PRINCIPLES OF ECONOMICS

AEM 102

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RECOMMENDED TEXTBOOK: Salvatore, D. and Diulio, E. A. (1996) Principles of Economics, 2nd Edn., Schaum's Outlines 400pp.

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WEEKS:

1 INTRODUCTION TO ECONOMICS and THE ECONOMIC PROBLEM

2-4 DEMAND, SUPPLY, EQUILIBRIUM and ELASTICITY

5 UNEMPLOYMENT, AND NATIONAL INCOME

6 CONSUMPTION, INVESTMENT AND EXPORTS

7 INFLATION, DEFICITS AND DEBT

8 THEORY OF CONSUMER DEMAND and UTILITY

9 COSTS OF PRODUCTION

1.0 INTRODUCTION TO ECONOMICS

- **Learning outcomes:**

- At the end of this presentation, students should be able to understand the following:

1.1. The Subject Matter of Economics

1.2. The Methodology of Economics

1.3. The Use of Tables, Graphs and Equations

1.1. THE SUBJECT MATTER OF ECONOMICS

Economics is a social science.

The Adam Smith's definition says that Economics is a social science which studies human behavior as a relationship between ends and scarce means, which have alternative uses.

It studies **individuals and organizations** engaged in **production, distribution and consumption of goods and services** (using scarce resources of land, labour, capital).

The study of Economics involves three different tools which are:

1. Principles
2. Theories and
3. Models.

PRINCIPLES, THEORIES AND MODELS

1. Principles:- are basic laws of the discipline

e.g. (a) an increase in the price of a commodity results in a decrease in the demand for the commodity, *Ceteris paribus* (other things being equal).

(b) The law of diminishing returns which states that the more a variable input is used in production with fixed inputs, the less is its marginal product.

(c) Consumption of a commodity increases as consumer's income increases

2. Theories: – these are further explanations of the general principles e.g., the consumer theory which states that consumption is a function of income.

- Quantity demanded for a commodity falls as its price increases
- Quantity supplied of a commodity increases as its price increases

3. Models:– are mathematical relationships between economic variables in a phenomenon, e.g. Cost of production is a function of the quantity of the outputs produced

i.e. C = f(Q). Where: C= Cost of production (₦),

Q = Output e.g. maize in tonnes , f=function

NOTE: There is a dependent variable (Regressand i.e. Cost)

There are independent variables (Regressors e.g. Quantity of output)

- Models are developed around the cause and effect of economic events.
- Also, models isolate a few of the most important determinants or causes of the economic events.
- They are used to:

i. Predict economic occurrences

ii. Develop policies that will prevent or correct economic problems e.g. unemployment, inflation, forex supply, forex demand, wastages in the economy.

BRANCHES OF ECONOMICS

Economics is subdivided into branches:

- Microeconomics
- Macroeconomics

Microeconomics studies the economic behavior of individual decision-making units e.g. farmers, consumers, companies and resource owners in a free-enterprise economy.

Macroeconomics studies the behavior of aggregates of economic activities e.g. aggregate demand, level of national income, aggregate output, level of employment, aggregate unemployment, the general price level and the balance of payment.

RELEVANCE OF ECONOMICS

- The performance of the economy (economic condition) affects all members of the nation.
- Economic conditions determine where we live (Villages, towns, cities), what we eat, when we eat, the school attended, whether we work or not and how much we earn.
- Economic conditions affect the peace and stability in our cities, nation and in the world – unemployment, inflation and corruption.
- Economics gives a better understanding of how the economy operates and what can be done to avoid, correct and alleviate unemployment, inflation and waste (economic problems).

1.2 THE METHODOLOGY OF ECONOMICS

Economic phenomena are **complex**, so, economists model economic behaviors.

In constructing a model, economists:

(i) make assumptions which cut away unnecessary details; and

(ii) reduce the complexity of the economic behavior.

The economic behavior is then presented as a relationship between a **dependent variable** (Regressand) and a few **independent variables** (Regressors)

- The economic behavior being explained is the dependent variable while the variables explaining that economic behavior are the independent variables.

Dependent variable: is a variable whose value depends upon another economic event. e.g. spending by an individual is dependent upon the receipt of income.

