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PRINCIPLES OF MACRO ECONOMICS

GOLD KAFILAH LOLA, PhD

& YUSUF HAMMED AGBOOLA, PhD

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PRINCIPLES OF MACROECONOMICS

Gold, Kafilah Lola PhD & Yusuf, Hammed Agboola PhD



PRINCIPLES OF MACROECONOMICS

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DEDICATION

This book is dedicated to all Economics students.

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PREFACE

Considering the need to make a reading material that will facilitates students' understanding of the elementary Principles of Macroeconomics as one of the core courses in the Department of Economics, the co-authors decided to come up with this book. The book is as brief as possible and is written in simple language.

The book, to ensure standard, treats the topics therein with relevant diagrams that will later be written with a volume contents.

Some algebraic treatment is made in the book to adequately equip students with the expected knowledge that is required to possess as a foundation student(s) of Macroeconomics.

It is our belief, that students and other users of the book will find it worthwhile.

Finally, we wish to stress that the book is meant for the National Certificate of Education (NCE), bachelor's degree in economics (B.Sc.) and bachelor's degree in economics education (B.Sc. Ed), and it is suitable for use in all tertiary institutions of learning.

Gold, Kafilah Lola PhD and Yusuf, Hammed Agboola PhD February 2023

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CHAPTER ONE

INTRODUCTION

SOME BASIC CONCEPTS DEFINED

A. Distinction between microeconomics and macroeconomics

Economics is broadly divided into two branches namely microeconomics and macroeconomics theories. Microeconomics is the study of the consumer (household), the producer (the firm), that determines the prices of commodities, wages of labour, etc. On the other hand, macroeconomics studies aggregate in the economy such as total income, total expenditure, total employment/unemployment, total saving, total investment, total consumption, the general price level, growth of the whole economy, etc. Hence, while microeconomics, for example, looks at how the price of a commodity is determined; macroeconomics looks at the general price level. Also, microeconomics looks at how the remuneration of the factors of production are determined while macroeconomics looks at the national income. As well, microeconomics looks at the part, and macroeconomics looks at the whole.

However, microeconomics and macroeconomics are closely related. Actions in one have effects on the other. For example, if a large industry lays off its staff this may have effects on the total employment situation in the economy. Also, if an industry increases the price of its product (e.g., petroleum product) this may have effects on the general price level. Despite this close relationship, the two are different.

Prior to 1930, the emphasis of economic theory was on microeconomics. But with the great depression and the Keynesian prescription to pull the world economy out of depression, the emphasis shifted to macroeconomics.

Macroeconomics as a separate branch of Economics is often justified on the grounds that the observed aggregate economic behaviour within an economy does not often equal the summation of the economic behaviours of the individuals within the economy.

B. Functions

Functions express relationships between two or more variables such that a change in the value of one variable is related to the change in the value of some other variable or variables in a regular and predictable way. They can be expressed in mathematical or graphical forms. They can also be linear, or nonlinear. In mathematical form, they can be written implicitly e.g., C = f(y), or explicitly e.g., C = a + by. Graphical, they can be represented in form of a schedule as follows:



Some functions in macroeconomics include consumption, investment savings, income, import and aggregate expenditure functions.

A. Model

An economic model is a set of relationships, which described how an economic entity functions under a set of simplifying assumptions. It is usually made up of a number of structural equations, which can be definitional or behavioural e.g., Y = C + 1 + G... aggregate demand expenditure, where:

 $C = C_0 + cY...$ Consumption function $I = I_0 + rY...$ Investment function $G = G_0...$ Government expenditure

B. Structural Equations

Both functions and models consist of structural equations, which have both dependent and independent variables. An independent variable is a known variable that will help to determine the value of the unknown or dependent variable e.g., C = f(Y). The dependent or unknown variable is C while the independent or known variable is Y. Thus, given the value of Y, we can determine the value of the dependent variable, C.

C. Stock and flow variables

Stock variables are quantities measured at a given point in time. Macroeconomic stock variables include the total money supply, total bank deposits, total stock, total national debt, etc. Flow variables on the other hand are quantities measured over a given period. Examples include income (per week, month, year), national income, national output, national expenditure, consumption, investment, and saving each of which is expressed per month, per year, etc. While a flow variable has a time dimension, a stock variable does not.

D. Endogenous and exogenous variables:

Exogenous variables are those whose values are determined outside an economic model or system e.g., the money supply is normally seen as an exogenous variable because it is determined by monetary authorities. Endogenous variables on the other hand are those, which are explained or determined within a model or a system e.g., aggregate consumption.

E. Types of equations:

Equations can be in a general (implicitly) form C = C(Y) or specific (explicit) form, i.e., $C = 80 + 07.5 \text{Y}\Delta$.

Behavioural equations: Simplify the relationship between certain variables based on the behavioural assumption made about them: C = Co + cY.

Institutional or technological equations: Specify institutional relationships e.g., R=rD i.e., banks are required by law to hold a fraction *r* of their deposits *D* as reserves.

Definitional equations: e.g., Y = C + I + G in which aggregate expenditure *Y*, is the sum of the consumption, investment, and government expenditure or S = I, i.e., saving is equal to investment. This type of equation is often referred to as IDENTITIES.

F. The circular flow of income:

We consider this from the perspective of a simple hypothetical economy that has only two units - the production and consumption units which are respectively called the business and household sectors. The business sector produces, and the household sector consumes. The household sector sells factors of production to the business sector in form of land, labour, capital, and entrepreneurs. In return, the business sector sells goods and services to the household sector. All that the household sector receives from the business sector for the sale of factors of production, it spends on buying goods and services from the latter. And all that the business sector receives from the household sector for the sale of goods and services, it spends on buying factors of production.

If we assume a barter economy, the exchange of goods and services for the factors of production between the two sectors is called the REALFLOW OF INCOME which is shown in Figure 1.1.



Fig 1.1. Circular flow of income

If we now introduce money, the business sector received from the household payment for the goods and services supplied while the household sector receives from the business sector remuneration for factor services in form of rent (land), wages, and salaries (labour), interest (capital), and profit (entrepreneur). This is the MONETARY FLOW or income.

Note that there is equality between the amount received by the two sectors. This is the sense in which OUTPUT = EXPENDITURE and EXPENDITURE = INCOME.

CHAPTER TWO

THE NATIONAL INCOME

The national income is the total money value of all the goods and services produced in an economy over a period, usually a year. It is the total output produced by all individuals, firms, and government of a country in a year.

It can also be seen as the total income received by all the factors of production in a country in a year. It is also the total expenditure made by all economic units for the purchase of goods and services in a country in a year. Before any income/ expenditure is counted as part of national income, two requirements must be met.

- (1) The income/expenditure must be in respect of the current year.
- (2) The income/expenditure must be in exchange for goods and services produced/received or a service rendered (quid pro quo).

Hence, transfer payments (money received from grants such as scholarships and bursary awards, gifts, retirement benefits, etc.) must be excluded.

MEASUREMENT OF NATIONAL INCOME

There are three approaches to calculating the national income, but the three approaches are different ways of looking at the same thing; hence with necessary adjustments the figures arrived at will be the same, in respective of whatever approach is employed. The approaches are:

The Income, output, and expenditure approaches

A. The income approach:

This is the aggregation of the remuneration paid to all the factors of production. It is made up of production.

- 1. Wages and salaries including commissions, overtime payments, etc.
- 2. Rent to land, shops, houses, factory buildings and estimates of rents on owner-occupied buildings.
- 3. Interest on all kinds of capital
- 4. Profits on personal businesses, professional firms, partnerships

(unincorporated businesses) corporate profits, both distributed (dividends) and undistributed plus corporate profit tax.

To arrive at Gross National Product (GNP) the following are added to the above four:

- i. Indirect taxes such as VAT and excise duties are included in the prices of commodities.
- ii. The amount set aside from the profit from depreciation i.e., the wear and tear of equipment and machines.

Payments received by individuals which have not been because of the exchange of goods and services i.e., transfer payments such as pensions, bursary awards, unemployment benefits, etc., should be deducted.

The GNP using this income approach is the summation of wages and salaries, rents, interests, profits of unincorporated firms, dividends, undistributed corporate profits, corporate profit, indirect tax, indirect taxes, and depreciation.

GNP Less depreciation is Net National Product (NNP) = National Income.

B. The Expenditure/outlay approach

This is the aggregation of all expenditures incurred during the year on goods and services.

The components are:

- 1. Personal Consumption Expenditure (C): This includes all expenditure on personal consumption by all individuals in a country on durable goods (vehicles, computers), non- durable goods (bread, provisions), and services (legal and medical services, transport etc.).
- 2. Gross Domestic Private Investment (I): This is the summation of all expenditures incurred on investments such as residential buildings, in addition to the stock of plant and machinery, and net changes in inventories, etc.
- **3.** Government Expenditure on Goods and Service (G): These include expenditure on currently produced goods and services by the government at all levels such as stationery, office equipment, payment of salaries of government employees,

construction of roads, bridges, buildings, expenditure on government enterprises, etc.

4. Net Foreign Export/Investment (X-M). This is the difference between the value of currently produced goods and services exported by the country and the value of currently produced goods and services imported from other countries. The national income by this approach is Y = C - 1 + G + (X - M)

C. The product or Output Approach

This is the aggregate of all goods and services produced by all the productive resources in the country in a year. The total value of the goods and services can be got by multiplying the final goods and services by their market prices. Alternatively, we can calculate the value added by all the sectors of the economy - the summation of all the value added to raw materials and intermediate goods before they become final goods and services.

Wheat \longrightarrow	Floor	→ Bread
FaImer →	Mill	→ Baker
₩30 →	₩40	→ ₩60

Hence, the value can be calculated as 430 plus (40-30) i.e., 10 plus (60-40) i.e., 20 = 60 for the final loaf.

Some important National Income Concepts: Gross Domestic Product sums up the goods and services produced within the geographical or territorial boundaries of a country irrespective of the nationality of the people involved. Gross National Product on the other hand involves the output produced or income earned by only nationals of a country wherever they are living.

Hence, we must deduct from the GDP the part of the output produced by foreigners and add the part of the output of nationals of the country living in other countries.

> GNP = GDP + (X - M) NNP = NDP + (X - M)GNP - Depreciation = NNP

- NNP- Net Indirect Business Taxes = National Income OR
- GNP- Depreciation Indirect Business Taxes

= National Income GNP at factor cost =

GNP at market price - Indirect Taxes + subsidiaries.

Uses of National Income figures

- 1. National Income data form the basis of national police e.g., manpower policies. The engagement taking place in industrial output, saving, and investment, etc. will serve as a signal for the manpower needs of the country.
- 2. The data are useful for economic planning purposes since figures of income, output, saving, investment, etc., are got from the data.
- 3. They help in the research effort.
- 4. They show the changes taking place in the level structure of economic activities in a country.
- 5. Per capita income could be gotten from this data. This is useful for Inter-temporal and inter-country comparisons of levels of economic welfare.

Problems with the Calculation of National Income Figures

- 1. **Double Counting:** Because of the difficulty of distinguishing between intermediate and final goods and services, some goods and services are counted twice e.g., counting expenditure on flour and bread. A way of solving the problem is to count only the final goods and services. Another is to count only the values added.
- 2. Non-marketed goods: A lot of economic activities are not marketed especially in developing countries, thus, leading to an underestimation of the value of the activities. Such activities include subsistence farming, farm labour paid for in kind rather than in cash, owner-occupied houses, etc. To solve the problem, value is usually imputed to such goods and services. But this is also difficult.
- **3. Omitted market transaction:** There are a lot of economic activities going on in an economy, but which is illegal. Such illegal activities include prostitution, smuggling, drug trafficking, foreign exchange racketeering, etc. Where a lot of such activities go on in the economy, the national income will be underestimated.
- 4. Changes in the value of money: Changes in the price level make it difficult to accurately measure the national income. A rise in the price level will give the impression that output has increased

even when such an increase has not occurred. A fall in the price level on the other hand will give the impression that the output of goods and services has fallen even when there is no change in output. This problem is usually solved by deflating the national income figures relative to a given base year when prices are stable.

- 5. **Depreciation:** The figures set aside by enterprises and films for the wear and tear of machines are usually arbitrary. They do not reflect the actual amount of depreciation for the year. Apart from this, when the price level is rising, should depreciation be based on historical cost or replacement value?
- 6. It is also difficult to estimate the value of the services rendered by some public servants e.g., the army. Their salaries are used as a surrogate for measuring the value of their services. But their services during the war period are not the same as those of peace time.

FACTORS DETERMINING A COUNTRY'S NATIONAL INCOME

The size of a country's national income or a country's material standard of living depends on several factors which include the following:

(1) **The stock of natural productive resources:** The size of a country's national income will depend to a large extent on the quantity of natural resource endowments such as fertile arable land, mineral deposits, fishing grounds, suitable climate, hydro-electronic power potentials, navigable rivers and lakes which enhance effective communication, and so on.

For example, a country that is naturally endowed with a large expanse of fertile arable land and suitable climate has the potential for a large output in the agricultural sector than the other country with a smaller arable piece of land experiencing the extremes of heat and humidity which contribute to deteriorating soil quantities.

Similarly, the OPEC nations of the developing world are richer than their non-oil-producing counterparts. In addition, the

qualities of resources differ from one country to the other. For instance, the Nigerian Bonny Light and the British Brent-type of crude oil are of better quantities and will yield higher income than most of the other crude oil being produced in other oilproducing countries.

- (2) The nature of the people and age structure: The quantity and quality of labour have a great influence on the volume of production. These, however, depend on the inborn intelligence, the growth rate of the population, the proportion of the population in the working age bracket, the quality of education and training, and the health of the people, to mention a few. Other things being equal, the national income will be higher, the greater the proportion of workers to the total population and, the longer their working hours. The labour force of an economy must be large and skillful enough for efficient utilization of other resources.
- (3) **The stock of capital equipment:** The larger a country's stock of modern forms of capital equipment, the greater its volume of production. Natural resource utilization is more effective and labour productivity is enhanced by capital equipment. In other words, capital formation is an essential prerequisite for material progress.
- (4) **The level of technology:** The volume of production of national income figures is relatively high in such countries like Japan, the USA, Britain, France, and other developed countries, while national income figures are relatively low in technologically backward countries of Africa, Asia and Latin America because of the widespread use of primitive tools in their real sectors (i.e., manufacturing, and agricultural sectors). For example, the Nigerian agricultural sector which accounts for about 60 percent of the country's entire labour force cannot feed the nation sufficiently because of the widespread use of cutlasses and hoes. Whereas foodstuffs are produced in surplus in most developed countries where the agricultural sector accounts for less than 10 percent of the total labour force. This is largely due to the

intensive and extensive use of harvesters and tractors which make large-scale farming possible coupled with the introduction of high-yield seeds.

- (5) **Political Stability:** If a country is to achieve a high level of production, political stability is essential. The frequent occurrence of military coups and countercoups in some African countries has hindered economic growth in these countries. Such a phenomenon apart from reducing the level of domestic economic activity often discourage foreign investors.
- (6) Foreign private investment, loans, and aids: The inflows of foreign capital often fill the gap between the domestically available resources (government tax revenue, savings, foreign exchange, and skill) and the planned level of these resources necessary to accelerate the economic growth rate. Therefore, national income will be higher in a country with an enabling environment for foreign investments and which has easier access to bilateral loans from richer countries and multilateral loans, from international capital markets e.g. The London and Paris Clubs of creditors.
- (7) **Net benefits in international trade:** The extent to which natural resources such as minerals can be exploited depends directly on both domestic and foreign demand. National income will increase in a country that is experiencing growing demand for its exports. For instance, when the Gulf War between the US allied forces and Iraq was gathering momentum in the third and fourth quarters of 1990, the demand for crude oil increased per barrel to about \$40. The country's export of crude oil increased from about 1.5 million barrels per day (mbd) to about 1. 9mbd resulting in a rise in foreign exchange income running to billions of naira during the Gulf War windfall.

CHAPTER THREE

NATIONAL INCOME MODELS

EQUILIBRIUM NATIONAL INCOME

It is necessary to define certain variables and concepts that relate to the determination of the equilibrium level of national income.

