC, that the MPS must also be positive but less than one and that it must also be the same for any change in income. Since what is not consumed is by definition saved, the MPS can be defined in a manner analogous to the definition of MPC as the ratio of the change in savings to the change in income (disposable or national). Thus, it is the slope of the saving function. Like the MPC, the value of MPS is greater than zero but less than 1: MPC + MPS = 1.

**1.3.5 Average Propensity to Save (APS)**

APS refers to that proportion of income that is devoted to saving. Since it is the fraction of income that is saved, it is expressed as the ratio of total saving to total disposable or national income. Like the APC, the APS is equal to the slope of the ray drawn from the origin to a chosen point on the graph of a linear savings function assuming that the savings function originates from the origin. This assumption however precludes the possibility of dis-savings. The APS is the saving counterpart of APC. While the APC is the ratio of C to Y, the APS is the ratio of S to Y. since Y itself is devoted to either C or S, it follows that the two ratios, C/Y and S/Y, must add up to one. Thus, when Y is 2000, C/Y = 1700/2000 =0.85 and S/Y is 300/2000 =0.15. Similarly, when Y is 2500, C/Y = 2100 / 2500 = 0.84 and S/Y is 400 / 2500 = 0.16. This follows that:

$$APC+APS=1 \text{ or } APC=1-APS \text{ or } APS=1-APC \dots \text{...............................} (2.4)$$



## 1.4 Summary

So far in this unit, consumption and savings as two macroeconomic aggregates have been explained. The various concepts of consumption and saving which include MPC, APC, MPS and APS have also been discussed. Understanding of these concepts is indispensable for the understanding of national income determination in an economy. The unit further elaborated on the fact that MPC+MPS =1 and APS+APC =1given that income not consumed is saved.



## 1.5 References/Further Readings

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## 1.6 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

➢ SAEs 1

1. Consumption refers to household's expenditure on goods and services which yield utility in the current period.

2. Savings can be described as the amount of income per time period that is not consumed by economic units.

➢ SAEs 2

1. The MPC refers to the fraction of additional disposable income that is consumed while

Average propensity to consume refers to the proportion (fraction) of total income that is spent on consumption, being the ratio of total consumption to total income (disposable or national).

2. It is the MPC that tells us how much additional spending will be induced by any change in income.

**UNIT 2      THE   BASIC   CONSUMPTION   AND   SAVING FUNCTION**

**1.1 Introduction**

To consider how consumption expenditures are related to disposable income, we may begin by posting that consumption expenditures vary directly with disposable income. Second, we can be more specific and say something about how much such expenditure will vary as disposable income varies. Keynes did this in putting forth his "fundamental psychological law" that "that men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income. In other words, as income increases, consumers will spend part but not all of the increase, for they will choose to save some part of it.

It is this relationship between consumption and income advanced by Keynes that is employed in the simple theory of income determination to be developed in this and the following units.



 **1.2 Learning Outcomes**

At the end of this unit, you should be able to:

• explain the basic consumption function
• describe algebraically and graphically the consumption function
• explain consumption hypothesis.

### 1.3 Concepts

### 1.3.1TheBasicConsumptionFunction

When we talk of how much an economy spends (consumes) out of income, we are as well referring to the relationship between consumption and disposable income. The function that depicts this relationship is referred to as the consumption function. Generally, the consumption function is the relationship between total expenditure and total disposable income in the economy, holding all other determinants of consumer spending constant (Mailafia, 2010).

According to Anyanwu (1995), a consumption function expresses the functional relationships between consumption expenditure and all its determinants. Since Keynesian economic analysis assigned an exalted place to consumption expenditure in aggregate income determination, it is worthwhile to examine the relationship between consumption and its determining variables.

In fact, the consumption function is one of the most crucial macroeconomic relations. The macro consumption function explains the relationship of aggregate desired consumption expenditure and its determining variables of all households in an economy. In its simplest form, consumption is specified as a function of income. Algebraically, this can be written as $C = f(Y^d)$ where C stands for consumption and it is expressed as a function of $Y^d$ (disposable income). Graphically, the consumption function is shown below in figure 2.1
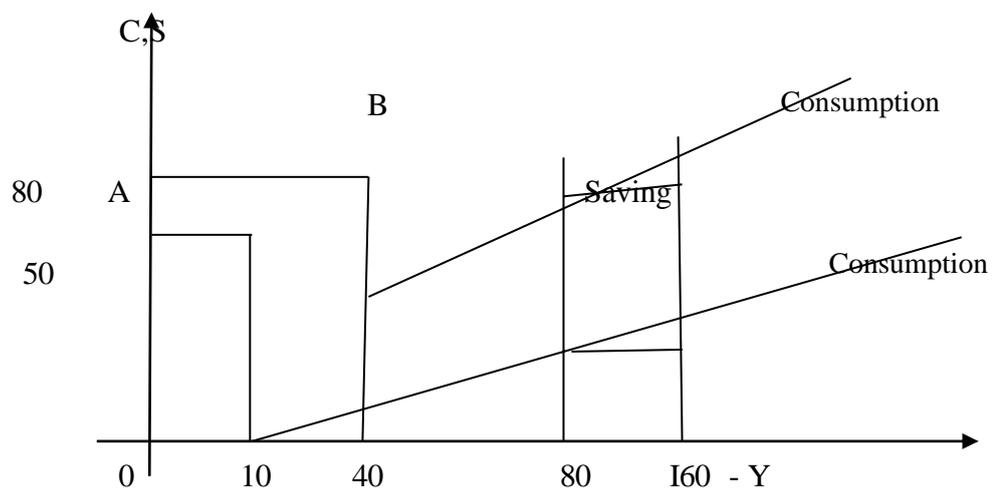


**Fig. 2.1:** **The Consumption and Saving Functions Showing MPC and MPS**

The empirical form of the functional consumption relationships depicted above can be expressed as for example $C = 0.8Y^d$. This is because the MPC = 0.8. This is interpreted to mean that for every ₦1 change in disposable income, consumption changes by 80k. Thus,

if disposable income rises by ₦1, this will be accompanied by a rise in consumption to the tune of 80k and vice versa.

Notice that 0.8 is the gradient or the slope of the consumption function and in discussing the concept of MPC in the previous unit, we pointed out that the slope of the consumption function is equal to the MPC. Hence, from the above consumption function expression, the MPC is 80k implying a marginal propensity to save (MPS) of 1 – 0.8 = 0.2. We have arrived at the value of this MPS because

MPS =1–MPC…................................................................................ (2.5)

## 1.3.2 Consumption Function with an Intercept

A simple consumption function such as we have above when graphically represented would pass through the origin in the Cartesian coordinate. However, it is possible to have consumption function which when graphically represented would exhibit an intercept, starting from a point above the origin of the Y – axis. This is because certain consumption of goods and services are not influenced by a change in income. Typical examples are the consumption of security services, like the police and military, and the consumption of goods and services that are necessities, and those under external economies. Total consumption of such goods and services are called autonomous consumption. They are autonomous because their consumption does not depend on changes in income. Consumption function of this nature can in functional form be expressed as

$$C = \alpha + \beta Y^d \quad (2.6)$$

Suppose total autonomous consumption for our example amounts to #100 billion. Then our consumption function can be written as:

$$C = 100 + 0.8Y \quad (2.7)$$

When consumption exhibits an intercept as we have above, two things are implied:

(i)     It reflects the fact that even when the consumers disposable income is zero, he can still consume. This consumption at zero level of income is called autonomous consumption and it could be financed by drawing on assets or wealth accumulated in the past.

(ii)    The intercept term reflects the fact that apart from income, other factors are at play to determine the size of consumption expenditure.

These other influences are legion but the most salient among them include wealth, usually by the consumers' assets holding the rate of interest and expected price movement constant. These other factors are called shift factors because a change in any of them would shift the consumption function upwards and vice versa. The complete consumption function in a more general form is:

$$C = f(Y^d, W, r, P^e) \quad (2.8)$$

C = consumption, $Y^d$ = disposable income, w = wealth r = rate of interest $P^e$ = expected

price movement.

1. Explain the basic consumption function.
2. List the two basic components of a consumption function.

## 1.3 The Basic Saving Function

Figure 2.1 shows the saving functions, that is, the counterpart of the consumption function. The amount of saving at any level of income is the difference between the consumption function and the guideline. The saving function can therefore be directly derived from the consumption function.

When income is 80, we see that consumption is 80 and saving is 0; this is depicted in Figure 2.1 by the intersection of the saving function with the horizontal axis at income of 80. When income is 40, consumption is 50 and saving is 10, the saving function lies below the horizontal axis at income of 40. When income is 160, consumption is 140 and savings in 20; the saving function lays 20 above the horizontal axis at income of 160

Therefore, you discover that the analysis of consumption functions above is largely relevant to savings function. Like the consumption function, the saving function is an expression of the functional relationships between saving and its determinants. This expression could take the form of equation, table or even graph. However, unlike the consumption function, a saving function usually exhibits negative intercept. This phenomenon reflects the financing of autonomous consumption by dissaving. In short, the intercept and parameters of saving function reflect the mirror image/inverse relationships between consumption and saving. This can be illustrated algebraically as follows:

Since $C = \alpha + \beta Y^d$. Then $S = Y^d - C$
Hence $S = Y^d - (\alpha + \beta Y^d)$
$S = -\alpha + (1 - \beta) Y^d \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots$ (2.9)

Notice the relationship between equation (2.6) and (2.9). It is noteworthy that like consumption, a number of variables apart from income jointly determine a consumer unit's saving decision.

**Self-Assessment Exercise 2**

1. Explain the basic saving functions
2. Give reasons why the intercept of the saving functions is negative.

## 1.4 Consumption Hypotheses (Short Run and Long Run Consumption Function)

Keynes in his general theory postulated that aggregate consumption is a function of aggregate current disposable income. The relation between consumption and income is based on his psychological law of consumption, which states that when income increases, consumption expenditure also increases but by a smaller amount. In other words, the

consumption expenditure increases with increase in income but not proportionally. This notion of disproportional consumption function implies that in the short run average and marginal propensity to consume do not coincide. Rather MPC<APC, and that the marginal propensity to consume is positive but less than unity (0 < MPC < 1). But the Keynesian consumption function is assumed to be stable both in the short run and the long run.

Recall that Keynes consumption function is given as: $C = \alpha + \beta Y$

In Keynes theory of consumption function, $\alpha$, which is the autonomous consumption of which he gave importance to the MPC. Keynes studied the consumption and income data for the United States during the period 1953-1979 (26 years) and estimated the consumption for this period as:

$$C = 6.71 + 0.89Y \ldots \ldots \ldots \ldots \ldots (2.10)$$
$$\text{From equation (2.10), APC} = 6.71/Y + 0.89 \ldots \ldots \ldots \ldots (2.11)$$

Since MPC = 0.89 in this particular case, it means APC > MPC and the APC declines as income increases.

Simon Kuznets discovered issues which brought the argument for Equation (2.10). According to Kuznets, Equation (2.10) is for a longer period. That if a shorter period is taken, a different result will be obtained with different meaning. Thus, he took data for the same economy for 12 years, and came up with the function:

$$C = 47.6 + 0.73Y \ldots \ldots \ldots \ldots \ldots (2.12)$$

Hence, he said that a shorter period will produce a higher APC and a lower MPC, i.e., higher autonomous consumption and lower MPC in relations to Keynes postulation.

In 1946, Kuznets also studied the consumption and income data for the United States during the period (1869 – 1938) and estimated the consumption function for this period as

$$C = 0.99Y \ldots \ldots \ldots \ldots \ldots (2.13)$$

Hence in the long run, there is no autonomous consumption. Equation (2.12) implies that, even without income, one consumes but Kuznets argued that this is for a short time and that nobody will consume if he does not have income in the long run, other things being equal (Kuznets said, in the long run, APC and MPC$\rightarrow$1 i.e. MPC = APC). Further, Kuznets arrived at two conclusions:

(1)     Over the long run, on the average, the APC did not show any downward trend so that MPC equaled the APC as income increased along a long run trend. This means that the consumption function is a straight line through the origin as shown by $C_L$ line in Figure 2.2 below.
(2)     The years in which the APC was below the long run average were boom periods and the years in which the APC was above the long run average were of slump periods.
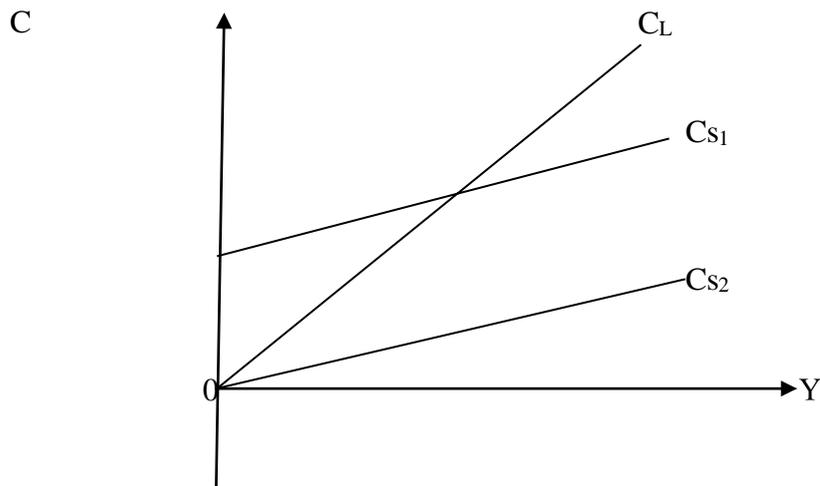
**Fig.2.2: Long-Run and Short-Run Consumption Function**

**Self-Assessment Exercise 3**

1. Explain why the long run consumption function has no intercept or autonomous component?



**1.5 Summary**

This unit analyzed and discuss consumption hypothesis (short run and long run consumption function). The unit equally explained why we have the short run and long run consumption function as a result of the works of Keynes and Kuznets, the reason for the presence of autonomous consumption in the short run and its disappearance in the long run. Finally, the unit ended with the analysis that in the long run APC = MPC = 1.



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## 1.7 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

- ➤ SAEs 1
  1. The basic consumption function expresses the functional relationships between consumption expenditure and all its determinants.
  2. a. Average propensity to consume
     b. Disposable income

- ➤ SAEs 2
  1. The basic saving function expresses the functional relationships between savings and all its determinants.
  2. It reflects the mirror image/inverse relationships between consumption and saving.

- ➤ SAEs 3
  1. According to Kuznets nobody will consume if he does not have income in the long run, other things being equal.

# UNIT 3    THEORIES OF CONSUMPTION

## 1.1 Introduction

In our previous unit on consumption hypothesis of short run and long run consumption function, there were questions why should consumption function in the short run differ from consumption function in the long run and why should there be changes in the MPC in the short run and in the long run? In an attempt to answer and reconcile the difference between the short run and the long run consumption functions, some theories of consumption function emerged. Over the years, economists have engaged in reconciling the short run and long run consumption and "the proposed solutions... have all taken the form of reinterpretation of the independent variable in consumption function. We therefore study below some of the important theories of consumption function. The primary purpose of this unit is to investigate the relationship between consumption and income through an examination of the theories of consumer spending.

## 1.2 Learning Outcomes

At the end of this unit, you should be able to:

- explain the various theories of consumption functions
- discuss the short run and the long run consumption function of the various theories
- state the differences generally noticed between the short run and long run behaviour of the consumption function.

**1.3 Concepts**
**1.3.1 Absolute Income Hypothesis (AIH)**

The basic tenet of the absolute income theory is that; the individual consumer determines what fraction of his current income he will devote to consumption on the basis of the absolute level of that income. Other things being equal, a rise in his absolute income will lead to an increase in the fraction of that income devoted to consumption. As we have noted, the first statement of this hypothesis is probably that made by Keynes in the general theory. Its subsequent development is primarily associated with James Tobin and Arthur Smithies.

The AIH is the oldest theory of consumptions and it was a fall-out of Keynes "psychological law". Its emphasis was that an individual's consumption decision was based upon the absolute level of his current income.

Recall our specification and discussion of the basis consumption function in the previous units. Recall also our analysis of such basic concepts as marginal propensities to consume and save. These concepts are relevant in discussing the features Keynes income hypothesis. These features are as follows:

(1)     Consumption and saving are functionally and directly related functions of disposable income. The relationship is a stable one.
(2)     Although, our emphasis has been on linear consumption and saving functions, it is possible for these functions to exhibit non- linear relationships. When we faced with nonlinear saving and consumption functions, the relevant graphical representation will exhibit linear shape. In this case, we would find that the MPC falls as income rises and MPS rising as income rises.
(3)     The APC fall with increases in income but it is greater than the MPC. This feature results from the existence of an intercept term in the consumption function. The implication of this is that, at very low-income levels, consumption spending could actually outstrip income

The third feature can be seen by examining our consumption function as follows:

$C = \alpha + \beta Y^d$

From the relationship, our MPC is $dC/dY^d = \beta$........................................................(2.14)

But our APC is

$APC = \alpha + \beta Y^d / Y^d$
$APC = \alpha / Yd + \beta$ ................................................................................. (2.15)

Thus, while $\beta$ is our MPC from the consumption function, our APC equals $\alpha/Yd + \beta$. Therefore, we see that the APC is greater than the MPC but declines as income rises and approaches the MPC at very high-income levels, since increases in disposable income brings about a reduction in the value of $\alpha/Yd$ in the APC function, causing the APC to fall. This third feature of the AIH is quite important because it is amenable to empirical verification.

The absolute income theory seems to be a plausible theory of individual consumer behaviour, and the non-economist would probably accept it today without hesitation. The AIH was consistent when tested with data collected from a sample of households and classifying them according to their income groups (cross sectional data). Moreover, it was consistent with empirical evidence obtained from annual data of real income and consumption for the economy as a whole (short run time series data). However, it was inconsistent with the empirical evidence obtained when it was tested using trend values of consumption and income collected over a long period of time (long run time series data). Long run time seriesdataarecharacterisedbyasmootheningoutofcyclicalfluctuation in the data series over time. Testing the AIH with this type of data showed an APC that exhibited constancy with no tendency to rise or fall as incomes fell or rose. Results obtained from this set of data pointed at the possibility of a consumption function that is proportional in the long run. From the mathematical view point, the explanation of the failure of the AIH to pass the empirical test was to be found in the existence of the intercept. APC equals MPC with a zero autonomous consumption function. Because both APC and MPC will be equal in the absence of the interpret term, both will exhibit constancy for all levels of income. But this way of reconciling the MPC with the APC for long run time series data created a different set of problem, that of explaining the short run cyclical fluctuation in APC which could not be explained with a zero-intercept consumption function. Research efforts were however directed at resolving the first problem of an unstable long run APC.

The first fall out of the AIH is first the observed long-run constancy which was a denial of Alvin Hansen's secular stagnation hypothesis. Hansen hypothesised, the possibility of an increasing APS to result in the economy being surfeited with capital-goods in the long run bring about an inadequate "investment outlet to channel the extra saving back in the spending streams". What was left was for researchers to establish the invalidity of the hypothesis following the empirical result from the AIH.

The second and more remarkable perspective was that of trying to reconcile the conflict that was apparent in the different sets of statistical results. In the first years, following the appearance of the general theory, economists also generally accepted the AIH as basically correct but the wide spread acceptance enjoyed by this theory was short-lived. Although, it still has some supporters, most economists lean towards one of the other theories such as the relative income hypothesis (RIH). Some reasons for this will become apparent as we continue.

**Self-Assessment Exercise 1**

Explain the main defects of the Absolute Income Hypothesis (AIH).

### 1.3.2 Relative Income Hypothesis (RIH)
The relative income theory, which is closely associated with the name of James S. Duesenberry, argues that the fraction of a family's income devoted to consumption depends on the level of its income relative to the income of neighboring families or other families with which it identifies and not on the absolute level of the family's income. Deusenberry's theory was based on ideas that were not considered in earlier economic analysis.
These are that:

(1) consumption behavior of individuals was influenced by consumption behaviour of individuals.

(2) the consumption behavior of individuals exhibits a "Rachet Effect" deriving from the fact that consumption behavior tends to be habitual; the habitual nature connoting that people try to maintain the standard of living they had become used to, the fact that they may have experienced a decline in income notwithstanding.

The theory posited that an individual's consumption and saving decisions are influenced by his social environment. Thus, given a level of income, an individual is likely to consume more of that income if he lives in environment dominated by the well-to-do in society, than if he lives in less affluent neighborhood. Moreover, efforts by individual to maintain a certain economic status in his neighborhood means that he spends more out of his income to maintain that status. Thus, his consumption, rather than being related to his absolute level of income would be related to his relative income within his neighborhood. This makes for a constant average propensity to consume given a relatively constant income distribution. Moreover, it makes for a proportional relationship between aggregate consumption and aggregate disposable income. The "demonstration effect" resulting from the high living standard of those with high income levels and the desire to "keep up with the joneses constituted one way of explaining the cross-sectional variation in APC.

The role of the "Rachet Effect" in explaining household's consumption was also explained by Duesenberry. In this regard, he argued that people, having become used to a standard of living, find it difficult to lower same even in the face of declining income. If we use the symbols, $Y_C$ and $Y_{PP}$ to denote current and previous peak income respectively, he bases his consumption on his previous peak income -his relative income within the society in which he lives. Thus, if current income falls below the previous peak income i. e $Y_c < Y_{pp}$, his current consumption would be related to the living standard he has become accustomed to on the basis of his previous income $Y_{pp}$. Achieving this entails a depletion of his saving with the concomitant rise in APC. Conversely, a $Y_c$ that exceeds $Y_{pp}$ will mean that his current consumption will be related to his living standard he established with his $Y_{pp}$ and therefore, the APC will decline, at least in the short run. Hence, Duesenberry asserted that in the short run, a non-proportional relationship would exist between aggregate consumption and aggregate disposable income if current income falls short of $Y_{pp}$. The graph below illustrates the RIH explanation of proportional/non proportional relationship consumption and disposable income.
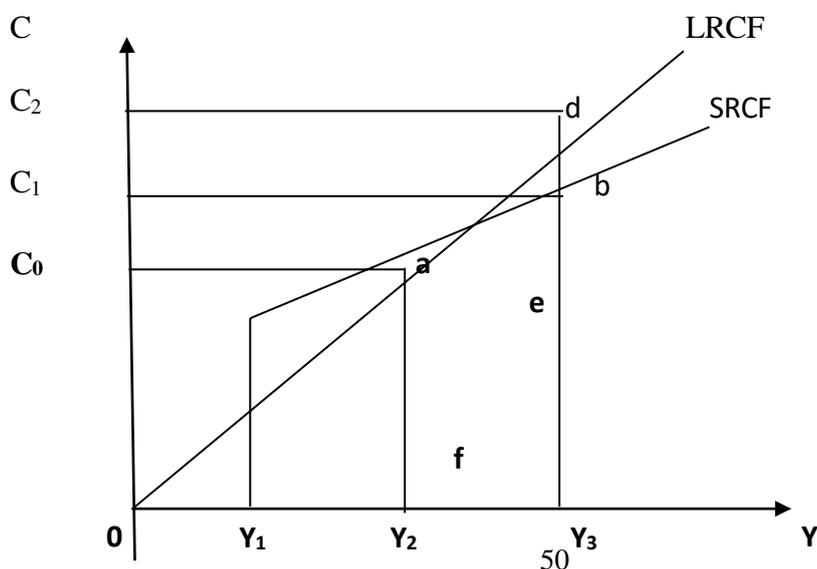
**Fig.3.1: Relative Income Hypothesis**

The line LRCF is the long run consumption function, passing through the origin and therefore without an intercept guarantees the equality of MPC and APC. But the SRCF is drawn to reflect the short run cyclical fluctuations which account for the drifts in the short run consumption functions. Thus, given an initial level of income of $Y_2$ consumption will initially be on the LRCF at point 'a'. This coincides with point $C_0$ on the vertical axis. A rise in income to $Y_2$ will make for an increase in consumption. But the movement will be along a short run consumption function to point 'b'. If the increase in income from $Y_0$ to $Y_2$, is persistent, the ratchet effect will hold and consumption will move to point 'd' along the LRCF. This means an increase in consumption from $C_1$ to $C_2$ on the vertical axis. However, if consumers were to experience a decline in income to $Y_1$, consumption would rather than decline along the LRCF to point 'f' fall along the SRCF, to point 'e'.

This is because consumption is still being influenced by Ypp, $Y_2$. The RIH suggests the following behavioural relationships between APC and MPC depending on the direction of the change in income:

(1)     If income is growing at a constant rate, the APC would be constant with MPC equaling APC.
(2)     If current income falls below a previous income level, the APC would be rising and it would be greater than the MPC.
(3)     If income is rising but lags behind previous income, the APC would be declining while the MPC would be rising but would nevertheless be less than MPC.
(4)     If income is rising and it is above a previous level, the APC would be constant but would ensure the equality between MPC and APC.

However, a major defect of the RIH was it emphasis on the habitual behaviour and the demonstration effect arguments as the factors underlying consumption decisions of economic agents. Indeed, these factors were too sharp at variance with the utility maximisation assumption of the consumer as well as the rational behavioural assumption of consumers.

**Self-Assessment Exercise 2**

Explain the "Rachet effect" or the "demonstration effect" of RIH.

**1.3.3 Permanent Income Hypothesis (PIH)**

Both the absolute and the relative income theories focus on the individual family's "current" income in relation to its spending. What is the meaning of current income in this context? A quite different approach to the role of income in the theory of consumer spending has been developed by Milton Friedman, and its point of departure is the rejection of this usual concept of "current" income and its replacement with what is called "permanent" income. A family's permanent income in any one year is in no sense indicated by its current income for that year but is determined by the expected or anticipated income to be received over a long period of time, stretching out over a number of future years. In Friedman's words, permanent income "is to be interpreted as

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the mean income regarded as permanent by the consumer unit in question, which in turn depends on its horizon and far sightedness". The time span that is relevant to permanent income is the minimum period of time over which income influences must be maintained in order to make the receiver of that income regard them as permanent.

Given this meaning of permanent income, a family observed or measured income in any particular year may be larger or smaller than its permanent income. Friedman divides the family's measured income in the year into permanent and transitory component, so that its measured income is larger or smaller than its permanent income, depending on the sum of positive or negative transitory components. For example, if a family wage earner receives an unexpected special bonus at work in one year and has no reason to expect the same bonus in following years, this income element is regarded as positive transitory income, and it raises his measured income above his permanent income. On the other hand, if he suffers an unexpected loss of income due to, a shutdown of a plant as a result of fire, this income element is regarded as negative transitory income, and it reduces his measured income below his permanent income.

In the same way, Friedman divides measured consumption into permanent and transitory components. A good purchase because of an attractive sale price or a normal purchase deferred due to unavailability of the good would-be examples of positive and negative transitory consumption. As with measured income, a family's measured consumption in any particular period may be larger or smaller than its permanent consumption.

The theory suggests that income can be divided into two components: permanent income, $Y^p$ and transitory income, $Y^T$ so that $Y = Y^p + Y^T$ $\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots$ (2.16)

The permanent income, $Y^p$ is income that would persist e.g. salaries, wages and increment's while transitory income, $Y^T$ is income that would not persist e.g. Overtime allowance, bonuses and gifts. This does not have substantial behaviour on income since individual gear their consumption behaviour to their $Y^p$, then consumption function is of the form:

$C = cY^p \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots$ (2.17)

This equation states that consumption varies in the same proportion with $Y^P$. The question then is how the person does determine his $Y^P$. Permanent income hypothesis brings in the issues of expectation since the individual is not so certain about what part of a change in income is likely to be maintained as permanent and what part is not likely to be maintained and thus transitory. Friedman argues for example, that if an individual income, has been earning relatively #100,000 per annum, this individual will not expect that his income will fall to #50,000 next year or that it will rise to #150,000 but he still expects that his income is going to be #100,000 so that the PIH-$Y^P$ is related to the previous year income and therefore is defined as:

$Y^p = Ypp + \Theta (Yc - Ypp) \ldots \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (2.18)
$Y^p = Ypp + \Theta Yc - \Theta Ypp \; Y^p = \Theta Yc + Ypp - \Theta Ypp$
$Y^p = \Theta Yc + (1 - \Theta) Ypp \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (2.19)

$\Theta$ is a fraction and in other words $0 < \Theta < 1$. Equation (2.19) writes that $Y^p$ is a weighted average of current income, Yc and past income, Ypp. The consumption on the other hand can be derived from $Y^p$.