Independent variable: is a variable whose value determines the value of another (dependent) variable. e.g. an individual's income largely determines the amount that an individual can spend.

Frequently, the dependent variable is presented as depending upon one independent variable, with the influence of the other independent variables held constant. e.g. $C = f(Y_d/T,W,D)$

That is, C depends upon Y_d (given that other independent variables T, W and D are held constant).

- A manufacturer of Compact Discs (CD) must anticipate the quantity of CDs that individuals will buy. Purchases or demand, are probably influenced by a large number of variables such as
- X_1 (Price of each CD)
- X_2 (Price of CD players)
- X_3 (Price of Tapes)
- X_4 (Price of Tape desks)
- X_5 (People's income)
- X_6 (Desire to listen to music rather than watch videos)
- X_7 (Other non-specified variables)
- Hence the demand for CDs can be presented as
- $Q_{cd} = f(X_1/X_2, \text{----------}, X_7)$. *Ceteris paribus*

An economic model also, specifies the type of relationship between the dependent and independent variables.

This relationship can be:

(a.) positive or (b.) negative

(a.) **Positive relationship**: when the dependent variable moves in the same direction as the independent variable e.g. positive relationship between price (independent variable) and supply (dependent variable*), Ceteris paribus*.

e.g. $C=f(Y_d)$

$C=a+bY_d$

(b.) **Negative relationship**: when the value of the dependent variable increases as the value of the independent variable decreases e.g. as the price of a commodity increases, its demand decreases**,** *Ceteris paribus* (all things being equal).

e.g. $Q_d=f(P)$

$Q_d=a-bP$

1.3. THE USE OF TABLES, GRAPHS AND EQUATIONS

Models which simplify real economic relationships provide the frame work for:

- organizing data,
- empirically testing economic hypotheses
- and forecasting economic behavior.

Below is a consumer spending model with data on consumer spending for a hypothetical economy.

We shall:

* graph the data with consumption on the Y-axis and disposable income on the X-axis

*establish an equation for consumer spending; and

*use the equation to forecast consumer spending.

TABLE 1: CONSUMPTION AND DISPOSABLE INCOME DATA (SCHEDULE).

	Disposable Income (X in Naira) Regressor	Consumption (Y, Kg) Regressand	$y=Y-\bar{Y}$	$x=X-\bar{X}$	xy	x^2
1	20,000	20,000	-2100	-2800	588 $x10^4$	784 $x10^4$
2	21,000	20,750	- 1350	- 1800	243x10 ^{4}	324$x10^4$
3	22,000	21,500	- 600	- 800	48 $x10^4$	64$x10^4$
4	24,000	23,000	900	1200	108$x10^4$	144$x10^4$
5	27,000	25,250	3150	4200	1323$x10^4$	1764$x10^4$
TOTAL	114,000	110,500	0	17325000	0	30800000
Average	$\bar{X}=$ 22,800	22,100	$b=\frac{\sum(xy)}{\sum x^2}$	$b=\frac{2310}{3080}=0.75$	$\Sigma(xy)=2310 \times 10^4$	$\Sigma x^2=3080x10^4$
SOURCE:	**Survey Data**					

EQUATION OF THE FUNCTION

The equation for above set of data.

- A linear relationship is evident in the graph.
- The appropriate equation is of the form:

$$\mathbf{Y = a + bX} ,$$

This is a linear relationship, where,

- a is **the intercept** (a constant) and
- b is **the slope** (a constant too) is the coefficient of X,
- Y and X are called variables while

a and b are **constants/parameters** of the relationship

Using Ordinary Least Squares Regression Technique (OLS) Estimators

- With the assumption of a linear equation between Y and X,
- With 2 variables (One Dependent variable Y and one Independent variable, X)
- We can say: $Y = a + b X$
- a is intercept. This is the value Y assumes when X=0
- b is the slope= $\frac{\Delta Y}{\Delta X}$
- OLS estimator for b= $\frac{\Sigma(xy)}{\Sigma(x^2)}$,
- where $x=X-\bar{X}$, lower case x; deviation from the mean X
- and $y=Y-\bar{Y}$, deviation from the mean Y
- $a = \bar{Y} - b\,\bar{X}$

- b = 231/308

  = 0.75
- b = 0.75
- a = 22100 - 0.75 x 22800
- a = 22100 - 17100
- a = 5000
- Y = 5000 + 0.75X

