

SOCIAL SCIENCES FOR BEGINNERS

VOL. I

Geography and Economics

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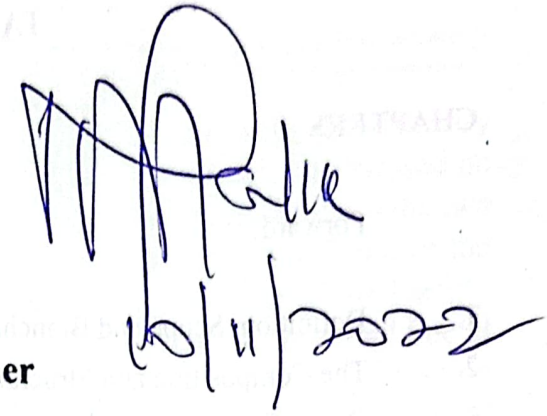
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CHAPTER 23
NATIONAL INCOME ACCOUNTING

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INTRODUCTION

In communities across the world, goods, services and factors of production are constantly exchanged for money. This money exchanges hands from one person to another, from firms to households in form of wages and salaries and from households to firms in form of payment for goods and services. This money constitutes income to the recipients. Thus, when these incomes are aggregated it becomes the national income. Therefore, the national income accounting shows how many economic activities that takes place within the nation and on behalf of their nationals. It is therefore important to study the national income accounting as it provides the foundation for the understanding of macroeconomics.

Meaning

National Income is total market value of all goods and services produced in an economy during a given period of time, or the total incomes earned over the same period of time. It can be used interchangeably with national dividend, national output and national expenditure. National income comprises of incomes earned and thus, it excludes things such as gifts, transfer incomes (retirement benefits), grants and so on.

BASIC CONCEPTS IN NATIONAL INCOME ACCOUNTING

Gross Domestic Product (GDP):-This is the total value of all the goods and services produced by the people resident in a country irrespective of their nationality in a year. This implies that it is concerned with domestic production and does not include net income from abroad. Therefore the value of goods and services produced by Nigerians abroad form part of those country's GDP.

GDP at Market Prices:-This is also refers to as GDP at current prices and it is the market value of the total production of goods and services attributable to all factors of production located in a given country. GDP at market prices = GDP at factor cost plus indirect taxes minus subsidies

GDP at Factor Cost:-This is the sum of the net value added by all the producers within the country. Since the net value gets distributed as income to the owners of factors of production, GDP at factor cost is therefore the sum of domestic factor incomes and depreciation. It can also be calculated as GDP at market price minus indirect taxes plus subsidies.

The GDP Deflator:- It is also referred to as the Implicit Price Deflator. It allows us to separate nominal GDP into two parts: one, measures quantities (real GDP) and the other measures prices. This is the ratio of nominal to real GDP.

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}}$$

The GDP deflator reflects what is happening to the overall level of prices in the economy.

$$\text{Nominal GDP} = \text{Real GDP} \times \text{GDP Deflator}$$

Nominal GDP values goods and services at current prices while real GDP values goods and services at constant prices. Real GDP rises only when the amount of goods and services has increased, whereas nominal GDP can rise either because output has increased or because prices have increased.

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP Deflator}}$$

In this form, GDP deflator helps to deflate (that is take inflation out of nominal GDP to yield real GDP.

Gross National Product (GNP):- This is the total measure of the flow of goods and services produced by the nationals of a country whether currently resident in the country or living abroad. This means that the GNP of a country can also be partly produced abroad. For instance, the income earned by a Nigerian working in China becomes part of Nigeria's GNP and it will also be included in China's GDP.

GNP at Market Prices:- This is the gross value of all the goods and services produced annually in a country plus net income from abroad (GDP at market prices plus net income from abroad). So, we can as well calculate it by multiplying the total output produced in one year by their market prices prevalent during that year in a country,

GNP at Factor Cost:- This is the income which the factors of production receive in return for their services alone. It is represented by GNP at market prices minus indirect taxes plus subsidies. In order to arrive at GNP at factor cost, indirect taxes are deducted. Also if the cost of production is higher than a price of a similar commodity in the market, and in order to protect such producers, the government can intervene by granting them monetary assistance in form of subsidy.

Net National Product (NNP):- In the production of gross national product of a year, we consume or use some capital, that is equipment, machinery etc. These capital goods wear out or depreciate in value as a result of its consumption or use in the production process. All these wear and tear are referred to as depreciation or capital consumption. Therefore NNP is calculated by deducting depreciation from GNP.