$C=cY^p=c[\Theta Yc +(1-\Theta)]Ypp\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(2.20)$

$C=c\Theta +c(1- c\Theta)Ypp\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots...(2.21)$
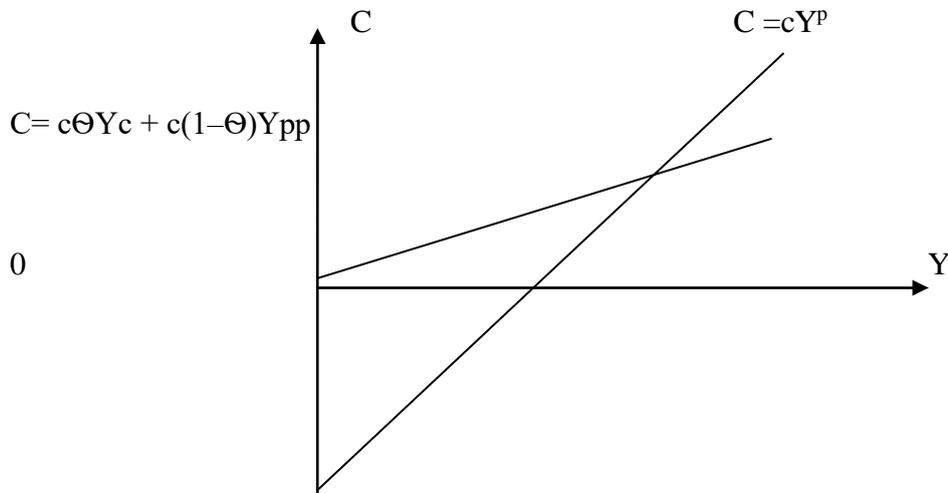


**Fig. 3.2:    Long-Run and Short-Run Consumption Functions under PIH**

This diagram is drawn for $C =CY^p$ as the long run function that passes through the origin.

Since $C = cY^P$, we substitute for C in Yp of equation (2.19) and so it gives rise to the short run consumption function.

The crux of the PIH then was that permanent income, YP determines permanent consumption $C^P$ with $C^p$ being proportional to $Y^P$. This relationship can be stated as $C^P = cY^p$ where c is the factor of proportionality. It is constant, equals the MPC and APC. The proportionality relationship specified above implies therefore that households consume about the same proportion of their permanent income notwithstanding. The factor of proportionality, c was deemed to be the long run marginal propensity to consume which depends on interest rate, wealth, personal preference between present and future consumption, age etc. In this way, Friedman was able to remedy the defect of AIH by successfully introducing wealth as a consumption determining variable. Moreover, he was able to reconcile the inconsistencies that were detected in the AIH by taking a long term, wide measure of income as determinant of consumption. In addition, "because permanent consumption and permanent income are long run time's series data which suggests that the APC is constant". In conclusion, the theory proposes the proportional nature of the basic long run relationship while predicting a short run non proportional relationship for cross section data.

One key policy implication of the PIH is that unless consumers perceive the increase in their income as permanent rather than transitory, any change in their income will not necessarily have an appreciable impact on their consumption behaviour. The implication of this policy designed to affect disposable income is far reaching. It means that consumers' failure to adjust to their expenditure in response to a change in disposable income brought about for example, by a fiscal policy action designed to affect output and employment will hardly be expected to exert the desired impact if consumers see the change in disposable income as transitory.

**Self-Assessment Exercise 3**

1. Differentiate between permanent income and transitory income.
2. What differences are generally noticed between the short run and long run behaviours of the consumption function?
3. Explain the purpose of the Keynesian consumption function.

### 1.3.4 Life Cycle Income Hypothesis (LCIH)

In economics, the **life-cycle income hypothesis** (LCIH) is a concept addressing individual consumption patterns. The life-cycle hypothesis implies that individuals both plan their consumption and savings behaviour over the long-term and intend to even out their consumption in the best possible manner over their entire lifetimes. The key assumption is that all individuals choose to maintain stable lifestyles. This implies that they usually don't save up a lot in one period to spend furiously in the next period, but keep their consumption levels approximately the same in every period.

Intheearly1950s, Franco Modigliani and his student, Richard Brumberg, developed a theory based on the observation that people make consumption decisions based both on the resources available to them over their lifetime and on which is their current stage of life. Modigliani and Brumberg observed that individuals build up assets at the initial stages of their working lives. Later on, during retirement, they make use of their stock of assets. The working people save up for their post- retirement lives and alter their consumption patterns according to their needs at different stages of their lives. While based on an examination of individual behaviour, this theory provided important predictions for the economy as a whole. It predicts that the aggregate saving of a country is dependent on the rate of growth of national income, not its level. Also, the stock of wealth in an economy is related to the length of retirement span. Although there were initially many challenges to this theory of consumption, its relevance in economic thinking has been recently acknowledged.

### 1.3.4.1 The hypothesis

Assume that there is a consumer who expects that he will live for another $T$ years and has wealth of $W$. The consumer also expects to annually earn income $Y$ until he retires $R$ years from now. In this situation, the consumer's resources over his lifetime consist both of his initial wealth endowment, $W$, and of his lifetime earnings, $RY$. Note that the interest rate is assumed to be zero. If the interest rate were positive, we would have to account for the interest earned on savings.

The consumer can distribute his lifetime resources over the remaining $L$ years of his life. He divides $W + RY$ equally among $L$ years and in each year he consumes

$$C = \frac{W + RY}{T}.$$

The consumption function of this person can be written as

$$C = \frac{1}{T}W + \frac{R}{T}Y.$$

If every individual in the economy plans his consumption in this manner, then the aggregate consumption function will be quite similar to the individual one. Thus, the

aggregate consumption function *of* the economy is

$$C = aW + bY,$$

Where *a, i*s the *marginal propensity to consume* for wealth and *b* is the marginal propensity to consume for income.

### 1.3.4.2 Implications

From the equation given above, it is clear that if the income falls to zero the amount of consumption will be equal to *aW*. However, this is not a fixed value, as it depends on wealth. Moreover, according to the given consumption function, the average propensity to consume is

$$\frac{C}{Y} = a\frac{W}{Y} + b.$$

Since wealth does not change proportionately with income from individual to individual or from year to year, we should get the result that high income leads to a low average propensity to consume while looking at the data across persons or over short periods of time. However, generally over a long period of time, wealth and income increase together which leads to a constant ratio *W/Y* and thus a constant average propensity to consume. In order to further analyse the implications of the life-cycle model, we start by considering the case of a *stationary economy* in which population and productivity are constant through time. Then, we relax these assumptions one by one.

### 1.3.4.3 Saving and wealth when income and population are stable

In an unpublished paper written by R. Brumberg, it was observed that if we make some rational guesses about the average duration of working life and retired life and additionally assume that the rate of earning is constant until retirement and so is the rate of consumption combined with a zero rate of return on net-worth we can find that in a stationary economy of constant population and productivity, the aggregate stock of wealth would be very significant. Moreover, under the given conditions, the aggregate rate of saving would become zero as the level of positive saving by the individuals during their earning years would be offset by the dissaving of the retired households using up their earlier accumulation. Hence, wealth will remain constant in totality even though it is constantly being transferred from dis-savers to savers in exchange for current resources.

### 1.3.4.4 The effect of population growth

Let us assume that income grows as a consequence of population growth or due to growth in income per employed which is itself a consequence of increasing productivity. We can then prove that saving will be positive even if there are no bequests. We initially analyse the effect of pure population growth while keeping all other assumptions the same. If the size of the cohorts born in successive years grows at the rate p then both population and the aggregate income will grow at the rate p. As a result of this growth there will be an increase in the ratio of younger individuals in their earning phase to retired individuals in their dis-saving phase, leading to a positive net flow of saving. It can also be seen that if the rate of growth of population is constant in time, then aggregate saving and wealth will also increase at the rate p and hence will be proportional to

aggregate income.

## 1.3.4.5 The effect of productivity growth

We now consider the situation where population is stationary but average income earned at each age, and hence, aggregate income rises continuously over time due to increasing productivity. This will also have a tendency to lead to a positive rate of saving and a growing stock of wealth. This is due to fact that each successive cohort will enjoy earning greater than the preceding cohorts, and thus a large level of consumption at each age, since by assumption the allocation of consumption over life remains unchanged in time. Moreover, this implies that the currently working generation will aim for a level of consumption in their post-retirement years larger than the consumption enjoyed by the currently retired individuals belonging to a less affluent generation. In order to support this future level of consumption post- retirement, the working individuals will have to save currently on a scale higher than the dissaving of the retired households. Hence even if population is stationary net aggregate saving will have a tendency to be positive.

## 1.3.4.6 Theory and evidence

The findings of many economists bring out a problem in the life-cycle model. It was found out that the elderly does not dis-save as quickly as has been said in the model. There are two explanations for the aforementioned behaviour of the elderly.

The first explanation is that the retired individuals are cautious about unpredictable expenses. The additional saving that arises due to this behaviour is called **precautionary saving**. Precautionary saving may be made for the probable event of living longer than expected and hence having to provide for a longer than the planned span of retirement. Another rational reason is possibility of ill-health and huge medical expenses. These probable events make the elderly save more.

The second explanation is that the elderly may save more in order to leave bequests to their children. This will discourage dissaving at the expected rate.

Overall research on the retired section of the society shows that the life- cycle model cannot completely explain consumer behaviour. Providing for retirement is an important reason for dissaving. However precautionary saving and bequests are also important.

## 1.4 Summary

This unit has thrown light on the different theories of consumption such as AIH, RIH and PIH of Milton Friedman. While the AIH says that consumption of an individual is based on the absolute level of income, the RIH argues that the fraction of a family's devoted to consumption and savings decision depends on the social environment. The PIH on the other hand rejects the usual concept of "current" income and its replacement with what is called "permanent" income, which is regarded as the mean income. The crux of the PIH then was that permanent income determines permanent consumption and unless consumers view that an increase in income is permanent, otherwise it will not make any

appreciable impact on their consumption. The life cycle hypothesis on the other hand implies that individuals both plan their consumption and savings behaviour over the long-term and intend to even out their consumption in the best possible manner over their entire lifetimes.

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## 1.6 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

➢ SAEs 1

   1. It was inconsistent with the empirical evidence obtained when it was tested using trend values of consumption and income in the long run.

   2. It exhibited an unstable long run APC.

➢ SAEs 2

   1. "Rachet effect" as explained by Duesenberry means that people, having become used to a standard of living, find it difficult to lower same even in the face of declining income.

- SAEs 3
1. Permanent income is an income determined by the expected income to be received over a long period of time while transitory income consists of unexpected rise or fall in income.
2. In the short run when wealth is constant, the consumption function looks like Keynesian consumption function. In the long run, when wealth rises, the consumption function shifts upward
3. It tracks the proportion of income used to purchase goods and services.

# MODULE 3 INVESTMENT FUNCTION

## UNIT 1 INVESTMENT AND CAPITAL

### 1.1 Introduction

In a two-sector economy consisting only of consumers and business, aggregate demand for goods and services equals the sum of consumers demand and business demands or the sum of personal consumption expenditures and private domestic investment expenditures. A change in aggregate demand may be initiated by a change in either consumptions expenditure or investment expenditures but it is more commonly the investment expenditures that appears to be the source of the changes in demand that set into motion sizeable movements in the income level. With changes in investment playing this strategic role, it follows that an explanation of changes that occur in income requires that we find an explanation for the frequent and sometimes drastic changes that take place in investment. Investment is the acquisition of capital assets. The first task of this module is to make clear the basic relationship between the flow called investment and the stock called capital. The firm's acquisition of a capital asset, whether a small piece of machinery or a whole new plant and its equipment, is based on considerations quite different from those that underlie an individual's purchase of consumer goods of any kind. The firm's decision to purchase or not purchase in the case of capital goods requires a calculation of the rate of return expected from the asset over its life.

### 1.2 Learning Outcomes

At the end of this unit, you should be able to:

- define investment and capital
- distinguish between capital and investment

- explain the relationships between capital and investment
- describe the types of investment.



**1.3 Definitions**
**1.3.1 Meanings of Capital and Investment**

The second component of the Keynesian model of income determination is investment. Investment can be defined from several perspectives depending on the basis of the individual giving the definition. To the economist for example, investment refers to the net capital formation, hence, it refers to such capital expenditure on consumer durables, residential constructions (buildings) and plants and machinery. Thus, investment from this perspective refers to the purchase of real tangible assets such as machines, factories or stocks of inventories which are used in the production of goods and services for future use as opposed to present consumption. From broader perspective however, investment can be viewed as the sacrifice of certain present values of consumption for (possibly uncertain) future value/consumption. It is the commitment of money in order to earn financial return of the purchase of financial assets such as stocks or bonds with future end date in mind (Anyanwu, 1995).

In Keynesians terminology, investment refers to real investment which adds to capital equipment. It leads to increase in level of income and production by increasing the production and purchase of capital goods. Investment thus includes new plant and equipment, construction of public works like dams, roads, buildings, etc. net foreign investment, inventories, and stocks and shares of new companies (Jhingan, 2003). Capital on the other hand refers to real assets like factories, plants, equipment, and inventories of finished and semi-finished goods. It is any previously produced input that can be used in the production process to produce other goods. The amount of capital available in an economy is the stock of capital. Thus, capital is a stock concept.

To be more precise, investment is the production or acquisition of real capital assets during any period of time. To illustrate, suppose the capital assets of a form on 31$^{st}$ march 1991 are N1000 and it invests at the rate of 10 percent during the year1991–1992. At the end of the next year (31st march 1992), its total capital will be N1, 100 symbolically let I be investment and K be capital in year t,

Then $I_t = K_t - K_{t-1}$................................................................................. (3.1)
Where:
$I_t$ = investment at period t $K_t$ = capital at period t
$K_{t-1}$ = capital at previous period t

Capital and investment are related to each other through net investment. Gross investment is the total amount spent on new capital assets in a year. But some capital stock wears out every year and is used up for depreciation and obsolesces. Net investment is gross investment minus depreciation and obsolescence. Net investment is gross investment minus depreciation and obsolesce charges (or replacement investment). This is the net addition to the exiting capital stock of the economy. If gross investment equals depreciation, net investment is zero and there is no addition to the economy's capital stock. If gross investment is less than depreciation, there is disinvestment in the

economy and the capital stock decreases. Thus, for an increase in the real capital stock of the economy, gross investment must exceed depreciation i.e. there should be net investment.

**Self-Assessment Exercise 1**

1. Distinguish between capital and investment.

### 1.3.2 Types of Investment

Types of investment in the literature include:

i.      Fixed investment
ii.     Inventory investment
iii.    Replacement investment.

**(1)     Fixed investment** refers to purchases by firms of newly produced capital goods such as production machinery, newly built structures, office equipment etc. Generally, investment is looked at as the acquisition of productive assets with a view of getting future profit, depending on time. If we assume a perfectly competitive market the inventor compares two things:

-       First, the cost of employing capital
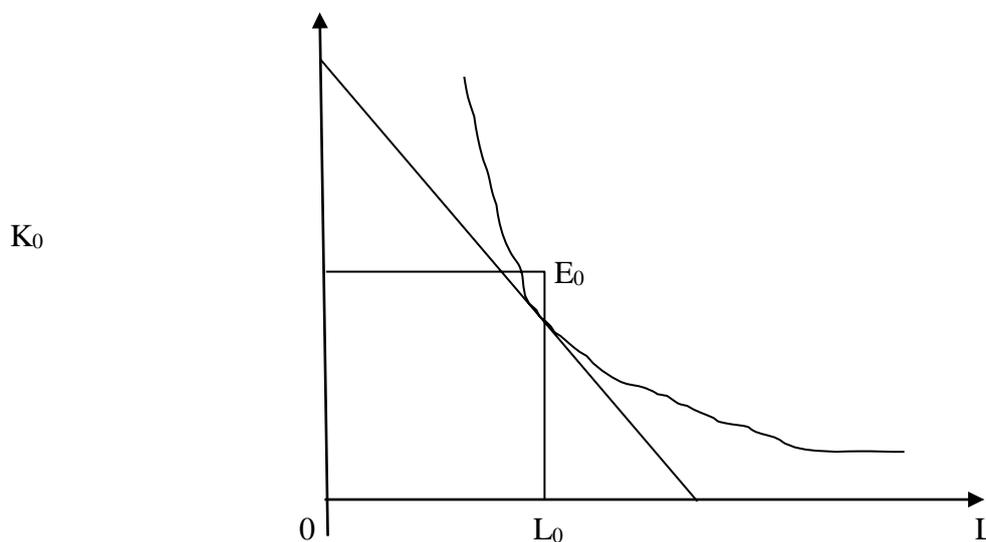-       Second, the marginal increase in employing additional capital compared to labour

K



**Fig.1.1: Capital Employed and Labour**

For cost minimisation, a producer at $E_0$ is at a point where the isoquant is equated with the factor prices and the ratios of the marginal productivity. At $E_0$, the ratio of marginal physical product of capital and labour must be equal:

$MPP_k/r = MPP_L/w$ ...................................................................................................3.2

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If we plot the MPPk against the capital employed, then we have an explanation that is depicted in the following diagram:
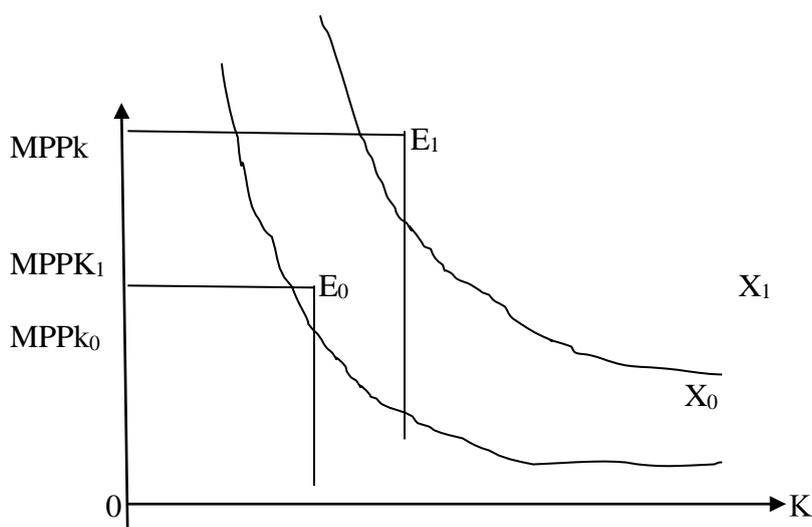


**Fig.1.2: MPPk and Capital Employed**

If at any time the producer increases the employment of capital, then there is a reduction in the employment of labour. Therefore, the marginal product of capital ratio will increase or rise.

**(ii)** **Inventory investment** is stocks of goods which have been produced by businesses but are yet unsold. Inventory investment refers to changes in stock of finished products and raw materials firms keep in their warehouse. These are meant to act as a safety cushion or buffer between production and sales. Firms avoid running out of stocks so as to avoid the risk of default in meeting customers' orders, since this will expose them to risk of losing these customers to their competitors if they do. Rising stocks denote increases investor investment while a depletion of same results in decreasing stock.

**(iii)** **Replacement investment** the third type refers to investment made to replace worn out capital goods resulting from their use in the production process. Replacement investment is also known as disposable investments.

Another type of investment is investment in real estate and residential construction taken together, three types constitute an economy's gross private domestic investment the subtraction of depreciation from the gross concept take us to the net investments.

In discussing investment, emphasis usually is placed on firm's expenditure on durable equipment and structures. This is the concept of business fixed investment. In the Nigerian context, the concept of investment is not different from the definition given above. The Nigerian National Income Accounts defines investment along the lines of gross private domestic investment or gross fixed capital formation (GFCF). The national account defines GFCF as consisting of all capital expenditures in building (residential and non-residential), land improvement, transport equipment, breeding stock and/or machinery and equipment (business fixed investment).

**Self-Assessment Exercise 2**

> 1.  Explain the types of investment.

### 1.3.3 Determinants of Investment

The determinants of investment are those factors that influence how much a firm is willing to expend in procuring investment goods. These determinants include: (1) the user cost of capital, (2) businessmen's profit expectation, (3) existing capital stock (4) corporate profit tax (5) technical progress.

### 1.3.3.1 User cost of capital

The user cost of capital is obtained as the sum of the interest rate (implicit or explicit) paid on funds used in procuring investment goods and the depreciation, being the wear and tear of a piece of machinery resulting from usage. This calls for it periodic maintenance and repair for it to stay in good working order. The life span of a piece of machine is estimated and the annual depreciation rate is calculated from the estimate.

Classical economists considered the rate of interest as the main determinant of investment spending. The reasoning is that firms compare the cost of funds spent on acquiring newly produced capital goods with the rate of return from the goods, assuming away uncertainties surrounding the return on investment. They proceed to carry out their decision to invest where the rate of return exceeds the cost of funds (implicit or explicit) obtained to finance the investment plan. In the light of this behaviour, it follows that a fall in the cost of fund as reflected in the interest rate will lead to an increase in investment. This microeconomic analysis of investment behaviour of a single profit maximizing firm can be generalized to all firms such that it can be concluded that in the aggregate, investment is inversely related to the rate of interest.

### 1.3.3.2 Business men's profit expectation

Unlike the classical economist however, Keynes opined that profit expectation from future economic activity on the part of businessmen was the most important determinant of investment behaviour. Businessmen's optimism about future economic activity will prompt them to carry out their investment decision, the rate of interest notwithstanding. Conversely, a pessimistic business outlook will induce them to withhold their investment plans irrespective again of the interest rate. This probably explains why Keynes regards businessmen's expectation as taking a prime position over the rate of interest in making investment decisions.

### 1.3.3.3 Existing capital stock

The existing stock of capital is a relevant variable in determining investment behaviour because it captures the hypothesis that net investment is constrained by the existing stock of capital goods. In this regard, it is reasoned that the decision to invest in new plant and machinery will be a function of the discrepancy between what the firm considers the optimal and the actual capital stock level. Intuitively, therefore, a firm with an excess capacity in plant size will engage in little or no new investment on plant and machinery.

### 1.3.3.4 Corporate profit taxes

Corporate taxes also constitute a vital determinant of firms' investment behaviour. Low corporate taxes and high corporate profits they imply permit firms to invest on capital goods. Conversely high corporate taxes and the implied low corporate profit serves to constrain the firms' scope to carry out investment on newly produced capital goods. High corporate profit taxes translate to low retained earnings by firms and vice versa. The size of a firms retained earnings largely determines its scope to carry out investment decisions.

### 1.3.3.5 Technical progress

Firm's investment decisions are also influenced by the rate of innovation. Innovation brings about technical progress. Rapid technical progress gingers firms to invest more on capital goods than if the reverse were the case. This is because when technical progress is rapid, machines of older vintages go into obsolescence quickly. Firms find it imperative to invest in machines of newer vintages embodying the fruits of technical progress.

**Self-Assessment Exercise 3**

> 1. List the determinants of investment.

### 1.4 Summary

The portion of aggregate demand that is accounted for by the business sector of the economy is measured by the investment expenditures of business for newly produced capital goods. To explain aggregate demand for any time period, we must concentrate on business investment expenditures for that time period rather than on the actual stock of capital held by business at any point within that time period. Net investment expenditures for any time period are the means by which a change in the capital stock is affected. In other words, net investment, which is zero when actual capital stock equals the profit-maximising capital stock, becomes positive when the profit maximising exceeds the actual stock. A prerequisite to the appearance of net investment expenditures is a rise in the profit maximising capital stock.

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### 1.6     Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

➢     SAEs 1

1. Capital refers to real assets like factories, plants, equipment, and inventories of finished and semi-finished goods while investment can be viewed as the sacrifice of certain present values of consumption for (possibly uncertain) future value/consumption.

➢     SAEs 2

Investment can be categorized as:

1. **Fixed investment** refers to purchases by firms of newly produced capital goods such as production **machinery**, newly built structures, office equipment etc.
2. **Inventory investment** is stocks of goods which have been produced by businesses but are unsold.
3. **Replacement investment** refers to investment made to replace worn out capital goods resulting from their use in the production process.

➢  SAEs 3

The following are the determinants of investment:
1. User cost of capital
2. Business men's profit expectation
3. Existing capital stock
4. Corporate profit taxes
5. Technical progress

**UNIT 2      THEORIES OF INVESTMENT**

## 1.1 Introduction

What was said a decade ago by two prominent students of investment demand is probably equally true today? "The theory and measurement of investment behaviour is one of the most controversial areas of professional economic study ... the subject is inherently difficult and complex". In view of these characteristics, it is not surprising that there is a plethora of theories to explain investment demand, "in fact, so many that selecting from among them the most worthwhile explanation has become most difficult". We will not attempt to present here all those that are generally recognized to be the most worthwhile. But we will limit our attentions to the two that were noted at the beginning of the preceding unit the marginal efficiency hypothesis and the accelerator theory.



## 1.2 Learning Outcomes

At the end of this unit, you should be able to:

- explain the accelerator theory of investment
- describe the marginal efficiency hypothesis
- discuss the relationships between MEC and MEI.



## 1.3 Concepts

### 1.3.1 The Accelerator Theory of Investment

The accelerator theory of investment posits that current net investment is a function of changes in income. It explains net investment as a function of growth in aggregate

demand. Although the modern form of the acceleration hypothesis was put forward by Clark in 1917, the original idea of the principle is traceable to the works of Aftalion in 1911.

Two versions of the acceleration hypothesis can be distinguished. These are:
(1) The fixed accelerator and (2) the flexible accelerator
The fixed accelerator is characterised by two distinguishing features based on the underlying assumptions. In the first case, there is an assumed fixity of the ratio of current desired capital stock to current output. This can be expressed as:

$$K = K^* Y_t \dots \qquad (3.3)$$

Where $K^*$ is the designed capital stock and $Y_t$ is current level of output. Equation (3.3) can be written as:

$$K_t^* = kY_t \dots \qquad (3.4)$$

Equation (3.4) expresses a firm's desired capital stock as a proportion of the output in the current period, where k is the factor of proportionality. The stability or otherwise of Equation (3.4) depends on the value of k, the actual values of which is a function of the time period within which the analysis is carried out. Longer time frame for the analysis makes the value of k approaches zero.

We can derive the second versions of the fixed accelerator model by assuming that current net investment equals the value of discrepancy between the capital stock desired in the current period and the actual capital stock in the previous period. Under this assumption, we have:

$$I_t = K^*_t - K_{t-1} = \Delta K \dots \qquad (3.5)$$

A net investment rate that guarantees the optimality of capital stock would yield:

$$K_{t-1} = K^*_{t-1} = kY_{t-1} \qquad (3.6)$$

Substitution of Equation (3.6) into (3.5) yields:

$$I_t = kY_t - kY_{t-1} = k\Delta Y_t \dots \qquad (3.)$$

Equation (3.7) is the accelerator expressions. It relates net investment to a change in the level of output. It specifies net investment as being proportional to the discrepancy between the actual level of income in the current period and the level of income in the immediate past period, the factor of proportionality being k, the assumed-fixed-capital-output ratio. It is this constant that is known as the accelerator and provided it is positive, even small changes in output will have an "accelerated" effect on net investment. If for example, output increases by N20 and k = 2 then this will result in a net investment of It = 2 (20) = 40 increase.
Equation (3.7) above can be specified in gross rather than net terms. Doing this will yield:

$$I_{Gt} = k (Y_t - Y_{t-1}) + D_t \dots \qquad (3.8)$$

Where Dt is disposable investment.

Equation (3.8) shows that gross investment, $Ig_t$ is proportional to the discrepancy between the current level of income and the level of income in the previous periods plus disposable investment, being the investment that is made to accommodate the depreciation suffered by capital goods in the course of usage.

### 1.3.1.1 Shortcomings of the accelerator theory

Although simple and elegant in exposition, numerous criticisms of the theory have been advanced. Among these are those criticisms that question the validity of the assumptions of the theory. These include:

1.  Assumption of Fixed-Capital-Output-Coefficient. This assumption is considered grossly unrealistic as firms do not necessarily operate under the conditions of constant returns to scale implied by it. Moreover, it ignores the possible effect technological advancement can have on the capital output ratio. Indeed, technical progress can have the effect of lowering the amount of capital needed for a specific level of output.
2.  The theory assumes that capital additions are instantaneous. This assumption effectively ignores the possible existence of lags in the process of adding to capital stock. These lags could be due to time lag between capital ordering and capital building.

3.  It assumes that firm's capital stock is at any time fully employed. This is a grossly unrealistic assumption because in practice, firms are usually able to meet some of their increased demand by working existing machines harder, using whatever idle capacity exists in the process. In fact, for an undeveloped country like Nigeria, this assumption is even more unrealities because "apart from the tradition of installing plant size that allows for idle capacity in order to provide for flexibility in production, scarcity of raw materials, balance of payment difficulties and high cost of funds necessarily force firms to operate at below installed capacity. The existence of idle capacity creates a gap between actual and potential output and so breaks down the simple accelerator principles".

4.  The hypothesis ignores the role of expectations in investment decision making. If investors expect a positive change in aggregate demand to be temporary, such increase might not elicit investment spending from them. However, an optimistic business outlook would make businessmen increase their investment outlay consequent upon an increase in aggregate demand (income).

**Self-Assessment Exercise 1**

1.  Explain the acceleration hypothesis/theory.

### 1.3.2 Marginal Efficiency Hypothesis

The decision to invest in new capital assets depends on whether the expected rate of return on the new investment in equal to or greater or less than the rate of interest to be paid on the funds needed to purchase this asset. It is only when the expected rate of return is higher than the interest rate that investment will be made in acquiring new capital assets.

In reality there are three factors that are taken into consideration while making any investment decisions. They are the cost of the capital assets, the expected rate of return from it during its lifetime, and the market rate of interest. Keynes sums up these factors in his concept of the marginal efficiency of capital (MEC).