GRAPH

- A graph is a visual presentation of the relationship between 2 variables or the behaviour of a variable over time.
- Graphs are useful in that they help establish relationships
- Whereas a verbal explanation may be misinterpreted, a graph provides a visual presentation which is easily appreciated
- Consumption is plotted on the vertical (Y)-axis
- Disposable income is plotted on the horizontal(X)-axis
- The dependent variable is usually on the vertical (Y)-axis
- The independent variable is usually on the vertical (X)-axis
- The consumption and disposable income display a positive relationship

GRAPH

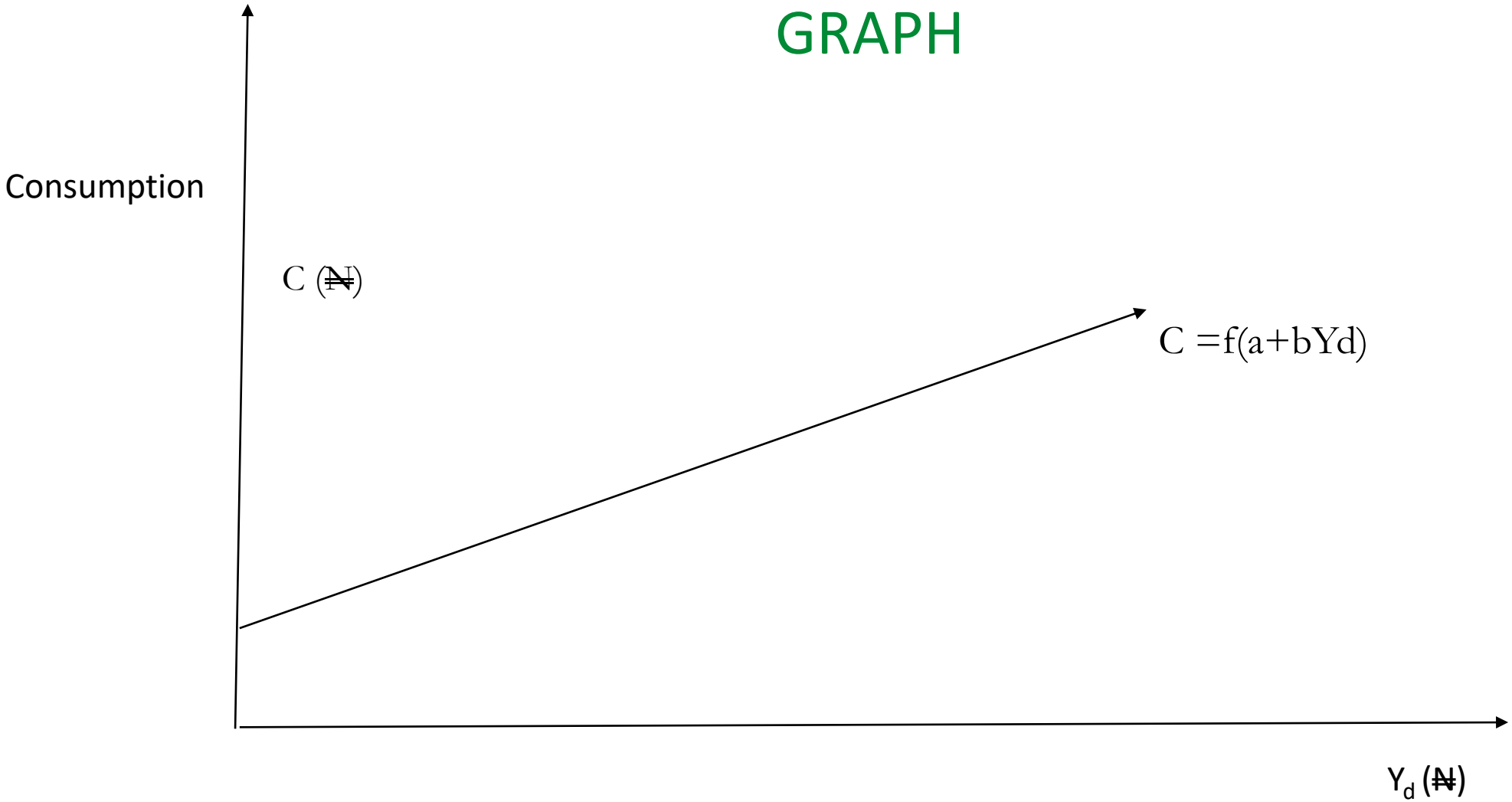


Fig.1: Consumption as a function of Disposable Income

CONSUMPTION AND DISPOSABLE INCOME DATA.

