National Income Accounting

Introduction:

National income is an important concept of macroeconomics. It is the measure of economic activities in a country. It is the money value of all final goods and services produced by residents of a country in a year. It is also defined as the sum of factor incomes in a country in a year. It is also expressed in terms of aggregate expenditure of a country in a year.

Importance of National Income Estimates:

- Indicator of Economic Progress.
- Measure of Economic Growth.
- Comparison with other Countries.
- Significance in Business Policy Making.
- Significance for Trade Unions.
- Knowledge of Structural Changes.
- Significant for Economic Analysis, etc.

Some Basic Concepts:

Domestic Territory of a Country: It includes land mass of a country, territorial waters, ships and aircrafts owned and operated by residents across countries, fishing vessels, oil rigs and floating platforms and embassies abroad.

Normal Residents: A person or institution who ordinarily resides in a country and whose centre of economic interest lies in that country.

The normal residents of a country **include** the following:

- All producing enterprises operating in a country;
- Nationals of a country and the foreign nationals who stay for one year or more in the country;
- Kurdistan nationals who have gone abroad but come back within a year's time;

- Kurdistan employees working in the foreign embassies and international institutions located in Kurdistan region; and
- Kurdistan students and patients who have gone abroad and stay there even for more than one year.

Normal Residents = Nationals living in Kurdistan region + Non- nationals living in Kurdistan region

Non- resident of a Country: if a Kurdistan national goes abroad and stays there for a period less than one year, he will remain normal resident of Kurdistan region. But, if he stays there for more than one year he will be treated as non- resident of Kurdistan region.

Flow: It is quantity that can be measured over specific period of the time.

Stock: It is quantity measureable at particular Point of the time.

Accounting Year: The financial year which the flow of income in an economy is recorded.

Capital formation: The surplus of the production over consumption in an accounting year which is further used for production.

Final Goods: Goods which directly satisfies human wants.

Intermediate Goods: Goods which are used in the production process to produce other goods.

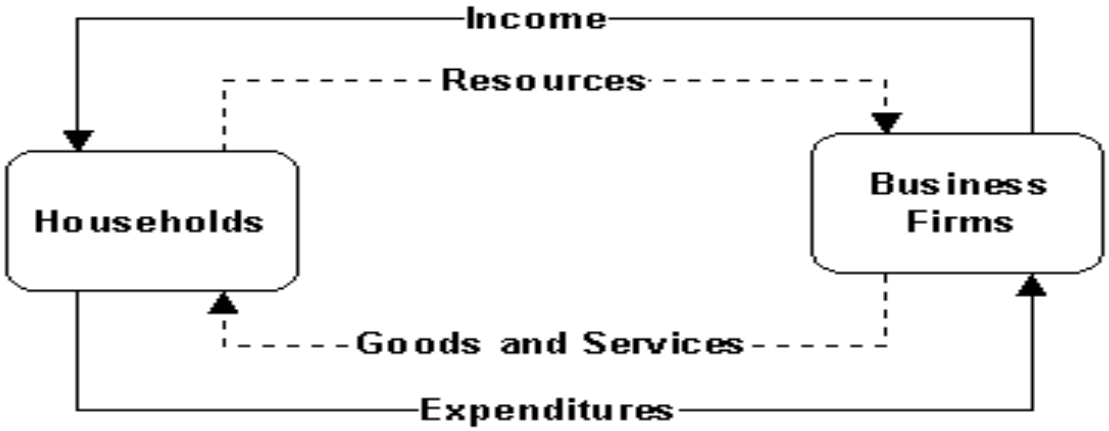
Per Capita Income: This is the average income of the citizens of a country obtained after dividing national income by living population.

Subsidies: economic assistance given to the producing unit by the state for compensating the cost of product so that it is available to consumers at affordable prices.

Factors of production/Primary Inputs/Economic Resources: Resources/goods which is used in the production process. For example, land, labour, machines, power etc.