Marginal Efficiency of Capital: The marginal efficiency of capital is the highest rate of return expected from an additional unit of a capital asset over its cost. In other words, "it is the ratio between the prospective yield of additional capital-goods and their supply price. The prospective yield (y) is the aggregate net return from an asset during its life-time, while the supply price (p) is the cost of producing this asset. If the supply price of a capital asset is N40000 and its annual yield is N4000, the marginal efficiency of this assets is 4000/40000 x 100 = 10 percent.

Thus, the marginal efficiency of capitals is the percentage of profit expected from a given investment on a capital asset.

Keynes relates the prospective yield of a capital asset to its supply price and defined the MEC as "equal to the rate of discount which would make the present value of the series of annuities given by the returns expected from the capital assets during its life just equal to its supply price.

As a matter of fact, the MEC is the expected rate of return over cost of new capital goods. In order to find out whether it is worthwhile to purchase a capital good, it is essential to compare the present value of the capital assets with its cost or supply price. If the present value of a capital good exceeds it cost of buying, it pays to buy it. On the contrary, if its present value is less than its cost, it is not worthwhile investing in these capital goods.

The same results can be had by comparing the MEC with the market rate of interest. If the MEC of a capital asset is higher than the market rate of interest at which it is borrowed, it pays to purchase the capital assets, and vice-versa. If the market interest rate equals the MEC of the capital assets, the firm is said to possess the optimum capital stock. Thus the equilibrium condition for a firm to hold optimum capital stock is where the MEC and the rate of interest are equal.
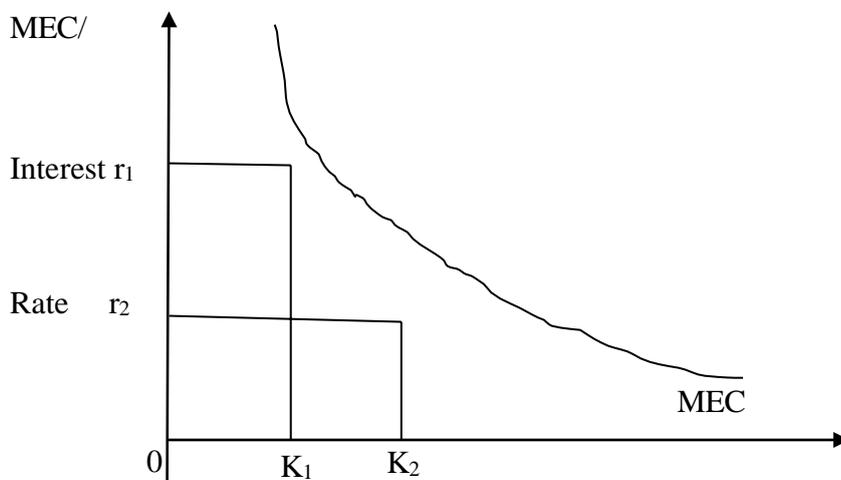


**Fig.2.1: The MEC Curve**

The Figure above shows the MEC curve of an economy. It is negatively slope which indicates that the higher the MEC, the smaller the capital stock. This is because of the operation of the law of diminishing returns in production. In the figure, when the capital stock is $0K_1$, the MEC is $0r_1$. As the capital increases from $0k_1$ to $0k_2$, the MEC falls from $0r_1$ to $0r_2$. The net addition to the capital stock $K_1 K_2$ represents the net investment in the economy.

Further, to reach the optimum (desired) capital stock in the economy, the MEC must equal the rate of interest. If, as shown in the figure, the existing capital stock is $0K_1$, the MEC is $0r_1$ and the rate of interest is $0r_2$. Everyone in the economy will borrow funds and invest in capital assets. This is because the MEC ($0r_1$) is higher than the rate of interest (at $0r_2$). This will continue till the MEC ($0r_1$), comes down to the level of the interest's rate (at$0r_2$). When the MEC equals the rate of interest, the economy reaches the level of optimum capital stock. The fall in the MEC is due to the increase in the actual capital stock from $0K_1$ to the optimum (desired) capital stock $0K_2$. The increase in the economy's capital stock by $K_1 K_2$ is the net investment of the economy. But it is the rate of interest which determines the size of the optimum capital stock in the economy. And it is the MEC which relates the amount of desired capital stock to the rate of interest. Thus, the negative slope of the MEC curve indicates that as the rate of interest falls, the optimum stock of capital increases.

**The marginal efficiency of investment (MEI)**: The MEI is the rate of return expected from a given investment on a capital asset after covering all it costs, except the rate of interest. Like the MEC, it is the rate which equates the supply price of a capital asset to its prospective yield. The investment on an asset will be made depending upon the interest rate involved in getting funds from the market. If the rate of interest is higher, investment is at a low level. A low rate of interest leads to an increase in investment. Thus, the MEI relates the investment to the rate of interest. The MEI schedule shows the amount of investment demanded at various rates of interest. That is why; it is also called the investment demand schedule or curve which has negative slope as shown in Figure 3.4 below:
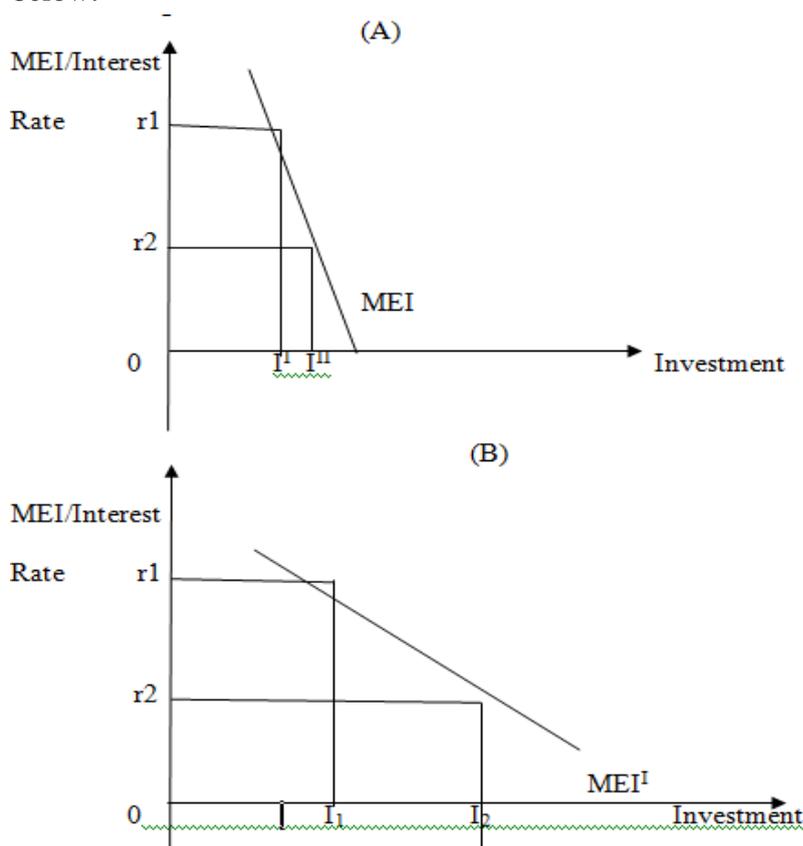
**Fig.2.2: The MEI Schedule**

At $0r_1$ rate of interest, investment is $0I^1$. As the rate of interest falls to $0r_2$, investment increases to $0I^{1I}$ (panel A). To what extend the fall in interest rate will increase investment depends upon the elasticity of investment demand curve of the MEI curve. The less elastic is the MEI curve, the lower is the increase in investment as result of fall in the rate of interest, and vice versa.

In Figure 3.4, the vertical axis measures the amount of investment; the MEI and $MEI^I$ are the investment demand curves. The MEI curve is panel (A) is less elastic, so investment increases by $I^I I^{II}$ which is less than the increase in investment $I_1 I_2$ shown in panel (B) where the $MEI^I$ curve is elastic.

### 1.3.2.1 Shortcomings of the marginal efficiency theory

(1)  It does not give explicit recognition to the role of expectations in investment decisions making. Yet the role of expectation is important in an attempt to capture an investor's view about the probability distribution of the possible stream of returns

(2)  Eisner and Strotz (1963) argued that the determinant of the internal rate of return that is used in discounting the stream of returns to their present value equivalent is both subjective and ambiguous. This criticism is of particular relevance in underdeveloped economies characterised by underdeveloped and imperfect capital market.

(3)  The concept of the "market rate of interest" is questionable. This is because what exists in practice and especially within the context of underdeveloped capital market is not the "market rate of interest" but a series of interest rates namely Lending rate, Minimum Rediscount Rate, Treasury Bill Rate etc. The difficulty of accepting any of these rates as optimal in the context of deregulation of interest rate as we have in Nigeria is even more fundamental. It is in cognisance of this that Ott, *et al*. (1975) caution that investors exercise cares in selecting the rate of interest they compare to MEI.

**Self-Assessment Exercise 2**

1.  Explain the marginal efficiency of capital and its shortcomings.

### 1.3.3 Relationship between the MEC (Capital stock) and the MEI (Investment)

Professor Lerner pointed out as early as in 1946 that Keynes erred not only descriptively but also analytically by failure to distinguish between the marginal efficiency of capital (MEC) and the marginal efficiency of investment (MEI). Following Lerner, Gardner Ackley and some other economists have clearly defined and distinguished between the two concepts.

The MEC is based on a given supply price for capital, and the MEI on induced changes in the price. The MEC shows the rate of return on all successive units of capital without regard to the existing stock of capital. On the other hand, the MEI shows the rate of

return on only units of capital over and above the existing stock of capital. The MEC determines the optimum capital stock in an economy at each level of interest rate. The MEI determines the net investment of the economy at each interest rate, given the stock of capital.

In the words of Anyanwu (1995), the distinction between MEC and MEI can be illustrated graphically as shown in Figure 2.3. The distinction between both concepts has been summarised by Shapiro (1974) as follows: a MEC schedule (curve) is constructed holding constant the supply cost of new capital and the expected rate of return on future cash flow.
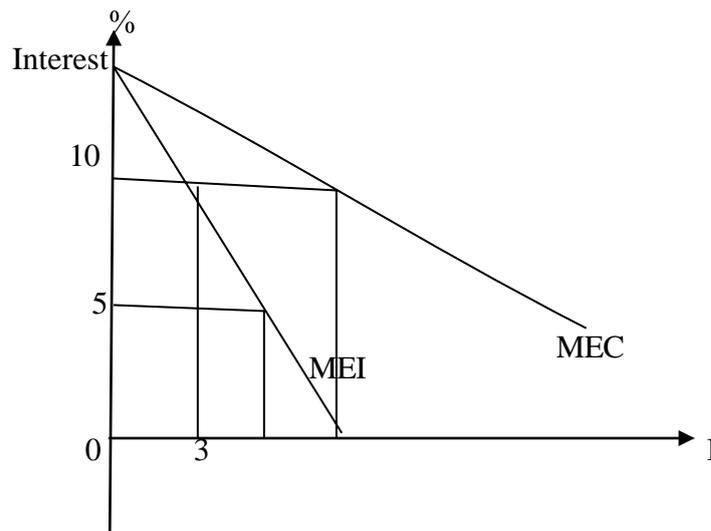


**Fig. 2.3: Marginal Efficiency of Investment and Marginal Efficiency**
            **of Capital**

The MEI schedule (curve) also holds the expected rate of return of future cash flows constant but assumes that the supply cost of new capital is positively related to the production of new capital. Since the expected rate of return from investment proposals fall as the supply cost of new capital rises, the MEI schedule (curve) has a steeper slope and is to the left of the MEC schedule as illustrated above.

**Self-Assessment Exercise 3**

1. Differentiate between the MEC and the MEI.

**1.4 Summary**

So far in this unit, we have attempted to explain the various theories of investment. Net investment expenditures for anytime period, are the means by which a change in the capital stock is affected. Net investment, which is zero when the actual capital stock

equals the profit maximising capital stock, becomes positive when the profit maximising stock exceeds the actual stock. A prerequisite to the appearance of net investment expenditure is a rise in the profit-minimising capital stock whether such a difference will appear depends on the relationship between the MEC schedule and the market rate of interest. The MEC in turn depends on the cost price of capital goods and the expected rate of return from such goods.

We also noted that the rate of net investment expenditures depends on the relationship between the rate of interest and the MEI schedule. The overall slope of the MEI schedule depends in turn on the cost price of capital goods and that its positions vis-à-vis the axes depends on the actual stock of capital. This is summarised in Figure 2.4.
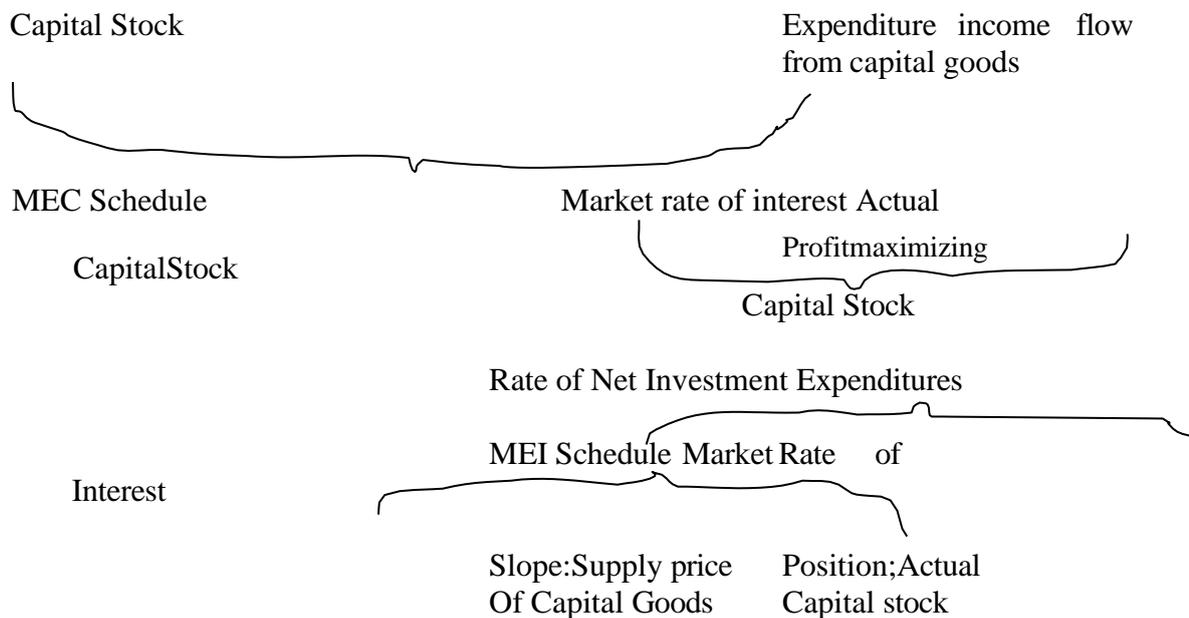
Capital Stock                                    Expenditure income flow
                                                 from capital goods

MEC Schedule                    Market rate of interest Actual
    CapitalStock                        Profitmaximizing
                                    Capital Stock

                    Rate of Net Investment Expenditures

            MEI Schedule Market Rate     of
    Interest

            Slope:Supply price    Position;Actual
            Of Capital Goods      Capital stock

**Fig.2.4: From the Stock of Capital to the Rate of Investment**

**1.5 References/Further Readings**

Anyanwu, J.C. (1995). *Modern Macroeconomics: Theory and Applications in Nigeria.* Nigeria: Joanee Educational Publishers Limited.

Eisner, R.A. & Stortz, R.H. (1963). *"*Determinants of Business Investments: Impact of Monetary Policy." *Commission on Money and Credit*.

Eisner, R.A. & Nadir, M.I. (1968). "Investment Behaviour and Neoclassical Theory." *Review of Economic Policy*. Vol. 50.

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Jovanovich, Inc.

**1.6 Possible Answers to SAEs**

These are the possible answers to the SAEs within the content.

➢ SAEs 1

1. The accelerator theory of investment posits that current net investment is a function of changes in income.

➢ SAEs 2

The marginal efficiency of capital is the highest rate of return expected from an additional unit of a capital asset over its cost. The following are its shortcomings:

a. It does not give explicit recognition to the role of expectations in investment decisions making.

b. The concept of the "market rate of interest" is questionable.

➢ SAEs 3

The following are the distinctions between MEC and MEI:

• The MEC is based on a given supply price for capital, and the MEI on induced changes in the price.

• The MEC shows the rate of return on all successive units of capital without regard to the existing stock of capital. On the other hand, the MEI shows the rate of return on only units of capital over and above the existing stock of capital.

• The MEC determines the optimum capital stock in an economy at each level of interest rate. The MEI determines the net investment of the economy at each interest rate, given the stock of capital.

# UNIT 3      INVESTMENT DEMAND: THE    RATE OF INTEREST AND THE ROLE OF FINANCE

## CONTENTS

## 1.1 Introduction

The extent to which a change in the rate of interest causes a change in the rate of investment spending depends on the elasticity of the MEC schedule. The more elastic the schedule, the greater the increase or decrease in the profit-maximising capital stock that follows from any decrease or increase in the rate of interest. In order to specify the relationship between a change in the rate of interest and a change in the rate of investment spending, we must proceed from a change in the rate of interest through the resultant change in the profit-maximising capital stock to the resultant change in the rate of investment.

## 1.2 Learning Outcomes

At the end of this unit, you should be able to:

* explain the determinants of the elasticity of the MEC schedule
* describe the role of finance, beyond the rate of interest
* discuss the factors other than interest rate affecting inducement to invest.

## 1.3 Concepts
## 1.3.1 The Determinants of the Elasticity of the MEC Schedule

Assuming again that a firm buys capital goods only in the expectation that each purchase will add to its profits, the elasticity of the MEC schedule for the economy as a whole may be said to depend on the significance of any given change in the interest rate as a factor altering the profit-maximising or desired capital stock for all firms combined. A fall in

the interest rate may lead some firms to expand their stock of capital goods substantially, while the same fall in the interest rate may lead other firms to no expansion at all. The elasticity of the aggregate MEC schedule thus depends on the combined responses of all firms to any change in the interest rate.
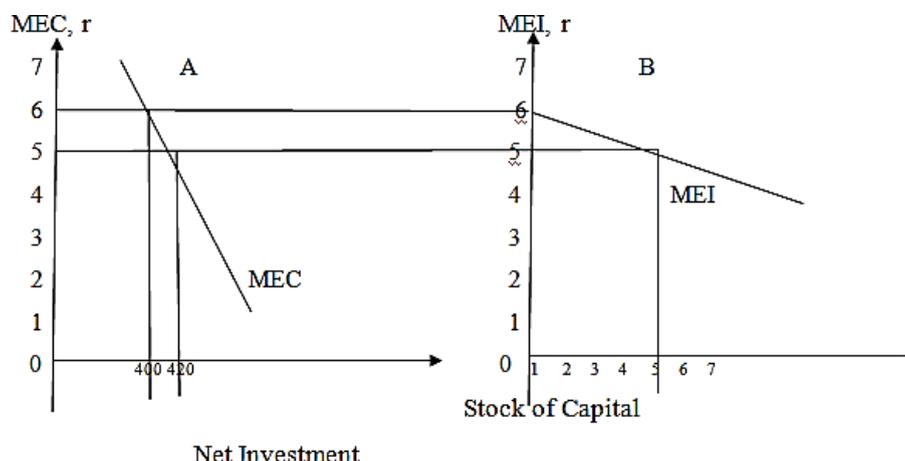


**Fig. 3.1:** **Net Investment with an Inelastic Marginal Efficiency of Capital Schedule**

Our problem, then, is to investigate what determines whether any given change in the interest rate will lead to a larger or smaller change in the profit-maximising capital stock. Although, it is immediately apparent that a lower interest rate, other things being equal, is also a reduction in one cost of doing business, we find that different businesses respond differently to such a drop. In seeking an explanation for this disparate reaction, we will get at the factors that determine the elasticity of the MEC schedule.

With all other things assumed to remain unchanged, especially the existing state of technology, one factor that determines how great an increase in the profit-maximising capital stock will result from any given reduction in the interest rate is the extent to which firms find it technologically possible to substitute what is now the relatively more expensive labour input. It must be seen here that, in terms of the cost of factor units, the comparison is between the rate of interest as the cost of capital and wage rate as the cost of labour. Since we express the rate of return from or the productivity of an addition to the stock of capital as a percentage – namely, the MEC – we must for comparability express the cost of capital as another percentage – namely, the market rate of interest. A fall in the rate of interest is then a decrease in the cost of capital. In contrast, since we express the return from or the productivity of an addition of a unit of a given type of labour as the naira value of the output that will be produced because of that additional unit, the cost of labour is also expressed as a naira value, the naira cost of a unit of the given type of the labour. A fall in the wage rate paid labour is then a decrease in the cost of labour.

With a fall in the interest rate and no change in the wage rate, there will be a tendency throughout the economy to substitute the cheaper input, capital, for the more expensive input, labour, in the production of any constant level of output. Although such a tendency will be present throughout the economy, the extent to which substitution of this sort actually takes place will vary widely from industry to industry and, to a lesser extent, from firm to firm.

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**Self-Assessment Exercise 1**

1. Discuss the determinant of the elasticity of the marginal efficiency of capital (MEC).

## 1.3.2 The Role of Finance, Beyond the Rate of Interest

So far in this chapter, the role of finance in the investment decision has been drastically simplified by assuming that it involves only one element, the market rate of interest. Investment spending in any time period has been determined from the MEI schedule by drawing a horizontal line at the market rate of interest to an intersection with the MEI schedule. With a given MEI schedule, only a change in the rate of interest would produce a change in investment demand.

Without denying the underlying correctness of this basic relationship, we must recognize the oversimplification that it involves. By showing that aggregate investment spending is determined by the intersection of the MEI curve with a horizontal line drawn at the prevailing rate of interest, we are assuming for one thing that funds are available in unlimited amounts to borrowers of every description at this one particular rate of interest that we called market rate of interest. A first objection to this is the fact that, in reality, there is no such thing as the market rate of interest. Rather there is a whole complex of rates. The rate paid by any particular borrower depends on such variables as the term of the loan, the size of the loan, the collateral offered, and especially the credit worthiness of the borrower. Beyond this, there is not an unlimited supply of funds available to any single borrower in any time period at this rate; there is some tendency for the rate he pays to rise with each addition to his indebtedness per time period, other things being equal.

A more fundamental objection to this formulation is its implication that the only way in which firms may secure funds to finance investment spending is by borrowing in the market and paying whatever rate of interest they must pay. Actually, there are three sources of funds for investment, only one of which involves borrowing in the usual sense of that word. These are:

(1) undistributed profits and depreciation allowances or so-called internal funds,

(2) borrowing from the banks or in the bond market, the source usually thought of in connection with the market rate of interest, and

(3) equity financing or the sale of new stock issues.

There are different costs and different risks incurred by firm in using each of these sources, but the cost of funds from each may still be expressed as a percentage so that one is compared with the other.

**Self-Assessment Exercise 2**

1. Explain the role of finance in investment decision.

## 1.3.3 Factors Other than Interest Rate Affecting Inducement to Invest

There are a number of factors other than the rate of interest which affect the inducement to invest. They are the following:

**(1)** **Element of uncertainty.** According to Keynes, the MEC is more volatile than the rate of interest. This is because the prospective yield of capital assets depends upon the business expectations. These business expectations are very uncertain. "They may change quickly and drastically in response to the general mood of the business community, rumors, news of technical developments, political events, may cause a sudden rise or fall of the expected rate of yield. As a result, it is difficult to calculate the expected annual returns on the life of a capital asset. As Keynes himself wrote, "if we speak frankly, we have to admit that our basis of knowledge for estimating the yield ten years hence of a railway, a copper mine, a textile factory, the goodwill of a patent medicine, an Atlantic liner, a building in the city of London amounts to little and sometimes nothing; or even five years hence". Further, because of uncertainty, investment projects usually have a short pay-off period. Capital assets become obsolete earlier than their expected life due to rapid technological developments. The rate of depreciation also does not remain constant and varies much. So, firms have a tendency to invest only if they are in a position to recover the capital outlay in a short period. These factors tend to bring instability in the investment function.

**(2)** **Existing stock of capital goods.** If the existing stock of capital goods is large, it would discourage potential investors from entering into the making of goods. Again, the induced investment will not take place if there is excess or idle capacity in the existing stock of capital assets. In case the existing stock of machines is working to its full capacity, an increase in the demand for capital goods manufactured by them will raise the demand for capital goods of this type and raise the inducement to invest. But it is the capital stock which influences the MEC. The MEC and the capital stock are inversely related.

**(3)** **Level of income.** If the level of income rises in the economy through rise in money wage rates and other factors prices, the demand for goods will rise which will, in turn, raise the inducement to invest. Contrariwise, the inducement to invest will fall with the lowering of income levels.

**(4)** **Consumer demand.** The present and future demand for the products greatly influences the level of investment in the economy. If the current demand for consumer goods is increasing rapidly, more investment will be made. Even if we take the future demand for the products, it will be considerably influenced by their current demand and both will influence the level of investment. Investment will below if the demand is low, and vice versa.

**(5)** **Liquid assets.** The amounts of liquid assets with the investors also influence the inducement to invest. If they possess large liquid assets, the inducement to invest is high. This is especially the case with those firms which keep large reserve funds and undistributed profits. On the contrary, the inducement to invest is low for investors having little liquid assets.

**(6)** **Inventions and innovations.** Inventions and innovations tend to raise the inducement to invest. If inventions and technological improvements lead to more efficient methods of production which reduce costs, the MEC of new capital

assets will rise. Higher MEC will induce firms to make larger investments in the new capital assets and in related ones. The absence of new technologies will mean low inducement to invest. An innovation also includes the opening of new areas. This requires the development of means of transport, the construction of housing etc, leading to new investment opportunities. Thus, inducement to invest rises.

**(7)** **New products.** The nature of new products in terms of sales and costs may also influence their MEC and hence investment. If the sale prospects of a new product are high and the expected revenues more than the costs, the MEC will be high which will encourage investment in this and related industries. For example, the invention of television must have encouraged the electronics industry to invest in the capital assets and used them to produce television sets, if they had expected profits to be higher than costs. Thus, lower maintenance and operating costs in the case of new products are important in increasing the inducement to invest

**(8)** **Growth of population.** A rapid growing population means a growing market for all types of goods in the economy. To meet the demand of an increasing population in all brackets, investment will increase in all types of consumer goods industries. On the other hand, a declining population results in a shrinking market for goods thereby lowering the inducement to invest.

**Self-Assessment Exercise 3**

1. What do you understand by induced investment?
2. Discuss the determinants of inducement to invest.

**1.4 Summary**

This unit examined the determinant of elasticity of the MEC schedule to include the extent to which firms find it technologically possible to substitute what is now the relatively more expensive labour input. The unit also looked at the role of finance beyond the rate of interest. The unit equally discussed a number of factors other than the rate of interest which affect the inducement to invest.

**1.5 References/Further Readings**

Anynawu, J.C. (1995). *Modern Macroeconomics: Theory and Applications in Nigeria*. Nigeria: Joanee Educational Publishers Limited.

Shapiro, E. (1974). *Macroeconomic Analysis*. (3$^{rd}$ Ed.). New York: Harcourt Brace Jovanovich, Inc.

### 1.6 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

➢ SAEs 1

The determinant of the elasticity of the marginal efficiency of capital (MEC) is a given change in the rate of interest.

➢ SAEs 2

The role of finance in investment decision is that only a change in the rate of interest would produce a change in investment demand.

➢ SAEs 3

1. Induced investment refers to the investment which changes as the level of income changes.
2. The following are the determinants of induced investment:
1 Element of uncertainty.
2 Existing stock of capital goods.
   3 Level of income.
   4 Consumer demand.
   5 Liquid assets.
   6 Inventions and innovations.
   7 New products.
   8 Growth of population.

**MODULE 4**  **THE IS-LM FRAMEWORK**

**UNIT 1**  **THE PRODUCT MARKET EQUILIBRIUM AND THE IS CURVE**

**1.1 Introduction**

Our general model in this unit is the determinants of equilibrium in the market for goods and the derivation of the IS curve. The IS - is the shorthand expression of the equality of investment and saving which represents the product market equilibrium. The understanding of this unit and the subsequent unit gives you a broader knowledge of how the various policies of fiscal and monetary work in stabilizing an economy. Hence you need to pay adequate attention.



**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

• explain equilibrium in the goods or product market
• discuss the equality of savings and investment
• describe algebraically and graphically the IS curve
• explain the slope of IS as well as shift in IS curve.

**1.3 Concepts**

**1.3.1 The Product or Goods Market Equilibrium**

The goods or products market equilibrium is defined by equality between saving (S) and investment (I) - the condition that gave us the equilibrium level of income. At the level of income at which S = I (a simple two-sector economy), the leakage from the income stream into saving is exactly matched by offsetting investment spending; or at this income level, aggregate demands for goods just equals the aggregate supply of goods. There is, accordingly, goods market equilibrium at this level of income (Shapiro, 1974).

The product market is in equilibrium when desired savings and investment are equal. Saving is a direct function of the level of income.

$S = s(Y)$…......................................................................…………… (4.1)

Investment is a decreasing function of interest rate,
$I = I(r)$…..................................................................... …………. (4.2)

From equation (4.1) and (4.2), we have S=I
Equilibrium condition is $s(Y) = I(r)$…...................................................... ……… (4.3)

It is also assumed in the presents analysis that the price level is stable so that all changes in saving, investment and income (and in the interest rate as well) are real changes.