NNP at Market Prices:- NNP at market prices is the net value of final goods and services measured at market prices during a year in a country. GNP at market prices can thus be calculated by deducting depreciation from GNP at market prices.

NNP at Factor Cost:- Net national product at factor cost is the aggregate payments made to the factors of production. NNP at FC is the total incomes earned by all the factors of production in the form of wages, profits, rent, interest and so on plus net factor income from abroad. It is also called National Income. This differs from NNP at market prices in that indirect taxes are deducted and subsidies are added to NNP market prices in order to arrive at NNP at factor cost.

Thus it can be calculated as follows:

NNP at FC = NDP at factor cost plus net factor income from abroad.
NNP at market prices minus indirect taxes plus subsidies
GNP at market prices minus depreciation minus indirect taxes plus subsidies

Net Domestic Product (NDP):- This is the net output of goods and services produced within the territory of a country in a given year. During the particular year, some of the country's capital wears out or becomes obsolete during the production process. The value of the depreciation is deducted from GDP. Thus, NDP = GDP at factor cost minus depreciation.

Personal Income
This is the sum of all incomes actually received by all individuals or households during a given year. It refers to an individual's total earnings from wages, investments and other ventures. Personal income is calculated thus:
Personal Income = National Income – Social Security contributions (for example insurance) – Corporate Income Taxes – Undistributed Corporate Profits + Transfer Payments (for example pension)

Disposable Income
This is the amount left to an individual after taxes have been paid. This means that after a good part of income is paid to the government in the form of personal taxes, what remains of personal income is called disposable income. Thus, disposable income can either be consumed or saved.

$$\text{Disposable income} = \frac{\text{Personal income} - \text{personal taxes}}{\text{Consumption} + \text{saving}}$$

Per Capita Income
This is the average income in a country. It is defined as the national income divided by the country's population. This concept can be measured both in current and constant prices. For instance in order to calculate the per capita income for 2017 at current prices, the national income of the country is divided by the population of the country in that year.

$$\text{Per capital income in 2017} = \frac{\text{national income in 2017}}{\text{population in 2017}}$$

If the national income of a country in 2017 is 6.12 trillion naira and the total population is estimated at 180 million people. *Then the per capita income equals*

$$\frac{6.12 \text{ trillion}}{180 \text{ million}} = 34{,}000$$

While the real per capita income is measured using the real national income

$$\text{Real per capital income in 2017} = \frac{\text{Real national income in 2017}}{\text{population in 2017}}$$

The real national income is calculated by taking out the effect of inflation from the calculation and this is done with the use of the base year price. Now, suppose 2015 is used as the base year and the national income for 2017 is 6.12 trillion naira and the index number for this year is 105. Hence real national income for 2017 will be calculated thus,

$$6.12 \text{ trillion X } \frac{100}{105} = 4.08 \text{ trillion naira}$$

So, the real national income per capita for 2017 =

$$\frac{4.08 \text{ trillion naira}}{180 \text{ million}} = 22.667 \text{ naira}$$

NATIONAL INCOME AT CURRENT PRICES

The national income at current prices is also referred to as nominal national income. It is the money value of final goods and services produced by the residents of a country in a given year, measured at the prices of the current year. For instance, the measurement of Nigeria's national income of 2020 at the prices of 2020. Nominal national income does not account for diminished purchasing power and neither does it show the true picture of economic growth of a country because of inflation or outstanding debt. In order to eliminate the effect of inflation, the national income is also estimated at constant prices.

NATIONAL INCOME AT CONSTANT PRICES

The national income at constant prices is also known as real national income. It is the money value of final goods and services produced by the residents of a country in a year, measured at base year's price. Base year is a normal year which is free from price fluctuations. For instance, if the base year period of a country is 2015 and the national income of 2017 is to be measured according to the base year's price, then the national income of 2017 will be measured with the prices of 2015. The real national income can also be calculated by taking out the effects of inflation (price change) away from the nominal national income. This is done by dividing national income by the price index.

$$\text{Real income} = \frac{\text{National income in 2017}}{\text{General Price Index in 2015}} \text{ x } 100$$

$$\text{Real income} = 6.12 \text{ trillion x } \frac{100}{105} = 4.08 \text{ trillion naira}$$

Measurement of National Income

There are three methods of measuring or calculating national Income of a country. These are the Product, Income and Expenditure methods but these methods arrive at the same answer.

1. Product or Output Method

This method considers the national income from the output side. The economy is divided into different sectors such as agriculture, mining, manufacturing, commerce, transport, telecommunications and other services. Hence, it is also known as national income by sectoral origin. Under this method, we add the values of output produced or services rendered by the different sectors of the economy during the year in order to calculate the national

income. Only the value added by each firm in the production process is calculated. In order to avoid double counting intermediate goods and services should not be included rather only final goods and services should be included.