- 1. The 45° Line. It is the line that shows equality between annual income and annual expenditure. It makes an angle 45° with the Y-axis. Points on the left of the line show that expenditure is greater than income. Points to the right show that income is greater than expenditure.
- 2. The Consumption Line/Function/Equation: This relates household's consumption expenditure to national income i.e., the relationship between aggregate household consumption expenditure and national income. The short run consumption function takes the general form: C = a + bY where a is autonomous consumption which is not related to income bY is the induced consumption which depends on the level of income. 12 is the constant proportion of income spent on consumption i.e., b is the coefficient of Y. The linear consumption function intersects the Y-axis above zero which shows that consumption is positive at zero-level income. The constant a is positive. Consumption increases as income increases but not by as much as the increase in income. This means that the slope of consumption line 12 which is also the marginal propensity to consume (MPC) is positive but less than one i.e., 0 < b < 1.
- 3. **Investment:** This is exogenous because it does not vary with the level of income. It is therefore a horizontal straight-line investment and is an injection into the circular flow of income. An injection is any amount introduced into the circular flow of income from one sector which has not been received from the other sector.
- 4. **Saving:** The saving schedule shows the relationship between savings and different levels of income. The slope of the saving schedule is the marginal propensity to save (MPS). The

derivation of the saving function is:

Y = C + S ... (1) C = a + bY ... (2)Substitute (2) into (1) Y = a + bY + S Y - a - bY = S -a + Y - bY = S -a + (1-b)Y = S= S = -a + (1-b)Y ... (3)

Hence the intercept of the saving function -a is negative. Saving is a withdrawal or leakage from the circular flow of income. Any income received by the household which is not passed on to firms for buying goods and services is a withdrawal or leakage, e.g., personal income tax.



- 5. Aggregate Demand Function: This is also called the aggregate expenditure function. In a two-sector economy, it is the total expenditure incurred on the purchase of consumption and investment goods by the household and business sectors: Y = C + I
- 6. **Equilibrium income:** This is the level of national income that is just sufficient to purchase all the goods and services produced in the economy i.e., the aggregate expenditure is equal to the national income. The equilibrium can be determined both graphically and algebraically as shown below.



Graphically in a two-sector economy, equilibrium is determined where:

- 1. The aggregate expenditure function intersects the 45°
- 2. The saving line intersects the investment function Algebraically:

Income/Expenditure Approach

$$Y=C+I_{o}$$

$$C=a+by$$

$$Y=a+bY+I_{o}$$

$$Y-bY=a+I_{o}$$

$$(1-b)=a+I_{o}$$

Income/Expenditure Approach Y=C+I $= \underbrace{100}{20} = 0.75Y + \underbrace{100}{20} = \underbrace{100}{20} = \underbrace{100}{20} = \underbrace{100}{20} = \underbrace{100}{0.25} = \underbrace{100}{20} = \underbrace{100$

Given that: Y = C + I or Y = C + SWhen $C = \bigstar 20m + 0.75Y; I = \bigstar 40m$ And $S = \bigstar 20m + 0.25Y$ Or Saving/Investment Approach Y=C+S C=a+bY Y=a+bY+S Y-a-bY=SBut S=I Y-a-bY=1I Y-bY=I+a (1-b)Y=a+I $Y=\underline{a+I}$ 1-bSaving/Investment

Saving investment S=I $\Rightarrow 20m + 0.25Y = \Rightarrow 40$ $0.25Y = \Rightarrow (40+20) m$ $0.25Y = \Rightarrow 60m$ $Y = \Rightarrow 24m$

Three-sector model

Here the government expenditure (G) is introduced, and the graphical approach is:



Algebraic Approach Y=C+I+G C=a+bYd $Yd=Y-T_0$ $I = I_0$ G = G S = a+(1-b)Y

Income / Expenditure Y=C+I+G $Y=a+b(Y-T_0)+I_0+G_0$ $Y-bY=a-bT_0+I_0+G_0$ $Y=a-bT_0+I_0+G_0$ 1-b

 $\begin{array}{l} Saving/Investment \\ S=I_0+G_0 \\ -a+(1-b)(Y-T_0)=I_0+G_0 \\ -a+(1-b)Y+bT_0=I_0+bG_0 \\ (1-b)Y=I_0+G_0-bT_0+a \\ (1-b)Y=a-bT_0+I_0+G_0 \\ Y=a-bT_0+I_0+G_0 \\ 1-b \end{array}$

Consumption

Consumption is the total expenditure by households on goods and services. The largest component of aggregate demand is consumption.

Although, the amount spent by individuals or households on any particular good or service is determined by all sorts of factors, the major influence on the level of aggregate consumption is the level of current disposable income. An increase in disposable income will induce consumers to increase their total spending. On the contrary, a decrease in disposable income induces consumers to reduce their total goods and services. Keynes called this positive relationship between consumption expenditures and disposable income, the consumption function.

The consumption function is any equation, table, or graph which shows the relationship between consumers' disposal income and the amount, they plan, or desire, to spend on currently produced final goods and services.

In this general theory, Keynes assumed that consumption is directly and linearly related to disposable income.

If we assume that no government exists, there would be no taxation, and hence national income (Y) would constitute consumers' disposable income (Y). Therefore, in a non-governed or two-sector economy, the Keynesian consumption function can be express as: C = a + bY

In equation (2-2), the letter *a* represents the level of consumption that will occur independent of the level of income, that is, the level of consumption when income is zero. The letter *b* on the other hand stands for the marginal propensity to consume (MPC). Letters *a* and *b* are constants.

Marginal propensity to consume (MPC) is the fraction of additional income that will be consumed. But in a governed economy, disposable income is national income minus personal taxes (T)

 $Y_d = Y - T - (T)$

The consumption function will be:

 $C = a + bY_d$

or

C = a + b(Y-T) of change in consumption (C) to change in disposable income (AY_d)

 $MPC = \Delta C$

 ΔY

A typical consumption function is presented in Figure 2-1

The Consumption Function



Figure 2-1

The slope of the consumption function is b or MPC. From equation (2-4), substituting for C equation (2-7) APC = $a + bY_d$ $\frac{Y_d}{Y_d}$ From equation (2.8), we can see that at every lave

From equation (2-8), we can see that at every level of disposable income, APC will be greater than MPC. This is confirmed in Table 2-1 which is showing the consumption function schedule for a hypothetical economy.

Disposable income Y _d	Consumption Expenditure C	Average Propensity to consume APC	Marginal to consume MPC
0 100 200 300 400 500 600 700 800 900 1.000 1.100 1.200	180 250 320 390 460 530 600 670 740 810 880 950 1,020	- 2.50 1.60 1.30 1.15 1.06 0.00 0.96 0.93 0.90 0.88 0.86 0.85	- 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.7

Table 2-1

Consum	ntion	Function	(₩ billion)
Consum	puon	runction	(IN DIMON)

The consumption function illustrated in Table 2-1 is expressed by the following equation:

 $C = 180 \text{ billion} + 0.7 Y_{d}$

SAVINGS

Individuals or households can use their disposable income in two ways: (1) for the purchase of goods and services, and (2) for savings. Saving (S) is the function of disposable income which is not spent or consumed in the current period.

More precisely, saving is the difference between disposable income and consumption expenditures.

$Y_d = C + S$	(2-10)
it follows that:	
$S = Y_d - C$	(2-11)
$C = Y_d - S$	(2 - 12)

We can obtain the saving function from the consumption function by using equations (2-0) and (2-11).

 $S=Y_{d}-C$ = Y_d-(a+bY_d) = Y_d-a-bY_d = -a + (Y_d-bY_d) = -a + (l-b)Y_d

The saving function shows the relationship between planned savings and disposable income.

More specifically, the saving function given in equation (2-13), shows that saving is positively related to disposable income. The quantity (1-b) is the marginal propensity to save (MPS), and the first term gives the level of saving when $Y_d = 0$.

Marginal propensity to save (MPS) is the fraction of additional income that will be saved.

Alternatively, MPS is defined as the ratio of change in saving (S) to change in disposable income (AY). This relationship can be represented at:

 $MPS = \underline{\Delta S} \\ \underline{\Delta Y}_{d}$

The saving function expressed in equation (2-13) is shown graphically in Figure 2-2.

The arithmetical computation of the saving function is presented in Table 2-2. It is based on the consumption data of Table 2-1. The saving column is obtained by subtracting the consumption from the

disposable income. The algebraic equivalent of the saving function will be:

The Saving Function



Figure 2-2: The Saving Function

The slope of the saving function is (1-b) or MPS. **Table 2-2 Saving Function (₦ billion)**

Disposable income (Y _d)	Consumption Expenditure (C)	Saving (S)	Average Marginal Propensity to save (APS)	Propensity to Save (MPS)
0 100 200 300 400 500 600 700 800 900 1,000 1,100 1,200	180 250 320 390 460 530 600 670 740 810 880 950 1,020	$\begin{array}{c} -180\\ -150\\ -120\\ -90\\ -60\\ -30\\ 0\\ 30\\ 60\\ 90\\ 120\\ 150\\ 180\\ \end{array}$	- -150 -0.60 -0.30 -0.15 -0.60 0 0.04 0.70 0.10 0.12 0.14 0.15	- 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3

The second important concept of saving is the average propensity to save (APS).

The average propensity to save (APS) is the fraction of disposable income that is saved. The APS is expressed in the same way as the APC - that is, as the ratio of saving to disposable income. This:

$$APS = \underline{S}_{Y_{d}}$$
(2-16)

The APS column in Table 2-2 is obtained by dividing saving by disposable income.

Since any additional income that is not spent must be saved, MPC and MPS must add up to one.

MPC + MPS = 1 (2-17)

This relationship can be confirmed from the consumption and saving functions given in equations (2-4) and (2-13), respectively.

Where MPC = b, and MPS = 1-b, it follows that MPC + MPS = b + 1 - b = 1

Similarly in Tables 2-1 and 2-2, the MPC is complimentary to MPS at each level of disposable income, the sum of the two is always 1.0. It follows from equation (2-17) that:

MPC = 1 - MPS (2-18)MPS = 1 = MPC (2-19)

The argument above applies to APC and APS. Because consumption and saving exhaust disposable income, the APC and the APS must also add up to one. Therefore,

 $APC + APS = 1 \qquad (2-20)$

Let us confirm this relationship using an algebraic explanation. From the definitions given in equations (2-13) and (2-16).

$$APS = -a + (1-b) Y_d$$

$$= -a + (1-b)$$

$$Y_d$$

$$= -a + (1-b)$$

$$Y_d$$

$$= -a + (1-b)$$

From equations (2-8) and (2-21) APC + APS = a + b(-a + (1-b)) Y_d Y_d = 1

Similarly, an inspection of Tables 2-1 and 2-2 will confirm this relationship. And it follows from equation (2-20) that:

APC = 1 - APS (2 - 22)APS = 1 - APC (2 - 23)

There are two things to note in our analysis of the relationships between MPC and MPS on one hand, and between APC and APS on the other hand. First MPC and MPS are constant at 0.7 and 0.3 respectively throughout the various levels of disposable income. This follows from our assumption of a linear relationship between consumption and disposable income. Second, the APC declines as income rises, while the APS increases as income rises. The implication of these observations is simply that:

Consumption rises less than in the proportion to disposable income.

But many economists have recognized the fact that the relationship between consumption and disposable income might not be linear in real life. This implies that each level of disposable income will be associated with different MPC and MPS. A typical example is given in Table 2-3. A cursory glance at the table will also confirm the validity of the complimentary relationship between MPC and MPS.

Y С MPC* S MPS+ 8,000 8,200 -2800.92 0.08 9.000 9,200 -200 0.87 0.13 10,000 10,070 -70 0.16 0.84 11,000 10,910 90 0.26 0.74 12,000 11,650 350 0.66 0.34 13,000 12,310 690 0.60 0.40 14,000 12,910 1,090 0.55 0.45 13.460 1.540 15.000 0.49 0.51 16,000 13,950 2,050 0.58 0.42 17,000 14,370 2,630

Table 2-3 Hypothetical Consumption and Saving Function (₦ billion)

The formula in equation (2-6) is applied to obtain the MPC column + the MPS column is obtained using the formula in equation (2-14).

4 Changes in Equilibrium Income - The Multiplier

The multiplier refers to the equilibrium level of national income because of a change in an autonomous variable. It can be defined as an amplified increase (decrease) in the equilibrium level of the national income because of an initial increase (decrease) in an autonomous economy based on this multiplier principle. The concept is based on the following assumptions:

- 1. There is an initial increase in autonomous variables such as investment, taxation, imports, etc.
- 2. The new level of spending is maintained throughout the period of the working of the multiplier.
- 3. There is no time lag in the multiplier process. The change in the national income occurs spontaneously.
- 4. Consumption is a function of current income.
- 5. The marginal propensity to consume is constant.
- 6. There is excess or idle capacity in the industrial sector to meet the expected increase in demand.
- 7. Other resources are also readily available for employment to meet the increase in demand.

Working of the Multiplier: The multiplier begins with an initial position. Assume government expenditure increases by ₩20b over the previous level. This will lead to the employment of resources like land, labour, capital, materials, etc. to the tune of ₩20b. The various factors employed will also spend the money on consumption and further production which will lead to another round of employment of resources. This will again provoke another round of consumption and production. This will continue in successive rounds until no further increases in consumption and production can be noticed. By this time, the initial increase in government expenditure must have multiplied itself several times depending on the value of the (MPC). The number of times the initial increase multiplies itself ultimately is what is called a multiplier. Therefore, the higher the MPC, the higher the multiplier.

Assume a change in 1_0 in a two-sector model:

$Y=C+I_0$	 (1)
- 0	

 $\Delta Y = \Delta C + \Delta 1_0 \qquad \dots \qquad (2)$

Divide both sides by ΔY

Make ΔI_0 the subject of the formular ΔY

- We have $\underline{\Delta I} = 1 \underline{\Delta C} \qquad \dots \qquad (5)$
- Take the reciprocal $\Delta I \qquad \dots \qquad (6)$

We have
$$\underline{\Delta I} = 1 - \underline{\Delta C} \dots$$
 (7)

But note that
$$\underline{\Delta C} = MPC \text{ or } b \dots (8)$$

 $\underline{\Delta I} = 1 - b$
 $\underline{\Delta Y} = \underline{1} - b$
 $\underline{\Delta Y} = \underline{1} - b \dots (9)$

The change in national income (Y) because of a change in investment (I_0) is equal to 1 divided by 1 minus the MPS.

Graphically:



More formally:

$$Y = C + I_0$$

$$C = a + bY$$

$$Y = a + bY + I_0$$

$$Y - bY = a + I_0$$

$$(1 - b) Y = a + I_0$$

$$Y = a + I_0$$
Equilibrium Income

Balanced Budget Multiplier (Unit Multiplier):

The balanced budget multiplier analyses the effect on the equilibrium level of national income of a simultaneous equal increase in government expenditure and taxation i.e., an increase in government expenditure that is financed by an increase in taxation. Given a model:

Y=C+I+G C=a+bYd Yd=Y-T $T=T_{0}; G=G_{0}; 1 \text{ and } I=I_{0}$

Find both the government expenditure and tax multipliers

dY = -b	dY = -b
dG_0 1-b	dT 1-b
dY + dY =	<u>1</u> + <u>-b</u>
dG dT	1-b 1-b
$= \underline{1-b} =$	1
$\overline{1-b} =$	1

The balanced budget multiplier is 1. This shows that the effect of an increase in government expenditure and taxation on the national income is that the national income will increase by the increase in government expenditure.

Four-Sector Model:

This is an open economy where international trade is allowed. While the level of exports is autonomous, imports are endogenously determined by the level of income. That is, the higher the level of income, the higher the level of imports, ceteris paribus. Hence the import function is like the consumption function: $M = M_0 + mY$. Also, there are two components of the import function too - the autonomous element *Mo*, a constant, and an element that depends on the level of income *mY*. The slope of the function, *M*, is the marginal propensity to import (MPI). Note that the import function can also be *M*-*mY*. It depends on the specification.

The model:

$$Y = C_{0} + G_{0} + (X_{0} - M).$$

$$C = a - bYd$$

$$Yd = Y - T$$

$$M = M_{0} + mY$$

$$Y = a + b(Y - T_{0}) + 1_{0} + G_{0} + (X_{0} - (M_{0} + mY))$$

$$= a + bY - bT = 1_{0} + G_{0} + X_{0} - M_{0} - M_{0}$$

$$Y - bY + mY = a - bT_{0} + 1_{0} + G_{0} + X_{0} - M_{0}$$

$$(1 - b + m)Y = a - bT_{0} + 1_{0} + G_{0} + X_{0} - M_{0}$$

$$Y = \underline{a - bT_{0} + 1_{0} + G_{0} + X_{0} - M_{0}}$$

$$(1 - b + m)$$

The import multiplier is negative. That is, an increase in the level of imports will lead to a fall in the level of equilibrium national income. Because imports constitute a leakage in the flow of income.

Criticisms of the Multiplier

- 1. The multiplier process assumes that there is no time lag in its working. This assumption of instantaneity in the change of equilibrium income is unrealistic.
- 2. Investment is assumed to be exogenous. But some investment may be introduced resulting from induced consumption.
- 3. The principle assumed that there are idle resources in the economy which are then employed during the multiplier process. This is unrealistic as there may be a shortage of types of labour and other resources in the economy.
- 4. If there is full employment in the economy, the multiplier principle breaks down completely.
- 5. The principle is also based on a linear relationship between consumption and income in which the MPC is assumed to be greater than zero but less than unity. Empirical studies however show that the relationship between consumption and income is complicated, and non-linear consumption depends not only on current income but also on average current, past and expected income.