The set of equations maybe shown graphically as in Figure 1.1 below: Part A gives the MEI (investment demand) schedule, showing that investment spending varies inversely with the interest rate. The straight line in part B is drawn at an angle $45^0$ from the origin. Whatever the amount of planned investment measures along the horizontal axis of part B, equilibrium requires that planned saving measured along the vertical axis of part B be the same. Thus, all points along the $45^0$ line in part B indicate equality of saving and investment. Part C brings in the saving function, showing that saving varies directly with income.
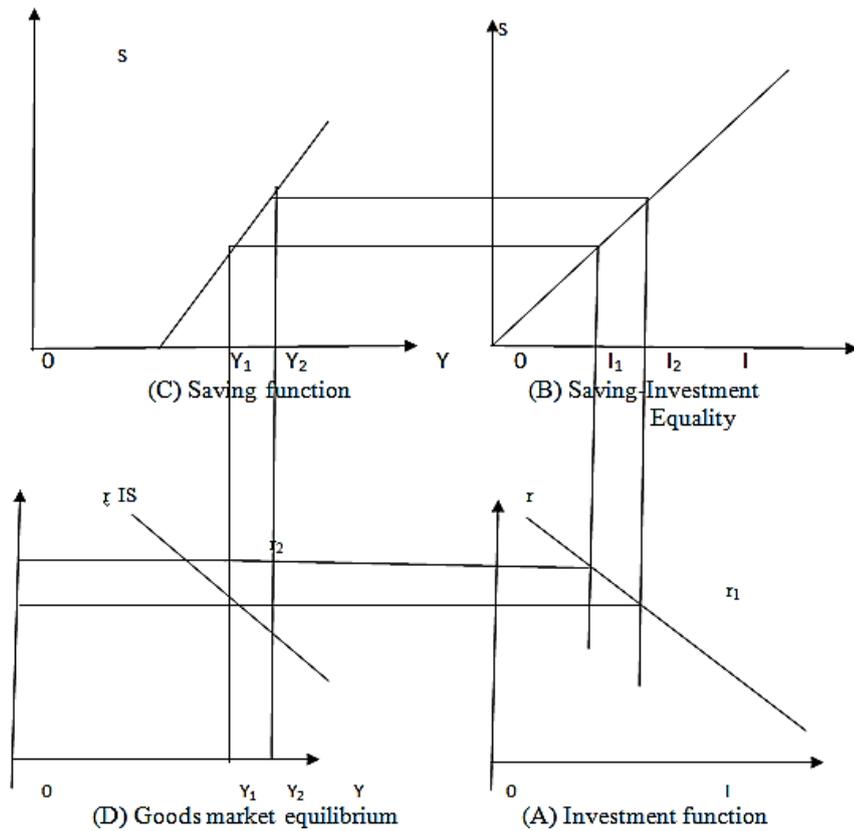
**Fig.1.1: Goods Market Equilibrium**

**Self-Assessment Exercise 1**

1. Describe the equilibrium in the product market.

### 1.3.2 The IS Curve

The IS curve or schedule reflects the equilibrium of the product market. It is the locus of pairs of income and interest rate for which the expenditure sector is at equilibrium. That is, the expenditure (or goods) market equilibrium curve or IS curve shows combination of interest rates and levels of output such that planed spending equals income. It is that relationship that links the level of income and the interest rate such that investment demands plus government demand equals saving plus taxes.

$I+G= S+T$. Equivalently, the IS curve is the relationship between the level of income and interest rate which ensures that aggregate demand (consumption demand plus investment demand plus government demand) is equal to the level of income:

$Y=C +I+G$ or
$Y=\alpha+\beta y+I_0+I_1(Y,r)$…..............................................................................(4.4)

Thus, there exist a set of combinations for Y and r which provide equilibrium in the expenditure market, by equating expenditure plans with income. By implication those sets of Y and r also equate the planned levels of saving and investment that is satisfying the condition:

$S= I$ or $S_0 + S_1 (Y) =I_0 +I_1 (Y, r)$ …….................................................……… (4.5)

## 1 . 3 . 2 . 1 Derivation of the IS Curve.

The IS curve which is negatively sloped can be derived as shown in Figure 1.1 above.

**Quadrant (A)** Part A shows the relationship between investment and interest rate hence yielding the marginal efficiency of investment (MEI).

**Quadrant (B)** Part B shows the saving–investment equality i.e. the demonstration of the equality of planned saving and planned investment.

**Quadrant(C)** Part C shows the saving schedule where savings are positively related to income.

**Quadrant (D)** Part D of the figure is the goods market equilibrium, yielding the IS curve.

Algebraically, the IS curve can be derived from the following procedures:

Let's assume that income is made up of only consumption and investment, where investment is dependent on income and interest rate.

$Y = C + I$
$C = \alpha + \beta Y$
$I = I_0 + I_1 Y - I_2 r$

We then solve for the endogenous variable, Y in terms of the exogenous variables r

$Y = \alpha + \beta Y + I_0 + I_1 Y - I_2 r$…..................................................................(4.6)
$Y = 1/1 - \beta - I_1 [\alpha + I_0 - I_2 r]$ …..................................................................(4.7)

This expresses the equilibrium level of income as a function of the rate of interest and it is referred to as the IS curve when shown graphically.

**Self-Assessment Exercise 2**

1. What do you understand by the "IS curve"?

## 1.3.2.2 The Slope of the IS Curve

The IS curve slopes downward from left to right. This negative slope reflects the increase in investment and income as the rate of interest falls. The IS curve may be flat or steep depending on the sensitiveness of investment to changes in the rate of interest, and also on the size of the multiplier $(1/1 - \beta - I_1)$.

If investment is very sensitive to the rate of interest, the IS curve is very flat. This is shown by the segment AB of the IS curve in Figure 1.2 where a fall in the rate of interest from $r_1$ to $r_2$ leads to a proportionate large rise in income from $Y_1$ to $Y_2$. The IS curve is interest elastic in the AB segment of the IS curve.

On the other hand, if investment is not very sensitive to the rate of interest, the IS curve is relatively steep in terms of Figure 1.2, when the rate of interest falls from $r_2$ to $r_3$, income increases by a relatively smaller amount $Y_2 Y_3$.
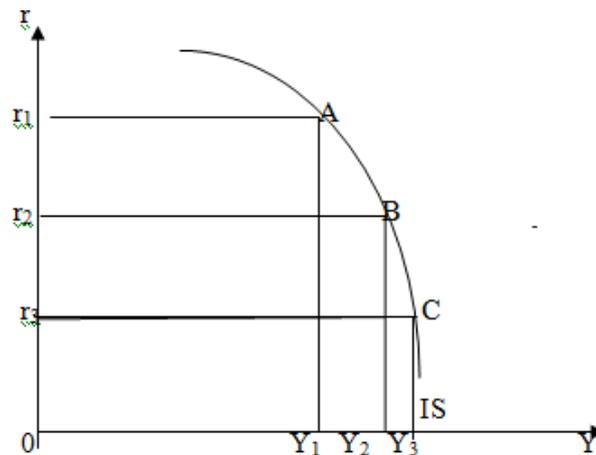
**Fig.1.2: The Slope of IS curve**

The BC segment of the IS curve is less interest elastic. Any further fall in the rate of interest from $r_3$ will lead to no change in income because the IS curve is vertical in that range. It is interest inelastic. Algebraically, the negative slope of the IS curve can be obtained by taking the partial derivative of income, Y with respect to interest rate r of equation (4.7):

$$Y = 1/1 - \beta - I_1[\alpha + I_0 - I_2 r]$$
$$dY/dr = -I_2/1 - \beta - I_1 < 0 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4.8)$$

**Self-Assessment Exercise 3**

1. Discuss why the slope of IS curve is negatively sloped.

### 1.3.2.3 Shifts in the IS Curve

The IS function shifts to the right with a reduction in saving. Reduction in saving may be the result of one or more factors leading to increase in consumption or increase in investment. Moreover, government expenditure and tax policies have the effect of shifting the IS function. In all these cases, the IS function will shift to the right, equal to the decrease in the supply of saving times the multiplier or the increase in the investment times the multiplier. With the increase in the autonomous investment, the IS curve shifts from $IS_1$ to $IS_2$ and the new equilibrium is established at point $E_2$ which indicates a higher level of income $Y_2$ at a higher interest rate, as shown in Figure 1.3 below:
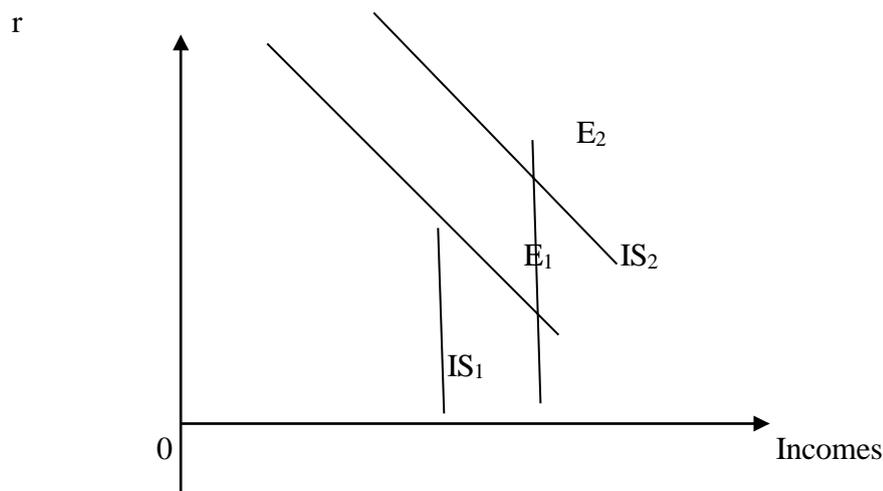
85

r



**Fig.1.3: Shifts in the IS Curve**

In the opposite case, when investment falls or saving increases, the IS function will shift to the left and the equilibrium will be established at a lower level of income and interest rate. This situation can be explained by assuming $IS_2$ as the original curve.

**Self-Assessment Exercise 4**

1. Discuss the factors that can lead to a shift in the IS function.



**1.4 Summary**

This unit has explained the product market and the derivation of the IS curve. Both the graphical and the algebraic derivation of the IS functions (curve) have been considered alongside the slope and shifts in the IS curve. In the next unit, you will be introduced to the money market and the LM curve.



**1.5 References/Further Readings**

Anyanwu, J.C. & Oaikhenan, H.E. (1995). *Modern Macroeconomics: Theory and Applications in Nigeria*. Onitsha-Nigeria: Joanee Educational Publishers Limited.

Dornbusch, R., Fischer, S. & Startz, R. (2008). *Macroeconomics*. (10th Ed.). New York: MacGraw- Hill/Irwin.

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Shapiro, E. (1974). *Macroeconomic Analysis*. (3rd Ed.). New York: Harcourt Brace
Jovanovich, Inc.

## 1.6 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.

➢ SAEs 1

   Equilibrium in the goods market refers to the equality between saving and investment.

➢ SAEs 2

The expresses the functional relationship between the level of income and the rate of interest.

➢ SAEs 3

The IS curve slopes downward from left to right. This negative slope reflects the increase in investment and income as the rate of interest falls.

**UNIT 2       MONEY MARKET EQUILIBRIUM AND THE LM CURVE**

**1.1 Introduction**

The term LM is the short hand expression of the equality of money demand (L) and money supply (M) and represents the money market equilibrium. Just as the IS function which represents equilibrium in the goods market where saving equals investment, the understanding of the LM concept helps you to also have a broader knowledge of how monetary policy works in an economy hence the need to pay adequate attention.



**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

- explain equilibrium in the money market
- analyse the equality of demand for and supply of money
- illustrate both graphically and algebraically the LM function
- explain the slope as well as the shift in LM curve.



**1.3 Concepts**
**1.3.1 The Money Market Equilibrium**

Equilibrium in the money market requires equality between the supply of and the demand for money. The Keynesian theory of the demand for money makes the transactionary demand (which is here combined with the precautionary demand), a direct function of the income level alone, or Lt= k(Y)      (4.9)
and the speculative demand, an inverse function of the interest rate alone, or

Ls=I(r)…………………………………………………………………………. (4.10)

Total demand for money is:

$$L = L_T + L_S = k(Y) + l(r) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{(4.11)}$$

The supply of money M is determined outside the model-it is exogenous. This may be written as

$$M = M_0 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{(4.12)},$$

In which $M_0$ is simply the amount of money that exists, an amount determined by the monetary authorities. This gives us three equations to cover the money market:

Demand for money $L_T + L_S = k(Y) + l(r)$ Supply of money $M = M_0$
Equilibrium condition $L = M$

As before, it is assumed that prices are stable, so that a change in any variable is entirely a real change.

This set of equations is shown graphically in Figure 2.1. Part A shows the speculative demand for money as a function of 'r'. Part B is drawn to show a total money supply, all of which must be held in either transaction balances ($L_T$) or speculative balances ($L_S$). The points along the line indicate all the possible ways in which the given money supply may be divided between $L_T$ and $L_S$. Part C shows the amount of money required for transactions purposes at each level of income. The LM curve of part D is derived from the other part
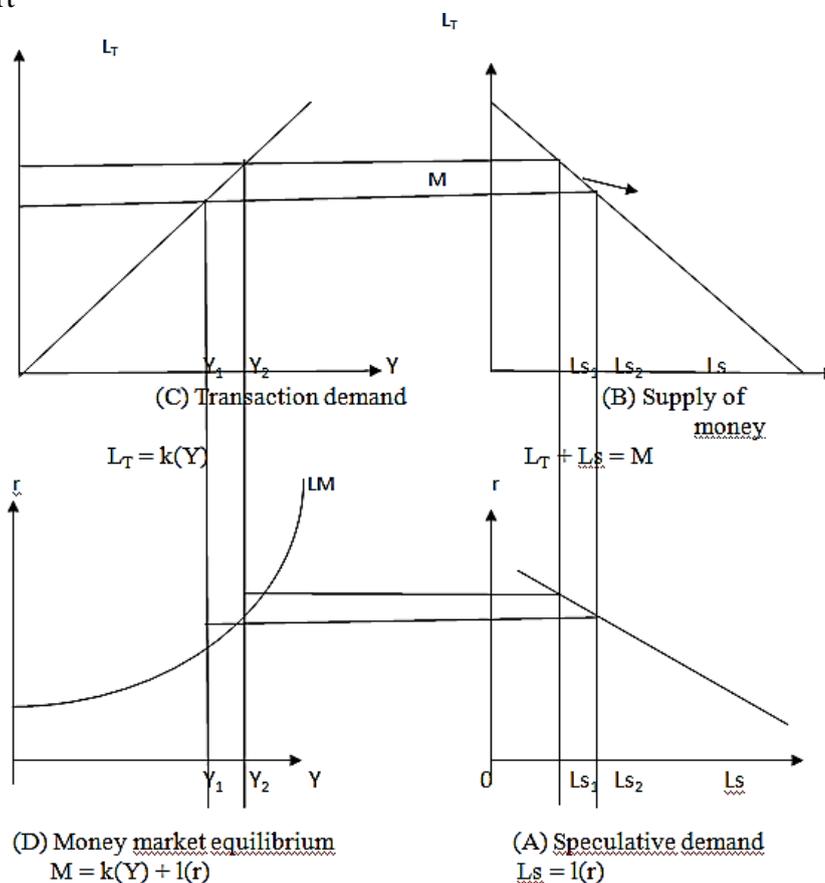


Fig.2.1: Money Market Equilibrium

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**Self-Assessment Exercise 1**

1. Explain the equilibrium in the money market

## 1.3.2 The LM Curve

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 rates and levels of income where the demand for money (L) and the supply of money (M) are equal such that the money market is in equilibrium.

The LM curve is derived from the Keynesian formulation of liquidity preference schedule and the schedule of money. The LM curve is positively sloped such that an increase in the interest rate reduces the demand for real balances. To maintain the demand for real balances equal to the fixed money supply, the level of income has to rise in the same vein; money market equilibrium implies an increase in the interest rate is accompanied by an increase in the level of income (Dormbusch & Fischer, 1974).

### 1.3.2.1 Derivation of the LM Curve

Graphically, the LM curve can be derived as shown in Figure 2.2 below:

**Quadrant A:** Here, the speculative demand for money in relation to interest rate is shown as a negatively sloping curve.

**Quadrant B:** In this quadrant, the total money supply is shown as a negatively sloping Curve.

**Quadrant C:** The transactions demand for money in relations to income is here shown as a positively sloping curve.

**Quadrant D:** The money market is demonstrated as the equality between money demand and money supply and hence yielding the LM curve.

Assume in part A, an interest rate of ($r_2$); at this interest rate the public will want to hold $Ls_1$ in speculative balances. In part B, subtracting the $Ls_1$ of speculative balances from the total money supply leaves $Lt_2$ of transactions balances, an amount consistent with an income of level of $Y_2$ as shown in part C. Finally, in part D, bringing together $Y_2$ from Part C and $r_2$ from part A, we have one combination of Y and r, at which L = M or at which there is equilibrium in the market for money. If we assume the lower interest rate of $r_1$, part A indicates that speculative balances will be $Ls_2$; Part B indicates that transaction balances will be $L_{T1}$ and part C indicates the income level of $Y_1$ as that is consistent with the transaction balances of $L_{T1}$. This gives us another combination of Y and r, at which L=M. Other such combinations can be determined in the same way. The function in part D labeled LM results when these combinations are connected.

Algebraically, for the money market to be in equilibrium, we require that money demand equals money supply.
M=L or

$$M = L_0 + L_1 Y - L_2 r \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4.13)$$

Such that solving for r in terms of Y gives:
$$r = 1/L_2[L_0 + L_1 Y - M] \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4.14)$$

This equation expresses the equilibrium rate of interest as a function of the level of income and its graph is called LM curve as shown in Figure 2.1.

**Self-Assessment Exercise 2**

1.      What do you understand by the LM curve?

### 1.3.2.2 The Slope of the LM Curve

The LM curve slopes upward from left to right because given the supply of money, an increase in the level of income, increases the demand for money which leads to higher rate of interest. This, in turn, reduces the demand for money and thus keeps the demand for money equal to supply of money. The smaller the responsiveness of the demand for money to income, and the larger the responsiveness of the demand for money to the rate of interest, the flatter will be the LM curve. This means that a given change in income has a smaller effect on the interest rate.

The LM curve is steeper, if a given change in income has a larger effect on the rate of interest. In this situation, the responsiveness of the demand for money to income is larger and is smaller for the interest rate. If the demand for money is insensitive to interest rate, the LM curve is vertical, that is perfectly inelastic. If the demand for money is very sensitive to the rate of interest, the LM curve is horizontal. The LM curve is perfectly elastic in relation to the rate of interest. This portion of the LM curve at the extreme left is equivalent to the Keynesian liquidity trap.

Algebraically, the positive slope of the LM curve can be obtained by taking the partial derivative of the LM curve i.e. r with respect to Y.

$$r = 1/L_2[-M + L_0 + L_1 Y] \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4.15)$$
$$dr/dY = L_1/L_2 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4.16)$$

**Self-Assessment Exercise 3**

1. Why is the slope of the LM curve positive?

### 1.3.2.3 Shifts in the LM Curve

The LM function shifts to the right with the increase in the money supply given the demand for money, or due to the decrease in the demand for money, given the supply of money. If the Central bank follows an expansionary monetary policy, it will buy securities in the open market. As a result, money supply with the public increases for both transaction and speculative purposes. This shifts the LM curve to the right.

A decrease in the demand for money means a reduction in the quantity of balances demanded at each level of income and interest rate. Such a decrease in the demand for

money balances creates an excess of the money supplied over the money demanded. This is equivalent to an increase in money supply in the economy which has the effect of shifting the LM curve to the right.
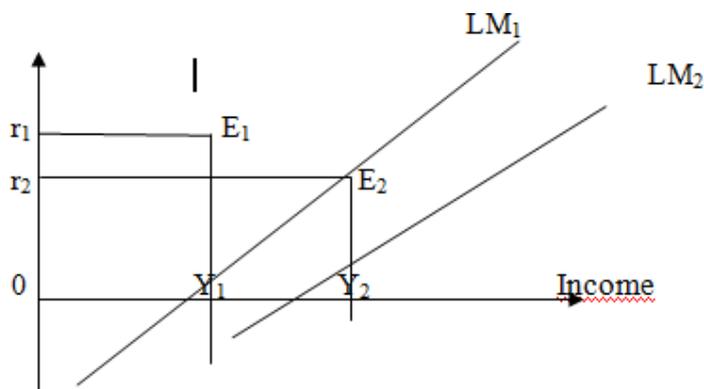


**Fig. 2.2: Shift in the LM Curve**

With the increase 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 $Y_2$.

Thus, the effect of the increase in money supply is to shift the LM curve to the right and a new equilibrium is established at a lower interest rate $r_2$ and higher income level $Y_2$.

Contrariwise, a decrease in the money supply or an increase in the demand for money will shift the LM curve/function to the left such that a new equilibrium is established at a higher interest rate and lower income level. This case can be explained by assuming $LM_2$ as the original curve.

**Self-Assessment Exercise 4**

1. Discuss the factors that can cause shifts in an LM curve.

**1.4 Summary**

Discussion on the money market and the derivation of the LM curve has been done. Both graphical and algebraic derivation of the LM curve has been considered, alongside the slope and shifts in the LM curve. The slope of the LM curve has been shown to be positive while a shift in the LM curve is caused by an increase or decrease in money supply as well as a decrease or increase in the demand for money.

## 1.5 References/Further Readings

Anyanwu, J.C. & Oaikhenan, H.E. (1995). *Modern Macroeconomics: Theory and Applications in Nigeria.* Onitsha-Nigeria: Joanee Educational Publishers Limited.

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Shapiro, E. (1974). *Macroeconomic Analysis*. (3rd Ed.). New York: Harcourt Brace Jovanovich, Inc.

## 1.6 Possible Answers to SAEs

These are the possible answers to the SAEs within the content.
➢ SAEs 1
Equilibrium in the money market refers to the equality between the demand for money (L) and the supply of money (M)

➢ SAEs 2
The LM curve shows the combinations of interest rates and levels of income where the demand for money (L) and the supply of money (M) are equal
➢ SAEs 3
The LM curve slopes upward from left to right because given the supply of money, an increase in the level of income, increases the demand for money which leads to higher rate of interest.

➢ SAEs 4
Factors that can cause shifts in an LM curve are:
1. An increase in the money supply
2. A decrease in the money supply

**UNIT 3     GENERAL EQUILIBRIUM OF PRODUCT AND MONEY MARKET (IS-LM FRAMEWORK)**

**1.1 Introduction**

So far, we have analysed the conditions that have to be satisfied for the general equilibrium of the product and money markets in terms of the IS and LM functions. Now we study how these markets are brought into simultaneous equilibrium. It is only when the equilibrium pairs of interest rate and income of the IS curve equal the equilibrium pairs of interest rate and income of the LM curve that general equilibrium is established. In other words, when there is a single pair of interest rate and income level in the product and money markets that the two markets are in equilibrium.

**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

• define the general equilibrium or the IS-LM framework
• explain changes in general equilibrium due to changes in fiscal policy and monetary policy
• discuss the simultaneous change in both policies and the effects on income and interest rate
• describe the IS–LM elasticity and monetary & fiscal policies.

**1.3 Concepts**
**1.3.1 General Equilibrium (IS-LM Framework)**

Equilibrium between saving (s) and investment (I) is possible at all combinations of income and interest by the IS curve, similarly, equilibrium between demand for money

(L)and supply of money (M)is possible at all combinations of income and interest rate indicated by the LM curve. However, there is only one combination of income and interest at which I = Sand L = M and it is defined by the intersection of the IS and LM functions derived in previous units of Figures 3.1and 3.4 respectively and brought together in Figure 3.1 below:
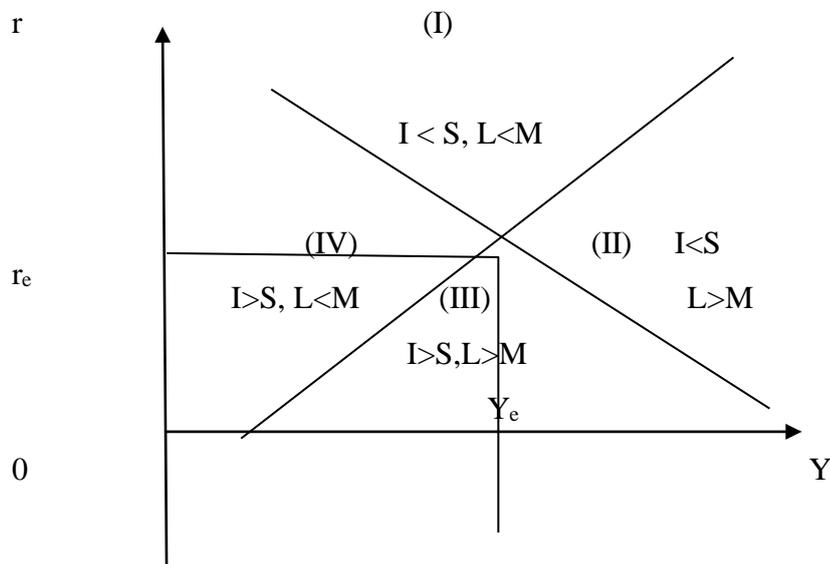


**Fig.3.1: Equilibrium at IS-LM Curve Intersection**

Since the IS curve slopes downward and the LM curve slopes upwards, these two curves cut in just, one places at $r_e$ and $Y_e$, that two sets of equilibrium conditions are simultaneously satisfied. First, planned saving plus government expenditures equals income. Second, the stock of money in existence is equal to the stock of money demanded. The interest rate $r_e$ and the income $Y_e$ represent the only point at which those two equilibria are simultaneously satisfied. That position is the equilibrium level of income and interest rate in the Hicks-Hansen framework or neoclassical synthesis. Every other possible combination of Y and r is one of which there is disequilibrium in either the goods market or the money market, or in both. All those combinations that do not lie either on the IS curve or on the LM curve fall into this last category. Since all such combinations are not on a line, they necessarily lie in one of the four areas identified by the roman numerals I through IV. As we saw earlier, any combination of Y and r that lies anywhere to the right of the IS curve is a combination at which I < S or the output of goods exceeds the demand for goods, and the opposite is true for any combination of Y and r anywhere to the left of the IS curve. Similarly, any combination of Y and r anywhere to the right of the LM curve is a combination at which L > M and the opposite is true for any combination to the left of the LM curve. Accordingly, each of the four spaces may be distinguished from the other three in terms of the relationship between I and S and between L and M for any combination of Y and r that falls within that space. We find the following:

In space I: I < S and L < M In space II: I < S and L > M in space III: I> S and L>M. In space IV: I>S and L<M

From the analysis of the goods market considered in isolation, we know that a situation

which I > S will lead to a rise in income and vice versa. From the analysis of the money market considered in isolation, we know that a situation in which M > L will lead to a fall in the rate of interest and vice versa. What we now have in the four spaces laid out in Figure

3.6 are various combination of IS and LM disequilibrium situations. Simply knowing the direction in which the income level tends to move in response to I > S or I < S and the direction in which the interest rate tends to move in response to L > M or L < M, it is possible to trace out in a non-rigorous fashion a possible path that the income level and the interest rate may follow in response to any given disequilibrium situation to arrive at equilibrium $Y_e$ and $r_e$.

**Self-Assessment Exercise 1**

1. Explain the concept of general equilibrium in the IS-LM framework.

### 1.3.1.1 Changes in general equilibrium

The general equilibrium combination of Y and r identified by the intersection of the IS and LM functions will, of course, change in response to any shift in those functions. Shifts in the IS function are caused by shifts in the investment function or the saving function or government spending and taxes; shifts in LM curve are caused by shifts in the money supply or transactions demand or speculative demand functions. Finally, a shift in any of the functions on which the IS and LM curves are based may result from a change in any of the factors that determine the position of these functions. We thus, have a method of analysis by which we can trace the effects of a change in any of the many underlying factors through the system to its final effect on the income level and interest rate-assuming, of course, that all other factors remain unchanged.