From Table 1, it is evident that consumption and disposable income display a positive relationship.

Note: **A Table/Schedule** is made up of a number of rows and columns of data.

The following must be specified for a Table: a title, a Table number, units of measurement of the data and the source of the data.

GRAPH AND EQUATION

In a graph, the following must, also, be specified: a title, a figure number, scale and axes (vertical and horizontal) identities with units of measurement.

The equation for above set of data.

A linear relationship is evident in the graph. The appropriate equation is, therefore of the form:

EQUATION OF THE FUNCTION

$Y = a + bX$,

since it's a linear relationship

where: a is the intercept (a constant)

and b is the coefficient of X, or the slope of the equation

Y and X are the variables.

With observations on X and Y variables

Parameters of the relationship can be computed.

From Ordinary Least Squares (OLS) :

$$b = \frac{\sum(xy)}{\sum x^2}$$

$$a = \bar{Y} - b\bar{X}$$

x = deviations from the mean of X i.e. $x = X_i - \bar{X}$

y = deviations from the mean of Y, i.e. $y = Y_i - \bar{Y}$

$\sum$ is summation sign

$\bar{X}$ is mean of X

$\bar{Y}$ is mean of Y

We can compute a and b , and insert in the equation, to have $Y = a + bX$

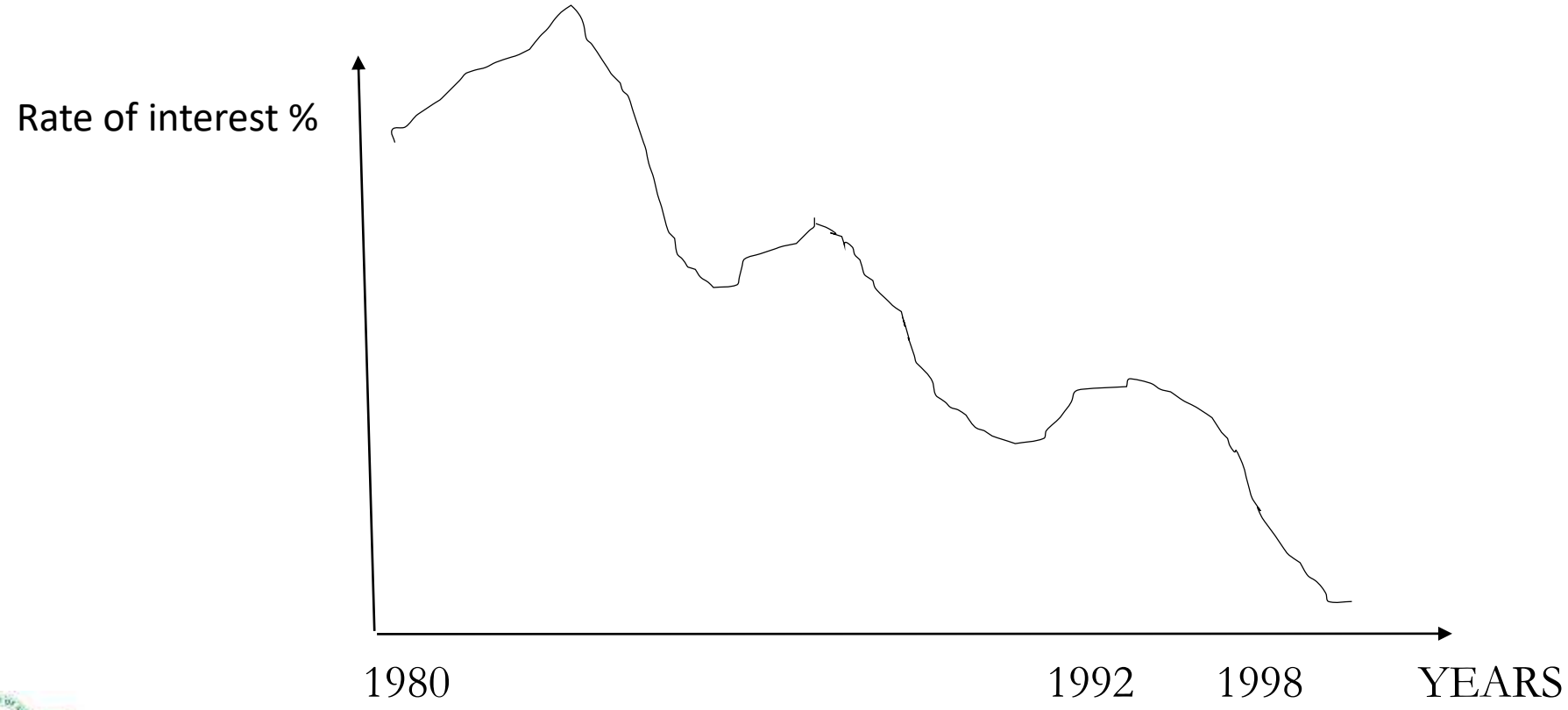
TIME SERIES GRAPH

- Suppose average yield on 3-month treasury bills from 1980 to 1998 are plotted with rate of interest on Y-axis and the year on X-axis. The graph will be a time series graph.

- A time series graph is one in which the behaviour of a single variable has been presented at various time intervals.

- The relationship between 2 variables can be presented over periods of time (in a time series graph) or at a point in time.

- We could plot a variable against the values it takes over time.
- This would give the time series graph.
- When 2 variables are plotted against one another, they represent the cross-sectional data, that is the values they take at a point in time.



BRAIN TEASERS

- Suppose consumption spending is presented as:

  $C = 50 + 0.50Y_d$

- Create a Table that shows the amount consumed (C) when disposable incomes (Y_d) are N150, N200, N250, N300 and N350
- Graph the data from the Table and label it C_1.
- Suppose the consumption equation changes to:

  $C = 75 + 0.50Y_d$

- Plot the new consumption equation on the same graph and label it C_2.