CHAPTER FOUR

MODELS IN MACROECONOMICS

Income Determination with Government Spending and Tax

- The two additional variables to the two-sector model are the government spending on purchases (G), and income tax (T). It assumes:
- (i) There is no transfer payment.
- (ii) There is only one form of tax, that is, a lump sum income tax, determined exogenously, independent of the national income, and
- (iii) The government spending is too exogenously determined.

Let us assume, for the sake of simplicity that the government follows a balanced budget policy, ie, the government keeps its expenditure (G) equal to its tax revenue (T).

Given these conditions, the variables of the aggregate demand (AD) and aggregate supply (AS) of the three-sector model can be specified as

AD = C + 1 + G(1)

 $AS = C + S + T \dots (2)$

The Keynesian condition for the equilibrium of the national income may now be written as

C + I + G = Y = C + S + T.....(3)

Thus, at equilibrium, Y=C+1+G.....(4)

In three sector model, variable C in Equation (4), in needs to be redefined.

Where: $C = a + bY_d$ $Y_d = Y - T$ ------ (Disposable Income) T = Tax ------- (Lump Sum)
Therefore, in a three-sector model, consumption function reads as $C = a + b(Y - T) \dots (5)$

By substituting Equation (5) for C in Equation (4), the equilibrium level of national income can be written as Y=a+b(Y-T)+I+G......(6)

Solving Equation (6) for Y, we get the equilibrium level of income (Y) as Y = a + bY - bT + I + G Y(1 - b) = a - bT + I + G $Y = \underline{a - bT + I + G}$(7) 1 - b

Equation (7) gives the equilibrium level of national income. If consumption function and the equilibrium values of constants (I, G and T) are known, the equilibrium level of the national income can be easily worked out. A numerical example is given below.

Numerical Example

 $C = 200 + 0.8 Y_{d}$

I = 300

Let us also assume that the government has a balanced budget with G = T = 150

By substituting these values into Equation (7), we get the equilibrium level the national income (Y) as follows.

$$Y = \frac{200 - (0.8)150 + 300 + 150}{1 - 0.8}$$
$$= \frac{200 - 120 + 300 + 150}{0.2}$$
$$= \frac{530}{0.2}$$
$$Y = 2650$$

Question 2

Given an economy that is characterized as follows. $C = C_0 + bY_d$ $bY_d = Y - T$ Y = C + I + GT = To + 1Y (Tax Function) Where C = Consumption Yd=Disposable Income T = Lump Sum TaxI = Investment Expenditure G = Government Expenditure b = Marginal propensity to consume t = Marginal tax rate (MTR)C = N500 + 0.75 YdT = N 600m + 0.2Y where t = 0.2I = N 400mG = N350m

Required:

- (a). Derive the equilibrium national income equation (Y)
- (b). Find the value of the equilibrium national income
- (c). Determine the value of disposable income
- (d). Find the value of consumption
- (e). What is the value of tax rate?
- (f). Determine the value of tax multiplier and investment multiplier

a) Derivation of Equilibrium National Income Equation Y=C+I+G(1)

$$Y = C_0 + bY_d + I + G$$
(2)

$$Y = C_0 + b(Y - T) + I + G$$
.....(3)

$$Y = C_0 + b[y - (T_0 + ty)] + I + G$$
.....(4)

 $Y = C_0 + b(Y - T_0 - ty) + I + G$(5)

 $Y = C_0 + bY - T_0 - btY + I + G$(6)

Collect like terms in equation (6)

 $Y - bY + btY = C_0 - bT_0 + I + G$(7)

Factorize the left side of equation (7)

 $Y(1-b+bt) = C_0 - bT_0 + I + G$(8)

Divide both sides of equation (8) by (1-b+bt)

$$\frac{Y(1-b+bt)}{(1-b+bt)} = \frac{C_0 - bT_0 + I + G}{1-b+bt}$$
$$Y = \frac{C_0 - bT_0 + I + G}{1-b+bt} \quad \dots \dots \dots \dots (9)$$

b) The value of the equilibrium national income is found by substituting the actual values C_0 , G, T_0 , I, b, t, into equation (9)

Where
$$C_0 = 700$$
, $G = 450$
 $T_0 = 800$, $b = 0.8$
 $I = 600$, $t = 0.25$
 $Y = \frac{700 - 0.8(800) + 600 + 450}{1 - 0.8 + (0.8 \times 0.25)}$
 $Y = \frac{700 - 640 + 600 + 450}{1 - 0.8 + 0.2}$
 $Y = \frac{1110}{04} = 2775$
Thus: The Value of the equilibrium national income is N

Thus: The Value of the equilibrium national income is N2,775

c)
$$Y_{d} = Y - T$$

= $Y - (T_{0} + tY)$
= $Y - T_{0} - tY$

Where
$$Y = 2775$$
, $T_0 = 800$, $t = 0.25$
 $Y_d = 2775 - 800 - 0.25(2775)$
 $= 2775 - 800 - 693.75$

 $Y_{d} = 1281.25$ Thus: The value of the disposable income is №1,281.25 d) $C = C_{0} + bY_{d}$ Where $C_{0} = 700$, b = 0.8, $Y_{d} = 1281.25$ = 700 + 0.8(1281.25)= 700 + 1025C = 1725

Thus: The value of consumption is №1,725

e)
$$T=T_0+tY$$
 Where $Y=2775$, $T_0=800$, $t=0.25$
 $T=800+0.25(2775)$
 $T=800+693.75$
 $T=1493.75$
Thus: The value of tax rate is $\aleph 1,493.75$

f) Formula for Tax Multiplier (T_m) in this model is

$$T_{m} = \frac{\Delta Y}{\Delta T} = \frac{-1}{1 - b + bt} \qquad \text{Where } b = 0.8, \quad \text{and } t = 0.25$$

$$= \frac{-1}{1 - 0.8 + (0.8 \times 0.25)}$$

$$= \frac{-1}{1 - 0.8 + 0.2}$$

$$= \frac{-1}{4}$$

$$T_{m} = -2.5$$

The tax multiplier is -2.5, meaning a unit change (increase/decrease) in tax value induces the national income to change (decrease/increase) by 2.5.

Thus: Tax multiplier is having negative relationship with national income because tax is a leakages to the economy.

Formula for Investment Multiplier (k) in this model is $\Delta \mathbf{V}$

$$k = \frac{\Delta I}{\Delta I} = \frac{1}{1 - b + bt} \quad \text{Where } b = 0.8, \text{ and } t = 0.25$$
$$= \frac{1}{1 - 0.8 + (0.8 \times 0.25)}$$
$$= \frac{1}{1 - 0.8 + 0.2}$$
$$= \frac{1}{4}$$
$$= 2.5$$

The investment multiplier is 2.5, meaning a unit change (increases/decreases) in investment expenditure induces the national income to change (increases/decreases) by 2.5.

Thus: Tax multiplier is having positive relationship with national income because tax is an injection into the economy.

Question 3

Suppose that the behavioural equations and identities for an economy are given as follows

- (a) Derive the reduced form of the equilibrium equation
- (b) Find the value of the equilibrium national income
- (c) Find equilibrium value of imports

Solution

From the question:

 $Y_{d} = Y - 50 - tY = Y - T,$ $T = T_{0} + tY$

Y = C + I + G + X - M.....(1)

$$Y = C_0 + bY_d + I + G + [X - (M_0 + mY)]....(2)$$

$$Y = C_0 + b(Y - T) + I + G + [X - (M_0 + mY)]....(3)$$

$$Y = C_0 + b[y - (T_0 + ty)] + I + G + (X - M_0 - mY) \dots (4)$$

$$Y = C_0 + b(Y - T_0 - ty) + I + G + X - M_0 - mY$$
 (5)

$$Y = C_0 + bY - T_0 - btY + I + G + X - M_0 - mY$$
(6)

Collect like terms in equation (6) $Y-bY+btY+mY = C_0-bT_0+I+G+X-M_0$ (7)

Factorize the left side of equation (7)

$$Y(1-b+bt+m) = C_0 - bT_0 + I + G + X - M_0 \dots (8)$$

Divide both sides of equation (8) by (1-b+bt+m) $\frac{Y(1-b+bt+m)}{(1-b+bt+m)} = \frac{C_0 - bT_0 + I + G + X - M_0}{1-b+bt+m}$ $Y = \frac{C_0 - bT_0 + I + G + X - M_0}{1-b+bt+m} \dots (9)$

b) The value of the equilibrium national income is found by substituting the actual values C_0 , I, G, X, M_0 , T_0 , b, t, and m into equation (9)

Where
$$C_0 = 200$$
, I=60, G=60
X=20, M_0=10, T_0=50,
b=0.75, t=0.2 m=0.2

$$Y = \frac{200 - 0.75(50) + 60 + 60 + 20 - 10}{1 - 0.75 + (0.75 \times 0.2) + 0.2}$$

$$=\frac{200-375+60+60+20-10}{1-0.75+0.15+0.2}$$
$$=\frac{292.5}{0.6}$$

Y = 487.5

c) $M = M_0 + mY$ Where Y = 487.5, $M_0 = 10$ and m = 0.2 = 10 + 0.2 (487.5) = 10 + 97.5 M = 107.5

Question 4

Suppose that an economy is in equilibrium at $Y = C + I + G + G_T + (X - M)$ Where: C = 100 + b(X - 100 - tX + G) I = 200

 $\begin{array}{ll} C = 100 + b(Y - 100 - tY + G_{T}), & I = 200 \\ T_{g} = 50, & X = 20, & M = 10 + 0.12Y \\ b = 0.9, & t = 0.2 \end{array}$

Required:

- (a). Find the national income at equilibrium
- (b). Find foreign trade multiplier
- ©. How much additional government expenditure will be required to increase the equilibrium level of national income by N 50?
- (d). At equilibrium, does the economy have trade deficit or trade surplus and by how much?

Solution

(a).
$$Y = 100 + 0.9(Y - 100 - 0.2Y + 50) + 200 + 100 + 50 + [20 - (10 + 0.1Y)]$$

 $Y = 100 + 0.9(0.8Y - 50) + 350 + 20 - 10 - 0.12Y$
 $Y = 100 + 350 + 0.72Y - 45 + 20 - 10 - 0.12Y$
Collect the like terms
 $Y - 0.72Y + 0.12Y = 100 + 350 + 20 - 45 - 10$
 $0.4Y = 415$
Divide both side by 0.4
 $\frac{0.4Y}{0.4} = \frac{415}{0.4}$

$$Y = 1037.5$$

Thus: The national income at equilibrium is №1037.5

(b). Formula for Foreign Trade Multiplier (F_m)

$$F_{m} = \frac{\Delta Y}{\Delta X} = \frac{1}{1 - b + bt + m} \quad \text{Where } b = 0.9, \quad t = 0.2 \text{ and } m = 0.12$$
$$= \frac{1}{1 - 0.9 + (0.9 \times 0.2) + 0.12}$$
$$= \frac{1}{1 - 0.9 + 0.18 + 0.12}$$
$$= \frac{1}{0.4}$$
$$= 2.5$$

c) We have to find the level of changes in government expenditure (G) when national income increases Yby N50.

Since Government Multiplier $(G_m) = \frac{\Delta Y}{\Delta G}$ $G_m = \frac{\Delta Y}{\Delta G} = \frac{1}{1-b+bt+m}$ Where b = 0.9, t = 0.2 and m = 0.12 Where $G_m = 2.5$ (*Check answer b*) Therefore: $2.5 = \frac{50}{\Delta G}$ $2.5 \ \Delta G = 50$ Divide both sides by 2.5 $\frac{25\Delta G}{25} = \frac{50}{25}$ $\Delta G = 20$

Thus, an additional \$20 of government expenditure is needed to increase the equilibrium level of national income by \$50

(a). Net Export (NX) = X - M where Y = 1037.5
=20 - (10 + 0.12Y)
= 20 - 10 - 0.12 (1037.5)
= 20 - 10 - 124.5
NX = -114.5
Thus: At equilibrium, the economy has trade deficit of
$$\aleph$$
114.5

Question

Suppose in an economy Consumption function: $C = 200 + 0.8Y_d$ Investment expenditure: I = 150Government expenditure: G = 170Tax: T = 25 + 0.1YTransfer payment: $T_r = 50$ Export: X = 50Import: M = 18 + 0.12YWhere: Y = C + I + G + X - M $Y_d = Y - T$ $T = T_0 + tY$ and $M = M_0 + mY$

Find the followings:

- (a). The equilibrium national income equation
- (b). The equilibrium level of income
- (c). Consumption at equilibrium income
- (d). Net exports at equilibrium income
- (e). By how much the equilibrium changes if investment increases by N50
- (f). The increase in the government expenditure required to ensure that the economy reaches the full employment level of income of N1600

Solutions

(b). The value of the equilibrium national income is found by substituting the actual values C_0 , I, G, T_r, X, M₀, T₀, b, t, and m into equation (9)

$$Y = \frac{200 - 0.8(25) + 0.8(50) + 150 + 170 + 40 - 18}{1 - 0.8 + (0.8 \times 0.1) + 0.12}$$
$$Y = \frac{200 - 20 + 40 + 150 + 170 + 40 - 18}{1 - 0.8 + 0.08 + 0.12}$$
$$Y = \frac{562}{0.4} = 1405$$

Thus: The national income at equilibrium is №1,405

(c).
$$C = C_0 + bY + bT_0 - btY + bT_r$$

Where Y = 1405, $C_0 = 200$, $T_0 = 25$, $T_r = 50$, b = 0.8, $t = 200 + 0.8(1405) - 0.8(25) - (0.8 \times 0.1 \times 1405) + 0.8(50) = 200 + 1124 - 20 - 112.4 + 40 = 1231.6$

=

Thus: Consumption value at equilibrium income is \$1231.6(d). Net Exports (NX) = X - M where Y=1405 = 40 - [18 + 0.12(1405)] = 40 - (18 + 168.6) = 40 - 18 - 168.6 NX =-146.6 Thus: Net exports is having negative balance of \$146.6 (Trade deficit)

(e). When Investment (I) changes by $\Delta I = \Re 50$, what is ΔY Since Investment Multiplier (k) = $\frac{\Delta Y}{2}$

$$k = \frac{\Delta Y}{\Delta I} = \frac{1}{1 - \frac{b}{b} + bt + m} \text{ where } b = 0.8, \quad t = 0.1 \text{ and } m = 0.12$$
$$= \frac{1}{1 - 0.8 + (0.8 \times 0.1) + 0.12}$$
$$= \frac{1}{1 - 0.8 + 0.08 + 0.12}$$

$$= \frac{1}{0.4}$$

K = 2.5
Therefore: 2.5 = $\frac{\Delta Y}{50}$
 $\Delta Y = 2.5 \times 50$
 $\Delta Y = 125$

(e). $\Delta Y = \text{New National Income } (Y_1) - \text{Initial Income } (Y_0)$ $\Delta Y = 1600 - 1405$ $\Delta Y = 195$ Thus: We have to find the level of changes in government expenditure(ΔG) as a result of national income increased (ΔY) by \aleph 195. Since Government Multiplier (G_m) = $\frac{\Delta Y}{\Delta G}$ $G_m = \frac{\Delta Y}{\Delta G} = \frac{1}{1 - b + bt + m}$ where b = 0.8, t = 0.1 and m = 0.12 Where $G_m = 2.5$ (*Check answer d*) Therefore: $2.5 = \frac{195}{\Delta G}$ $2.5\Delta G = 70$ Divide both sides by 2.5 $\frac{2.5\Delta G}{2.5} = \frac{195}{2.5}$ $\Delta G = 78$

Thus: Additional ₩78 of government expenditure is needed

to increase the equilibrium level of national income by \aleph 195 to make the new national income (Y₁) = \aleph 1600

Question 5

An economy shows the following features Consumption $C = 80 + 0.8 Y_{d}$ (Where, $Y_d = Disposable income$) T = 60 + 0.2Y(Where, Y = National income) Investment I = 200 - 10R(Where, R = Rate of interest, percentage)Transfers $T_r = -40$ Government Expenditure G = 160Transaction and precautionary demand for money $M_1 = 0.4Y$ Speculative demand for money $M_2 = 300 - 20R$ $M_s = 476$ Supply of money (Amounts in Naira)

Required:

- a. Calculate the equilibrium values of Y and R.
- b. Is the government budget in surplus or deficit?
- c. What is the level of consumption at equilibrium level of income?