2. Incomes Method

The method approaches the national income from the distribution side. It is the factor income method which entails adding all the incomes earned by factors of production during a given year from the production activities in an economy. Therefore, national income is calculated by adding up income received from employment, and ownership of assets before taxation received from all the production activities in an economy. These include income from self-employment, interest on capital, profits of entrepreneurs, rent on land, gross profit of corporate businesses and gross trading surplus of public corporations and enterprises. Thus, national Income can be written

as: $Y = W \& S + R + I + P.$

Where W is wages and salaries, R is rent; I is interest; P is profits. However, in order to avoid double counting, there is the need to exclude items not arising for productive activities such as sickness benefits and interest on national debts.

3. Expenditure Method

This approach is derived by adding up all expenditure on final output in a yearThe method measures the total domestic expenditure of the economy. It consists of two elements, viz consumption expenditure and investment expenditure. Consumption expenditure includes consumption expenditure of the household sector on goods and services and consumption outlays of the business sector and public authorities. While, investment expenditure refers to the expenditure on the making of fixed capital such as plant and machinery, building and so on. This method measures the total value of investment and consumption expenditure on goods and services by individuals, firms and the government. It is pertinent to exclude government expenditure for social security, unemployment compensation and veterans benefits since they are not spending for a good or service. The receipts of these amount spent by government do not provide a good or service to the government in exchange. Such expenditures are referred to as government transfer payments and must be excluded since they do not reflect output of goods and services and their inclusion would rob the total expenditure of its usefulness as a measure of the value of economy's output of goods and services. The expenditure method is calculated thus:

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

Where

C = consumption expenditure
I = investment expenditure
G = Government expenditure
X = Export earnings
M = Imports

NATIONAL INCOME DETERMINATION: TWO, THREE AND FOUR SECTOR ECONOMY

In a two-sector model, aggregate demand consists of consumption expenditure (C) and investment expenditure (I) hence, households allocate its income between consumption and investment. Aggregate demand is thus given by AD = C+ I, but AD=Y hence Y= C+ I, where C is Consumption and I is Investment. In a three-sector model, equilibrium level of national income occurs when planned output equals planned expenditure. And aggregate demand consists of consumption expenditure (C), investment expenditure (I) and government (G).

Thus,

AD = C + I + G

but AD = Y *in equilibrium, hence, we have*

Y = C + I + G.

Example 1: Assuming that we have the following:

C = 50 + 0.75Yd

(I) I = 100

G = 40

Yd = Y -T

(II) = Y -0.2Y

= 0.8Y

Our consumption function now becomes

C = 50 + 0.75Yd

= 50 + 0.75 (Y-0.2Y)

= 50 + 0.75 (0.8Y)

= 50 + 0.6 Y

The equilibrium level income is now calculated.

C + I + G = Y in equilibrium

Thus, 50 + 0.6Y + 100 + 40 =Y

Restated as :

Y = 50 + 0.6 Y +100 + 40

= 50 + 100 + 40 0.6Y

Y = 190 +0.6 Y

Y-0.6Y = 190

0.4Y = 190

Y = 190/0.4

Y = ₦475

The equilibrium level of Income is ₦475 billion.

Furthermore, assuming government expenditure increases from ₦40 billion to ₦90 billion. The new national income is calculated thus:

$C = 50 + 0.6Y$

$I = 100$

$G = 90$

Hence, the new equilibrium national income

$Y = 50 + 0.6Y + 100 + 90$

$Y = 50 + 100 + 90 + 0.6Y$

$Y = 240 + 0.6Y$

$Y-0.6Y = 240$

$Y(1-0.6) = 240$

$0.4Y = 240$

$Y = 240/0.4$

$Y = ₦600$ billion

In the four-sector model, we introduce exports and imports and equilibrium level of national income occurs when planned output equals planned expenditure. And aggregate demand consists of consumption expenditure (C), investment expenditure (I), government (G), exports (X) and imports (M) and the difference between exports and imports is net export (NE=X-M). *Our model now becomes*:

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

$$GDP = Y = C + I + G + (X-M)$$

Net exports refer to the value of goods and services exported to other countries minus the value of goods and services a country purchase/ import from other countries. We have positive net exports when the value of exports is greater than the value of our imports and negative when the value of our imports is greater than the value of our exports.