- What happens to the consumption line when the constant term (the intercept) of the consumption equation increases from N50 to N75?

BRAIN TEAZERS/ASSIGNMENTS

- Assume you are given the following data as the number of TV sets individuals are willing to buy from two cities –A and B at various prices

Prices(₦'00)	Q-City A	Q-City B
350	100	75
325	150	100
300	200	125
275	250	150
250	300	175

ASSIGNMENTS

- Plot these data with P on the vertical axis and quantity Q on the horizontal axis.

- Set price and quantity increments at N25 and 25 units
- For city A and B draw the demand graphs and label them D_1 and D_2

- Find the increase in TV quantities purchased in cities A and B when the price is lowered from N300 to N275

SLOPE OF LINES

- The slope of a straight line is the change in the vertical axis, ΔP divided by a change in the horizontal axis, ΔQ i.e. line slope = $\Delta P/\Delta Q$
- Find the slope of the demand line D_1 and D_2, when the price is lowered from N300 to N275
- Which demand line is more steeply sloped?
- What does the difference in the slope of demand lines D_1 and D_2 indicate?

- Re-plot the data. Plot price on the vertical axis in increments of N25 but plot quantity demanded on horizontal axis in increments of 50 units rather than 25.
- Virtually compare the demand lines in the 2 graphs.
- Does it appear that the steepness of the demand lines has changed?
- Has the slope of either demand line changed?
- Can one misinterpret the strength of the relationship of the 2 variables by virtual inspection of the data?

Summary of the Topic:

- Economics is a discipline which studies how scarce economic resources are used to maximize production for a society. Microeconomics studies the economic behavior of individual units; Macroeconomics studies the behavior of aggregates.
- Economic theories and models are developed to facilitate the understanding of complex economic phenomena. Models of economic behavior relate a dependent variable to a limited number of independent variables. The term *Ceteris paribus* is used when the value of all but one of the independent variables is held constant.
- Economics use tables, graphs, and equations to present modeled behavior. Graphs are useful in that they provide visualization of the relationship between two variables. An equation is a more concise presentation of a relationship and is essential for the forecasting of economic behavior.