Solution

(a). To find the equilibrium level of Y and R, we need to find IS and LM functions

IS function: $Y = C + I + I$	+ G	
Where: $C = 80 + 0.8Y_{d}$	I = 200 - 10R,	G = 160,
$Yd = Y - T + T_r$,	T = 60 + 0.2Y,	$T_{r} = -40$
$Y = 80 + 0.8Y_{d} + 200 - 0.8Y_{d}$	100R + 160	(1)
$= 80 + 0.8(Y - T + T_r) +$	-200 - 100R + 160.	
= 80 + 0.8[Y - (60 + 0.2)	2Y) - 40] + 200 - 10	$00R + 160 \dots (3)$
= 80 + 0.8(Y - 60 - 0.2Y)	(Y-40) + 200 - 100	$R + 160 \dots (4)$
= 80 + 0.8Y - 48 - 0.16	Y - 32 + 200 - 100H	$R + 160 \dots (5)$
= 80 + 200 + 160 - 48 -	-32 - 100R + 0.8Y -	- 0.16Y
= 360 - 100R + 0.64Y.		
Collect like terms		
Y - 0.64Y = 360 - 100F	2	
$0.36Y = 360 - 100R \dots$		(7)

Divide both sides of equation (7) by 0.36 360 - 100R 0.36Y $\frac{1}{0.36} = \frac{300}{1000}$ 0.36 Y = 1000 - 277.8R(8) LM function: $M_1 + M_2 = M_s$ Where $M_1 = 0.4Y$, $M_2 = 300 - 20R$, $M_s = 476$ 0.4Y + 300 - 20R = 476(9) Solve for Y 0.4Y = 476 - 300 + 20R0.4Y = 176 + 20R (10) Divide both sides by 0.4 $\frac{0.4Y}{0.4} = \frac{360-100R}{0.4}$ Y = 440 + 50R(11) Equilibrium R can be found by equating (8) to (11) 1000 - 27.7777778R = 440 + 50RCollect like terms -27.77777778R - 50R = 440 - 1000-77.7777778R = -560Divide both sides by -77.7777778 $\frac{-77.7777778R}{-77.7777778} = \frac{-560}{-77.7777778}$ <u>- 77.7777778</u>R R = 7.2

Equilibrium Y can be found by substituting R = 7.2 into Equation (11) Y=440+50(7.20)Y=440+360Y=800 (a). Government Budget Balance $(G_{bb}) =$ Total Budget Government Revenue (Tax) – Total Budget Government Expenditure $(G+T_r)$ Where T = 60 + 0.2Y, $T_r = -40$ and G = 160, Y = 880 $G_{bb} = T - (G+T_r)$ $G_{bb} = 60 + 0.2(880) - (160 - 40)$ $G_{bb} = 60 + 160 - (120)$ $G_{bb} = 220 - 120$ $G_{bb} = 100$

Thus: The government budget is surplus, meaning; the total budgeted government revenue (Tax) is greater than the total budgeted government spending $(G+T_r)$

(b).
$$C = 80 + bYd$$
 where $Y = 800$
 $= 80 + 0.8[Y - (60 + 0.2Y) - 40]$
 $= 80 + 0.8(Y - 60 - 0.2Y - 40)$
 $= 80 + 0.8(800 - 60 - 0.2(880) - 40)$
 $= 80 + 0.8(800 - 60 - 160 - 40)$
 $= 80 + 0.8(540)$
 $= 80 + 432$
 $C = 512$

Question 6

Consider an economy with the following specificationConsumption:C = 50 + 0.8(Y - 75)Investment:I = 180 - 8iGovernment expenditure:G = 115Money demand: $M_d = 0.25Y - 5i$ Money supply: $M_s = 80$ Where: Y is Income and i is percentage interest rate

Required:

a) Compute the equilibrium income, Y and interest rate, i.(b) Suppose the government increases its expenditure on security and housing by N90. What would be the impact on equilibrium income?

Solution

(a).	IS function:	Y = C + I + G
	Y = 50 + 0.8(Y - 7)	$5) + 180 - 8i + 115 \dots (1)$
	Y = 50 + 0.8Y - 60)+180-8i+115(2)
	Y = 50 + 180 + 113	5 - 60 + 0.8Y - 8i
	Y = 285 + 0.8Y - 8	3i(3)
	Y - 0.8Y + 8i = 28	5(4)
	0.2Y + 8i = 285	(5)

LM function: $M_d = M_s$

0.25Y - 5i = 80	(6))
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Solve equation (5) and (6) simultaneously using elimination method

Multiply equation (5) by 5 and equation (6) by 8 to eliminate i

$0.2Y + 8i = 285 \dots$	$(5) \times 5$
0.25Y-5i=80	(6)×8
Y+40i=1425	(7)
2Y-40i=480	

Add up equation (7) and (8) together

 $3Y = 1905 \dots (9)$

Divide both sides by 3 to get the value of Y

 $\frac{3Y}{3} = \frac{1905}{3}$ Y = 635Thus: The equilibrium income is N635 To get the equilibrium interest rate, i – Substitute Y = 635 into equation (6) to get i 0.25(635) - 5i = 80 158.75 - 5i = 80 -5i = 80 - 158.75 -5i = -78.75 Divide both sides by (-5) $\frac{-5i}{-5} = \frac{-78.75}{-5}$

i = 15.75% (remember interest (i) is in percent)

(b). When government spending increase ΔG by $\mathbb{N}90$, what is the new equilibrium income.

New government expenditure $(G_1) = G_0 + \Delta G$ = 115 + 90 = 205

By substituting the new value of government spending (G) into equation (1)

$$Y = 50 + 0.8(Y - 75) + 180 - 8i + 115 \dots (1) \text{ we get}$$

$$Y = 50 + 0.8(Y - 75) + 180 - 8i + 205 \dots (10)$$

$$Y = 50 + 0.8Y - 60 + 180 - 8i + 205 \dots (11)$$

$$Y = 50 + 180 + 205 - 60 + 0.8Y - 8i$$

Y = 375 + 0.8Y - 8i(12)

Y - 0.8Y + 8i = 375(13)

0.2Y + 8i = 375(14)

Since our LM function remain the same $M_d = M_s$

0.25Y - 5i = 80(6)

Solve equation (14) and (6) simultaneously using elimination method

Multiply equation (14) by 5 and equation (6) by 8 to eliminate i

 $0.2Y + 8i = 375 \dots (14) \times 5$

0.25Y - 5i = 80(6) × 8

Y + 40i = 1875(15)

Add up equation (15) and (8) together

3Y = 2355(9)

Divide both sides by 3 to get the value of Y

$$\frac{3Y}{3} = \frac{2355}{3}$$

Y = 785
Thus: The new equilibrium income is N785
 $\Delta Y =$ New equilibrium income (785) – Initial equilibrium
income (635)
 $\Delta Y = 150$
Thus: when the government spending increased by ~~N~~90 makes

the equilibrium income increased by $\mathbb{N}150$

CHAPTER FIVE

INVESTMENT

In its ordinary use, investment means buying shares, bonds, and securities. But this is not a real investment. Rather it is a financial investment. In the analysis of national income, investment refers to the part of aggregate output which takes the form of the construction of new structures such as building, buying of new capital equipment, and changes in business investment.

TYPES OF INVESTMENT

- 1. Gross and net investment: All investments in a country in a year are gross investments. This is the increase in the total assets in a year. Net investment is what remains after deducting depreciation and obsolescence charges from investment. Net investment is gross investment minus depreciation and obsolescence charges.
- 2. Intended and Unintended Investment: When investment is planned with a specific objective in mind it is an intended or voluntary investment. For example, entrepreneurs deliberately invest to raise productive capacity or install a new plant that will reduce the cost of production, these are intended investments which are planned. But when stocks of capital or inventories accumulate because of an unexpected fall in demand, this is an unintended or involuntary investment.
- 3. Autonomous and Induced Investment: When investment is made independent of the level of income but rather made dependent on such other factors as innovation, invention, growth of the population, etc., it is an autonomous investment. Such investment could be made by the government on such projects as infrastructures or by the private sector. In this respect, the investment curve/line is horizontal. However, an investment may also be income motived i.e., when the level of income is rising. Other factors that cause induced investment function depend on the level of income.

- 4. **Motivation for Investment:** In a free enterprise economic system where there is competition, the decision to invest is influenced by the profit motive. This is the main motivation for investment. However, other motives include:
- i. <u>The existing stock of capital:</u> If this is large and there is idle capacity in the economy, potential investors may be discouraged from investing and vice- versa.
- ii. <u>Level of income:</u> If the level of income in the economy is rising, the demand for goods and services will rise, then, investors will be encouraged to invest.
- iii. <u>Business expectation:</u> If businessmen are generally optimistic about net returns from investment, the investment will rise.
- iv. <u>Consumers' demand:</u> The present demand for goods influences the level of investment in the economy. If it is rising rapidly, investment will rise.
- v. <u>Growth of the population</u>: If the population is growing rapidly this means an expanding potential market. Businessmen will increase their investment in such a situation.
- vi. <u>Availability of bank and other credit facilities:</u> If credits are readily available to investors there will be an increased investment.
- vii. Inventions and innovations which lead to technological improvement will also motivate businessmen to invest to enjoy the benefits of improved efficiency of the method of production.
- viii. <u>Liquid assets</u>: If business firms possess huge liquid assets they will be induced to invest.
- ix. Government Policies especially on taxation may motivate investment. If tax reliefs are granted to industrialists, they will be motivated to invest.
- x. <u>Political Climate:</u> If there is political stability and peace in the country, investment both local and foreign tends to be higher in the country than when there is unrest and political instability.

DECISION OF INVEST

The two most important factors determining inducement to invest are:

- 1. The rate of interest and
- 2. The marginal efficiency of capital (MEC).

The two are interdependent. If the market rate of interest falls, investment increases, and if it rises investment falls. Hence, there is an inverse relationship between investment and the rate of interest. But the marginal efficiency of capital (MEC) is even more important for determining investment decisions. The MEC is the rate of return on the last unit of capital employed. For example, if the cost of a new machine is 20,000.00 and the estimated return on it for a year is 2,000.00, the MEC is calculated as $2000 \times 100\% = 10\%$

20000

It is this MEC [r] that will be computed to the market rate of interest (*i*) If r>I, then, the investment is profitable and should be undertaken. If r < i, then, do not undertake the investment.





Marginal efficiency of capital

As more capital is added to a fixed amount of land, the MEC declines over a period because of the operation of the law of

diminishing returns; hence, MEC is negatively sloped. Note that the MEC relates the flow of capital stock to investment. Another curve is the Marginal Efficiency of Investment (MEI). This relates the flow of investment per year to the rate of interest. It is the rate of return on the last unit of investment made. In each case, equilibrium is attained when the market rate of interest is equal to the MEC/MEI.



Fig 5.2 Marginal efficiency of capital

5. THE ACCELERATION PRINCIPLE

The principle is based on the fact that the demand for capital goods is a derived demand i.e., it is derived from the demand for consumer goods which the capital goods help to produce. The principle explains the process by which an increase (or decrease) in the demand for consumers will lead to a change in the capital stock.

The principle is based on some assumptions:

- 1. The capital-output ratio is constant.
- 2. Resources are easily available.
- 3. There is no excess or idle capacity in plants.
- 4. Credit and capital can be supplied to any extent to meet the increase in investment goods.
- 5. An increase in output instantaneously leads to a rise in investment.

The working of the principle depends on the acceleration coefficient

or accelerator (compare to the multiplier). It is the ratio of induced investment to an initial consumption expenditure i.e.

 $V = \underline{DI}$ which is the capital-output ratio. DY

For example, if an increase in consumption expenditure of ₩10.00 leads to an increase in

investment of \aleph 30.00, then the accelerator is:

 $V = D \div 7 DY, 30 \div 10 = 3$

Thus, if output in time t is Y and in the preceding period is Yt - I, r is replacement investment and V is the capital-output ratio or the acceleration coefficient, then investment in time t can be expressed as the difference in output in the two time periods (t, and t-l) multiplied by accelerator i.e Gross investment 1gt:

1gt = v(Yt - Yt - I) + R= VDY + R

Gross investment (lgt) is equal to the accelerator multiplied by a change in output plus replacement investment. The net investment will be gotten by deducting replacement investment (depreciation) from the two sides i.e.

 $1_{nt} = v(Y_1 - Y_1 - I) = VDY_1$

Net investment is equal to the accelerator multiplied by the change in output Demand for capital.

CHAPTER SIX

CLASSICAL/KEYNESIAN DEBATE ON INTEREST RATE

The classical theory of interest rate determination is based on the inter-action of the supply and demand for capital.

Demand for capital: The classical school asserts that capital is demanded by the investor because it is productive. But the productivity of capital is subject to the law of diminishing return i.e., additional units of capital employed will just be worthwhile - it will yield only normal profit. Since the investor is assumed to borrow to finance the project at a higher rate of interest, the demand for capital and the rate of interest are inversely related.



Supply of capital: This depends on saving by the community. Some people save irrespective of the rate of interest. Others save because the current rate of interest is just right and if the rate of interest falls, they will reduce their saving. There are those who are induced to save only when the rate of interest is raised. These people see saving as a sacrifice that should be compensated for. Hence, saving and the supply of capital varies directly with the rate of interest. Therefore, The higher the rate of interest, the higher the saving and therefore the supply of capital. The equilibrium rate of interest is determined by the inter-action of the demand for and supply of capital.



The equilibrium rate of interest is determined by the inter-action of the demand for and supply of capital.



Demand and Supply of Capital **Fig. 6.3 Equilibrium rate of interest**

At the equilibrium point, the quantity of capital demanded and supplied is $0K^*$. The rate of interest is $0R^*$. If the rate of interest will fall. The reverse also holds. Hence there is an automatic adjustment to equilibrium in case of disturbance.

DEFECT OF THE CLASSICAL MODEL

The school believes that only the rate of interest determines the level of saving and investment in the economy. But Keynes successfully proved that the level of income is also a strong factor. The theory neglects the effects of investment on the level of income. If investment

fall, the level of income and by extension saving also will fall.

The theory assumes full employment. This is unrealistic. The theory also neglects the influence of monetary factors in the determination of interest rates. This is because the school sees money as a veil that only facilitates exchange.

Keynesian Theory of Interest Rate

This is otherwise called the "Liquidity Preference Theory". It is based on the demand and supply of capital.

Demand for money: This means the desire of the people to hold money in liquid form rather than in the form of interest-yielding assets. Money can be kept in form of assets that will yield interest to the owner. Most people are aware of this. For people to keep it in form of idle cash balances when they can invest it, there must be reasons for doing this.

In his liquidity preference theory, Keynes identified three motives for holding money: transitionary, precautionary, and speculative motives.

The Transitionary Motive: Incomes and expenditures do not synchronize perfectly. People therefore must hold an average level of cash balances to pay for food, transport, and pleasure daily since incomes come weekly, monthly, etc.

The size of income held for this purpose depends on the size of income, the interval between incomes, the level of prices, and the possibility of securing credit facilities.

The Precautionary Motive: Cash balances are also kept covering events of a more uncertain nature such as illness, breakdown of vehicles, unemployment, etc. The amount held for this purpose depends on the size of income, the outlook of the person - whether an optimist or a pessimist, and whether it is possible for the individual to borrow money at short notice.

The Speculative Motive: People also hold cash balances to take advantage of rises in the price of bonds/securities on the stock exchange. The price of bonds and the rate of interest are inversely related. The speculative demand is a function of the current rate of interest, the expected rate of return, and the degree of certainty people place on their estimates.

Money supply: This is the total amount of money in circulation or an economy. It is believed by the Keynesian school that the supply of money is exogenously determined by the monetary authority - the Central Bank, which can increase or decrease the amount of money in circulation through several instruments. The equilibrium rate of interest is then determined at the point. Where the demand for and the supply of money are equal.



Fig 6.4: Money Supply

The Modern Theory of Interest Rate:

The theory identifies two markets in the economy - the product and money markets. The interest is then determined by simultaneous equilibrium in both markets.

The product/goods market: This is the real sector of the economy. Equilibrium is achieved when aggregate saving and aggregate investment in the economy are equal i.e., S = I.

The curve which shows the relationship between saving and investment in the economy is the IS curve. It is defined as the locus of all combinations of rates of interest and levels of income which guarantee equilibrium in the product market i.e., equality between saving and investment. Therefore, the curve is negatively sloped since there is an inverse relationship between investment and the rate of interest.



The Money Market: This is the monetary sector of the economy. Equilibrium is brought about here when the demand for, and the supply of money are equal. The curve that shows the relationship existing between various schedules of the demand and supply of money is the LM curve which is derived from the Keynesian liquidity preference. The LM curve is defined as the locus of all combinations of rates of interest and level of income which guarantees equilibrium in the money market i.e., equilibrium between the demand and supply of money. The curve is positively sloping showing that with a given level of money, an increase in liquidity preference will lead to a rise in the rate of interest.



Equilibrium: The equilibrium rate of interest is determined where there is simultaneous equilibrium in both the real (product) market and the money (monetary) market, i.e. S = I and Md = Ms.



Fig 6.7: Equilibrium rate of interest

The equilibrium is a unique one since if there is a disturbance leading to disequilibrium, forces will be set in motion to restore the original equilibrium position.

If $Y_t - Y_t - I$, net investment is positive in the period, But If $Y_t - Y_{t-1}$, net investment is negative in period *t* or there is disinvestment in period *t*.