### 1.3.2 Effects of Changes in Government Spending and Taxes

We also note that a rise in government spending or a tax cut will shift the IS curve from $IS_1$, to $IS_2$ (Figure 3.2). The result will be a higher income level$Y_1$ to $Y_2$) and a higher interest rate ($r_1$ to $r_2$). Equilibrium is from $E_1$ to $E_2$.
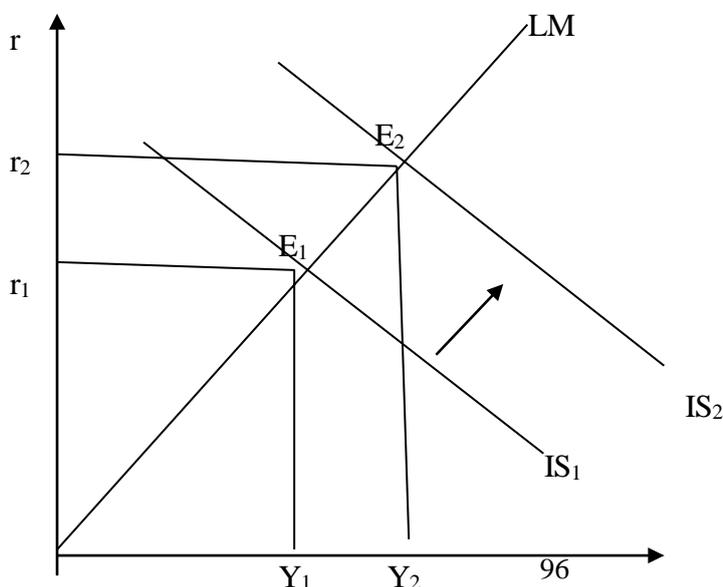
**Fig.3.2: The Effect of Fiscal Policy on Interest Rate and Income**

We also note that the flatter the LM curve; the bigger is the effect of a fiscal policy change on income and the smaller its effect on the interest rate. In the extremes, a horizontal LM curve ($LM_A$), income will rise from $Y_1$ to $Y_3$ and interest rates stay constant, and with a vertical LM curve ($LM_B$), the interest rate will rise from $r_1$ to $r_3$ and income will remain unchanged at $Y_1$.



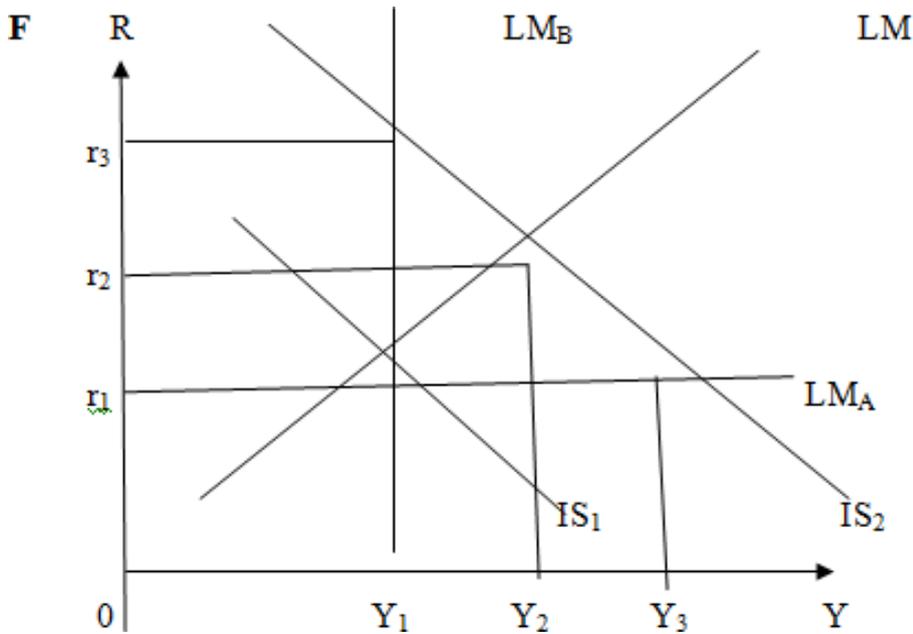**Fig.3.3: Fiscal Policy and the Steepness of the LM curve**

On the other hand, the flatter is the IS curve, the smaller is the effect of fiscal policy on both interest rate and income. If the IS curve is $IS_A$, the rise in income and interest rate will be $Y_2$ and $r_2$, compared with the IS curves $IS_1$, and $IS_2$ and incomes ($Y_1$ and $Y_2$) and interest rate ($r_1$ and $r_2$) solution, see Figure 3.4 below.
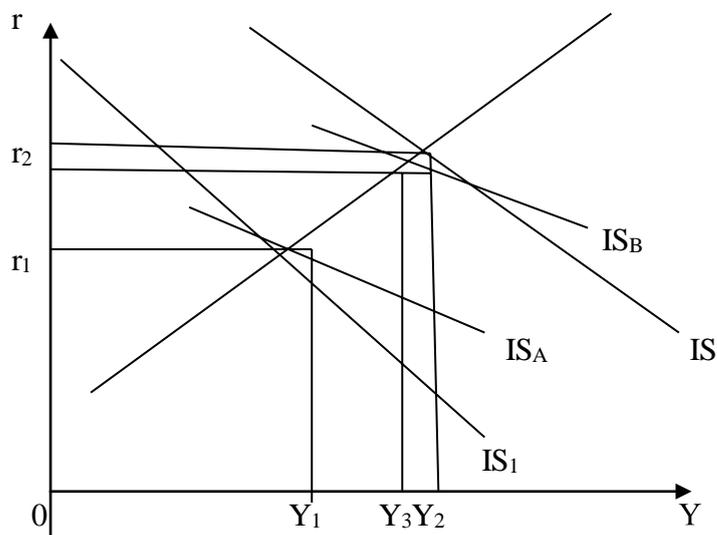
**Self-Assessment Exercise 2**

1. Explain the effects of changes in government spending.

### 1.3.3. Effects of Changes in Monetary Policy

A rise in the money stock shifts the LM curve to the right; lowering the rate of interest and raising the level of income (see Figure 3.5).



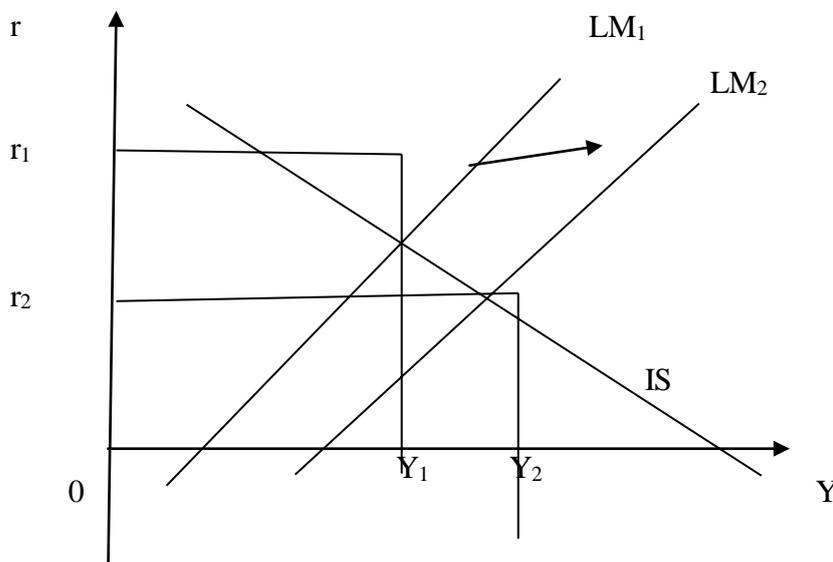**Fig. 3.5:**    **The Effect of Monetary Policy on Income and the Rate of Interest**

Also, the flatter is the IS curve, the bigger the effect of a change in the money stock on the level of income, and the smaller its effect on the rate of interest.

If the IS curve is horizontal ($IS_A$), the shift in LM from $LM_1$ to $LM_2$, raises income from $Y_1$ to $Y_3$ and leaves the interest rate unchanged (see Figure 3.6).
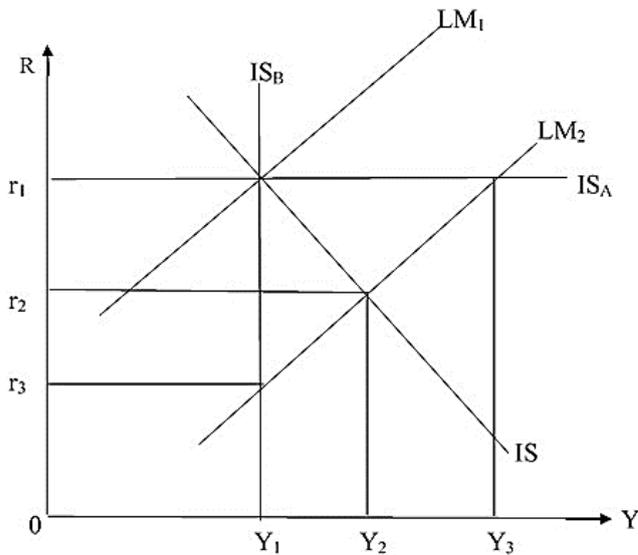
**Fig. 3.6: Monetary Policy and the Steepness of the IS Curve**

On the other hand, the steeper is the LM curve, the bigger the effects of a change in the money supply on both the level of income and the rate of interest. If the LM curves are $LM_A$ and $LM_B$, then the change in income and the rate of interest is from $Y_1$ to $Y_3$ and $r_1$ to $r_3$. These are larger than the shifts arising in the case of the flatter, $LM_1$, and $LM_2$ curves (see Figure 3.7).
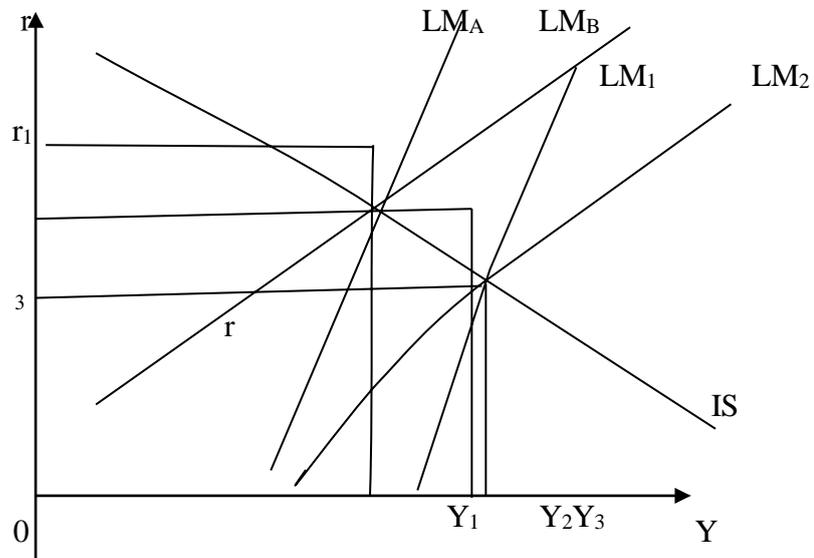


**Fig.3.7: Monetary Policy and the Steepness of the IS Curve**

**Self-Assessment Exercise 3**

1. What are the effects of a change in monetary policy on income and interest rate?

**1.3.4 Simultaneous Shift in the IS and LM Curves**

We noticed above that with the increase in government expenditure or investment when the IS curve shifts to the right, both the rate of interest and the level of income tend to rise, given the LM curve. On the other hand, when an increase in money supply shifts the LM curve to the right, it lowers the rate of interest and raises the income level, given the IS curve.

Now suppose both the IS and LM curves shift to the right simultaneously as a result of the increase in government expenditure and money supply respectively. How will these expansionary fiscal and monetary policies, affect the level of income and the rate of interest? This is shown in Figure 3.8 where the increase in government expenditure shifts the IS curve to $IS_1$, and the increase in the supply shiftstheLMcurvetoLM$_1$.Consequently, the new equilibrium is where the $IS_1$ and $LM_1$ curves intersect. The rate of interest remains at the old level r, but the income increases from Y to $Y_2$.
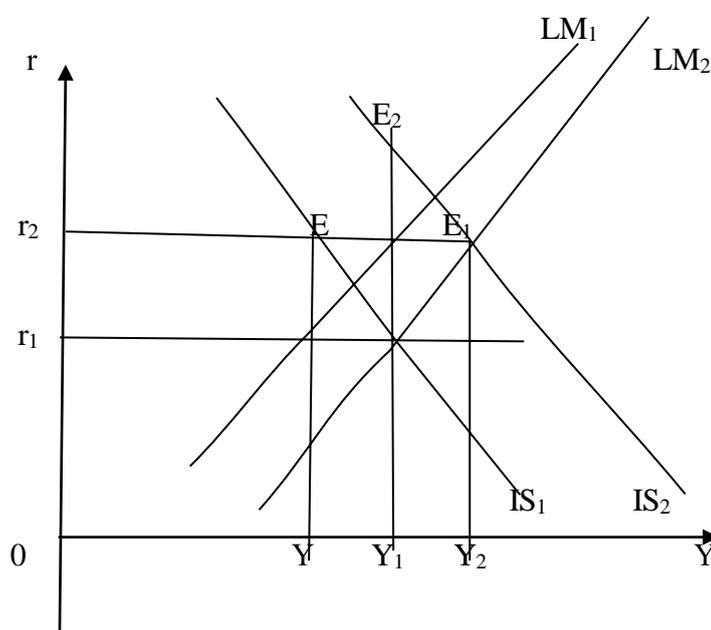


**Fig. 3.8:    Simultaneous Changes in Government Expenditure and Money Supply**

Given the money supply with no change in the LM curve, an increase in government expenditure would raise both income and rate of interest. When the $IS_1$ curve intersects the LM curve at $E_2$ and the interest rate rises to $r_2$ and income to $Y_1$. But the rise in income is slowed down because of the rise in the interest rate. If the money supply increases by so much as to prevent the rise in the interest rate, the increase in income will be equal to the full expansionary effect of the rise in government expenditure. This is depicted in Figure 3.8 by shifting the LM curve to the right as $LM_1$ which intersects the IS curve at $E_1$. The income increases to $Y_2$ but the rate of interest remains at the same level $r_1$. So there has been full income-expansionary effect of the increase in government expenditure as a result of the simultaneous increase in money supply by just the amount necessary to prevent the rise in the interest rate.

**Self-Assessment Exercise 4**

1.  Discuss the effects of an increase in money supply on investment.

**Mathematical Exposition of General Equilibrium of Product and Money Markets**

Given the following models for XYZ economy:

| | |
|---|---|
| C=8+0.6Y | where Y=income |
| I=70– 40r | r= interest rate |
| Y=C +I | C=consumption |
| L=300+0.8Y- 160r | I= investment |
| M = N400 | L=demand for money |
| | M = fixed money supply |

Determine:

a.    The IS function

b.    The LM function

c.    The general equilibrium (interest rate and income) of the economy

**Solution**

(a)    The IS function equilibrium of the IS occurs when:

$Y = C + I$

Y=8+0.6Y+70 –40r Y – 0.6Y = 78 – 40r 0.4Y = 78 – 40r

Y=195– 100r……………………………………………………… (4.17)

(b)    The LM function: Equilibrium of the LM occurs when:

$L = M$

300+0.8Y -160r=400

0.8Y –160r=400– 300

0.8Y=100+160r

Y=125+200r…................................................................................ (4.1)

(c)    The general equilibrium requires simultaneous equilibria in both markets thereby given the same values of Y and r, after solving equations (4.17) and (4.18) simultaneously:

IS function: Y = 195 – 100r, LM function: Y=125+200r

Equilibrium condition stipulates that,

$IS = LM$

195–100r=125+200r

200r-100r=195–125

300r=70

r=70/300= 0.23

Y = 195 - 100r

Alternatively, using equation (4.18):

| | |
|---|---|
| Y = 195 – 100 (0.2333) | Y = 125 +200r |
| Y=195 – 23.33 | Y=125+200(0.2333) |
| Y=#171.7 | Y=125+46.66=#171.7 |

Graphically,

The figure shows r on the vertical axis and Y on the horizontal axis. Curve I slopes down (IS), curve LM slopes up. They intersect at point $E_0$. A horizontal dashed line from 0.23 on the r-axis and a vertical line from ₦171.7 on the Y-axis meet at $E_0$.
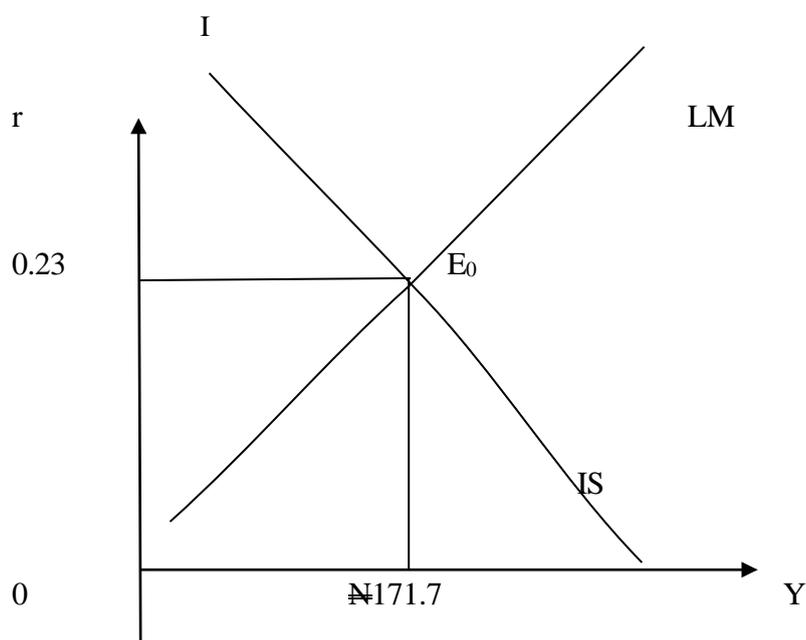
**Fig.3.9: General Equilibrium of XYZ Economy**

**Self-Assessment Exercise 5**

> 1. What do you understand by IS-LM framework?



**1.4 Summary**

A discussion of the general equilibrium of products and money markets has been undertaken in this unit. Equilibrium between S and I is possible at all combinations of Y

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and r indicated by the IS curve; similarly, equilibrium between L and M is possible at all combinations of Y and r indicated by the LM curve. However, there is only one combination of Y and r, at which both I = S and L = M, and it is defined by the intersection of the IS and LM functions. The general equilibrium combination of Y and r identified by the intersection of the IS and LM functions will, of course, change in response to any shift in those functions. Shifts in the IS function are caused by shifts in the investment or saving function while shifts in the LM curve are caused by shifts in the money supply or transactions demand or speculative demand functions.

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## 1.6 Possible Answers to SAEs
These are the possible answers to the SAEs within the content.
➢ SAEs 1
A rise in government spending or a tax cut will shift the IS curve upward. The result will be a higher income and a higher interest rate and vice versa.

➢ SAEs 2

The LM curve shows the combinations of interest rates and levels of income where the demand for money (L) and the supply of money (M) are equal

➢ SAEs 3

The effect of a change in monetary policy on income and interest rate is that an upward shift in

LM curve, raises income and leaves the interest rate unchanged.

➢ SAEs 4

An increase in money supply shifts the LM curve to the right, it lowers the rate of interest and raises the income level, given the IS curve.

➢ SAEs 4

IS-LM framework describe the functional relationship between the product market and the money market.

**MODULE 5          INFLATION AND UNEMPLOYMENT**

Unit 1 Inflation
Unit 2 Unemployment
Unit 3 The Phillips Curve (Inflation–Unemployment Trade-off)


**UNIT 1                          INFLATION**

**1.1 Introduction**

Inflation is a highly controversial term which has undergone modification since it was first defined by the neo-classical economists. They meant by it a galloping rise in prices as a result of the excessive increase in the quantity of money. They regarded inflation as "a destroying diseases, born out of lack of monetary control whose results undermined the rules of business, creating havoc in markets and financial ruin of even the prudent" (Jhingan, 2003).

In this unit, attempt is made to define inflation from the point of view of many scholars and schools of thoughts. We shall also study all theories of inflation, types, measurement, causes, effects as well as policies to fight inflation. But before we analyse them, it is instructive to know the meaning of inflation.



**1.2 Learning Outcomes**
At the end of this unit, you should be able to:
• 	explain the meaning of inflation
• 	enumerate and analyse the different types of unemployment
• 	analyse the measurements, causes as well as the effects of inflation with reference to Nigerian economy
• 	mention policy measures to fight inflation.

**1.3 Concepts**
**1.3.1 Meaning of Inflation**

One of the most difficult problems facing almost all the countries of the world, a problem which appears to be defined as a high and persistent rise in the price level is inflation. This implies that not every price increase is termed inflation, a once for all rise in the price level may not be termed an inflationary phenomenon. Again, prices of all goods and services may not rise simultaneously or by the same proportion. Even if the increase in price is over a prolonged period, it may not be considered inflation if the rate of increase is considered minimal. Therefore, a practical definition of inflation would be a persistent increase in the general price level at a rate considered too high and therefore unacceptable. There are other definitions of inflation but they are more academic than practical. Examples are "the excess domestic demand over domestic supply, the result of excess money creation" too much money chasing too few goods etc.

The literature is full of a plethora of definitions of inflation. Solow (1979) for instance, sees inflation as going on when one needs more and more money to buy some representative bundle of goods and services, or a sustained fall in the purchasing power of money. As Johnson (1972) notes, and for most purposes, inflation is generally and conveniently defined as a sustained rise trend in the general price level.

Economists often defined two different inflation – shock inflation and core or steady state inflation quite apart from pure inflation.

**a.     Shock inflation**

Shock inflation refers to a sudden change in the price level (including wages) that is caused by arise in the price of an important good or factor of production. It is generally associated with supply shocks and decreases in real income resulting from a change in the relative price of factors compared to the price of goods. It occurs in one-time spurts. For example, large sudden fall in the relative value of a nation's currency is a typical cause of shock inflation.

**b.     Core or steady inflation**

This is a steady, continual rise in the average price levels, not resulting from a relative change in the price level over time. It is the underlying rate of inflation when shock inflation has been adjusted out. The term steady-state refers to the continual nature of the core inflation process. In fact, the steady-state of a variable is the value at which the variable eventually settles after it has been disturbed. Thus, if inflation rate has settled at some particular value, then it is called the steady-state rate of inflation.

**c.     Pure inflation**

Economists focus on this theoretical concept in analysing inflation. A pure inflation is that in which all prices, including wages and other sources of income rise at an equal rate. Today, however, economists refer to inflation as the continual upwards movement of the general price levels.

**Self-Assessment Exercise 1**

1.  Based on the above definitions, describe the term inflation.

### 1.3.2 Types of Inflation

**a. Demand pull inflation**

This type of inflation takes place when aggregate demand is rising while the available supply of goods is becoming less. Goods may be in short supply either because of resource is fully utilised or production cannot be increased rapidly to meet the increasing demand. As a result, prices begin to rise in response to a situation often described as "too much money chasing too few goods". This was the situation during the Biafra- Nigeria war and after the Udoji Salary Awards of 1974 when wages extensively increased. According to the demand-pull theory, what initiates a rise in the price level is the emergence of excess demands over existing supply.
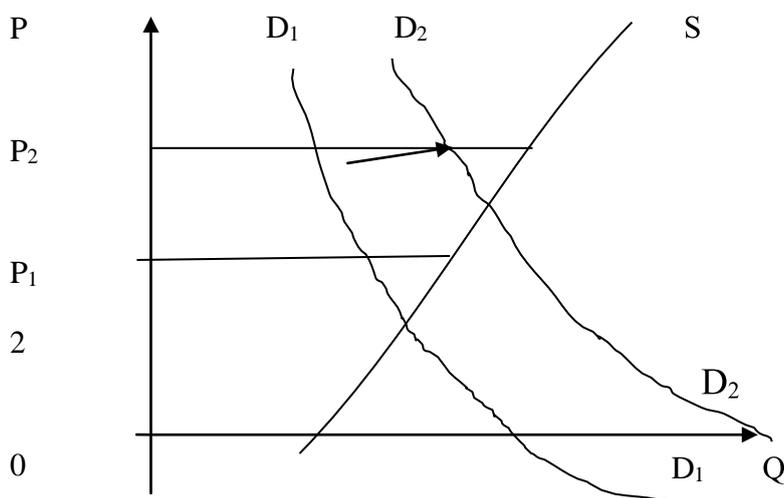


**Fig.1.1: Demand Pull Inflation**

While demand increased from $D_1D_1$ to $D_2D_2$, supply remained unchanged, thus causing price to rise from $P_1$ to $P_2$.

**b. Cost push inflation (Wage-Price-Spiral inflation)**

This is indicated by rising cost of production, particularly rising wages. If for instance, the cost of living of workers suddenly rises and they demand and are granted higher wages, this increases cost of production. This will be reflected in the form of higher prices on commodities which consumers and workers have to purchase. This leads to workers to demand for more wages since the initial increment has been eroded by the rising prices. In fact, the cycle continues and prices continue to rise. Hence, the name wage-price spiral.

Another cause of cost push inflation is profit push inflation. Oligopolistic and monopolistic firms raise the price of their products to offset the rise in labour and production costs so as to earn higher profits.



**Fig.1.2: Cost-Push Inflation**

We observe from the above graph, that due to rising costs of production, the supply has fallen from $S_1S_1$ to $S_2S_2$ thus leading to higher prices. Here price increases from $P_1$ to $P_2$.

## c.     Hyperinflation

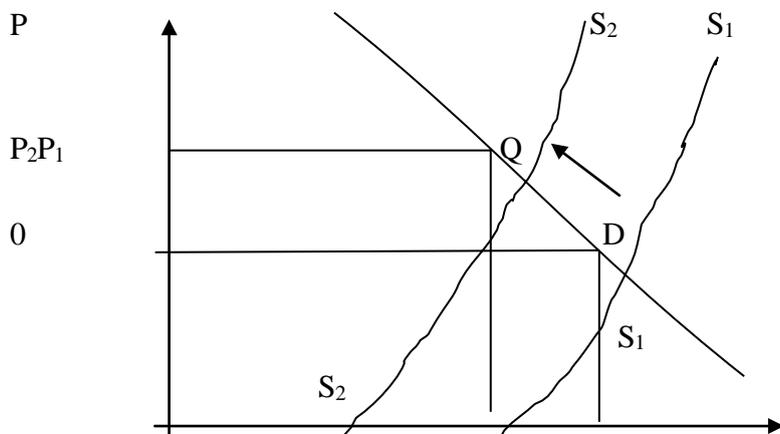This type of inflation occurs when the price level rises at a very rapid rate. In this case money loses its functions as a store of value and its medium of exchange function may be affected if people are unwilling to receive it, preferring trade by barter. This was the situation in Germany after World War II in 1945 when people preferred cigarette to money. The main cause of hyperinflation is an enormous expansion of the money supply.

**Self-Assessment Exercise 2**

> 1. Clearly differentiate between demand pull inflation and cost push inflation.

## 1.3.3 Measurements of Inflation

Basically, there are two widely used inflation measures in Nigeria, the percentage change in the consumer price index and the Gross Domestic Product (GDP) deflator.

## a.     The percentage change in the consumer price index as a measure of inflation

Nigerian inflation can be seen as a percentage rate or change over a specified unit of time (usually a year) in the consumer price index (CPI). This is computed as follows:

$$\frac{P_t - P_{t-1}}{P_{t-1}x} \times 100 \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5.1)$$

Where $P_t$ = Current period CPI $P_{t-1}$ =Previous period CPI

## b.     GDP deflator

The GDP deflator is calculated by dividing the current price GDP by the constant base year) price GDP

GDP deflator = GDP in current prices/GDP at constant price…………………… (5.2)

## 1.3.4 Theories of Inflation

The literature identifies a number of theories of inflation, viz: demand pull, cost push, structural monetary and imported inflation. However, two competing theories of inflation are the Keynesian and the Classical or Monetarist theories.

**Keynesian theories of inflation**: The debate between Keynesian and monetarists with respect to inflation concerns the strength of competitive forces. Thus, two separate Keynesian theories of inflation are discernable: The quasi-competitive Keynesian theory of inflation and the non-competitive Keynesian theory of inflation. However, for the Keynesian, the arrow of causation in the equation of exchange.
$MV = PY$ is from right to left-increases in price cause increases in money,
$MV \leftarrow PY$.