Uses of National Income Accounting in Nigeria

1. **To know a country's economic progress:**
   National income statistics helps in determining the performance of the economy signifying economy's strength and failures. It is a good measurement in knowing whether the country is progressing or retrogressing economically between a given periods of time by comparing the national income figures of that country over time.
2. **To determine the standard of living of the population**
   National income gives a rough estimate of a country's living standards. To determine the living standard, the national income is divided by the total population and gives the income per head (also known as the per capita income). The higher a country's per capita income, the higher the country's standard of living.
3. **To compare the standard of living of one country to another**
   The per capita income of one country can be compared with that of another country. The country with a higher per capita income is said to have a better standard of living than a country with a lower per capita income.
4. **To aid foreign investment**

National income estimates show the value of a country's foreign investment and hence suggest the necessary adjustment in that direction.

5. **To know the structure of production**
The national income shows the value of all productive activities in the country. It therefore reflects how national income is shared among the various factors of production.

6. National income statistical data reflect the specific contribution of individual sectors and their growth over time.

7. National income is of important benefits to businessmen, students and individuals as the figures serves as input to their planning and decision purposes.

Problems of Measuring National Output/Income

I) The **underground economy** consists of illegal and undeclared transactions. These may involve transactions where the goods and services are themselves illegal such as drugs and prostitution or where the transactions are illegal because they are not declared for tax purposes. It could also be the case of 'moonlighting', where people do extra work outside their normal job and do not declare the income for tax purposes. For instance, an electrician employed by a building contractor during the day may rewire people's houses in the evening for cash. Similarly, unemployed people may do causal work which they do not declare for fear of losing benefits.

II) **Non-marketed Items:** GNP estimates usually exclude some activities such as 'do it yourself' (washing your car yourself or painting your house yourself) hence, they tend to understate GDP statistics. Similarly, the employment of people to do housework will overstate the rate of growth since the housework which was previously unrecorded now enters into GNP estimates.

III) **Unpaid goods and services:** Since consideration is given to only goods andservices for which payments are made, the national income statistics may not give an accurate figure of the total value of goods and services produced in a country within the given period of time. For example, if a man employs a cleaner, payment to the cleaner will appear in the national income. But, if the man were to do the cleaning himself, no payment would be made to him. In this case the national income will be reduced because no payment is made for the job done.

IV) ***Inflation:*** Inflation is one of the major problems in national income accounting. It is the changes in the value of money and upsets the national income calculation. Due to inflation, the value of national income for particular year appears to increase even when the production is decreasing. For this reason, adjustments are made to take out the effects of inflation if there is to be any meaningful comparison between the national income of one year to another,

v) **Capital gains and losses:** Whenever the market prices of capital assets change, the owners make capital gains or losses and such gains and losses are not included in the national income accounting.

vi) **Problem of double counting:** Only final goods and services should be included in the national income accounting. But there is always the difficulty in calculating the value of a commodity twice. Some of the goods that are regarded as final goods may eventually enter the production line as intermediate goods thereby, calculating both the values of the final and intermediate goods in the national income and thus leads to the problem of double counting.

vii) **Transfer payments:** These are payments made for no work done. For example, pension, gifts, unemployment benefits, relief payments and so on. Only payments for productive services should be included, whereas, transfer payments are by rule, not to be included in the national income. These payments create difficulty in the measurement of national income as it is often very difficult to draw a line between payment for productive services and transfer payments.

viii) **Illegal activities:** Some business activities produce goods and services that are deemed illegal and consequently, some amount of income are made from those activities and these incomes may end up being computed into the national income. For example, gambling, prostitution, smuggling and so on.

ix) **Inadequate and unreliable statistics:** This is a serious problem in the computation of national income. The national income may be affected due to unreliable and up to date data and it may therefore lead to underestimation.

Problems of Using National Income Statistics to Measure Economic Welfare

Although, GNP statistics provides a good index for measuring the level of economic activities in a country, it is however, a poor indicator for measuring economic welfare of a society for a number of reasons:

GNP only considers market transactions:- Economic welfare does not depend only on market transactions but also on non-market transactions. For most developing economies, non-market transactions forms a substantial part of their economies hence, GNP fails to be a good indicator of welfare of the people in these countries.

GNP Ignores Externalities :- GNP does not consider social costs of production resulting from negative externalities due to increase in production. For instance, the flow of effluents from chemical industry that spills into rivers, which leads to pollution of water and air in such communities may not be captured by national income estimates. Where these external costs exceed the increase in real output per capita generated from such production, then welfare improvement has not occurred.