The working of the principle can also be explained with a table:

Years	Y	R	1 _n		1 _g
1 t+1 t+2 t+3 t+4 t+5	2 100 100 105 115 130 140	3 400 400 420 460 520 560	4 40 40 40 40 40 40 40	$ \begin{array}{cccc} + & 5 \\ & 0 \\ & 0 \\ & 20 \\ & 40 \\ & 60 \\ & 40 \\ \end{array} $	$ \begin{array}{rcrcr} = & 6 \\ & 40 \\ & 40 \\ & 60 \\ & 80 \\ & 100 \\ & 80 \\ \end{array} $

The table assumes that the value of the acceleration coefficient v = 4. The required capital at each time is 4 multiplied by the corresponding output in each period.

Hence, $100 \ge 4 = 400$; $105 \ge 4 = 420$ and $140 \ge 4 = 560$.

Replacement investment is assumed to be 10% of the capital stock in period *t*, net investment is *v* multiplied by the change in output between one period and the preceding period, for t + 2, 5 x 4 =20; t+3: 10 x 4 = 40; t+4: 15 x 4 = 60, etc.

Gross investment is the addition of columns 4 and 5.

In period t + 2, an increase of 5 in total output leads to an increase of 20 in net investment of 20 in net investment since the accelerator is 4. In period t + 4, an increase of 15 (130-115) in total output leads to an increase of 60 in net investment.

Thus, the table shows that the net investment depends on the change in output. An increase in total output will lead to an amplified increase in net investment (compare it to the multiplier).

Limitations of the Model:

- 1. The capital-output ratio may not remain constant as the model implies in those days of inventions and innovations.
- 2. The model also assumed resources are easily available. This may be so if there is an unemployment of resources in the economy.

But if the economy is fully employed, this assumption becomes unrealistic.

- 3. The principle assumes there is no idle or excess capacity in the economy. This is also unrealistic as there are usually resources not employed in the economy.
- 4. Capital goods may not be readily available when needed as the principle assumes.
- 5. The assumption of permanently increased demand is also unrealistic.
- 6. Credit also may not be easily available for investment purposes; and if available, the rate of interest may not be tolerable.
- 7. The model does not take into cognizance other factors apart from demand which may influence investment decisions. Such other factors include stock market changes, political developments, international economic developments, etc.
- 8. The assumption of an instantaneous change in investment as output changes is unrealistic.

CHAPTER SEVEN

INFLATION

Inflation can be defined as a persistent and appreciable rise in the general price level or an average of prices.

CAUSES/THEORIES OF INFLATION

1. Demand-Pull/Excess Demand Theory

The theory says inflation arises when aggregate demand exceeds supply i.e., when the total demand for goods and services in the economy exceeds supply. We can see this from the IS and LM angles. After the full employment level of output has been reached, if there is then an increase in government expenditure or investment (which affects the IS curve) or an increase in money supply which affects the LM Curve) then inflation will occur.



60

It can also be explained through the quantity of money: MV = PT where M is the money supply; V is the velocity of circulation in M, that will lead to an equal proportional increase in the level of prices, i.e., if money supply increases by 40%, then the level of prices will increase by an equal percentage.

- 1. **Cost-push inflation:** This is when inflation results from an increase in the cost of production of goods and services such as an increase in wages and salary, increase in the rate of interest on loans, increase in taxation which will be passed on to consumers in form of an increase in prices of goods and services etc.
- 2. **Ratchet Inflation/Demand Shift Inflation:** This is like demandpull inflation, but it does not arise from excess demand. Rather, because of changes in taste and technology, there is excessive demand in certain sectors of the economy but inadequate demand in others. Prices rise when there is excess demand. But due to the activities of a trade union, prices do not fall in sectors where demand is inadequate. The overall effect is that there is an increase in the general price level.
- 3. War-induced inflation: When a country is at war resources will be diverted to the procurement/production of arms and ammunition to prosecute the war. Production of consumer goods and services will suffer. Where the supply of money is not reduced, inflation will occur.
- 4. **Imported Inflation:** Any country that has a predominant foreign sector in terms of imports or exports which operates a flexible exchange rate regime is prone to inflation (major supplier or buyer of internationally traded goods). If the prices of such commodities are rising, the country either imports at higher prices or benefits from higher earnings. Either may lead to inflation.

EFFECTS OF INFLATION

- 1. Generally, it leads to a fall in the value of money and distortion in the economy.
- 2. Fixed-income earners and pensioners suffer during the period.
- 3. Creditors and holders of government bonds do suffer.
- 4. Debtors are at an advantage.
- 5. Saving is completely wiped off. People want to spend no sooner than they receive income.
- 6. Commercial activities are favoured during the period and business profit increases.
- 7. It may lead to the misallocation of resources and discourage the growth of the economy.
- 8. Government revenue from indirect taxes and corporate profit tax increases.
- 9. It may cause social and political upheavals.

CONTROLOFINFLATION

It is important that the cause of inflation be diagnosed before knowing the instruments to apply. There are three major instruments.

- 1. Fiscal Policy Reduction in government expenditure
 - Reduction/increase in taxation
- 2. Monetary Policy
- Open Market Operations: Increase / Decrease in minimum lending

rate.

- Special deposits Directives Moral suasion

CHAPTER EIGHT

UNEMPLOYMENT

Unemployment may be better appreciated by looking at it from the angle of full employment. The classical economists believe that full employment exists when everybody who is at the running rate of wages wishes to be employed. This implies that those who are not employed and are not prepared to work at the existing wage rate are not regarded as unemployed.

They voluntarily choose to be unemployed. Keynes on the other hand believes that full employment is a situation in which everybody who wants to work gets work. Summing up these views, full employment may be said to exist when all willing and able people are gainfully employed.

Unemployment has been described as the involuntary idleness of a person willing to work at the prevailing rate of pay but unable to find it. It implies that it is only those people who are prepared to work at the prevailing rate but do not find work that are unemployed. People who are voluntarily unemployed such as the idle rich, women in purdah, etc. are not regarded as unemployed.

CAUSES OR TYPES OF UNEMPLOYMENT

- 1. Frictional Unemployment: This occurs when there is a lack of adjustment between the demand for and the supply of labour to a lack of knowledge on the part of the employer or employee. Employers are not aware that work is available at a particular place. Workers also may not have the required skill for a particular job or due to labour immobility. The period of unemployment between losing one job and finding another is also called frictional unemployment.
- 2. Seasonal Unemployment: This results from seasonal fluctuations in demanded e.g., in the temperate region, employment in ice cream factories is only for summer, and in the tropics where rainfall is seasonal, and agricultural workers are employed only during sowing and harvesting periods.

- 3. Cyclical Unemployment: This arises because of cyclical fluctuations in the economy which produce alternating periods of booms and bursts. During bursts, income, output, and aggregate demand fall resulting in widespread unemployment.
- 4. Structural Unemployment: This results from a variety of causes. It may be because of a lack of co-operant factors of production. It may be due to a change in the country's industrial structure i.e., switching from one kind of production to another e.g., from labour-intensive to capital-intensive.
- 5. Technological Unemployment: In the dynamic modern production process, innovation led to the adoption of new machines and inventions which displace existing workers leading to unemployment. This is like structural unemployment.
- 6. **Residual Unemployment:** Due to physical and mental disability and the low standard of efficiency attributable to such people, such workers are not employable.

CHAPTER NINE

ECONOMIC GROWTH

HARROD-DOMAR GROWTH MODEL:

The model was developed by two economists, Sir Henry Roy Forbes Harrod and Professor Evsey David Domar. It is a mode of growth that emphasizes the influence of saving and investment in the growth process i.e., saving, both domestic and foreign are expected to be mobilized to generate sufficient investment to accelerate economic growth. Indeed, with the model, it then becomes easy to set a growth target and then set aside a given proportion of the national income for investment purposes to achieve the set target.

Assumption:

The model is predicated on some simplifying assumptions:

- 1. There is an initial full employment equilibrium level of income.
- 2. The model operates in a closed economy that does not engage in foreign trade.
- 3. The ratio of capital to output called capital-output ratio is assumed to the constant.
- 4. There are no lags in the adjustment between investment and the creation of productive capacity. Adjustment is assumed to be instantaneous.
- 5. The marginal propensity to save is constant, and the APS and MPS are equal.
- 6. Saving and investment related to the income of the same year.
- 7. Labour and capital are used in a fixed proportion.

WORKING OF THE MODEL:

The concept of capital output ratio should be looked at more closely. Every economy must undertake saving i.e., desist from consuming a certain proportion of its national income to:

- 1. Replace worn-out equipment and
- 2. to add to the existing stock of capital.

It is believed that there is a direct relationship between the size of the total stock of capital in a country and the total GNP. If for
example, \$5.00 worth of capital is necessary to produce \$1.00 worth of GNP, then, the capital-output ratio is 5:1.

This capital ratio is important in the model. Let us define it as k.

ASSUME

Further that the national saving out of the national income is also known. This is the savings ratio. Assume for every \$100 of GNP, \$5.00 is saved. Hence the national savings ratio is 5%. The total amount of the new investment depends on savings. If we combine the savings ratio with the capital-output ratio we can arrive at national income i.e.

S-sY.....(1) (If, s=5% and $GNP= \bigstar 100m$ then, $S= \bigstar 5$).

(1) Investment is defined as the change in capital stock i.e.

 $I=\Delta K$ (2) But the total capital stock K has a direct relationship with Y i.e., the national income is:

 $\underline{\underline{K}}$ Y= i.e., Total capital stock = k, i.e., capital-output ratio of national income

Or $\Delta K = Ky$ (3)

Total national savings must equal total investment i.e., S = IFrom e.g. (1) S = Sy and $1 = k\Delta Y$ e.g. (2) become $sY = k\Delta Y$ Dividing by k and Y

 $\frac{SY}{kY} = \frac{k\Delta Y}{kY}$ $\frac{S}{kY} = \frac{Y}{kY} = g \text{ i.e., the growth rate of national income}$ $K = \frac{Y}{Y}$ Hence g = S

K K

This equality is very important in the neo-classical growth theory, and the fact that the conclusion of the growth model was developed by Harrod - Domar.

Hence an economy that wants to grow must save and invest a

certain proportion of their GNP. The higher the saving and investment, the faster the economy will grow.

If for example, we assume an economy's capital-output ratio k is 2 and the saving ratio is 4% of the GNP then the rate of growth of the GNP will be;

 $G = \Delta Y \div Y = S \div K = 4 \div 2 = 2\%$

If the national saving ratio increases to 10% with the capital out-put ratio remaining unchanged, then the growth rate will now be $g = S \div K = 10 \div 2 = 5\%$.

LIMITATIONS OF THE MODEL:

Most of the criticisms of the model emanate from the unreality of the assumptions:

- 1. The saving rate and the capital-output ratio are not likely to remain constant.
- 2. Labour and capital are not used in fixed proportions as the model assumes.
- 3. The model ignores the influence of the government sector on economic growth. This is unrealistic.
- 4. The model fails to distinguish between capital and consumer goods.
- 5. The model is however easy to apply.

Governments, having known the economic growth rate and the capital-output ratio simply set growth targets and then arrive at the proportion of the GNP that must be saved and invested to achieve the target.

CHAPTER TEN

TRADE OR BUSINESS CYCLE

Trade or business cycle is a phenomenon peculiar to the capitalist system. It has been defined in various ways by different economists. Professor Gottfried von Haberler defined it as an alternation of periods of prosperity and depression, of a good and bad trade. John Maynard Keynes defined it as a period of good trade characterized by rising prices and low unemployment percentages, alternating with periods of bad trade characterized by falling prices, and high unemployment percentages, etc. From the above, the concept implies wave-like movements in economic activities and economic variables in which booms and bursts alternate. The economic variables referred to include aggregate output (GNP), aggregate demand, employment, and price levels. Hence during booms, aggregate demand and price levels are high and the unemployment rate low while during bursts, the reverse is the case. And the business cycle phenomenon is depicted graphically in the Figure 10.1.



Figure 10.1; Business Cycle

TYPES OF CYCLES:

Business cycles are usually classified according to the length of the period between a

boom and bust. Five such cycles are identified as:

- 1. The short kitchin cycles or Minor Cycles that was postulated by Joseph Kitchin in 1923 to be a period between three and four years or forty months.
- 2. The Long Juggler or Major Cycles was hypothesized by Clement Juggler (1862) and his followers to be about nine and a half years.
- 3. The very long Kondratieff cycles which Nikolai Dmitrievich Kondratieff in 1925 concluded would last more than fifty years.
- 4. The building cycles relate to the construction of buildings which are of regular duration. This is associated with the work of two American economists Warren and Pearson. They in 1937 wrote that a cycle would last about eighteen years.
- 5. The Kuznets Cycles is named after Professor Simon Kuznet, an American economist who in 1967 propounded the secular swing cycle of between sixteen to twenty-two years.

Phrases of a Business Cycle



According to Burns, Arthur F. And Mitchell, Wesley C. (1927) a normal cycle consists of four phrases - recovery, prosperity, recession, and depression.

1. **Recovery Phase:** After a depression has lasted for some time, the revival phase begins. The forces that will start the recovery may

be endogenous or exogenous. Semi-durable goods wear out in the economy, and it is necessary to replace them. This leads to increased demand. To meet this increased demand, investment and employment increased leading to the revival of industries. Once this process of revival has begun it becomes cumulative and leads to an increase in the levels of employment. Income and output, initially, excess, or idle capacities in industries are utilized to increase output. Later, as idle capacities in industries are used up, plants are expanded, prices rise and profits increase. Business expectations is positive. Investors become increasingly optimistic, credit expands, and all these will lead to the prosperity phase.

2. **Prosperity Phase:** In the prosperity phase, macroeconomics variables of aggregate demand, output, employment, and income are at a high level. They all tend to raise prices. However, wages, salaries, rate of interest, and taxes do not rise in proportion to the rise in prices. This led to an increase in profit level and stock market values. The values of securities including bonds continue to rise as expectations and optimism of larger profits rise, thus, further increasing investment. Economic activities continue to increase. Aggregate demand increases. The expansionary process continues until the peak period is reached.

The peak may lead the economy to over full employment and inflationary pressures. There then emerge scarcities of labour, raw materials, etc. leading to a rise in costs relative to prices, a rise in the rate of interest due to scarcity of capital and a fall in aggregate demand to rising prices. The profit rate falls. Investment declines. The seeds of recession have been sown.

3. **Recession Phase**: A descent from the peak starts a recession. There are strains in the stock market and the banking system. Prices begin to decline. Aggregate demand, income, and employment fall as the profit level of companies decline. Some firms close down. Others reduce production, investment, employment, income, and aggregate demand continues to fall. The process becomes cumulative. The recession may be mild or severe. It is severe when there is panic in the stock exchange and the banking sector leads to a crisis. There is a demand for liquidity because of a loss of confidence in the banking system. There is distress and failure in the banking sector, which spread to the other sector too. Once a recession starts, it builds upon itself, thus leading to a depression.

Depression Phase: During this phase, there is a sharp and 4. significant decline in economic activities, production of goods and services, employment, income, aggregate demand, and prices. Bank deposits fall. Credit expansion stops because the business community is not willing to take loans. Bank rate falls. All these lead to mass unemployment; general fall in prices, profits, wages and salaries, interest rate, aggregate demand, consumption, bank deposit investment etc. Factories close down, and construction of all types of capital goods and buildings comes to a standstill. The economy enters a trough ultimately. The longest depression that affected history was the great depression which occurred between 1929 and 1933 and which affected the economies of most of the Western European countries and America. There was another milder one in the seventies (1970s).

THEORIES/EXPLANATIONS OF THE TRADE CYCLE:

- 1. Monetary Theory of the Trade Cycle: Ralph George Hawtrey (1928) says that the trade cycle is a purely monetary phenomenon. He says it is the changes in the flow of monetary demand on the part of businessmen that lead to prosperity and depression. Non-monetary factors like strikes, floods, earthquakes, droughts, and other disasters may at best cause a partial depression but not a general depression. Cyclical fluctuations are caused by the expansion and contraction of bank credit, which in turn leads to variation in the flow of monetary demand by producers and traders.
- 2. The Innovation Theory: This was postulated by Joseph Alois, Schumpeter (1883 – 1950) who theorized innovations in the structure of an economy as the source of economic fluctuations.

Innovation may consist of the introduction of a new product, the introduction of a new method of production, the opening of a new market, the discovery of a new source of raw material, and the re-organization of an industry. This innovation by an entrepreneur is financed by bank credit. Innovation takes the economy to a higher level. However, when the entrepreneur starts repaying the bank loan, this may lead to depression.

3. The Keynesian Theory: The Keynesian explanation of the trade cycle is part of his theory of income, output, and employment. Hence, he explains the trade cycle as the periodic fluctuations of income, output, and employment. The principal cause of depression and unemployment according to Keynes is a fall in aggregate demand. Revival can be brought about by rising aggregate demand. This can be achieved by increasing consumption and/ or investment either through fiscal or monetary installment. This will bail the economy out of a depression to recovery and ultimately to a peak.