## 1. The quasi-competing theory of inflation

The quasi-competitive Keynesian theory of inflation (as advocated by James Tobin, Mancur Olson, James Meade, David Colander, etc.) states that at competitive equilibrium "structural imperfections" inherent in a monetary economy generate upward pressure on the price level. That is, Keynesians see perfect competition as unstable in many markets, because suppliers will seek rents by establishing institutions that will prevent other potential suppliers entering the market. These activities, called "invisible foot" place an upward pressure on the price level. As an illustration, consider Figure 1.3 where the supply/demand equilibrium price is $P_e$. Faced with such competitive equilibrium, individuals would have strong incentives to "escape" the competition by joining with other individuals (monopolise) to obtain a higher price for the goods they sell and a lower price for the goods they buy. Thus, if suppliers of quantity OA got together and prevented suppliers of quantity AB from entering the market, their income would rise by the quantity represented by the rectangle $P_eRHP_m$. They are therefore willing to spend up to that amount to prevent competition from forcing price down. As they spend money to create the necessary barriers to entry that will assure them in the higher price, they create an upward pressure on the price in the market.
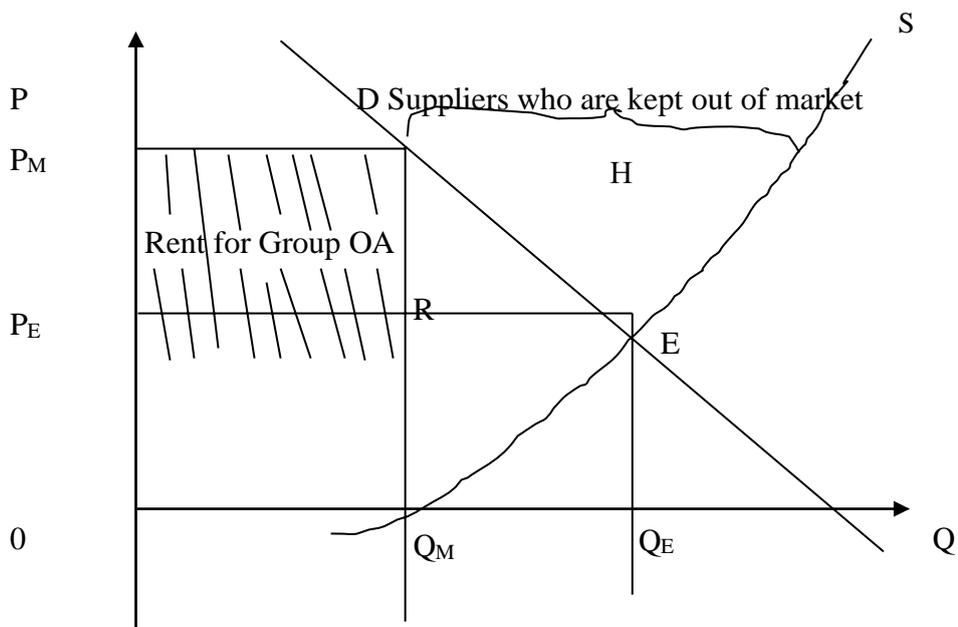
**Fig. 1.3:**        **Forces of Monopolisation: The Quasi-Competitive Theory of Inflation**

## 2.      The non-competitive Keynesian theories of inflation

The non-competitive Keynesian theory of inflation generally assumes the forces of competition to be so weak that a useful model of inflation should not focus on competition or market forces; it should instead focus on real world institutions or on specific institutional arrangements in markets. Thus, the first variant of these theories focuses on specific markets - either the product market or the labour market and the problem of inflation are discussed while centering on the institutional arrangements in that particular market.

For early *cost-push theories* such as that by Gardner means focused on the product-market monopolies and the monopolist's profit as the cause of inflation. However, the product-market emphasis was later dropped while for later economists, it was fashionable to focus on the labour market and wage-push inflation. These *wage-push theories,* which have various forms, are the most popular in Keynesian literature. In some, market forces are almost non-existent and wage levels are sociologically determined. Peter Wile's theory of inflation, for example, focuses on wage inflation and it maintains that wage inflation is determined by the whim of union leaders and is almost impervious to economic forces. Thus, if union leaders decide to be unreasonable, money wages rise and that increases are passed on via firm's markup pricing procedures, resulting in price inflation. The same reasoning and analysis were followed by "Sidney Weintrans earlier wage    cost markup theory". In this theory, it is postulated that once the nominal wage and price level has risen, government has two options: it can either ratify the increase, causing inflation, or it can refuse to ratify, causing unemployment. The second variant of the non-competitive Keynesian theories of inflation is called the *leap-frogging models* and they focus on normal wage differentials or wage contours hence, the name *wage contour theories*. Such views are advocated by John Hicks, Michael Piore, and others. To them there are forces at work in the determination of money wages which are noncompetitive. If wage differentials are disturbed for some reasons, an inflationary process is set in motion, which again, can either be ratified by the government or not ratified. The role of wages results in a series of fixed relationship among the wage rates of certain groups of jobs and workers, these relationships are known as wage contours. The economy is composing of series of these more or less self-contained contours, whose

boundaries evolve overtime as the relationships within them. When a wage breaks out of time, distorting one of the fixed relationships, immense pressure is generated to restore it. Such pressures emanate directly from rank-and-file workers and take the form of job action and strikes. These consequently generate political and organisational conflicts among various branches and division of such bodies as trade unions and companies.

The view is that inflation is a two-part process. It is triggered by external shocks, which drive wage within a stable contour out of line. Individuals and institutions then react to restore the original differentials. The process of restoration generates the bulk of the actual inflation. But the initial factors are the strategic factors. Thus, leap-frogging theories consider sociological and class variables much more important than economic variables in determining relative wages.

Since wage contours adjust eventually, new "acceptable contours are reached after a series of leap frogging wage increases. Therefore, the wage contour theories are short run theories. What changes then to long run theories of inflation is the assumption that the long run consists of successive short runs, the theory provides for an ongoing inflation, leaving the government with the dilemma of ratifying that inflation or not. In all cases, accommodation of supply shocks results in higher inflation but reduces unemployment rate. That is, policy makers accommodate supply shocks when they increase the growth rate of money to prevent unemployment that would otherwise occur as a result of supply disturbance that shifts the short run Phillips curve.

## (B)    The monetarist theory of inflation

The earliest theory of inflation was based on the quantity theory of money. According to the monetarist, inflation is always a monetary phenomenon. They based their analysis using familiar Fisher's equation of exchange that is: $MV = PQ$.

According to this theory, if V and Q are held constants, the price level (P) will vary proportionately with the supply of money (M). With factors of production and technology changing slowly over time, while the economy operates at full employment level, a doubling of the quantity of money would simply double the price level. This would leave individuals and firms with excess cash leading to a rise in prices. According to M. Friedman, inflation is always and everywhere a monetary phenomenon that arouses from a more rapid expansion in the quantity of money than in total output". He sees excess spending as a result of rise in the nominal quantity of money supplied to the economy.

**Self-Assessment Exercise 3**

1.  Distinguish between Keynesian theory of inflation and monetarist theory of inflation.

## 1.3.5 Causes of Inflation

In summary, many forces can cause inflation. On the demand side, anything that shifts aggregate demand curve to the right will have this result cater is paribus (increase in C, I, G, X–M, as well as relaxation of monetary policy, or decrease in money demand). On the supply-side, anything that increases cost of production leading to a shift of short run aggregate supply to the left will cause the price level to rise.

In more explicit form, the underlisted factors are the main causes of inflation in Nigeria:

**a.      Excessive money supply over the available goods**

The Udoji Salary Award of 1974 and the Minimum Wage Act of 1981 injected a lot of money into the economy which gave impetus to inflationary trend in the economy.

**b.      Inadequate supply of goods and services**

When the supply of goods and services fall short of the aggregate demand, the tendency is raising prices. In Nigeria, the craze for government employment without corresponding increase in productivity has helped in fueling inflation.

**c.      Deficit financing by government**

Most developing countries through deficit budgeting can fuel inflation when such expenditures are not directly tight to viable projects.

**d.      Rural-urban migration**

A situation where able-bodied men who are supposed to be producers of agricultural products drifts to urban areas in search of other employment and social amenities often causes inflation because of the decline in the supply of agricultural products. This creates a serious demand gap that force prices to rise.

**e.      Imported inflation**

If a country depends for so much on imports from an inflationary infested country, inflation in the exporting country will be readily transmitted into the importing country.

**f.      Increase in population**

Population growth in the developing countries is generally higher than growth in productivity. For instance, Nigeria population that was about 55 million in 1963 rose to over 88.5 million in 1991 and by 2006; it has risen to 140 million. This rapid growth in population without corresponding growth in productivity puts aggregate demand in excess of aggregate supply.

**g.      High cost of production**

The high cost of production experienced by Nigerian industries is one of the causes of inflation in Nigeria. Most of our raw material are imported at high cost and coupled with the rising wage rate push production costs higher which are transferred to the consumers in form of high prices.

**h.      Foreign exchange rate**

The Nigerian economy, and of course most West African economies depend heavily on the external sector for productivity of the domestic economies leading to high exchange rates. This translated to high cost of production resulting in inflationary pressures in these

economies.

**i.      Indirect taxes**

Are some of the causes of inflation in the country these taxes are shifted to consumers in form of high prices of goods and services so affected.

**j.      The introduction of Structural Adjustment Programme (SAP)**

With its elements such as withdrawal of subsidies from agricultural inputs and petroleum products, devaluation of currency, privatisation etc have largely contributed to increase in inflationary tendencies in Nigeria, especially in the late 1980s and 1990s

**Self-Assessment Exercise 4**

1.  Explain the causes of inflation.

### 1.3.6 Effects of Inflation

Inflation affects people in different ways. When prices rise, certain group of people benefit from the rise while some do not.

1.      Inflationary trend causes disequilibrium in an economy while a continuous substantial rise in the general price level is injurious to the economy; a milder inflation acts as a stimulant to the productivity of an economy. During this period, entrepreneurs have high expectations of the future, investment is encouraged which will bring about increase in demand for factor inputs. This leads to a decline in the level of unemployment.

2.      On redistribution of income and wealth, a high rate of inflation brings about a redistribution of income in favour of businessmen at the detriment of fixed income earners. In Nigeria, for instance the SAP induced inflation brought harsh economic conditions on the salary/wage earners and pensioners. The fixed income earners suffer because their wages and salaries were not flexible while prices of commodities continued to rise.

3.      Inflation discourages savings. This is because the real value of savings cannot be maintained. By discouraging savings, inflation could be perpetuated because wealth owners would want to keep their wealth in real assets as opposed to money.

4.      During inflation period, debtors gain and creditors lose. During this period, the value of money falls although debtors would return the same amount of money borrowed during stability or low prices, it will not be able to pay for the same units of commodity it would at the time the loan was granted.

5.      Loss of confidence in money. In extreme cases of hyperinflation, money virtually becomes worthless. Supplier of factors of production would want to be paid in kind, and creditors will keep away from debtors in order not to be paid worthless

money. Money will be deprived of its function as a medium of exchange and as a store of value. It also ceases to function as a standard unit of account because of the instability in the value of money.

**Self-Assessment Exercise 5**

> 1. Describe the effects of inflation in Nigeria.

### 1.3.7 Measures to Control Inflation

Methods to control inflation are usually grouped under three headings; monetary, fiscal and other measures

1.  **Monetary measures:** These measures aimed at reducing money incomes. These include:

a.  **Credit control:** The monetary authority adopts a number of methods to control the quantity and quality of credit. It raises the bank rates, sells securities in the open market, raises the reserve ratio etc. This is effective when the cause of the inflation is demand pull.
b.  **Demonetisation of Currency**: The demonetisation of higher denominations is usually adopted when there is abundance of black money in the economy - the existence of black money in all countries due to corruption, tax evasion etc.
c.  **Issue of new currency:** This involves the issues of new currency in place of the old currency. Under this system, one new note is exchanged for a number of notes of the old currency.

2.  **Fiscal measures**: Monetary measures alone cannot control inflation but have to be supplemented by fiscal measures.

a.  **Reduction in unnecessary expenditures**: The government should reduce unnecessary expenditure, on non-development activities in order to curb inflation.
b.  **Increase in taxes:** To cut personal consumption expenditure, the rates of taxes should be raised and even new taxes should be levied, but the rate of taxes should not be so high as to discourage saving, investment and production.
c.  **Increase in saving:** This will tend to reduce disposable income with the people and hence personal consumption with the people.
d.  **Surplus budget:** Government should adopt an-anti inflationary budgetary policy. It means collecting more revenues and spending less.

3.  **Other measures**
a.  To increase production such as food, clothing etc.
b.  Rational wage policy (freezing of wages, incomes, dividends bonus etc.).
c.  Rationing: This aims at distributing consumption of scarce goods to essential consumer goods.
d.  Price control: Fixing an upper limit for the prices of essential goods.

**Self-Assessment Exercise 6**

> 1. Enumerate and explain measures to control inflation.

## 1.4 Summary

In this unit, the meaning of inflation has been explained as well as the types and measurement of inflation. Theories of inflation have also been discussed in details especially the Keynesian and the monetarist theories of inflation. The unit equally discussed the causes, impacts of inflation. As a result, measures put in place to control inflation were analysed. In the next unit, we shall focus on unemployment.

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## 1.6 Possible Answers to SAEs
These are the possible answers to the SAEs within the content.
➢ SAEs 1

Inflation can be described as a persistent increase in the general price level without a corresponding increase in the production of goods and services.

➢ SAEs 2

Demand pull inflation is when aggregate demand is rising while the available supply of goods is becoming less while cost push inflation is indicated by rising cost of production, particularly rising wages.

➢ SAEs 3

The Keynesian theory of inflation generally assumes the forces of competition to be

so weak that a useful model of inflation should not focus on competition or market forces; it should instead focus on real world institutions or on specific institutional arrangements in markets. The monetarist theory assumes that the price level varies proportionately with the supply of money

➢ SAEs 4
➢ Causes of inflation
1. Excessive money supply
2. Inadequate supply of goods and services
3. Deficit financing by government
4. Rural-urban migration
5. Imported inflation
6. Increase in population
7. High cost of production


➢ SAEs 5

Effects of Inflation
1. High expectations of the future, investment is encouraged which will bring about increase in demand for factor inputs.
2. On redistribution of income and wealth, a high rate of inflation brings about a redistribution of income in favour of businessmen at the detriment of fixed income earners.
3. Inflation discourages savings. This is because the real value of savings cannot be maintained.
4. During inflation period, debtors gain and creditors lose.
5. Loss of confidence in money.

➢ SAEs 6
Measures to control inflation
a. Credit control
b. Demonetisation of Currency.
c. Issue of new currency.
d. Reduction in unnecessary expenditures
e. Increase in taxes
f. Increase in saving
g. Surplus budget

**UNIT 2**                                        **UNEMPLOYMENT**

**1.1 Introduction**

Towards the end of the 19th century and the beginning of the 20th century, one of the most troubling questions was the reason for unemployment. Unemployment has been one of the most persistent and imaginable problems facing all industrial countries of the world. Unemployment has been defined as "involuntary idleness of a person willing and able to work at a prevailing rate of pay but they do not find work." This definition implies that unemployment must be involuntary. Voluntary unemployed persons who do not want to work like the idle rich are not considered unemployed. Excluded also are those who are incapable of work due to mental or physical disability. This unit introduces us into another macroeconomic theory that has a lot of policy implications in an economy. Hence, your attention is needed.

**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

- explain the meaning of unemployment
- enumerate and analyse the different types of unemployment
- analyse the measurements as well as the causes of unemployment with reference to Nigerian economy
- suggest policy measures to fight unemployment.

## 1.3 Meaning of Unemployment

It is generally agreed that unemployment like inflation is a symptom of basic economic illness or macroeconomic disequilibrium. What is however controversial is the "appropriate" conceptualisation of the subject. During the early days of the development of unemployment theory, much controversy over the definition and origins of unemployment revolved around the distinction between "voluntary" and "involuntary" unemployment. Despite the difficulties of measurement and norm-setting of the above classification, the taxonomy of unemployment includes a condition (being out of work), an activity (searching for work), an attitude (desiring a job under certain conditions), and a need (needing a Job (Levine, 1957).

The eight international conference of Labour Statistics held in 1954gave rise to an International Labour Organisation (ILO) definition concerning statistics of the labour force, employment and unemployment. It sees the unemployment problem as having three dimensions. The first dimension is determined by insufficient employment possibilities involving disguised or open unemployment. The second dimension is marked by an insufficient income structure. Unemployment and poverty therefore constitute two different viewpoints of one and the same problem. The third dimension is marked by unproductive employment (under utilisation) of a considerable part of the working population.

However, in October, 1982, the 13th International Conference of Labour Statisticians adopted a new resolution concerning statistics of the economically active population, employment, unemployment and underemployment. The resolution defined the unemployed as persons above a specific age who, during the reference period, were without work, and were seeking work. This 1982 ILO definition, though similar to the 1954 definition, includes certain amplifications and modification for a more accurate measurement of unemployment.

**Self-Assessment Exercise 1**

1. Describe the concept of unemployment.

## 1.4 Types of Unemployment

Basically, unemployment may be classified into two categories: unemployment that results from deficient aggregate demand and all other unemployment due to frictions and labour market (mal) adjustments. The latter in turn is often divided into frictional, structural, seasonal, real wage, technological cyclical unemployment.

a.   Deficient demand unemployment occurs when there is not enough aggregate demand to produce work for the whole labour force, no matter how it is trained or deployed.

b.   Frictional unemployment arises because it takes time and resources for workers to change jobs, either voluntarily or involuntarily, even though suitable job vacancies exist and can be found without the worker having to adjust his broad

occupational status or his reservation wage.

c.      Structural unemployment on the other hand, exists when there is a mismatching between the unemployed and the available jobs in terms of geographical location, required skills or any other relevant dimension

d.      Seasonal unemployment is seen as unemployment due to the existing too high level of real wage. It normally results from seasonal fluctuations in demand for example; agricultural workers are employed during the peak of periods of sowing and harvesting but remain idle for some periods of the year.

e.      Technological unemployment arises when machines replace men in the production process. This is a regular feature of technological advanced nations of Europe and America.

f.      Cyclical unemployment however, is traditionally associated with the trade cycle, especially recession and depression. This explains why some experts classify it as a variant of deficient demand unemployment (Anyanwu, 1995).


## 1.5 Measurements of Unemployment

The unemployment rate (U) is measured as follows:
U=Number of unemployed/Total labour force… ....................................................... (5.3)

The labour force of any nation can be classified as "potential" and "active". The "potential labour force" refers to the entire population less
(a) young people below a prescribed age (usually 15 years),
(b) old people above a certain age (usually 65 years in most nations but 59 years in Nigeria),
(c) people who are institutionalised - those hospitalised/ in penal or mental institutions /nursing homes, incarcerated, or physically and mentally disabled,
(d) full-time housewives, and
(e) those unwilling to work.
Children ("age-ineligible population")-thosebelow15-are excluded on the assumption that schooling and child labour laws keep most of them out of the labour force. These people excluded can be regarded as "economically inactive population."
However, the above measure of unemployment rate has been criticised on the following grounds.

a.      People who have part time temporary jobs are counted as employed, even though they are significantly underemployed.

b.      To be counted as unemployed, one must be looking for a job. Many individuals have become so discouraged that they do not even look and hence are not counted as unemployed.

c.      Many individuals are working at unsatisfying jobs that do not use their potential. They should be also counted as part of the unemployment problem, at least underemployed.


## Self-Assessment Exercise 2

| |
|---|
| 1. How is unemployment measured? |
| 2. What are the criticisms of measurements of unemployment? |

## 1.6 Causes of Unemployment

a.	Rising population. West African Population, particularly Nigeria's population is rising faster than job opportunities. A situation in which birth rate is rising and death rate is falling.

b.	Rural urban migration and neglect of agriculture. In Nigeria for instance, since the oil boom days, there had been a neglect of the agricultural sector and consequent mass exodus of able-bodied youths from the rural to the urban areas in search of non-existent white collar jobs. This further reduces employment in agriculture and puts pressure on existing urban jobs.

c.	Tremendous expansion in educational opportunities and investment in human capital. There has been a very rapid expansion of primary, post primary and tertiary education in West Africa which has given rise to an expanded labour market. This has resulted to an influx of thousands of school leavers to the cities in search of wage-employment.

d.	Continuous shortfall in foreign exchange earnings and the resultants fluctuation in the capital expenditure of governments. Because most West African nations are mono cultural economies (exporting of only one commodity) the fall in their prices such as Nigeria's oil) has led to decline foreign exchange earnings. This has further led to decline in government's capital expenditure which would have been used to create jobs.

e.	The problem of alien influx. As a result of the free movement agreement of the Economic Community of West African states (ECOWAS), there has been a rising influx of foreigners into the relatively richer nations such as Nigeria. In addition, Asians are in great number in West African countries. These aliens take up jobs, sometimes at lower wage rates than could have been taken up by nationals (Anyanwu, 1995)

f.	Pre mature retirements and retrenchments. Most successive West African governments on the protest of old age, ill health, declining productivity, misconduct and other trivialities such as inability to host the national flag engage in mass retrenchment and premature retirements. The private sector also follows on the ground of lack of raw materials and spare parts. This exercise in Nigeria in 1975, 1984 and 1985 had gone a long way in increasing the number of unemployed in the country.

g.	Activities of Multinational Corporation. Most of the multinationals in West Africa only engage in assembling and thus employ only a handful of West Africans. In addition, they adopt high technology methods of production (use of computers and automated machines) thus causing technological unemployment.

h.	Non-Revolutionisation of agriculture. The use of crude implements such as hoes and cutlasses had made agriculture both unattractive and unprofitable. This has gone a long way in increasing the volume of unemployment in the sub-region.

## Self-Assessment Exercise 3

1.	Discuss the causes of unemployment in developing countries.

## 1.7 Effects of Unemployment

a.	Brain drains: Unemployment, especially among university graduates, results in

emigration of youths to other countries such as advanced nations of Europe and America. This brain drain leads to loss of highly educated and skilled manpower.

b. Increase in social vices and crimes: Frustrated unemployed youths could be a recruiting source of armed robbery, prostitution, economic saboteurs, drug trafficking, smuggling etc.

c. Increased rural-urban migration: Unemployment aggravates rural-urban drift by youths who move to the cities in search of non-existent jobs. This helps also to put pressure on existing food and social amenities in the cities.

d. Fall-in national output: Following Okun's, law, a one percent fall-in employment means a three per cent fall in output. Thus, the existence of unemployment means that a nation cannot maximise the use of its labour force increased output.

e. Increased drain on government finance: The presence of unemployment means increased government expenditure for the payment of unemployment benefits in nations where they are paid. The government also spends more for the provision of social services at the same time that it collects less from taxes.

f. High dependency ratio: The mass of unemployment will have to depend on the small number of the working population for their survival. This will reduce efficiency and savings.

g. Fall in the standard of living: Unemployment through the resulting poverty and income inequality reduces the standard of living of the masses.

**Self-Assessment Exercise 4**

1. Explain the effects of unemployment.

**1.8 Measures to control Unemployment**

a. Reduction of population rate: Government of West Africa should adopt stiff measures to reduce population growth through family planning, persuasion, coercion, financial incentives and disincentives, legislation and education.

b. Tackling the alien influx: All illegal aliens in Nigeria and in the West African sub region should be identified and deported irrespective of their nationalities.

c. Fighting rural-urban migration: There should be integrated rural- urban development programmes, re-orientation of economic activity, social investments and the spread of small-scale labour intensives industries in the rural areas to check rural-urban drift.

d. Modification or the direct linkage between education and employment: Science, technology and skills appropriate and necessary for our rural development should be emphasised in our educational institutions. Skills inculcated in schools should be relevant to industrial and commercial needs of the countries. The successful implementation of the 6-3-3-4 system of education in Nigeria will help make our graduates job creators rather than job seekers.

e. Diversification of the base of the nation's foreign exchange earnings: Most West African countries should diversify their mono-cultural economies so as to increase their revenues for the creation of job opportunities.

f. Creation of national employment schemes: National employment schemes, charged with the responsibility of collating reliable information on the job matter should be created. It will undertake the registration of the unemployed and make placements where openings exist.

## 1.9 Summary

This unit has analysed unemployment as a situation or condition being out of work, an activity searching for work, an attitude desiring a job under certain conditions, and a need, needing a job. The unit equally discussed causes of unemployment and effects to include rural-urban migration, brain drain, social vices and crimes among others. The unit concludes with various measures to control unemployment. The next unit discusses the Philip's curve, an interaction of inflation and unemployment.



## 1.10 References/Further Readings

Anyanwu, J.C. & Oaikhenan, H.E. (1995). *Modern Macroeconomics: Theory and Applications in Nigeria*. Onitsha-Nigeria: Joanee Educational Publishers Limited.

Levine, I. (1957). "Unemployment by Locality and Industry." In: *The Measurement and Behaviour of Unemployment (MBER)*. New Jersey: Princeton University, Press.

## 1.11 Possible Answers to SAEs
These are the possible answers to the SAEs within the content.
➢ SAEs 1
    Unemployment occurs when someone is willing and able to work but does not have a paid job

➢ SAEs 2
1. The unemployment rate is measured as Number of unemployed divided by Total labour force

2. Criticisms of measurement of unemployment
a. People who have part time temporary jobs are counted as employed, even though they are significantly underemployed.
b. To be counted as unemployed, one must be looking for a job. Many individuals have become so discouraged that they do not even look and hence are not counted as unemployed.
c. Many individuals are working at unsatisfying jobs that do not use their potential. They should be also counted as part of the unemployment problem, at least underemployed.

➢ SAEs 3
**Causes of Unemployment**
a. Rising population.
b. Rural urban migration and neglect of agriculture.

c. Tremendous expansion in educational opportunities and investment in human capital.
d. Continuous shortfall in foreign exchange earnings and the resultants fluctuation in the capital expenditure of governments.
e. The problem of alien influx.
f. Premature retirements and retrenchments.

➢ SAEs 4

**Effects of Unemployment**

a. Brain drain
b. Increase in social vices and crimes
c. Increased rural-urban migration
d. Fall-in national output
e. Increased drain on government finance
f. High dependency ratio
g. Fall in the standard of living

**UNIT 3        TRADE-OFF BETWEEN    INFLATION  AND UNEMPLOYMENT
              (THE PHILLIPS CURVE)**

**1.1 Introduction**

Since wage cost represents the backbone of the price structure, in recent years, the interest of economists in supply inflation has led them from the examination of the relationship between the rate of price increase and the rate of wage increase to an examination of the relationship between the rate of wage increase and the rate of unemployment of the labour force. If in addition to the direct relationship between the rate of price increase and the rate of wage increase, there is also an inverse relationship between the rate of wage increase and the rate of unemployment, it follows that there is an inverse relationship between the rate of inflation and unemployment rate. Because the data for various countries and for various time periods do show this inverse relationship between the rate of wage increase and the unemployment rate, the unemployment rate in this indirect way becomes a factor of major interest in the study of supply inflation.

**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

* explain the concept of the Philips curve
* analyse the basic tenets of the Philips curve
* discuss the monetarists' challenge of the Philips curve and the natural rate hypothesis.

**1.3 Concept**
**1.3. Concept of the Philips Curve**

The analysis of the particular relationship between the rate of wage increases and the unemployment rate proceeds in terms of the "Philips's curve" so named after A.W. Philips who pioneered in the investigation of this relationship for the United Kingdom. In its simplest form, a Philips curve may be derived from an economy's data for a period of years by plotting for each year the percentage of money wage rate increase, $\Delta w/w$ (vertical axis), against the percentage of the labour force that is unemployed, U (horizontal axis). A curve fitted to the points so plotted will slope downward to the right like the hypothetical curve in Figure 3.1. Any curve of this general shape suggests that the rate of money wage increase is inversely related to the unemployment rate.
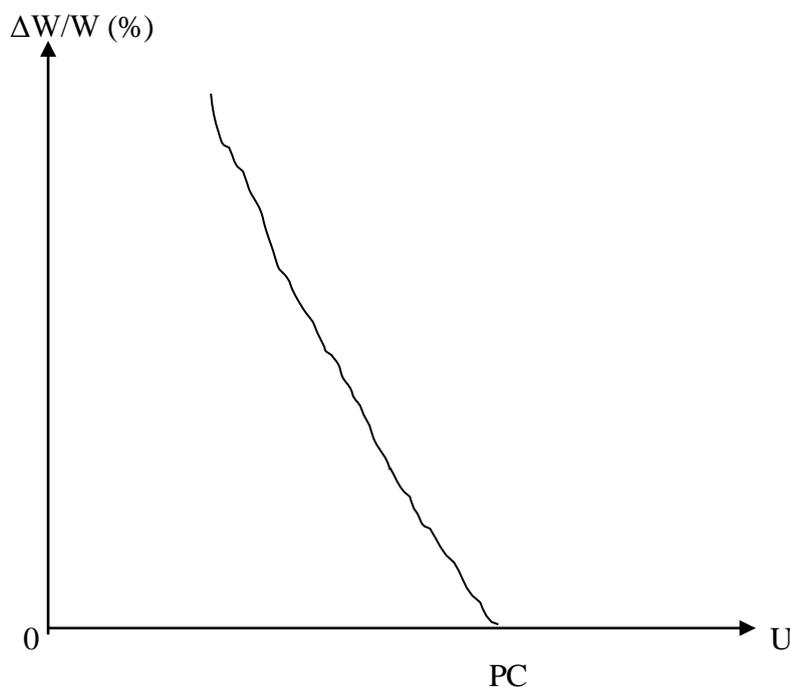


**Fig.3.1: The Original Philips Curve**

Philips had detected an inverse curve linear relationship between inflation rate and the rate of unemployment in a statistical study of observed annual figures for unemployment and money wage for the fifty-two-year period 1861 – 1913. Other studies were for the period 1913 – 1948 and 1948 – 1957: Phillips approach was to draw a curve of best fit through the scatter gram of observed combinations of unemployment and money wage rate for the United Kingdom. The resulting curve exhibited a negative shape, much like a demand curve.

**Self-Assessment Exercise 1**

1. Describe with the use of diagram the concept of the Philips curve.

**1.4 Basic Tenets of the Philips Curve**

A basic tenet of Philips curve is that a stable but inverse relationship exists between

unemployment and inflation rate as provided by money wage rate changes. The continued existence of this observe stable relationship was deemed to have far reaching implications for policy makers, for it represented a menu of policy choice between inflation and unemployment rate. This tenet of the Philip curve relationship meant that policy makers could choose between inflation and unemployment in the course of macroeconomic management. It meant that high levels of employment (low unemployment could only be obtained by tolerating a high rate of inflation. Conversely, a government desirous of achieving low rates of inflation (stable prices) could do so only at the cost of high unemployment rate. The existence of this tradeoff as revealed in the Philips curve relationship explain the application of "the twin evil of macroeconomics" with which both unemployment and inflation have been dubbed.