GNP Ignores distribution of Income:- Increase in national income of some countries does not translate to improvement in general welfare of the citizens of the country due to income inequality. We may have a situation where the increase in real output or income may accrue to

only few citizens while majority may not benefit due to growing income inequalities. This scenario is usually synonymous with developing economies where the rich may be getting richer and the poor may be getting poorer.

Production does not equal Consumption:- Production is desirable to the extent that it enables us to consume more. However, if the increase in production results from people working harder or longer hours, its net benefits will be less.

Increase in GDP attributable to rising prices:- The GDP of a country can increase either due to increase in the quantities of goods and services produced or due to an increase in prices of goods. When there are price increases without a corresponding increase in quantity of goods and services produced, the GDP would not be a good gauge of economic well-being hence it would not accurately reflect how well the economy can satisfy the demands of households, firms and the government. If all prices doubled without any change in quantities, GDP would double, yet it would be misleading to say that the economy ability to satisfy demand has doubled because the quantity of goods produced remains the same. In such situation, we have nominal GDP, that is, GDP at the current prices. This explains why economists use real GDP, which is a better measure of economic well-being and this reflects actual increase in the value of goods and services measured at constant prices.

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Review Questions

1. GDP may not be a good measure of economic welfare in LDCs Discuss?
2. In measuring national income what items should be excluded to avoid double counting?
3. Enumerate the problem that could be encounter in measurement of national income.

Multiple Choice Questions

1. Construction of railways and roads belong to which part of the GDP formula?
   GDP = C + I + G + (X – M).
   a. Consumption expenditure b. Investment expenditure
   c. Government expenditure d. Industrial expenditure

2. The value of the output of all goods and services produced within a country in a year is known as
   a. Total output b. Gross Domestic Product
   c. Gross National Product d. Gross National Income

3. Which of the following is NOT among the problems faced in measuring National Income?

a. Illegal activities
b. Marketed item
c. Unpaid goods and services
d. Double counting

4. Which of the following is NOT a final expenditure?
a. Meat purchased by a restaurant
b. A pencil purchased by a student
c. Chicken purchased by a household
d. Vegetables purchased by a housewife

5. Phones and laptops belong to which part of the GDP formula? $GDP = C + I + G + (X - M)$.
a. Consumption expenditure
b. Investment expenditure
c. Government expenditure
d. Foreign expenditure

6. In a two-sector economy, when consumption is ₦ 40 + 0.9Y and investment is ₦ 50, equilibrium output is?
a. ₦90 b. ₦400 c. ₦500 d. ₦900

7. Suppose the marginal propensity to save (MPS) in a three sector model is 0.4, what is the value of the multiplier?
a. 2.7 b. 3.7 c. 2.5 d. 3.4 e. 5.1

8. Which of the following activities constitute part of GDP?
(I.) Mrs Johnson picks flowers in her garden
(II) Fruits are sold in the market
(III) Patients, hurt in a car accident, are treated in a hospital
(IV) Pensioners do community work for free
(V) A garage buys spare tyres to sell them to customers next year.

a. I, II & III b. II, III & IV c. II, IV & V d. I, IV & V *e. II, III & V*

ABOUT THE BOOK

The Faculty of Social Sciences under the Deanship of Professor I.P Ifabiyi, being student-centered and results driven, observed a dearth of reading materials for students in specific courses and topics the implication of which include difficulty for students in preparing for examinations and continuous assessment with negative consequences for their performance. This situation cannot be adequately addressed by a long list of references in different courses alone because these references may not be handy during examinations. Thus there is a need for a painstaking selection of such courses and topics across departments in the Faculty with a view to preparing a compendium of reading materials on them. This approach is expected to yield better results because these materials were compiled from the submissions of the lecturers that have been teaching these courses and are familiar with the topics. Thus, students, through these materials will access the 'minds' and 'styles' of their lecturers first-hand. Thus, '*Social Sciences for Beginners*' is produced in three volumes covering a wide range of courses in all the departments in the faculty. Volume 1covers topics in Geography and Economics, Volume 2 covers topics in Sociology, Social Work, Criminology and Security Studies, Psychology and Political Science while Volume 3 covers topics in Elementary Social Statistics and Computer Appreciation. The topics in the three volumes were rendered in classroom languages and down to the level of the student. We are fervent believe that students will find solutions to a host of challenges in many courses and topics that may have menaced them over time. The lecturers will also find teaching even more convenient since course materials have been produced in advance and may also aid students' participation in class since they already have a fairly good idea of the topics through the social sciences for beginners series. The Book Project Committee expresses its appreciation to the Dean for the confidence reposed on us and our colleagues for the maximum cooperation extended.

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