CHAPTER ELEVEN

INTERNATIONAL TRADE

International Economics is one of the branches of economics that studies international trade and international finance — that is, how rates of exchange are determined in international trade and similarly, how international payments are settled. Trade in economics is generally taken to mean the exchange of goods and services. Trade is one of the two main divisions of commerce, the other being aids to trade such as, banking, insurance, and transportation. Principally, trade is usually classified into two major parts; we have internal or domestic trade and international or external o r foreign trade. Internal trade is trade within the same country and can take place between different individuals, different localities, different districts, or different regions within the same country. For example, all the buying and selling of goods and services, which take place in Nigeria, constitute an internal trade, and internal trade can be wholesale or retail trade

International trade, on the other hand, is trade between different countries. It can be bilateral or multilateral. Bilateral trade refers to trade between two countries — Nigeria and Ghana for example. While multilateral trade refers to trade between one country and other countries in the world.

DIFFERENCES BETWEEN INTERNATIONAL TRADE AND INTERNAL TRADE

1. Differences in Currency: In internal trade, payment is settled in local currency, while international trade payment is paid for in international currency, called foreign exchange. International trade, therefore, involves difficulties and problems associated with the foreign exchange rates by which local currencies are measured in terms of other currencies.

- 2. Trade Barriers: Within the same country there are no barriers to trade, but in international trade, there are various barriers such as louts, tariffs, exchange control, subsidies, and so on.
- **3.** Mobility of Factors of Production: The factor of production is more mobile within a country than between countries that do not exist in internal trade.
- 4. **Transport Costs:** International trade involves high transport costs because of geographical distance as against domestic trade within a country.
- 5. **Differences in Economic Policies:** In international Trade, different economic policies are pursued by the different governmental systems, which affects the flow of goods and services. While in internal trade, the same economic policies are pursued by the government.

REASONS FOR INTERNATIONAL TRADE

Despite the problems/differences in international trade, countries still engage in trading with one another. Why then do countries trade with each other? Countries trade with each other because of many reasons. These reasons are:

- 1. Necessity: Countries trade with each other because no nation in this world can produce all the things its citizens require, that is, no n a t i o n is self-sufficient. It is on this basis that nations trade with each other so that they can buy those things they cannot produce themselves.
- 2. Uneven distribution of Natural Resources: Natural resources are not evenly distributed among countries. Different countries are blessed with different types of natural resources. It is because of the differences that countries tend to specialize in the production of those commodities in which they are richly blessed and trade them with other countries that are not richly blessed. For example, Nigeria is more blessed with petroleum deposits, while Japan is noted for electronics. The result is that Nigeria sells petroleum products to Zambia and buys electronics from Japan.

- **3. Differences in Climate**: Other reasons for international trade stems from the differences in climate in the world. Certain crops can be better produced in some countries but not in others. For example, Cocoa and Palm produce can thrive well in the tropics than in temperate climates. Similarly, such crops as wheat grow better outside the tropics. It is because of these climate factors that certain crops are grown in certain areas and countries needing them and not endowed with them must buy them from the counties where they are produced.
- 4. Special Skill: People of a particular country may have special skills and the technical know-how to produce certain commodities or render certain services. Switzerland, for example, is noted to produce quality wrist watches. Because of her reputation in the world, other countries have requested her technical advice.
- 5. **Differences in Taste:** Another reason for international trade is the difference in taste. Consumers in different countries demand many different things, which most time is not possible to satisfy from the production possibilities in any other country. For instance, the fact that Nigeria produces some manufactured commodities, and she also imports these in large quantities. The main reason for this situation is the difference between the patterns of production and consumption. In Nigeria, for instance, we mostly produce what we do not consume and consume what we do not produce.

BENEFITS OF INTERNATIONAL TRADE

- 1. It helps the countries to consume a variety of goods and services that they may not have been able to produce.
- 2. International trade leads to an increased international division of labour and specialization. This in turn leads to increase output and employment throughout the world.
- 3. It facilitates the national and international mobility of factors of production. This, in turn, brings about the exchange of ideas and

improved technology, which further leads to a more efficient international allocation and distribution of scarce resources.

- 4. Through international trade, countries can obtain essential raw materials and machinery needed for the setting up of industries.
- 5. International trade promotes economic development of the various countries of the world. The economic development of most countries, especially developing countries depends on the acquisition of capital equipment, which is made possible through international trade.
- 6. International trade leads to greater world peace. It helps people from different countries to meet each other. This leads to the development of friendship and better international understanding.

DRAWBACKS OF INTERNATIONAL TRADE

The following are the drawbacks of international trade:

- 1. **Structural Unemployment:** Excessive dumping of foreign goods into a country may shift demand from locally produced goods to those dumped by other countries. This will affect local producers negatively and the result will be a reduction in the employment of factors to curtail supply. This creates unemployment.
- 2. International trade may lead to the over-production of some goods and services, which may in turn lead to depression.
- 3. International trade, which leads to specialization, may eventually put some countries at a disadvantage vis-à-vis other country. This accounts for the relative underdevelopment of many countries of the world. For example, the theory of international trade postulates real developing countries, to specialize in the production of primary products, while economically advanced countries such as the USA, Japan, and others specialize in the production of manufactured goods. This type of specialization has been of benefit to developed countries at the expense of developing nations. While the developed countries become

richer and richer, developing countries become poor and poorer due to the low prices of their commodities in the internal market.

- 4. International division of labour and specialization may lead to over-dependence of countries on each other, such dependence is disastrous in times of war or other international emergencies.
- 5. International trade breeds competition, rivalries, international jealousies, suspicion, and mistrust, which are the causes of all wars.

THEORIES OF INTERNATIONAL TRADE

Aside from the absolute advantage theory by Adam Smith, the theory of international trade is based on the principle of comparative advantage. This principle was first propounded by 19th-century economist, David Ricardo and later improved upon by John Stuart Mill and Bastable, Charles Francis. The assumptions of the comparative theory, the illustration, and the criticism of the comparative cost theory can be found in (Ajadi and Gold 2006). Also, the modern theory of factor endowments as propounded by Heckscher - Ohlin in his famous book International Trade criticized the classical theory of international trade, formulated the general equilibrium or factor endowment or factor proportional theory of international trade. The H-O theory is also known as the modern theory of international trade or the Heckscher - Ohlin (H - 0)Theorem. In fact, it was El- Heckscher, Ohlin's teacher, who first propounded the idea in 1919 that trade result from differences in factor endowments in six different countries and Ohlin carried it forward to build the modern theory of International Trade. The criticism of the factor endowments theory, it's superiority over the classical theory is explained in detail in (Ajadi and Gold 2006).

CHAPTER TWELVE

MACROECONOMIC OBJECTIVES

There are certain economic objectives, which the government of various countries seeks to achieve. These objectives affect economy-wide aggregates. The objectives are also called target variables. Usually, there are several measures that can be used to achieve the objectives. These measures which government authorities can manipulate to achieve the target variables are called instrument variables. And there are two major instruments, Fiscal and Monetary policies with others.

The following are some of the macroeconomic objectives, which countries seek to achieve:

- i. Price stability
- ii. Full employment
- iii. Equitable distribution of income
- iv. Economic growth
- v. Balance of payments equilibrium

Different countries may have other goals, but the above are common to most countries of the world and they are easy to quantify.

1.) Price Stability: Because price stability, especially inflation has more unsalutary or adverse consequences on the economy than beneficial ones, price stability is an important macroeconomic objective. Ackley (1961) defines inflation as a persistent and appreciable rise in the general or average of prices. Inflation reduces the value and usefulness of money as a medium of exchange. And distribution of income is distorted i.e., while people with fixed incomes, like fixed salary earners and pensioners suffer, businessmen are favoured, because business profits rise. Remember people want to spend their money no sooner than they earn it. Also, while creditors lose during a period of inflation, debtors are at an advantage.

As well, saving is discouraged and inflation leads to a misallocation of resources, which may affect the growth of the economy, especially in the long run. Inflation can also provoke social unrest. Which leads to asking the following question: Is there a tolerable level of inflation?

A growing economy is bound to experience inflation. This is why there is a controversy surrounding what constitutes price stability. It is agreed generally that when the annual rate of increase in the general price level as measured by a suitable index is less than 2%, then there is price stability. How then do we measure the price level?

The Consumer Price Index Number (CPI)

The CPI measures inter-temporal changes in the level of prices of a basket of commodities, thus it measures the change in purchasing power of money. It can be used to compare prices over space too. Also, index numbers may be computed for a wholesale price, retail prices, agricultural prices, industrial prices, building materials prices, etc. But the most popular is the CPI.

Some Index Number Formulae

1. Laspeyres Price Index Number. It is a weighted aggregate price index number, which uses base year quantities as weights.

$$CP1_1 = \underline{\pounds P_1 q_0} X \underline{100}$$

 $\pounds P_0 q_0$

Where: P_1 is the current year price, P_0 is the Base year price, and q_0 is Base year quantity. It may have an upward bias (it tends to be inflated).

2. Paasche Price Index Number. It is also a weighted average, but the current year quantities are used as weights.

 $CP1_{n} = \underline{\pounds}P_{1}q_{0} X \underline{100}$

 $\pounds P_0 q_0$

Where: P_1 is the current year price, P_0 is the Base year price, q_1 is the current year quantity and q_0 is the Base year quantity. It may have a downward bias (discounted).

3. Fisher Price ideal Index Number. It is the Geometric mean of Laspeyres and Paasche Price indices, and the formula is:

 $CP1_{1} = \sqrt{Lx} P$ $\sqrt{\underline{\pounds}P_{1}q_{0}x \underline{\pounds}P_{1}q_{0}} X \underline{100}$ $\underline{\pounds}P_{0}q_{0} \underline{\pounds}P_{0}q_{1} 1$ Where the variables are as defined in 1 and 2 above.

Marshall-Edgeworth Price Index Number. It is a composite 4. index number. It is constructed to take care of the defects in Laspeyres and Paasche indices.

$$CP1_{m} = \sum P_{1}(q_{0}+q_{1}) x \frac{100}{EP_{0}(q_{1}+q_{1})} 1$$

$$EP_{0}(q_{1}+q_{1})$$

where the variables are as defined in 1 and 2 above.

2.) **Full Employment**

This is another macroeconomic objective desired by most countries of the world. This is because of the adverse consequences of unemployment. In terms of opportunity cost, what the unemployed would have contributed to the country's total output would be lost. Where a country puts in place a good social security scheme, those unemployed may be receiving unemployment benefits thereby raising the country's dependence ratio. From the perspective of the unemployed, there is a feeling of lack of personal fulfillment. What then constitutes full employment?

This is when all willing and able members of a country's workforce are gainfully employed. Age classification 0-19, 20-59, 60, and above. Hence, there may be people that are not willing to work (princes in the Old Yoruba tradition); those not able to work (the physically and mentally handicapped - residual unemployment and women in purdah); those not employed due to seasonal climatic changes; and those who are trying to move from one job to the other and they are temporarily out of job -Frictional Unemployment. This implies that there is always an unavoidable level of unemployment in a country. Importantly, there is no commonly agreed percentage that constitutes full employment. While Canada accepts 97%, the USA adopts 96% as their benchmark. While, Nigeria, like many other developing countries, does not have a target of employment percentage as a policy.

Measurement of employment

The rate of employment is measured as:

 $ER = \frac{L_{w}}{L_{T}} \times \frac{100}{1}$

Where L_w is the total number of workers employed. L_T the total labour force.

3.) Equitable Distribution of Income:

It is believed in economic development literature that the closer the income gap between the highest and lowest income earners in a country, the more developed the country is. Hence the equitable distribution of income is another macroeconomic target variable. Though desirable, the goal is however a complicated one. It is difficult to define income equitability i.e., what should be an acceptable gap between the income of the rich and the poor. Moreover, policymakers do not agree on how to bridge the gap.

Measurement of income inequality

Todaro (1977) distinguishes between two measures:

- 1. Personal or size distribution and
- 2. Functional or distributive factor share. Our concern is with the first one.

Personal or Size Distribution

There are several measures here. We describe some.

- 1. The population is divided into classes of ascending income levels and then we determine the proportion of the total income received by each group. See Todaro (1977).
- 2. The Lorenz Curve. It is developed by an American economist Maz Otto Lorenz who devised it in early of the last century. It shows the relationship between population groups and their respective shares in the total income. On the horizontal axis, the cumulative percentage of income earners is plotted while on the vertical axis, the shares in total income received by each percentage of the population are also plotted cumulatively.

Hence the figure is thus enclosed in a square. A diagonal line is then drawn from the origin to the upper right-hand comer. At every point on the diagonal, the percentage of incomes received is exactly equal to the percentage of income receivers i.e., 20% of income is received by 20% of income receivers, 80% of income is received by 80% of income receivers, etc. The further away the curve is from the diagonal the greater the degree of income inequality.



The Gini Co-efficient: The Gini coefficient or Gini concentration ratio was devised by an Italian statistician, C. Gini, and is based on Lorenz's curve. It also measures the degree of income inequality in a country by calculating the ratio of the area between the diagonal and the Lorenz curve to the total area of the half square in which the curve lies. It varies between zero and one 0 < G < 10 shows perfect equality (it falls on lines BC and CD). Hence the farther away the co-efficient is from 0, the greater the degree of inequality.



4.) Economic Growth: Kuznet (1971) defines a country's economic growth as long-term rise in its capacity to supply increasingly diverse economic goods to its populations; this growing capacity is based on advancing technology and the institutional and ideological adjustments that it demands. Thus, growth implies an increase in a country's real output of goods and services achieved through technological progress.

It is important that growth is measured in real output i.e., an increase in real goods and services in the economy and not increases in monetary values. In a period of inflation, even when total outputs might not have increased, they increase in the general level of prices which gives the impression of an increase in output.

- **i.** Measures of economic growth: If this is increasing year in and year out, then it can be concluded that the economy is growing.
- **ii. The growth rate of GDP:** If the annual rate of growth in real output is positive, it **might** be concluded that the economy is growing. It is important that the GDP must be adjusted for price changes to obtain the real output since inflation will give the erroneous impression of an increase in output. It should be noted however that even when the annual rate of growth is increasing there is no guarantee that the quality of life of the average man is improving. The increases may be appropriate only for a few in the country. This is the more reason why the equitable distribution of income is an important target variable.
- iii.Moreover, if the rate of population growth is higher than the rate of output growth, such increases in output will give a false impression. This is why a measure of growth that takes care of the population is often used. This is the per capita income:

 $Y_p = Gross National Product$

Total Population

This gives an indication of what everyone in a country would receive if the total income were to be distributed equally. If there is a sustained rise in the growth rate of GDP and the per capita income of a country, then the economy is growing. However, the per capita income also does not give an indication of income distribution neither does it show whether the standard of living of the people is improving.

5.) Balance of Payment (BOP) Equilibrium: The Balance of Payment table presents the summary of a country's transactions with the rest of the world. It shows the summary of a country's receipts from other countries and payments to them. It is usually divided into segments: Balance of trade (merchandise), current account, and capital account. Equilibrium in the BOP table implies equality between a country in total foreign receipts and payments.

But this equality is usually achieved only in the accounting sense. Countries usually record surpluses or deficits in their BOP. When all autonomous transactions have been recorded, accommodating capital flows are then used to bring the table into equilibrium in the accounting sense. When a country records a deficit, this may be corrected by the country depleting its resources of foreign exchange. This will reduce the country's ability to import needed capital and consumer goods. If it persists, as often happens in developing countries, the country will run into serious foreign exchange flows which will have to be solved by several policy options.

If a country has a surplus in its BOP position, the surplus also must be financed by either adding to its stock of foreign reserves or increasing its investments in other countries.

A surplus in BOP position implies that the country has not exhausted its potential to import capital, intermediate, and consumer goods.

For a developing country this has constitute a constraint to her developmental efforts. A surplus is, however, more desirable as a persistent deficit may spell doom for a country's economy.

A Hypothetical BOP Table

Item	amount (n'b)
CurrentAccount	
Exports	+35
Imports	-45
Services	-5
	Item Current Account Exports Imports Services

В	Capital Account	
	Investments	+10
	Loans etc.	+6
	Transfer payment	-1
С	CashAccount	
	Balance on cash account	+6
	Official monetary resources	-6

Achieving Macroeconomic Objectives

The following are the instruments available to a country to achieve the above macroeconomic objectives.

Monetary Policy:

Monetary policy is the combination of measures, which are aimed at regulating the value, volume, and cost of money in an economy. For the effectiveness of the monetary policy, there should be as many instruments as there are targets. Though, all the instruments should not be directed at the same target and the instruments should be redundant.