Another tenet of the Philips curve is that, apart from the simultaneous attainment of both objectives being in conflict, the attainable combinations of both variables were known. Hence, the diagram shows that a rate of inflation can be obtained only at a cost of an unemployment rate of say 5.5 per cent. On the other hand, effort to attain a 7.5 per cent rate of wage inflation would only be compatible with a one per cent point rate of unemployment. In general, the relevant policy trade-off, being the rates of exchange between policy goals at the disposal of the authorities was reflected in the slope of the curve. Since the existence of the tradeoff could be traced to the existence of inherent conflicts among policy objectives, efforts to solve one of the policy problems necessarily exacerbate the other. For example, the inability to simultaneously achieve the goals of full employment and of price stability means that efforts to move the economy closer to one of them say, full employment will of necessity drift it farther and farther away from the other, price stability. The rate of trade-off (the cost of attainting a little lot more of one of the objectives as reflected in the magnitude of the other that must be tolerated) is measured by the slope of the curve. Thus, the steeper the curve the lower will be the decrease in unemployment that will be brought about by large increase in the rate of inflation.

On the other hand, the flatter the curve, the higher will be the fall in unemployment that will be attained by a small increase in the rate of inflation. The trade-off relationship implied by the Philips curve meant that it was possible for policy makers to determine the opportunity cost of a lowered inflation rate in terms of the employment forgone.

It was their task therefore to optimise this trade-off relationship by selecting the inflation-unemployment-combination that maximized social benefit or minimise social cost. Rational policy making of course means that policy makers would settle for that combination that minimise the social harm.

**Self-Assessment Exercise 2**

1. Explain vividly the two basic tenets of the Philips curve
.

## 1.5 Non-Trade-Off Philips Curve (The Natural Rate Hypothesis)

Economists who speak in terms of "trade-offs" between a higher rate of inflation and a lower unemployment rate or a lower rate of inflation and a higher rate of unemployment view the Philips curve as a fairly stable relationship along which policy makers may choose one position or another. For example, if the objective is to move from an

existing five percent unemployment rate to a three percent rate, the goal can presumably be achieved if we are willing to trade the higher rate of inflation indicated by the Philips curve at the three per cent unemployment rate for the lower rate of inflation that is found at the five percent unemployment figure. In other words, according to these economists, if we are willing to pay the price in terms of inflation, public policy is capable of moving an economy to a three percent unemployment rate or whatever other realistic rate is selected as a goal. But there are many other economists who deny that society can in this way trade-off more inflation for a lower unemployment rate on other than a temporary basis. To them, the Philips curve of the conventional type shown by curve PC in Figure 3.1 describes a short run or transitory relationship that is valid only as long as discrepancies between expected and actual price and wage changes prevail. According to these economists, once such discrepancies have been removed, the Philips curve of the conventional type ceases to exist. One of such economists that challenged the existence of a stable relationship between inflation and unemployment rate are the monetarists. The monetarists challenge to the Philips curve was articulated in the presidential address of Milton Freidman, President of the American Economic Association and High priests of Monetarism in1967, an address in which the Philips curve was integrated into macroeconomic theory.

The thrust of Friedman's position was the absence of a long run tradeoff between inflation and unemployment. Hence, he asserts that any observed trade-off was at best a short run phenomenon. Friedman notes that, there must be some level of unemployment that is consistent with a cleared labour market (full employment situation). This level of unemployment which he called the natural rate of unemployment is characterised by an equilibrium real wage rate. This natural rate, also known as non-accelerating inflation rate of unemployment (NAIRU) was the result of imperfections in the labour market, resulting for example, from imperfect flow of knowledge between job seekers and job givers about job openings bringing about frictional unemployment. Natural unemployment was also attributable to structural factors; bring about unemployment of the structural variety.

Friedman noted that the NAIRU was an irreducible minimum which was consistent with full employment. Consequently, the reduction of unemployment below this rate via the tools of monetary and fiscal policies he argued would at best be a temporary phenomenon, otherwise an ever-accelerating inflation would be the result should policy makers attempt to make it a permanent phenomenon.

To illustrate Friedman's view, assume an existing natural rate of unemployment is five percent or higher unemployment rate that is being combated by expansionary monetary and fiscal policy. The expansion of aggregate demand resulting from this policy will involve some upward pressure on prices to $P_1$ and some reduction in the real wage rate, thus giving employers an incentive to expand output, and to do this they will expand or reduce unemployment to $U_2$. It therefore appears that a lower unemployment rate may be obtained in exchange for some rises in prices. However, workers will recognise before long that the higher prices have reduce their real wage rate and will demand and secure higher money wages to offset the rise in prices. This is illustrated on Figure 3.2 below.
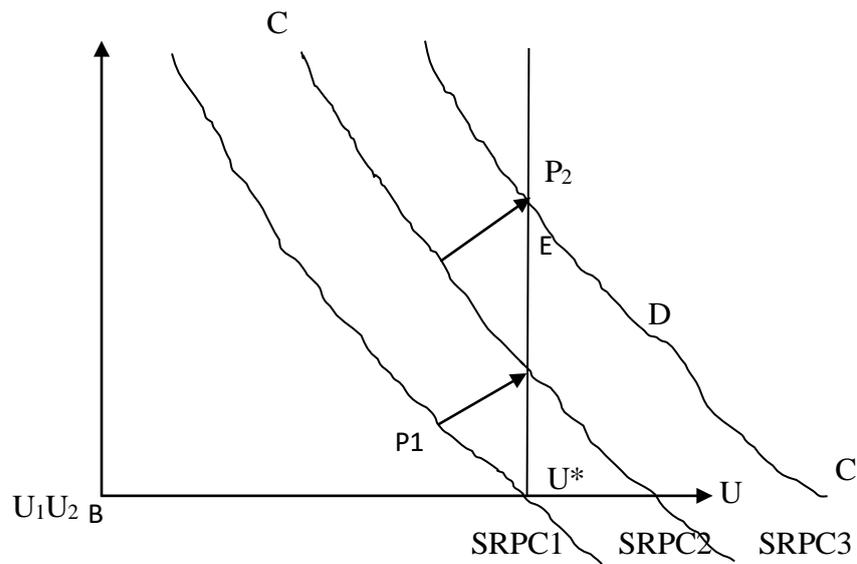
**Fig. 3.2:** **Expectation-Augmented Phillips Curve (The Natural Rate Hypothesis)**

Successful agitations increase their real wages but increase costs to employers who respond by cutting back on employment. With an increased price, remaining at $P_1$ and a cut back in employment, the economy will undergo an adjustment in the labour market characterised by virulent stagflation, a period in which both inflation and unemployment would co-exist in an intensified form. This situation would persist until there is a return to the natural rate $U^*$. Thus, the transition to the natural rate is characterised by (1) a new Short Run Phillips Curve (SRPC) labeled $SRPC_2$ and (2) a new and higher rate of inflation that is consistent with the natural rate labeled $P_2$. The transition path is denoted by the arrow labeled BC. The foregoing process will be repeated if the government, again dissatisfied with the natural rate attempts again to lower it beyond $U^*$ by implementing expansionary fiscal and/or monetary policy. This could mean attempting to reduce $U^*$ to $U_2$ in the diagram. Again, expansionary fiscal monetary policies trigger off increased prices, lowering the real wage rate if wage increase lag behind price increases, enabling employers to hire more labour and reducing unemployment, and achieving the goal of policy thereby, but at a higher price level $P_2$ than $P_1$. However, wage increases are soon negotiated and secured in response to the increased prices, raising the real wage rate necessitating a cut back in employment by employers; thus, increasing the unemployment rate until the natural rate, $U^*$ restored. The return to this new rate is characterised by (1) the movement to a new SRPC labeled $SRPC_3$ and (2) a higher price level $P_2$ with the transition path being defined by the arrow labeled DE, a path characterized by another round of virulent stagflation. Eventually, point E is arrived at, the natural rate is restored but at a higher price level $P_2$. Eventually, a long run Philips curve labeled Long Run Phillips Curve (LRPC) is traced out by the locus of the points formed by the successive short run Philips curves such as C and E and the natural rate $U^*$. This LRPC, according to the monetarist is vertical in shape. Thus, we can assert from the foregoing analysis that the monetarist challenge to the Philips curve inflation – unemployment trade-off was denied its existence at least in the long run, conceding that whatever is true of it is at best a short run phenomenon. This position is partly summarized in Friedman's word that

"there is always a temporary tradeoff between inflation and unemployment, there is no permanent trade-off".

**Self-Assessment Exercise 3**

1. Explain the trade-off between inflation and unemployment.

**1.6 Summary**

The unit has explained vividly the meaning of the Philips curve. The basic tenets of the Philips curve are considered alongside the expectation argument Philips curve - the natural rate hypothesis. The unit equally looked at the non-trade-off Philips curve advocated by the monetarist led by Milton Freidman, and finally graphical illustration of the long run Philips curve were given to justify the long run Philips curve.

**1.7 References/Further Readings**

Friedman, M. (1968). "The Role of Monetary Policy." *AER*.

Philips, A.W. (1958). "The Relation between Unemployment and the Rate of Change of Money Wage Rate in the UK 1861 – 1957." *Economics*. Vol. 15.

Shapiro, E. (1974). *Macroeconomics Analysis*. (3rd Ed.). New York: Harcourt Brace Jovanovich Inc.

**1.8    Possible Answers to SAEs**
These are the possible answers to the SAEs within the content.
➢ SAEs 1
Phillips curve describes the linear relationship between inflation rate and the rate of unemployment (see the diagram in your study material).

➢ SAEs 2
The two basic tenets of the Philips curve are:
1. A stable but inverse relationship exists between unemployment and inflation rate as provided by money wage rate changes.
2. Apart from the simultaneous attainment of both objectives being in conflict, the attainable combinations of both variables were known.

➢ SAEs 3

1. The trade-off implies a higher rate of inflation and a lower Unemployment rate or a lower rate of inflation and a higher rate of unemployment in the short run.


**MODULE 6     ECONOMIC GROWTH ANALYSIS AND GROWTH THEORIES**

Unit 1     Economic Growth Analysis
Unit 2     Economic Growth, Income Inequality and Environmental Quality
Unit 3     Growth Theories/Models


**UNIT 1     ECONOMIC GROWTH ANALYSIS**

1.1 Introduction
1.2 Learning Outcomes
1.3 Meaning of Economic Growth
1.4 Distinction between Economic Growth and Economic Development
1.5 Measurements of Economic Growth
1.6 Determinants of Economic Growth
1.7 Summary
1.8 References/Further Readings
1.9 Possible Answers to SAEs

**1.1 Introduction**

By introducing such factors as consumption, investment and governments expenditure and growth labour productivity into the static model of simple economy to a complex one, we took the first steps away from a purely static model of the economy towards a more dynamic view. In this unit and of course this module, we move into a more dynamic view of income and brief survey of dynamic models of economic growth.

**1.2 Learning Outcomes**

At the end of this unit, you should be able to:

• explain the concept of economic growth
• analyse the distinction between economic growth and economic development
• discuss measurements of economic growth
• state the sources of economic growth.

## 1.3 Meaning of Economic Growth

Economic growth for the underdeveloped countries is one of the four macroeconomic goals of any society. Recall that others are price stability, full employment and a healthy balance of payments position.

Modern economic growth refers to the development of the developed counties of Western Europe, the United States, Canada, Australia and Japan. Professor Simon Kuznets in his Nobel Memorial Lecture defined economic growth "as a long-term rise in capacity to supply increasingly diverse economic goods to its population, this growing capacity based on advancing technology and the institutional and ideological adjustments that it demands". This definition has three components. First, the economic growth of a nation is identified by the sustained increase in the supply of goods. Second, advancing technology is the permissive factor in economic growth which determines the growth of capacity in supplying diverse goods to the population. Third for an efficient and wide use of technology and its development, institutional and ideological adjustments must be made to affect the proper use of innovations generated by advancing stock of human knowledge (Jhingan, 2003).

Anyanwu (1995) defined economic growth as to the increase over time of an economy's capacity to produce those goods and services needed to improve the well-being of the citizen in increasing numbers and diversity. It is a steady process by which the productive capacity of the economy is increased overtime to bring about rising levels of national income (Todaro, 1997). Thus, in discussing growth, it is imperative to examine the behavior of the population overtime. This is because economic growth becomes a meaningful concept if it leads to an improvement in well-being of society over time and this can happen only if the rate of population growth lags behind that of economic growth overtime. Thus, growth is a steady process of increasing the productive capacity of the economy and hence of increasing national income, being characterised by high rates of increase of per capita output and total factor productivity, especially labour productivity.

Economic growth, according to Ochejele (2010) refers to the quantitative and sustained increase in the country's per capita output or income accompanied by expansion in labour force, consumption, capital and volume of trade.

**Self-Assessment Exercise 1**

> 1. What is economic growth?

## 1.4 Distinction between Economic Growth and Economic Development

Growth and development are two inseparable worlds/concepts and often used interchangeably to mean the same. Occasionally, this usage is sometimes accepted. Where the two terms exist, separating their meanings has merits.

Growth refers to increase, overtime, of an economy's output of goods and services. This definition does not take cognisance of desirable structural changes in the society's economic arrangement. Thus, while growth refers to the volume of output in the current year vis-a-vis the volume of output in a chosen previous year, it overlooks the distribution to and hence the well-being of the citizens in the economy. In contrast, the concept of economic development is more embracing for it does not only concerns itself with issues of growth but also focuses on the distribution of proceeds of growth. Thus,

economic development is generally defined to include improvements in material welfare especially for persons with lowest incomes, the eradication of mass poverty with its correlates of illiteracy, disease and early death, changes in the composition of inputs and outputs that generally include shifts in the underlying structure of production away from agricultural towards industrial activities (Kindlerberger and Herrick, 1977).

It is a multidimensional process involving the provision of basic needs, acceleration of economic growth, reduction of inequality and unemployment, eradication of absolute poverty as well as changes in attitudes, institutions and structures in the economy (Todaro, 1977).

Growth models are capable of expressing in a mathematical form but development models cannot be easily expressed in a mathematical form because of its complexity and the difficulty of some of the variables in it. Therefore, the former can easily be subject to empirical measurement and testing but it is sometimes more impossible to do same with the latter.

Growth can occur without development, but it is impossible to perceive development without economic growth. Therefore, there could be growth without development if the increase in national income does not have positive effects on the living conditions of the people, particularly the poor.

**Self-Assessment Exercise 2**

> Growth and development are two inseparable concepts and often used interchangeably to mean the same. Discuss.

**1.5 Measurements of Economic Growth and Development**

In discussing economic growth and development five strands of the measure of growth can be deciphered. These measures include (1) measurement of growth from the nominal perspective (2) growth defined from real magnitudes (3) growth measured in terms of per capita values (4) welfare, and (5) social indicators.

1.      **Nominal measurement of growth**

        Under the first measure of the concept economic growth is seen as the increase in current value prices of aggregate products. This measure of growth is based on an evaluation of the trend behaviour of aggregate expenditure overtime. It is considered the crudest measure of the concept as it does not take cognisance of such vital issues as to whether or not the increased expenditure is matched by a concomitant increase in the real value of output within the reference period.

2.      **Real output growth rate as a measure of economic growth**

        Determining whether or not the increased aggregate expenditure is matched by an increase in real output overtime entails deflating the nominal value of output by an appropriate price index to obtain the corresponding magnitude. The deflated value of the nominal output enables us to determine whether or not an economy has grown in real terms overtime. Thus, an economy is deemed to have grown in

real terms when there is an increasing aggregate output at constant price overtime.

**3.** **GNP per capita**

This measure relates to an increase in the per capita real income of the economy. This indicator emphasised that for economic development to occur, the rate of increase in the real per capita income should be higher than the rate of growth of population.

Graphical representation of economic growth takes the form of an outward shift in the economics' PPF. Supposing the economy produces two goods, say bread and butter with all its resources. Growth in this hypothetical economy is illustrated as shown below:
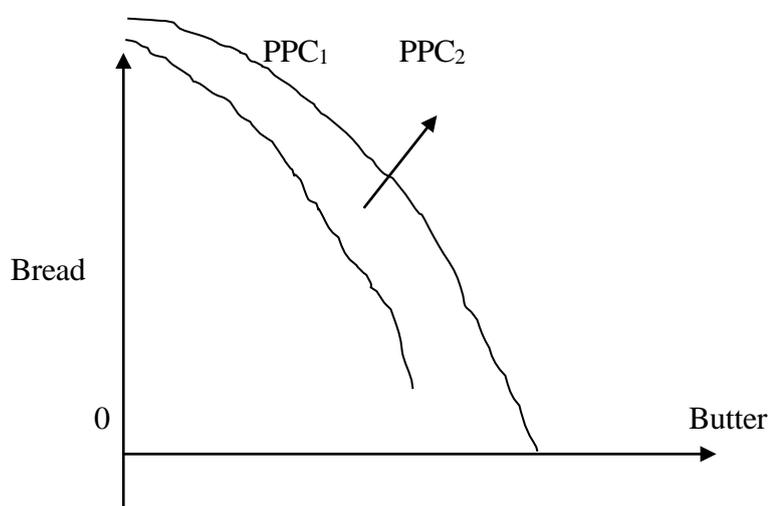


**Fig.1.1: Economic Growth**

The increase in economy's output of bread and butters shown as the outwards shift of the transformation curve from1980 PPF labeled $PPC_1$, to that of 1990 labeled $PPC_2$.

**4.** **Welfare**

Economic development can also be measured from the point of view of welfare, in this case economic development is perceived to be an increase in the consumption of goods and services.

**5.** **Social indicators**

Some economists that were dissatisfied with GNP and GNP per capita have tried to measure economic development in terms of social indictors. Hicks and Streeten (1979) as quoted by Ochejele (2010) considers six social indicators for basic needs, which include health, education, good, water supply, sanitation and housing. Social indicators are often referred to as the basic needs to a higher level of productivity and income through human development in the form of educated

and healthy people.

**Self-Assessment Exercise 3**

> 1. Explain the indicators of economic growth.

## 1.6 Determinants of Economic Growth

The determinants of economic growth can be broadly categorised into economic and non-economic factors. Economic growth is dependent upon economic factors such natural resources human resources, capital, enterprises, technology etc.     Non-economic factor such as social institutions, political conditions and moral values also influence growth.

**Economic factors**

The growth rate of any economy depends on the changes of the factors of production namely land, labour, capital and entrepreneurs.

- **Natural resources**

   One of the principal factors affecting development of an economy is the natural resources otherwise known as land. Land as used in economics includes natural resource such as the fertility of the land, its situation and composition, forest resources, minerals, climate, water resources etc. For economic growth to take place, the existence of these resources is germane. In the LDCs, natural resources are unutilised, underutilised or mis-utilised. The presence of abundant resources is only necessary but not sufficient condition for economic growth. Growth requires optimal exploitation and utilisation of these resources. As Fisher (1987) remarked "there is little reason to expect natural resource development if people are indifferent to the products or services which such resources can contribute".

   Some economists have argued that economic growth is possible even when an economy is deficient in natural resources. Japan is one such country which is deficient in resources but it is one of the advanced countries today, because of its technology and how it has been able to discover uses of its limited resources. Moreover, by importing raw materials and minerals from other countries, it has been successful in overcoming the deficiency of its resources through superior technology researches. Thus, for economic growth to take place, the existence of abundant natural resources and their proper exploitation coupled with the relevant technology which will limit wastage for better utilisation.

- **Capital accumulation**

   Another important economic factor in growth is capital accumulation. Capital represents the stock of physical reproducible factors which can be acquired through the stock of physical money. The increase on the capital stock over a period of time is capital accumulation. The process of capital formation includes:

a.    The existence of savings and the rise of them
b.    The existence of credit and financial institutions to mobilise savings and allocate them to the desired sectors; and
c.    the use of these savings for investment.

Capital formation is the main key to economic growth as it creates the opportunity for future production. Capital formation helps in providing machines, tools and equipment which are used in production process. The provision of social and economic infrastructure like transportation, education, health, power etc. is possible through capital formation. It also leads to technology, exploitation of natural resources, industrialisation and expansion of markets which are essential for economic development.

In LDCs, the propensity to save is low hence, government often resorts to forced savings by ways of taxation, deficit financing and borrowing.

- **Organisations**

    This is another factor that influences economic growth. It relates to the optimum use of factors of production in economic activities. In modern economics, the entrepreneur performs the role of an organiser. He is an economic leader who possesses the capability and ability to recognise opportunities for successful introduction of new commodities, new techniques, and new sources of supply and to assemble the necessary plant and equipment, management and labour force and organise them into a running concern. Therefore, entrepreneurship is indispensable in economic development.

    However, LDCs lack entrepreneurial capability. Such constraints as the smallness of market, capital deficiency, technological backwardness, lack of skilled and trained labour, non-availability of adequate raw materials and infrastructure as well as increased risks and uncertainties are major characteristics of the economies of the LDCs. The challenge therefore is for the LDCs to create a climate that will encourage entrepreneurship.

- **Technological progress**

    This is considered as one of the most important factors in the process of economic growth. This relates to changes in the methods of production which is the result of research and innovation. Technological changes lead to increases in the productivity of labour and capital. Kuznets traces five distinct patterns in the growth of technology in economic growth. These are scientific discovery, invention, innovation improvement and spread of invention. He therefore suggested that LDCs must import technology to accelerate their productive capacity in the short run because they cannot wait until they invent or modify the technology of advanced countries.

    Consequently, as they adopt the imported technology, they must develop their indigenous technical skills. This should be backed up by research and development studies to enable them know the problems associated with such technological adaptation. One of the principal factors of economic growth has been huge spending on research and development by the advanced countries.

- **Specialisation and division of labour**

  This also leads to increase in productivity. They lead to economies of large-scale production which further help in industrial and agricultural development. Division of labour leads to improvement in the productive capacities of Labour, it saves time; it makes invention more feasible and can widen the scope of market.

- **Structural changes**

  These are necessary ingredients for economic growth. Structural changes imply the transition from the traditional agricultural dominated economy to a modern industrial economy involving a radical transformation of existing institutions, social attitude and motivations. It implies reduction in the size of contribution to the net national output by agricultural sector. This does not however imply a reduction of output in absolute terms. It is its share in national income that has to decline because secondary and tertiary sectors will now take the commanding heights of the economy. Tertiary production includes a number of dissimilar services like transport, retail and whole sale distribution, education, government services etc.

  Innovation or the opening of a new area may bring about a structural change within an economy thereby widening the domestic and foreign markets. Structural changes which affect technical skills, administrative and entrepreneurial activities, transport and communication and supply of capital are very important. To facilitate this process both money and capital markets with their diverse instruments are required.

**Non-economic factors**

Non-economic factors play significant roles alongside with the economic factors in the process of economic growth and development of any country. Non-economic factors have much to do with human endowment, social attitudes, political condition and historical accidents. Therefore, social, cultural, psychological, political and administrative factors are as much important as economic factors in economic development. As pointed out by Cain cross in Jhingan (2003), "development is not just a matter of having plenty of money nor is it purely an economic phenomenon. It embraces all aspects of social behaviour, the establishment of law and order, scrupulousness in business dealings, including dealings with the revenue authorities, relationships with the family, literacy, and familiarity with mechanical gadgets and so on.

In the area of social factors, issues regarding social attitudes, values and institutions influence economic growth significantly. Attitude implies the totality of beliefs and values that cause human behaviour to be what it is. Western culture and education have led to reasoning and skepticism. It inculcates the spirit of adventure which led to new discoveries and inventions. People have cultivated the habit of savings and investments, and undertaking risks so as to earn profits. They develop the will to economise and to maximise output from a given input. As a result, European countries experienced Industrial Revolution in the 18th and 19th centuries.

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- **Human resources**

  Human resources have been an important factor in modern economic development. Growth does not depend on the mere size of human resources but on their efficiency. A proper use of human resources can be made for economic development. To increase the productivity of labour, emphasis should be placed on education and training. Thus, as Jhingan (2003) noted, "the most important requirement of rapid industrial growth is people. People ready to welcome challenges of economic change and opportunities in it. People, above all, who are dedicate to the economic development of their country and to high standards of honesty, competency knowledge and performance".

- **Political and administrative factors**

  This also helps in modern economic development. The economic growth of Britain, Germany the US, Japan and France can be explained in part due to the political stability of these countries. Peace, protection and stability have encouraged the development of entrepreneurship in developed countries along with the adoption of appropriate fiscal and monetary policies. The weak administrative and political structure is a big hindrance to the economic development of LDCs. Thus, the government of LDCs must step up effort to offer services required for economic development such as order, justice police and defense, security, reward system etc. In this way, clean and strong administration full of justice can stimulate economic development.

**Self-Assessment Exercise 4**

> 1. Economic growth is determined by some factors. Enumerate the factors in relation to the Nigerian economy.

## 1.7 Summary

The unit has thrown light on the meaning of economic growth. The distinction between economic growth and economic development was equally considered. The determinants of economic growth and development were also looked at.

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## 1.9 Possible Answers to SAEs
These are the possible answers to the SAEs within the content.
➢ SAEs 1
Economic growth refers to the quantitative and sustained increase in the country's per capita output or income accompanied by expansion in labour force, consumption, capital and volume of trade.
➢ SAEs 2
Economic growth refers to the volume of output in the current year vis-a-vis the volume of output in a chosen previous year, it overlooks the distribution to and hence the well-being of the citizens in the economy. In contrast, the concept of economic development is more embracing for it does not only concerns itself with issues of growth but also focuses on the distribution of proceeds of growth. Thus, economic development is generally defined to include improvements in material welfare.
➢ SAEs 3
The following are the indicators/measures of economic growth:
(1) Gross domestic growth from the nominal perspective
(2) Real GDP magnitudes
(3) GNP per capita values

➢ SAEs 4
Factors that determine economic growth are:
- Natural resources
- Capital accumulation
- Organisations
- Technological progress
- Specialisation and division of labour
- Structural changes
- Social attitudes
- Political condition
- Human resources

**UNIT 2     ECONOMIC GROWTH, INCOME DISTRIBUTION AND ENVIRONMENTAL QUALITY**

**1.1 Introduction**

There has been much controversy among economists over the issue whether economic growth increases or decreases income distribution. Professor Kuznets is the first economist to study this problem empirically. He observes that in the early stages of economic growth relative income inequality increases, stabilises for a time and then decline in the later stages. This is known as the invert U-shaped hypothesis of income distribution.



**1.2 Learning Outcomes**

At end of this unit, you should be able to:

• explain economic growth and inequality
• discuss economic growth in developed and developing economies
• explain rate and environmental quality.



**1.3 Economic Growth and Income Distribution (The Kuznets Hypothesis)**

One major proponent of the long-run processes of economic development is the Kuznets curve: the inverse-U shaped pattern of inequality. In a seminal paper, Simon Kuznets (1955) argued that as countries developed, income inequality first increased, peaked, and then decreased. The empirical validity of the "Kuznets curve" has been investigated but the evidence is mixed for developed and developing countries. Kuznets came to the conclusion that the size distribution of income was more unequal in LDCs than in DCs. It was high (1.67 to 2.33) in LDCs and low (1.25 to 1.29) in DCs.

It was his 1963 study that Kuznets developed his inverted U-shaped hypothesis by taking the data of 18 countries by size distribution of income. On their basis he constructed different Lorenz curves for DCs and LDCs and derived their Gini coefficients. It was 0.37 for DC sand 0.44 for LDCs. It showed that income inequalities were higher in LDCs than DCs. This is explained in Figure 2.1 where the $45^0$ straight line is of equal income distribution. The brown curve to the right and nearer to this line is the Lorenz curve of LDCs.