The instruments are:

- a. The rediscount or Minimum lending rate (MLR): The Central Bank (CB) makes loans available to other financial houses in the economy at a rate through a commercial paper already discounted by the financial house. The interest rate charged by the CB is known as the rediscount rate. This rate determines the other rates of interest in the economy. The CB can vary this rate to influence the availability of credit in the economy. If the MLR is high, financial institutions will be discouraged from taking loans. This reduces the amount of bank lending. If on the other hand, the rate is reduced, credit is encouraged.
- **b. Open Market Operation:** It is the most effective instrument available to the CB to carry out its monetary policy. It involves the sale or purchase of government securities depending on whether it wants to expand or contract the money supply. If the CB considers that there is more liquidity in the economy than is necessary, it sells securities to commercial banks and the public

thus mopping up excess liquidity. This is a contractionary monetary policy. If on the other hand, the economy does not have an adequate supply of money in circulation, the CB buys securities from commercial banks and the public. This is an expansionary monetary policy. The CB uses this instrument regularly.

c. Changes in minimum legal reserve requirement: This instrument affects the ability of commercial banks to lend. The CB can carry out expansionary monetary policy by decreasing the minimum legal reserve requirement. A pair of the existing reserve is now reclassified as excess reserves and becomes available for credit creation by commercial banks. The CB can achieve the same objective by buying government securities from commercial banks. If on the other hand, the CB can carry out contraction monetary policy by increasing the minimum legal reserve requirement which will curtail the money lending ability of commercial banks or sell securities to commercial banks.

Selective Credit Control: The instrument is designed to regulate both the amount and the terms on which credit is granted to selected sectors or purposes in the economy e.g., the conditions for granting loans to the agricultural sector may be liberalized. The proportion of credit going to the

the sector can also be increased to encourage development of the sector.

Other Instruments:

- a. Giving directives in which, the CB directs commercial banks on the credit line to toe.
- b. Special deposits in which the CB requests the commercial banks to make special deposits which will reduce the liquidity in the economy, and which reduce the lending ability of commercial banks.
- c. Moral suasion in which the CB uses gentle appeal without any force of law to direct the commercial banks on what credit policy to adopt.

Fiscal Policy: Fiscal policy refers to the discretionary changes in the level of government revenues and expenditures to achieve identified macroeconomic objectives. If government expenditures are directed to the productive sectors of the economy this may enhance the growth of the economy. Excess expenditure over revenue means deficit financing, which may lead to inflation. An increase in taxation may be used to mop up such excess liquidity. The government may even borrow from the public to mop up excess liquidity and pay back its debt to boost economic activities. They can be combined in different ways to achieve objectives or a combination of objectives in the economy.

There are three major instruments of fiscal policy:

- i. Taxation
- ii. Government expenditure
- iii. Public debt Management
- 1. Taxation: This can be direct or indirect. Direct taxation instruments include personal income tax, corporate profit tax, capital gains tax, and tax on bequests.

Personal income tax can be varied depending on the target expected. An increase in personal

income tax can be used to combat inflation. While a reduction may increase the aggregate demand, investment reduces the rate of unemployment and leads to economic growth. The corporate profit tax rate can be reduced to encourage investment and reduce unemployment. Capital gains tax which is the tax on the increase in the value of an asset over its purchase price at the time of its sale can also be varied to change people's disposable income, thus affecting the rate of inflation, employment, and growth of the economy. This tax is not yet popular in Nigeria.

Tax on bequests which is a tax on the assets of deceased persons can also be varied to achieve specific macroeconomic objectives. But this is also not too popular in Nigeria yet.

The instruments under tax include duty, export duty, excise, value-added tax, etc. A combination of which could be used to affect the rate of inflation, employment, the balance of payments, and income distribution.

- 2. Government expenditure: These can also be used to achieve any of the macroeconomic objectives identified above. Fiscal deficits which are excess of government expenditure over revenue can be used to promote economic growth and boost aggregate demand and employment depending on the state of the economy at the time of the deficit financing i.e., whether the economy is depressed or fully employed or buoyant. Surplus financing which is an excess of government revenue over expenditure on the other hand can be used to fight inflation and balance of payments deficit depending on the state of the economy.
- 3. Debt Management: Public debt can be both internal and external. Internal debts can be contracted from the Central Bank, Commercial Banks, other financial institutions, government departments and the public. Sources of external debt include governments of friendly countries, private foreign financial institutions e.g., the London Club and the Paris Club, International Financial Institutions such as, the World Bank, International Monetary Fund, African Development Bank, etc. Contracting debts in terms of how and the sources and the timing of repayment of debts and the amount can go a long way in solving macroeconomic problems. When there is inflation government can sell debt instruments in the economy to reduce the disposable income of the public. When the economy is depressed government can pay back internal debts to boost economic activities. Contracting debts can be used to redistribute income in the short run etc. External loans can be used to boost the productive capacity of the economy if such debt is reproductive debt as against a deadweight debt. However, external debt should be avoided because of the stringent repayment conditions that are attached to the loans, which may impede future growth of the economy.

It should be noted that debt management policies are taken as belonging to both fiscal and monetary policies. Some take them as separate and distinct from fiscal and monetary policies. Whatever the case, the policies are complementary and should also be so used if the objectives desired are to be achieved.

Administrative/Physical Control: The government can also use several administrative instruments to achieve macroeconomic objectives. They include:

- a. Income policy wage freezes or wage increases (depending on the objective) and dividend pegging.
- b. Price/rent control: This is the least effective and it encourages corruption.
- c. Exchange control, foreign exchange market, import licensing, and other qualitative commercial policies, etc.

Ad-hoc instruments: The government may also find it necessary to set up agencies to tackle specific macroeconomic problems. In Nigeria, examples include:

- (a) National Directorate of Employment (NDE)
- (b) Directorate of Foods, roads, and Rural Infrastructures (DIFRI)
- (c) River Basin Development Authorities (RBDAs) etc.

It should be noted that the achievement of the objectives may conflict. In trying to solve one problem, another may be created from other objectives. For example, fighting inflation may exacerbate unemployment and economic recession. Contra-wise, lifting an economy from a recession may lead to inflation and balance of payments problems. There is therefore a trade-off in the achievement of macroeconomic objectives.

CHAPTER THIRTEEN

THE SCOPE AND DEVELOPMENT OF PUBLIC FINANCE

Public finance may be regarded as a branch of economics concerned with the finance and economic activities of the public sector. The principles of public finance were developed by classical economists and the modern economists. The classical economists include Adam Smith, David Ricardo, John Stuart Mill, Arthur Cecil Pigou, and Edward Hugh Dalton. The modern economists that built on the work of the classical economists include Musgrave and Prest.

CLASSICAL ECONOMISTS' CONTRIBUTION/ DEVELOPMENT

Adam Smith on his own is remembered for his contribution made on canons of taxation such as: Equity principle, Convenience principle, certainty economy or cost of collection principle, etc. J. S. Mill and David Ricardo emphasized three aspects which include the revenue aspect, the expenditure aspect, and public debt. AC. Pigou and Hugh Dalton in their contribution to the development of the subject matter of public finance proposed taxation principles that are based on the theory of economic welfare. These principles by Pigou and Dalton required the government to levy taxes in such a way that the overall marginal sacrifices of taxation would be equal to the overall marginal benefit of public expenditure. The assumption behind this is that welfare would be maximized when expenditure and taxation are carried out in a way such that the benefit obtained from an additional unit of expenditure is equal to the sacrifice that must be made when an additional unit of tax is levied.

In summary, the work of the early writers may be broken down into two. These are:

- a. Principles of taxation and
- b. The principle of public expenditure

- A. THE PRINCIPLE OF TAXATION: The principle of taxation is based on the least aggregate sacrifice theory. This means that "the individual sacrifice that has to be made as a result of taxation is the difference between the net satisfaction in the absence of any tax and the net satisfaction he enjoys when there is tax".
- B. THE PRINCIPLE OF PUBLIC EXPENDITURE: The theory of public expenditure, on the other hand, holds that government expenditure should be carried out to the point where the marginal social benefit from the expenditure is equal to the marginal social cost.

MODERN ECONOMISTS' CONTRIBUTIONS:

Modern economists have shifted emphasis from the sacrifice - benefits approach to resource allocation, income distribution, and stabilization of the economy.

- a. Resources Allocation: The resources allocation aspect in public finance deals with the role of government in the allocation of resources because of market failure. Such as Externalities. Externalities arise because of the action by one economic unit which causes a gain or consumption production by other non-involved economic units. It is known that the initiator of the action will not pay the external cost or receives the external benefits unless "there is some form of coercive body" (such as the Government) to allocate either the costs or the benefits. Therefore, Public Finance is concerned with how Government allocates costs or benefits when externalities arise.
- **b. Income Distribution:** This aspect of Public Finance is concerned with how income is distributed in the economy. Factors of production such as land, labour, capital, and entrepreneurship are priced in the marketplace depending on competitive circumstances and the value of the marginal product. Hence, an individual's income depends on the demand and supply of the factor the had available, plus in some cases, inherited wealth. The resulting income distribution based purely on market pricing may or may not be in line with society's desires. In this

regard, society must determine somehow a "just" state of the income distribution.

In this wise, some economists have suggested that for justice to prevail in society income distribution should be distributed as

- 1. A person should receive the fruits derived from his endowments.
- 2. Income distribution should be such that total happiness should be maximized.
- 3. Distribution should be egalitarian.
- 4. The income of the least well-off individual in society is maximized.

With the above, we can say public finance is concerned with translating their rules of justice into a set of policies to distribute income.

c. **Stabilization of the Economy:** Under the stabilization aspect in public finance, it is concerned with how to achieve desirable levels of price stability as well as the desired level of employment. Without government involvement, through fiscal and monetary policies, a typical capitalist economy tends to be subjected to substantial fluctuations. Thus, economy maybe in equilibrium at a level of employment far below what the Government desires. When this happens, Government may use fiscal and monetary policies to adjust the economy to the desired levels. And public finance is concerned with how Government does this.

CHAPTER FOURTEEN

FISCAL POLICY

Fiscal policy is concerned with deliberate actions which the government of a country takes in spending money and or levying taxes with the objective of influencing macroeconomic variables, such as the level of national income or output, the employment level, aggregate demand level, the general level of prices in a desired direction.

OBJECTIVES OF FISCAL POLICY

The objective of fiscal policy differs from time to time. Generally, however, fiscal policy measures usually attempt to achieve one or some of the following objectives:

- 1. Influence the rate of growth of the economy.
- 2. Raise the level of national income, output, and employment.
- 3. Protect local industries from unfair competition from abroad.
- 4. Moderate inflationary pressures
- 5. Improve the balance of payments positions.

INSTRUMENTS OF FISCAL POLICY:

- i. Government Expenditures
- ii. Taxation

i. Government Expenditures

Every year the government of any country undertakes expenditures of various kinds, such expenditures have an impact on the level of economic activities, typically, government expenditures may be undertaken for the following purposes.

- a. To build roads and bridges
- b. To promote agriculture and allied activities
- c. To provide housing for the people
- d. To improve educational facilities
- e. To protect the citizens against aggression
- f. To maintain law and order
- g. To create jobs in different sectors of the economy
- h. To service a nation's debt

HOW A FISCAL POLICY THROUGH VARIATIONS IN GOVERNMENT EXPENDITURE CAN HELP TO ACHIEVE ECONOMIC GOALS

To observe the effectiveness of a fiscal policy, a business cycle is taken into consideration. A business cycle refers to the cyclical movement in the level of economic fortunes of a country.



A Business Cycle

A boom refers to the highest prosperity level. This describes a situation where the output level is high, employment, national income and all macroeconomic variables are at desirably high levels. While a boom period is generally desired, sometimes, an undesirable by-product of this situation is a high level of inflation. A recessionary phase of the business cycle refers to a downward in the economy. It is characterized by falling levels of aggregate demand, output, income, and employment.

A depression phase is when things are completely down and there is widespread unemployment and general misery.

A recovery phase refers to a situation when an economy is picking up again. Aggregate demand for goods and services may be rising gently to be followed by rising levels of income, output, and employment. As the trend continues, this may lead to another boom in the picture above.

To see the effect of changes in Government expenditures, consider an economy, which is in equilibrium at a recessionary phase. To improve the situation, the government should increase its expenditure which will in turn increase the aggregate demand (consumption, income, and government expenditure). The increased aggregate demand will in turn raise national income through the multiplier effect. To achieve the above, the marginal propensity to consume should be more than the marginal propensity to save. If the marginal propensity to consume is $\frac{4}{5}$, then, the marginal propensity to save will be $\frac{1}{5}$. Thus, the effect of increased government spending will be to stimulate the economy towards the pathway of growth only. Reduction in government expenditure in turn will reduce or moderate the inflationary pressures. Reduction in government expenditure will reduce aggregate demand for goods and services and will eventually lead to a reduction in prices. The consequence of a decrease in government spending will be deflation, reduction in national income, output level, reduction in employment rate, etc.

i. Taxation

Taxes may be defined as a compulsory contribution from individual and or business organizations for the purpose of financing expenditure.

Forms of Taxes

There are two forms of taxes.

- a. Direct taxes
- b. Indirect taxes

Direct taxes are levied on people or corporate bodies and the burden of such a tax cannot be

shifted to anyone else.

Indirect taxes are levied on goods and services. The whole or part of the burden of an indirect tax may be shifted by producers to consumers.

HOW A FISCAL POLICY THROUGH VARIATION IN TAXES CAN HELP TO ACHIEVE DESIRED ECONOMIC GOALS

In a depressed economy whose employment level, output and income level are very low, a fiscal measure in terms of reduced taxes may help to stimulate the economy toward the path of growth. A reduction in taxes may have an effect, on two components of aggregate demand. These are the consumption component and the investment component. A general reduction in personal income taxes, for instance, will lead to an increase in the disposable income of people. An increase in disposable income in turn will lead to an increase in aggregate demand for goods and services which, according to theory, the multiplier effects will increase the level of income, output, and employment.

Another way in which a reduction in tax can stimulate economic activities is through its effect on aggregate investment. A reduction in taxes, all other things being equal, is capable of increasing the level of aggregate investment. This is because the tax reduction serves as an incentive to businessmen who in turn, will increase investment, which will lead to an increase in aggregate demand, and this increase, through the usual multiplier effects, will increases the level of income, output, and employment.

As it has been discussed that a reduction in taxes can have an expansionary effect on the economy, so also an increase in the general level of taxes lead to a contractionary effect on the economy with income, employment, and output falling from their previous equilibrium level. To see this, suppose an economy is in equilibrium at a level where the inflation rate is very high, one fiscal measure the government would like to use is increase in taxes, which will reduce the disposable income of people, and will reduce the demand for goods and services and eventually reduce the prices of the goods. But the undesirable side effect of this is that it will lower income, growth, output, and employment. Government is therefore very cautious about a fiscal measure which, though lowers the inflation rate, at the same time, lowers the level of employment output and income.

Another way in which an increase in taxes will reduce inflationary pressures is through its effect on investment. An increase in the overall level of taxes will act as a disincentive to businessmen. This is because profit will be eroded. They will therefore invest less. A reduction in investment implies a reduction in aggregate demand for goods and services. The reduction in aggregate demand will lead to a fall in the general level of prices and inflationary pressures will be moderated. But an undesirable effect of this fiscal measure may be a reduction in the level of output, income, and employment when aggregate demand falls because of the increase in taxes. Again

Governments are very cautious about the use of a deflationary fiscal measure to control inflation because of its effect on the level of output, income, and employment.

CRITICISM OF FISCAL POLICY

- **a.** Savings: People may tend toward savings than spending when government increases its spending. This serves as a leakage for the economy.
- **b. Imported goods:** With the increase in purchasing power or spending of people, they may tend to purchase imported goods where the government exhibits a high propensity to import. The multiplier effect will be on income generated abroad and not on the domestic economy.
- c. Timely: It is argued that there are time lags between the time when fiscal policy is required and the time it is implemented. This, in turn, may result in a situation in which by the time a fiscal policy becomes operational, the result may be contrary to what was required originally.

PRINCIPLES OF TAXATION

The principles of taxation are the principles upon which any good tax system must be based. Although we have Adam Smith's Canon of taxation which is:

- i. Equity principle
- ii. Convenience principle
- iii. Certainty principle
- iv. Cost of collection principle (Economy).

Equally, we have the traditional principles of taxation, which were from the Adam Smith Canon of taxation and J. S. Mill's benefit principle of taxation. These include:

- a. The ability to pay principle of taxation.
- b. The benefit principle of taxation

With the above "principles of taxation", modern experts in public finance have argued that the two traditional principles of taxation and Adam Smith's Canons of taxation are not sufficient to meet the modern economic policy which is partly achieved through the budget. These are the allocation, distributional and stabilization functions. Modern principles of taxation can achieve this.