But the Gini coefficient of distribution is a better measure of the degree of income inequality. It varies from 0(complete equality) to 1 (complete inequality).
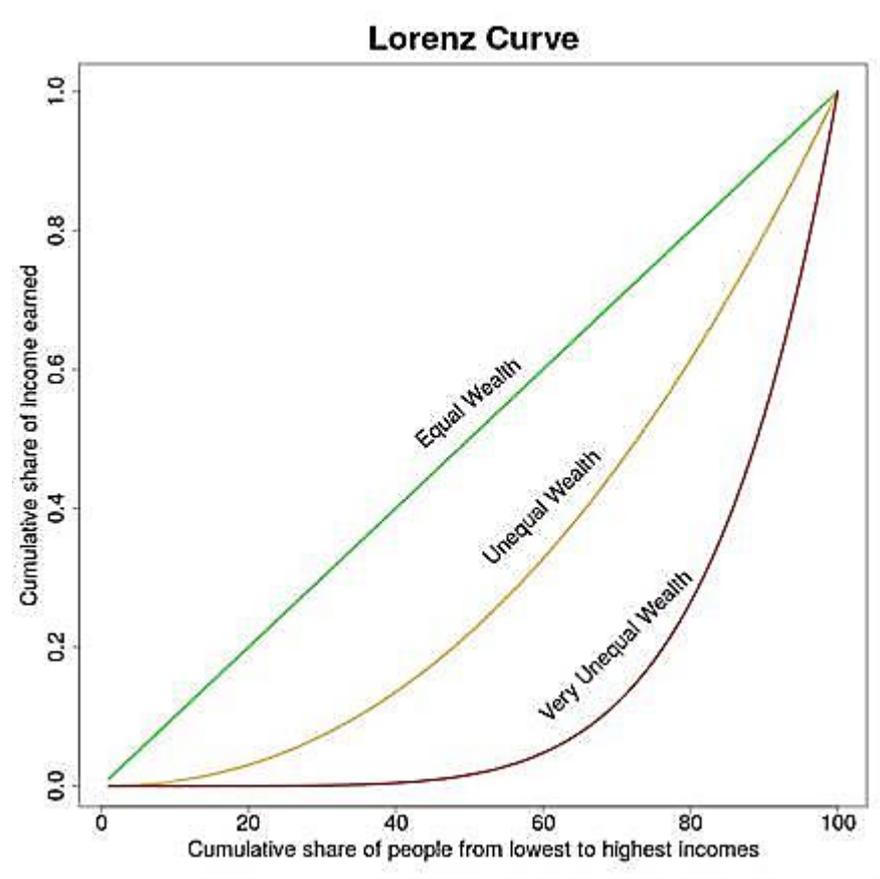


**Fig.2.1:  Lorenz Curve (LC)**
**Source:** www.economicsonline.co.uk

From Figure 2.1, the larger the coefficient, the greater the inequality. The Gini coefficient is measured in Figure 2.1 as the ratio of area A/A+ B or A/Δ OCD. The greater is this ratio, the more unequal is the distribution of income i.e., the more the Lorenz curve falls below the $45^0$ lines. In Figure 2.1, the area A covered by the rough Lorenz curve roughly represents 37 per cent of the triangle OCD for DCs and the area covered by the smooth Lorenz curve represents roughly 44 per cent of the area of the triangle OCD for LDCs.

The changes in the distribution of income as measure by the Gini coefficient in relation to

the increase in per capita income trace out the Kuznets inverted U-shaped curves K, as shown in Figure 2.2.

Gini Coefficient



**Fig.2: The Kuznets Curve**

Note that the more robust portion of the Kuznets curve lies to the right: income inequality falls with an increase in per capita income at higher levels of development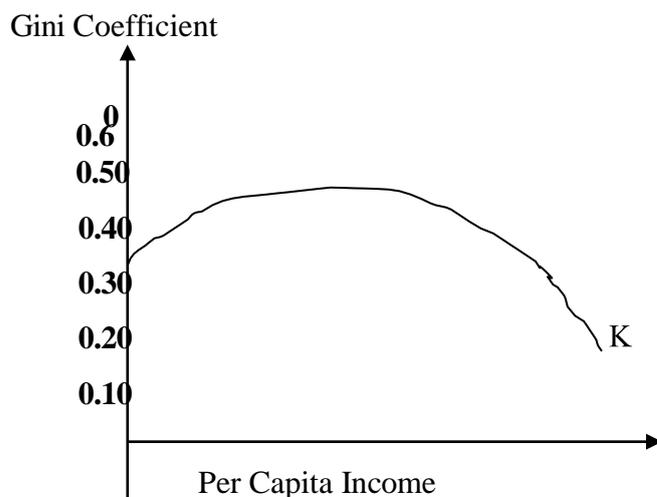. The variance around the estimated Kuznets curve is greatest, however, from low to middle levels of development. The inverted U-shaped curve hypothesis applies to the present developed and developing countries but the degree of inequality in the latter is greater than in the former.

**Self-Assessment Exercise 1**

Explain the concept of income inequality.

**1.4 Economic Growth in Developed and Developing Economies**

The problem of growth is not limited to developed capitalistic economies. In the area of pollution, the Volga Communist in Russia is just as polluted as some of our major rivers in Nigeria, and pollution runs in the streets in many developing countries. As there are similarities, so there are differences. The sources of economic growth are quite uniform for developed countries, and a quantitative study of these sources for any developed country could precede along much the same lines as those followed by Denison in his study of the U.S. economy and eight western European economies. Although the relative quantitative importance of each of the primary sources of growth will not be the same in all developed economies, the primary sources themselves will be the same. In the same way, a theory of economic growth that attempts to explain the process by which growth takes place in a developed economy will, in general, be applicable to any developed economy. However, the same growth theory will not be applicable to a developing economy. Since the next unit is devoted entirely to growth theory relevant to developed economies, it may be helpful at this point to mention the pertinent distinctions between growths in the two types of economies.

To begin with, the most serviceable criterion for classifying economies as developed or

developing is per capita real income. Those with "low" per capita income are considered to be developing; those with "high" per capita real income are developed. Income is judged to be high or low by comparing it to income in countries such as the United Kingdom and Germany, which are relatively "high". It is the level of absolute per capita real income in the country relative to that in another that is relevant for this classification. The parallel criterion for classifying economies according to their growth rates for any particular period of years is the rate at which per capita real income grows. Notice that although developing countries are typically countries with low growth rates, it is possible for such a country to show a high growth rate. If sustained, a high growth rate will clearly move the country out of the "developing" class.

## 1.5 Economic Growth and Environmental Quality

From the late fifties through the mid-sixties, no economic issue received more attention than the country's growth rate. An annual growth rate for a country indicates success in this direction. But at the same time that this success was achieved, doubt began to arise as to whether this was indeed a success in a more complete sense of that word. By the late sixties there was serious questioning of a proposition that had long been practically taken for granted – that the national well-being is enhanced by an increase in the rate of output of the goods and services designed to satisfy the needs of ultimate consumers currently and in the future. What was by then being asked is whether there is a "tradeoff" between the rate at which we expand the output of goods and services and the rate at which the quality of the environment deteriorates. A more rapid rate of growth means more of the goods and services that most people want, but it also means more of the air, water, land, and noise pollution and environmental damage that people do not want. With the awakening to the seriousness of the pollution problem in the late sixties, economic growth, which had long been generally viewed as something close to an unmixed blessing, came to be viewed by the more extreme environmentalists as something close to an unmixed evil.

It is, of course, true that pollution did not suddenly appear in the late sixties. What did appear for the first time was the widespread awareness of the fact that pollution had reached such proportions that, if allowed to grow completely unchecked, it could destroy civilization in the course of not too many generations. Accompanying real GDP of #38923.2 in 1980 was a level of pollution that was apparently close to the assimilative capacity of the natural environment and thus gave rise to no great concern. However, twenty years later, in 2000, real GDP had increased to #4582127 and with it probably came more than a proportional increase in the amount of pollution and other poisons deposited annually in the air and water and in the amount of environmental damage of practically every other kind. It is easy to understand the opposition to growth voiced by those who believe there is inevitably a close relation between the rate of growth of GDP and the rate of decay of the environment.

**Self-Assessment Exercise 2**

1. Discuss the relationship between the growth of GDP and pollution.
2. Explain vividly the Kuznets U-shaped curve.

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## 1.6 Summary

This unit has explained economic growth and income distribution popularly known as the Kuznets hypothesis. Kuznets comes to the conclusion that the size distribution of income was more unequal in LDCs than in DCs. The unit equally discussed growth rate and environmental quality. A more rapid rate of growth means more of the goods and services that most people want, but it also means more of the air, water, land, and noise pollution and environmental damage that people do not want.

## 1.7 References/Further Readings

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## 1.8 Possible Answers to SAEs
These are the possible answers to the SAEs within the content.

➢      SAEs 1
Income inequality refers to how unevenly income is distributed throughout a population. The less equal the distribution, the greater the income inequality.

➢      SAEs 2
 1. Economic growth increases, environmental pollution increase. Consequently, as pollution emissions intensify, economic growth is inhibited.

 2. Simon Kuznets hypothesized that an inverted U-shaped relationship exists between inequality and development. This implies that as countries develop, inequality increases until a certain tipping point, after which it would start to fall again.

# UNIT 3          THEORIES  OF GROWTH AND DEVELOPMENT

## 1.1 Introduction

There are several theories or models of various aspects of economic growth and development process. These models have at all times being the basis of policies aimed at helping the development processes along. The sole aim is to reveal these intellectual theories provided by different scholars in the aspect of economic growth and development.

Although economic growth has been identified as one of the key macroeconomic goals of society, issues of growth did not assume a dimension of prominence until the mid-thirties. Two events largely account for the outburst of interest in issues of growth. The first was the publication of Keynes' General Theory of Employment, Interest and Money in 1936, who viewed deficiency in aggregate demand as the key factor to economy's stagnation. The second was the struggle to overcome the devastating effect of the World War II on war ravaged economies.

Interest in growth issues subsequently led to development of various theories of growth each purporting to explain the mechanics of growth.



## 1.2 Learning Outcomes

At the end of this unit, you should be able to:

- explain the Marxian growth theory
- describe the Schumpeterian growth theory
- discuss the classical growth theory

- explain the Harrod-Domar growth model

- discuss the neo-classical with respect to their limitations and applicability to underdeveloped economies.

## 1.3 The Marxian Theory of Growth

One of the historical theories of economic growth, the Marxian theory of growth is a mixture of reasoning proceeding from economics and sociological perspectives. It proceeds by viewing growth as a process of continue transformation of the society and social function and political life. Such transformation can be traced to the society mode of production as well as the property rights of the society, economic power and prestige seeking class. Marxian growth theory asserts that growth is dependent on the rate of accumulation of labour surplus value by the capitalists' class, labour surplus value being the rate of profit in excess of labour's true remuneration which has however, been expropriated from the workers by their factors owners (the capitalists). Thus, the Marxian theory of growth attributes growth to labour surplus value which is the difference between subsistence wages paid to workers and the true value of labour output. It is this difference that constitutes the sources of investible fund necessary to foster economic growth. Therefore, the larger this difference is, the more rapid growth is expected to be. However, the Marxian theory of growth points at the possibility of the eventual collapse of the capitalist systems resulting from the intensification of the clash between the expropriators and the expropriated.

**Self-Assessment Exercise 1**

1. Explain vividly the Marxian theory of

## 1.4 Schumpeterian Theory of Growth

Schumpeter appears to provide an answer to the problem raised by Keynes theory through the very significant role he gives to the innovator or the entrepreneur. Instead of the business minds expectation, Schumpeter talks about the innovator who undertakes new combination of factors of production. This combination opens the way for profits in a statutory state or during a down turn which then leads to an upswing. Also, instead of Keynes propensity to save, Schumpeter holds that, the innovator/entrepreneurs secured the fund for his investment from the banking sector - and the inflationary process which result from this, forced people to save and higher capital accumulation is obtained. Instead of the propensity to consume, he assumed that changes in taste are brought by the action of the entrepreneur, the lack of real resources endangered by the inflationary process, the destructive competition that followed the upswing or boom, the repayment of bank loan and the effects which the cessation of innovative activity has on secondary investment, all combined to bring about the down turn. Schumpeter believes that the economic system is full of uncertainties and risks that is inevitably discontinues or moves in a speed.

This theory has won great admiration from economists, but the conclusions are not generally accepted. The criticism is that, there are no longer innovators of the types assumed by Schumpeter - there are instead large business units whose innovative activities and motivations are not distinguishable from the ordinary business activities. Also view from the developing countries point of view, Schumpeter type of innovation is strictly the type from the developed world. Even if it exists in a developing country, its

effects will be limited because of competition from the developed countries. This considerably lessens the dynamism ascribed to innovation by Schumpeter. In addition, large business units more easily absorb changes in economic environment and plan for adjustment alone, therefore cannot explain the causes of down turn.

It should be noted however, that, Schumpeter emphasis on innovator and innovations is very important in the consideration of factors responsible for economic growth. Equally important is his idea that sources of investible funds are not just personal or corporate savings but the banking system.

**Self-Assessment Exercise 2**

1. Clearly explain the Schumpeterian growth theory and its limitations
2. What are the criticisms of the Schumpeterian growth theory?

**1.5 The Classical Theory of Economic Growth and Development**

Without doubt the best-known name in economics is Adam Smith. His monumental work *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776) has had tremendous influences on scholars and policymakers alike. As the title of the book indicates, Smith was mainly concerned with the problem of economic development. He wanted to discover how economic growth came about and what factors impede it. Itis interesting to know that no single compressive theory of growth and development has emerged that has superseded the original work by Smith. In his work, which most economists view as marking the beginning of the classical economics, Smith sets forth the classical principles of economic development. These principles are anchored on a governmental policy of laissez-faire. The principle of division of labour and the increase productivity brought on by the division of labour but limited only by the extent of the market. As a result, free trade was advocated as a way to promote this division of labour by exploiting each nation's comparative advantage in production.

Recent actions by less developed countries and policies advocated by some developed economies are at odds with this laissez-faire principle. Their argument is that government must direct the development process. Many of these opinions grew out of the experience of the 1930s and the 1940s when Soviet Union was able to grow very rapidly by applying severe authoritarian development techniques - as a result of this, the Soviet Union development process was very successful given room for economies from the underdeveloped world to attack the laissez-faire principles. They began to argue that "no policy of economic development can be carried out unless the government has the capacity to adhere to it…" Quite often however, democratic government loses touch and determination in the face of opposition. This is the dilemma of most democratic government. It is here that Soviet countries have an immense advantage; their totalitarian structure shields the government from rigorous and reactionary judgment of the electorates.

**1.5.1 The Classical theory can be summarized as follows:**

• Laissez-faire Policy: The classical economics believes in the existence of an automatic free market which is an economy free from government interference. It is the invisible hand doctrine commonly associated with Adam Smith which maximises the material income.

- Capital accumulation. Capital accumulation was accepted as the key to economic progress. All classicists regarded capital accumulation as the only way to economic prosperity and by extension to political leaderships. They therefore, lay emphasis on large saving.
- Profits as an incentive to investment. Profits induce investment, the larger the profit the larger the capital accumulation and investment.

## 1.5.2 Criticisms of the classical theory of growth

The simple and abstract classical theory of development is not free from criticism.

i.  Neglect of the public sector. To the classicists, the perfect competition and the institution of the private sector were essentially prerequisite for economic development. They have however, failed to realise the important of the public sector in accelerating capital accumulation, and so preached by the classical.

ii.  It ignores the middle class. The whole classical analysis was based on socio-economic environment prevailing in Britain and certain part of Europe. It assumed the existence of a rapid division of society between the capitalists and the proletariat or labourers. It neglected the whole of middle class which provides the necessary impetus to economic growth. It did not occur to the classical that the major source of saving in an advanced society was the income receive and not the property owners.

iii.  Unrealistic growth process. The classical theory assumed a stationary stage in which there was no change, but hovered around a point of equilibrium, even where there were disturbances, such was transition and temporary and can be restored through the automatic device.

**Self-Assessment Exercise 3**

1. What are the criticisms of the classical theory of growth?

## 1.6 The Harrod-Domar Growth Model

The model is a product of two scholars: Professor Roy Harrod of Britain (1939) and Evsey Dommar of USA (1946). It is actually a growth theory and it emphasizes one of the components of the big-push -capital which has always been considered important for economic development. The source of capital is mainly saving consequently, in order to achieve economic development; saving or capital formulation must increase over a period of time. This of course should result in relative decrease in consumption which in turn is necessary if rapid economic growth is to be achieved. A key objective of the Harrod-Domar Model is to overcome the limitation inherent in the short-run nature of the simple Keynesian model. This model takes cognisance of only one of the dual roles of investment in the economy, its role as a component of aggregate demand. However, the dual role of investment as (1) a component of aggregate demand and (2) as an addition to the stock of productive resources must be accommodated in any long-run analysis for it to be meaningful. This is because net investment has both a demand and supply effect.

The Harrod-Domar model is based on a number of simplified assumptions which include:

i.  A closed economy with no foreign sector.

ii.     Homogeneity of labour that grows at a constant natural rate.
iii.    Two factor inputs, labour and capital only exist in the economy with absence of technical progress.
iv.     Output increases (decreases) by the same proportion of input increases (decreases). This is the assumption of constant returns to scale.
v.      The production function is of the Leontief type characterised by fixed factor proportions with L shaped isoquant.
vi.     A Constant-Capital-Output-Ratio: The model assumes a constant capital output ratio. It implies a production function with constant capital output coefficients. Simply put, Harrod-Domar model assumes that national income is proportional to the stock of capital.
i.e. $Y=kK$, $(k>0)$ … .................................................................................... (6.1)

Where Y=national output
        K=total output for capital k = output capital ratio

Since output-capital-ratio is assumed to be constant, any increase in national output ($\Delta Y$) must be equal to k time's $\Delta K$, i.e.

$\Delta Y=k\Delta K$……………………………………………………………………………… (6.2)

It follows from Equation (6.2) that the growth of national output per time unit depends on and is limited by the growth of capital stock per time unit. If an economy is in equilibrium and the existing stock of capital is fully employed, their capital output (K) can easily work out. Once k is known, then additional capital required for producing a given additional output can be easily worked out by using Equation (6.2).
Since increase in capital stock ($\Delta K$) in any given period equals net investment (I) of that period, Equation (6.2) may be written as:

$\Delta Y=kI$……………………………………………………………………………… (6.3)

vii.    A Constant-Saving-Income-Ratio: It assumes that society saves a constant proportion of the national income. i.e., total savings (S) is a function of income, Y and the savings function can be written as:

$S=s(Y)$ $(s>o)$ …………………………………………………………………… (6.4)
Where S=savings
s=constant propensity to save.

At equilibrium level of output, the desired savings must be equal to the desired investment i.e.

$S=I=sY$… .................................................................................. (6.5)

Given the assumptions, the growth rate defined as $\Delta Y/Y$ may be obtained as follows:

$\Delta Y/Y=Y_t-Y_{t-1})/Y_t$ Where:
$Y_{t-1}$ =national output in period $t_{-1}$
$Y_t$ = national output in period t

It may be inferred from Equation (6.3) that in period t,
$$\Delta Y_t = kI_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6.6)$$

By substitution, Equation (6.6) may be written as:
$$Y_t - Y_{t-1} = k.sY_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6.7)$$

Equation (6.5) tells us that the Harrod-Domar model assumes that at equilibrium in period t, $I_t = S_t = Y_t$

By substituting $sY_t$ for $I_t$ in Equation (6.7) we get:
$$Y_t - Y_{t-1} = k.sY_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6.8)$$

By dividing Equation (6.8) by $Y_t$, we get the growth rate $\Delta Y/Y$ or what Harrod calls the warranted growth rate Gw as:
$$Gw = Y_t - Y_{t-1}/Y_t = \Delta Y/Y = k.s \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6.9)$$

Where Gw is the warranted growth rate

Equation (6.9) shows that the rate of growth equals the output-capital- ratio times the constant propensity to save. Since growth rate pertains to the condition that I = S, this may also be called equilibrium growth rate which implies capacity utilisation of capital. This growth rate fulfilled the expectations of the entrepreneur. Therefore, this growth rate has been termed as warranted growth rate.

Harrod-Domar defines Gw as that rate of growth which if it occurs, will leave all parties satisfied that they have produced neither more nor less than the right amount. According to the Harrod-Domar model, a target growth rate can be attained either by increasing the marginal propensity to save and increasing simultaneously the stock of capital or by increasing the output-capital-ratio.

### 1.6.1 Capital accumulation and labour employment under Harrod-Domar model

We have so far discussed the Harrod-Domar model of growth with respect to only one aspect of the model i.e. capital accumulation and growth. We now discuss another important aspect of the model i.e. employment of labour. In the Harrod-Domar model, labour can be introduced to the model under the following assumptions:

1.    that labour and capital are perfect complement instead of being substitute for one another
2.    that capital-labour ratio is constant.

       Under these assumptions, given the capital-labour-output-ratio, economic growth can take place only so long as the potential labour force is not fully employed. This implies that a potential labour supply imposes a limit to economic growth at the full employment level. This means:

(i).   That growth rate will take place beyond the full employment only if supply of labour increases.
(ii).  That actual growth rate will be equal to a warranted growth rate (Gw) only if growth of labour force equals the warranted growth rate (Gw). If labour force

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increases at a lower rate, the only way to maintain the growth rate is to introduce the labour-saving technology. Under this condition the long-term growth rate will depend on:

a.       growth rate of labour force($\Delta L/L$)

b.       the rate of progress in labour-saving technology.

Thus, the maximum growth rate that can be sustain in the long run will be equal to $\Delta L/L$ plus a factor n i.e. the rate at which capital substitute labour.

Harrods calls this growth, the natural growth rate ($G_N$).

$G_N = \Delta L/L + n$…............................................................................................(6.10)

### 1.6.2 Limitations of the Harrod-Domar Model

1.       **Unrealistic assumptions:** The Harrod-Domar propositions that savings will always increase to match with investment need is based on the assumption that the warranted growth rate is equal to the actual growth rate. This is possible only under the following simplified assumptions of the model:

   - MPC remains constant
   - Output capital ratio (k) is constant
   - The technology of production is given
   - The economy is initially in equilibrium
   - There is no government expenditure and no foreign trade
   - There are no lags in adjustment between:
     a.     Demand and supply
     b.     Savings and investment.

   Since these assumptions make the modern economy unrealistic, the warranted or expected growth rate may not always be equal to the actual or realised growth rate. And if warranted and actual growth rate are not equal there will be economic instability.

2.       **Another major defect of the model is that the parameters used namely**: Capital output ratio, marginal propensity to save, growth rate of labour force, progress rate of labour-saving technology are all determined independently out of the model. The model therefore, does not ensure the equilibrium growth rate in the long run. Even the slightest change in the parameters will make the economy deviate from the path of equilibrium.

   In spite of these limitations, the Harrod-Domar model had been used in development planning of many countries. Besides, it has a great analytical power.

   One key policy implication of the Harrod-Domar model is that the growth rate of the economy can be influenced by policy makers by tinkering with components of the warranted growth rate. This means that by designing policies to influence the saving rate or enacting policies to reduce the output-capital-ratio say, by investment in human capital, productivity of capital can be increased hence the growth rate of the economy can be considered a policy variable.

**Self-Assessment Exercise 4**

1. Explain the warranted rate of growth as contained in the Harrod-Domar model.
2. Discuss the assumptions of the Harrod-Domar model and its limitations.

**1.7 The Neoclassical Growth Model**

In one sense, neoclassical growth theory stands at an opposite extreme from Harrod-Domar. In place of the Harrod-Domar assumption of a single production process that imposes a fixed ratio between capital and labour is the assumption of an indefinitely large number of production processes, one shading off from another in a way that permits any combination of labour and capital to be employed. Capital is thus regarded as a unique, abstract agent of production that can be adjusted at any time to absorb into employment a labour force of any size. With the combination of labour and capital capable of varying in this way, it follows that, instead of the fixed ratio between output and capital employed by Harrod-Domar, the output capital ratio is also capable of varying continuously. Thus, the larger the labour force absorbed into employment with a given stock of capital, the greater will be the output capital ratio, or the productivity of capital and the smaller will be the output-labour ratio or the productivity of capital and the higher the productivity of labour. These results follow simply as a matter of diminishing returns.

In order to explain the model, it begins by pointing out the differences and similarities between the assumptions of the Harrod-Domar and Classical growth models.

1. While the production function implicitly in the Harrod-Domar model contains only one factor i.e. capital, the neoclassical growth model assumes a multifactor production function including capital, labour and technology.
2. In the Harrod Domar, labour and capital are deemed to be perfect complement of one another where as in the Neoclassical model, capital and labour are assumed to be substitute for one another.
3. While Harrod-Domar model assumes a constant capital output ratio, the neoclassical model assumes a variable capital output coefficient. Incidentally, both models assume that capital and labour are subject to the law of diminishing marginal returns to scale.
4. In addition, the neoclassical model assumes perfect competition where factor prices equal their marginal revenue productivity. According to the neoclassical model, rate of economic growth depends on growth rate of:
- Capital, K;
- Labour supply, and
- Technological progress overtime, T.

The relationship between the national output and these variables maybe expressed in the form of a production function i.e.:

$$Y=f (K, L, T) …............................................................ (6.11)$$

Where:
Y= national output L = Labour supply, K=stock of capital
T= the scale of technological progress

If technology assumes to remain constant for the sake of simplicity, then the growth rate depends on K and L. The production function then takes the following

form:

$$Y = f(K, L) \dots \dots \dots \dots (6.12)$$

Given the assumption of constant returns to scale, if the increase in L is not very great in the period in question, the increase in Y will be approximately equal to the increase in L times the marginal physical product of L, or $\Delta Y = MPP_L \cdot \Delta L$ in which $MPP_L$ is the marginal physical product of labour or the increase in Y that accompanies a unit increase in L with K held constant. If we had assumed an increase in K with no change in L, under the same assumptions, we would have had $\Delta Y = MPP_K \cdot \Delta K$ in which $MPP_K$ is the marginal physical product of capital or the increase in K with L held constant. Finally, for changes in both K and L in a given time period we may write:

$$\Delta Y = MPP_K \cdot \Delta K + MPP_L \cdot \Delta L \dots \dots \dots (6.13)$$

Dividing both sides by Y, we have:
$$\Delta Y/Y = (MPP_K)/Y \cdot \Delta K + (MPP_L)/Y \cdot \Delta L$$

This may also be written as:
$$\Delta Y/Y = (MPP_K/Y \cdot K) \Delta K/K + (MPP_L/Y \cdot L)\Delta L/L \dots \dots \dots (6.14)$$

If we recall the assumption noted earlier of perfect competition markets and now adopt the marginal productivity theory of factor pricing, each unit of a factor will be paid its marginal product, and the total earnings of capital and labour will equal to $MPP_K \cdot K$ and $MPP_L \cdot L$ respectively. Given that factors are paid their marginal products, the total earnings of capital and labour will exactly absorb the total output in the case of the present production functions with constant returns to scale that is:

$$MPP_K \cdot K + MPP_L \cdot L = Y \dots \dots \dots (6.15)$$

Since:

$$MPP_K \cdot K/Y + MPP_L \cdot L/Y = Y/Y = 1 \dots \dots \dots (6.16),$$

We may substitute b for the first term on the left and $(1 - b)$ for the second term and rewrite equation (6.14) in the following form:

$$\Delta Y/Y = b(\Delta K/K) + (1-b)(\Delta L/L) \dots \dots \dots (6.17)$$

The magnitude of b indicates the proportion of the total product or of total income that would be received as a return on capital if capital were paid its marginal product. This is the same as saying that b measures the elasticity of output with respect to changes in the amount of capital used. The same kind of statement may of course be made for labour by making the appropriate substitutions in the second preceding sentence.
Assuming a value for $b = 0.25$, we may read from equation (6.17) the percentage change in output that will follow from a given percentage change in capital, labor or both. If both K and L rise by 3 per cent, output also rises by 3 per cent, for the underlying production function is one with constant returns to scale. In this case, we have:

ΔY/Y=0.25X3+0.75X3=3

Like the Harrod-Domar model, the neoclassical growth model implies that the path and speed of an economy's growth are endogenous policy variables that are within the ambit of policy makers.

**Self-Assessment Exercise 5**

> 1. What were the major limitations in the Harrod-Domar growth model?
> 2. What are the criticisms of the Schumpeterian growth theory?

**1.8 Summary**

This unit provided us with the theories of economic growth. The basic conditions necessary for economic growth were discussed. We differentiated between Marxian and classical theories as well as the Harrod Domar and the neoclassical growth models. The unit ended it analyses on the mathematical derivation of the models under Harrod- Domar and Neoclassical as well as some policy implications for economic growth.

**1.9 References/Further Readings**

Anyanwu, J.C. & Oaikhenan, H.E. (1995). *Modern Macroeconomics: Theory and Applications in Nigeria*. Onitsha-Nigeria: Joanee Educational Publishers Limited.

Domar, E. (1946). "Capital Expansions, Rate of Growth and Employment." *Econometrica*, Vol. 14.

Harrod, R.F. (1948). *Towards a Dynamic Economics*. Macmillan.

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**1.10 Possible Answers to SAEs**
These are the possible answers to the SAEs within the content.

➢ SAEs 1
According to Marxian theory of growth, if unproductive labour (which does not produce profit) increases faster than productive labour (which produce profit), this will cause the rate of profit to fall, because costs are increasing, but profit is not.

➢ SAEs 2
1. Schumpeterian growth theory is economic growth that is driven by innovation and governed by the process of creative destruction.

2. The criticisms of the Schumpeterian growth theory are:
  a. It concentrates only on innovation
  b. It does not consider profit as the only reward for risk taking.

➢ SAEs 3
The following are the criticisms of the classical growth theory:
  i. Neglect of the public sector.
  ii. It ignores the middle class.
  iii. Unrealistic growth process.

➢ SAEs 4
 1. The warranted growth rate is the growth rate at which all saving is absorbed into investment. For instance, if people save 10 percent of their income and the economy's ratio of capital to output is 4, the economy's warranted growth rate is 2.5 percent (10 divided by 4)

 2. Assumptions of Harrod-Domar model
   • MPC remains constant
   • Output capital ratio (k) is constant
   • The technology of production is given
   • The economy is initially in equilibrium
   • There is no government expenditure and no foreign trade
   • There are no lags in adjustment between:
     a.    Demand and supply
     b.    Savings and investment.

Limitations:
   i.    It uses only capital and savings as determinants
   ii.    ii. The model assumes that the economy is operating at full employment.