MODERN PRINCIPLES OF TAXATION INCLUDE (EESNR)

- a. Equity principle
- b. Efficiency principle
- c. Simplicity principle
- d. Neutrality principle
- e. Revenue principle

A. THE EQUITY PRINCIPLE

This principle relies on the ability to pay principle. The equity principle tries to bring fairness to tax system. The tax system is designed according to the proportion of income earned. The two notions that explains the equity principle.

1. Horizontal Principle: This explains a situation where two people earning an equal amount of money as income should pay equal tax. But the problem associated with this notion is that a person named "A" might be a bachelor with no dependents and a person named "B" might be a family man with dependents (wife, children, and dependent relatives). The problem is that A and B should not pay the same amount of tax if fairness is to be brought into the computation of tax liability.

In Nigeria's context, because of these anomalies, the tax authorities have tried to introduce fairness into the Nigerian tax system by providing for concessional deductions or relief, with respect to dependents, life insurance, and so on. But no tax system in Nigeria has considered the time spent earning the income or how dangerous the work is. The notion of horizontal equity is therefore an ideal not likely to be achieved in practice.

2. Vertical Equity: This notion explains a situation where tax is being levied in a progressive manner. This means the more you earn, the more you pay. The problem here is what the progressive rate structure should be. A political factor and people's attitude to or maybe the determinants of the progressive rate structure.

B. EFFICIENCY PRINCIPLE

A tax is deemed to be based on good principles when it is administratively efficient. The administration includes an easy way of assessing the tax liabilities of people, choosing a tax rate that is easily understood by people, that will not cause any, ambiguity. However, it needs to be pointed out that, the simpler the tax system, the greater the probability and avoidance.

C. REVENUE PRODUCTIVITY

This principle holds that the cost of collecting the tax should be relatively low to the amount of tax collected.

D. NEUTRALITY PRINCIPLE

A tax may be regarded as neutral if after it has been levied, it does not change the behaviour of the taxpayers. This means that the consumption pattern of individuals as well as the production decisions of businesses must not be influenced by the imposition of tax if neutrality is the objective.

E. CERTAINTY PRINCIPLE

In taxation, certainty in terms of the exact amount of tax liability is important. If the exact amount to be paid is unknown to taxpayers or is subject to the whims and caprice of tax collectors, this can result in arbitrariness. Case of business, laws governing taxation in a particular country must be known to prevent inadvertent miscalculations.

FORMS OF TAXES

As explained earlier we have two forms of taxes, which are Direct taxes and Indirect

taxes. Direct taxes include personal income tax, company tax, petroleum profit tax, capital gains tax, and capital transfer tax.

a. **PERSONAL INCOME TAX**

This is the tax imposed on income earned from the business, trade, vocations, etc. This is

progressively imposed in Nigeria as Pay as You Earn (PAYE) on every income earned by

individuals. As an employee, you pay tax progressively on income earned. Personal income

tax forms a substantial position of Government revenue in Nigeria. Leakage on the Personal

Income Tax is transferring earnings. These are the income to the dependents, pensions, etc.

ii **COMPANY TAX**

This is sometimes called a corporate tax. It is levied on the profits of business organizations. Company tax is relatively easier to collect in Nigeria because of the Government existence on the submission of tax certificates in respect of any official obligation from the Government by companies. This tends to encourage compliance.

The company income tax is assessed and collected under the company income tax Act of

1979 and its various amendments. Taxable profits for the purpose of the act include profits made from:

- a. Any trade business.
- b. Rents obtained for the property.
- c. Dividends, interests, discounts, charges etc.
- d. Any profit not falling into any of the above categories.
- e. Any amount judged to be profit under the above act.
- f. Fees, dues, and allowances etc.

The company tax applies to all income earned by residents and non-residents by companies carrying on business in Nigeria.

iii. **PETROLEUM PROFIT TAX**

This is a special type of tax, which was introduced in Nigeria in 1959. This tax has become an important source of Government revenue because of the special position, that petroleum occupies in the Nigerian economy. Only oil-producing companies or companies engaged in the oil exploration business are expected to pay this tax.

iv. CAPITAL GAIN TAX

A capital gain tax as the name implies is a tax resulting from the sale of capital assets.

v. CAPITAL TRANSFER TAX

When a person dies, Government usually imposes a tax on his estates, if any, before the

estates could be taken over by relatives or those eligible. In some cases, such taxes may even be paid when the transfer is made prior to the death of the person transferring the property.

INDIRECT TAXES

i. IMPORT DUTIES:

Import duties, sometimes called tariffs, are taxes levied on goods imported into a country. Import duty has the effect of increasing the prices of such commodities in the importing country. Where imported goods are elastic in demand, import duties on them tend to shift demand on locally produced goods because their prices (imported goods), skyrocket.

ii. EXCISE DUTIES:

Excise duties are taxes imposed on specific goods produced in a country. Cigarettes and alcoholic drinks are popular targets for excise taxes because of their low elasticity of demand.

iii. EXPORT DUTIES

A third form of indirect tax is levied on goods produced for exports. Such a tax is called an export duty. It tends to raise the price of such export goods making them relatively uncompetitive in the consuming country. Thus, there is a dilemma here. The tax yield revenue for the government but lead to a loss of foreign exchange earnings because of a reduction in demand following the higher prices that the tax leads to.
iv. VALUE ADDED TAX

This is a multiple-stage tax popularly known as VAT. To lessen evasion, some tax experts advocate the use of this tax form, instead of the single-stage form that is used in collecting sales tax by the various state tax authorities.

Every value added in producing a particular good is subjected to VAT. Such is the selling of skin of animal to a tanner who makes leather, and the tanner sells the leather to a shoe manufacturer.

TYPES OF TAXES

Taxes may also be classified with respect to how the burden falls on income earners. Thus, in this regard, a tax may be described as: a. Progressive; b. Proportional; c. Regressive.

PROGRESSIVE TAX: A progress tax is levied when a percentage of one's income paid as tax, goes up when one's income increases. A person which is required to pay 5 percent of \$5,000.00 he earns as tax and another who is required to pay \$12% of \$10,000.00 as tax, pays a progressive tax.

PROPORTIONAL TAX: A tax is said to be proportional, when the percentage of one's income

paid as tax, is the same irrespective of the size of income. Thus, a person who earns say, \$1,000.00 may be required to pay to say, 5% of this income as tax, and this same percentage of 5% may be that which is required for income levels say \$10,000.00.

REGRESSIVE TAX: A tax regressive is when people with smaller incomes, pay a greater percentage of their income as tax compared with people relatively better off, that is, people who earn higher income levels. This tax usually occurs in a form of an indirect tax on goods. A poor man and a rich man pay the same tax on \$200 worth of goods purchased.

REASONS FOR TAXES/PURPOSE OF TAXES

- **a.** The Revenue to Cover Expenditure Argument: This is one of the most powerful arguments in support of taxation. It is use as a revenue source to cover government expenditure. This includes the provision of goods and services which are public goods whose use cannot be restricted.
- **b.** The Stabilization Argument: Taxes may be used for the purpose of stabilization. Two aspects are easily identified:
- i. The use of tax to reduce inflation.
- ii. The use of tax to stimulate economic growth.
- **c.** The Regulation Argument: In a microeconomic context, taxes may be used as a means of influencing consumption and production patterns, that is, to regulate the consumption and production of certain goods.
- d. Income Distribution Argument: Existing patterns of income and wealth distribution in an economy without tax may aggravate the disparity in the standard of living between the rich and poor. By levying taxes in a programmed manner, the gap is somewhat reduced, and this may be the prime reason for levying taxes in some cases.

NOTIONS OF EQUITY USED IN TAXATION

Equity in taxation involves some degree of subjectivity. The concept of fairness which it embodies depends on the judgment of everyone. However, economists have looked at equity in taxation, in terms of the sacrifice which different categories of individuals are required to make when they pay taxes.

THREE SACRIFICE CONCEPTS ARE INVOLVED

A. EQUAL ABSOLUTE SACRIFICE: Equal absolute sacrifice rests on measurement of utility. Utility is the amount of satisfaction that an individual enjoys when he consumes goods. It is assumed that as the number of goods an individual consumes increase, marginal utility, that is, the additional utility he obtains from each extra consumption of the good, diminishes. Thus, if an individual pays tax, he is deemed to lose the

satisfaction he would have obtained if, he had spent the money on a good. Therefore, the sacrifice he makes when the pays tax is seen in terms of the loss of his satisfaction (assumed to be measured in utilities). The equal absolute sacrifice concept sees fairness being embodied in progressive taxation because the sacrifice to be made between the higher income earner and the lower income earner is being moderated because of the progressive nature of the tax such as PAYE.

B. EQUAL PROPORTIONAL SACRIFICE CONCEPT: Under this notion of equity, each taxpayer is required to pay the same percentage of total utility. For example, two individuals A and B, with A earning higher than B. Suppose in addition, that A's income fetches him 1000 utilities, while B's income fetches him 250 utilities. If A must give up to 100 utilities when he pays tax (that is, one-tenth of the utilities obtained from his income), then under this notion of equity, B would be required to give up 25 utilities to bear the same proportional sacrifice. Thus, the proportion of utility paid over in terms of tax is identical.

But as argued earlier because of diminishing marginal utility, A would have to pay more naira to reach 100 utils which he gives up in taxes than B would need to pay to reach 25 utils. Assuming in the case of A that one marginal utility (1 utility) is equivalent to \$1.00, then 100 utils that is given up would be equivalent to \$100.00. On the other hand, since B's income is lower, if we assume that 5 marginal utilities in utils in equivalent to \$1.00 to him in terms of tax payment, then to give up the 25 utils under this notion of equity, might require only 5 naira in terms of tax payment.

C. EQUAL MARGINAL SACRIFICE: Under this approach, each taxpayer bears an equal marginal decrease in the utility of his income after the payment of taxes. Like the equal proportional sacrifice concept, the equal marginal sacrifice concept depends on the utility assigned the last naira of a taxpayer's income, but here, the dependency is quite different. If again, we assume diminishing marginal utility, the first naira tax

paid by the highest income earner in a country costs taxpayer, the smallest number of units of utility (more is paid if consumes more). If we assume that the taxpayer's utility is comparable, then, the approach of taking the lowest naira sacrifice first, ultimately equalizes incomes for all the payers in society given sufficiently large government revenue needs.

For example, the last naira income received by taxpayer A (the higher income earner) is assigned 5 units of utility. In addition, suppose that the last 10 unit of income received by taxpayer B is attached to its 15 units of utility. Taxpayer A would have to pay 3 units of income to give up 15 units of utility. Taxpayer B, on the other hand, would have to pay 1 unit of income to experience the same loss of utility due to the tax payment (this, of course, assumes that each of the last three units of A's income has attached to them, a utility of 5 units). In this example, the marginal tax rate is 100 percent for the highest income group on the marginal income that separates it from the next highest income group, and this is repeated through successively lower income brackets, and ultimately post-tax income for all taxpayers, is equalized.

CHAPTER FIFTEEN

STABILIZATION POLICIES IN CLOSED ECONOMIES

Brief Introduction on Stabilization Policies

Stabilization policies in closed economies refer to as the relative effectiveness of fiscal and monetary policies in closed economies. These analysis of the effectiveness of fiscal and monetary policies can be done using IS-LM Curve analysis. To the monetarists, for stabilization of an economy, monetary policies is more important than fiscal policies. But Keynesian opposed this assertion by advocating for economic stabilization through fiscal policies, such as government expenditure and taxation as a tool for achieving these objectives.

The Investment and Saving Curve (IS curve)

The Investment and saving curve (IS curve) is a graphical representation of the relationship between the level of interest rate and the level of output (GDP) in an economy. It illustrates the state of equilibrium in the goods market, where aggregate demand and supply are equal. It shows the level of output required to equate planned savings and planned investments at various levels of interest rates. The IS curve illustrates the relationship between two variables: real interest rate (r) on the vertical axis and real national income or output (Y) on the horizontal axis. The IS curve is downwardly sloping to the right because a fall in interest rates implies a higher level of investment, which then leads to a higher level of output. Thus, showing a negative relationship between the level of the real interest rate and the level of real output.

The Liquidity Preference - Money Supply Curve (LM curve)

The liquidity preference - money supply curve (LM curve) is a graphical representation of the relationship between the level of interest rate and the level of income in an economy. It illustrates the state of equilibrium in the money market, where demand for money (liquidity preference) and supply of money are equal. It shows the level of interest rates required to equate the demand for money with the supply of money at various levels of income. In the money market, the independent variable is income, and the dependent variable is the interest rate. The LM curve is upwardly sloping to the right because a rise in the level of income implies a higher level of demand for money, which then leads to a higher level of interest rate to keep money supply and liquidity demand in equilibrium.

MONETARY POLICY

Monetary policy is a macroeconomic measure that is implemented by a country's central bank or monetary authority to manage and control the money supply and influence the rate of interest in the economy.



The Keynesian Range Case 1

At the Keynesian range, the LM curve is perfectly elastic. This is called the liquidity trap region. It is a situation in which the LM curve is horizontal, and the level of interest rate cannot fall below OR_1 . So, an increase in money supply shifts the LM curve from (LM₁ to LM₂). This shift in the LM curve has no effect on the interest rate, investment, and level of income also remains unchanged at OY_1 . This is because at a low rate of interest OR_1 , people prefer to hold their money in cash or liquid form. Thus, under the Keynesian range of

liquidity trap the IS_1 curve interests the LM curve in the flat range at A. However, monetary policy is totally ineffective in the Keynesian range.

The Classical or Monetarist Range

In the classical range, the LM curve is perfectly inelastic. In the classical range, equilibrium is at point D, where IS₃ intersects the LM_1 curve, and the interest rate is at OR_5 and the income level is at OY_4 .

Supposing the Central Bank (CB) adopts an expansionary monetary policy that increases the supply of money through open market operation (OMO). Then, the increase in money supply will shift LM_1 to LM_2 and income level will increase from (OY₄ to OY₅) and the interest rate will fall from (OR₅ to OR₄), where IS₃ will intersect LM₂ at point E.

The fall in the level of interest rate has increased income from $(Y_4 \text{ to } Y_5)$ as a result of an increase in the supply of money which shows the assumption of the classical economists that money acts as a medium of exchange. Hence, monetary policy is absolutely (highly) effective at the classical range.

Intermediate Range

At the intermediate range, the LM curve is slightly elastic i.e., at point B where IS_2 intersects the LM_1 , and income level is OY_2 , and the interest rate is OR_3 . An increase in money supply will shift LM_1 to LM_2 and, interest rate will fall from (OR_3 to OR_2) and income rises from (OY_2 to OY_3).

In the intermediate range, the increase in income $(Y_2 \text{ to } Y_3)$ is less than the increase income in the classical range i.e. $(Y_4 Y_5)$. In this case, monetary policy is less effective. Conclusively, monetary policy is absolutely effective in the Classical range, less effective in the Intermediate range and absolutely ineffective at the Keynesian range.

FISCAL POLICY

Fiscal policy involves the activities of the government to influence the economy through government expenditures (spending) and revenue (taxation). Government agencies, particularly the legislative and executive departments, are responsible for determining fiscal policy.



The Keynesian Range

The Keynesian range initial equilibrium is at point A, where IS_1 intersects the LM curve. Supposing government expenditure increased, this will bring about the new equilibrium is at point B where IS_2 curve the LM curve. Hence, the income level rises from (Y₁ to Y₂), while the interest rate remains unchanged. Since we have an increase in income due to an increase in government expenditure, fiscal policy is very effective along the Keynesian range.

Classical or Monetarist Range

In the Classical range, the LM curve is perfectly inelastic and IS₅ curve intersects it at point E, and interest rate is at OR₃, and income is at (OY_5) . When government expenditure increases through expansionary fiscal policy, the 1S₅ curve will increase to IS₆ intersect LM at point F which leads to a rise in interest from (R₃ to R₄) while income remains unchanged at point (OY_5) which often leads to fall in investment. That is, income and private investment has been chopped

off by an increase in interest which shows that fiscal policy is not effective along the classical range.

Intermediate Range

In the intermediate range, the initial equilibrium is at point C, where the IS₃ curve intersects the LM curve. And the interest rate is OR₁ with income OY₃ the level of income. Supposing there is an increase in government expenditure IS₃ curve will shift to IS₄ curve, and a new equilibrium will be at point D. So, increase in government expenditure will increase income from (Y₃ to Y₄) and interest rate will increase from (OR₁ to OR₂).

Furthermore, at both the classical range and intermediate range give room for rises in income. However, at the classical range, increasement in interest rate is greater than that of intermediate range because of some investment, income has been chopped off by rise in interest rate. Hence, fiscal policy is less effective. Conclusively, fiscal policy is very effective at Keynesian range, less effective at intermediate range and not effective at all at classical range.

Overall, both monetary and fiscal policies are used to regulate economic activity over time. The primary objective of both monetary and fiscal policies is to achieve certain economic goals, such as controlling inflation, promoting stable economic growth, and maintaining low unemployment rates. However, fiscal policy can be used to redistribute income and wealth.

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