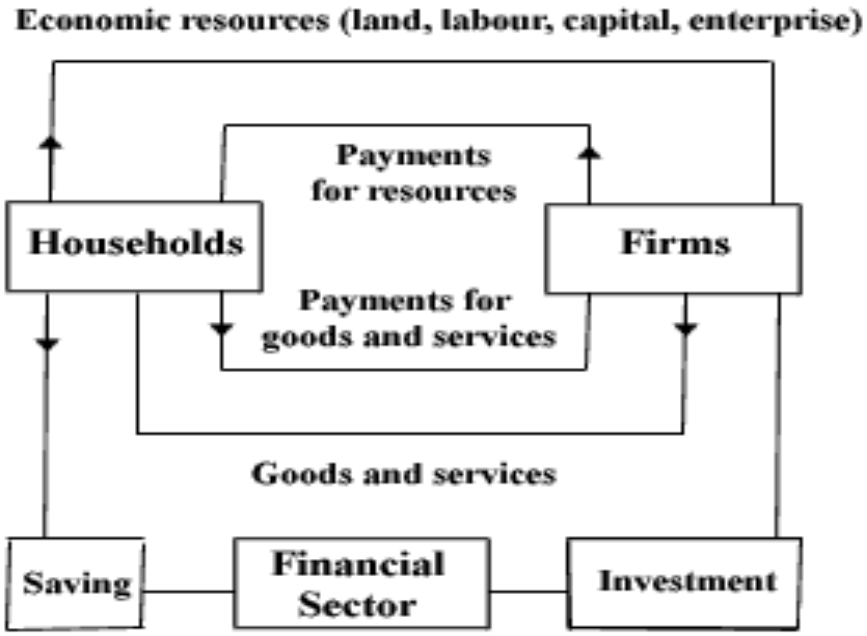
Circular Flow of Income:

Flow of Income in a Two- sector Economy:

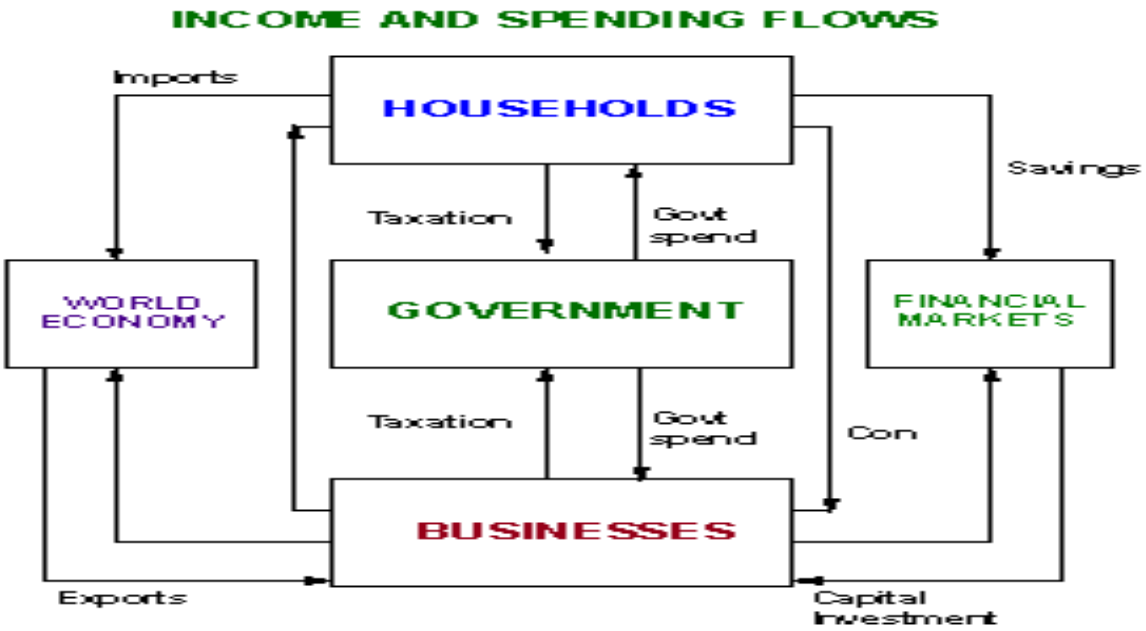


Solid Lines - Flow of Money
Dashed Lines - Flow of Goods and Services

Flow of Income in a Three- sector Economy (Introduction of Saving and Investment in the Flow of Income):



Flow of Income in a Four- sector Economy (Introduction of Foreign Trade in the Flow of Income):



Some Concepts of National Income and Related Aggregates:

The important concepts related to national income are:

- Gross Domestic Product at Market Price (GDP_{MP});
- Gross Nation Product at Market Price (GNP_{MP});
- Net Domestic Product at Market Price (NDP_{MP});
- Net Nation Product at Market Price (NNP_{MP});
- Gross Domestic Product at Factor Cost (GDP_{FC});
- Gross Nation Product at Factor Cost (GNP_{FC});
- Net Domestic Product at Factor Cost (NDP_{FC});
- Net Nation Product at Factor Cost (NNP_{FC});
- Private Income;
- Personal Income;
- Personal Disposable Income;

Gross Domestic Product at Market Price (GDP_{MP}): Gross Domestic Product (GDP_{MP}) is the market value of all final goods and services produced within domestic territory of the country during a year.

Features of GDP_{MP}:

- It includes only final goods and services produced in the domestic territory of a country;
- It includes consumption of fixed capital (depreciation);
- It is estimated at the prevailing prices.

Gross Nation Product at Market Price (GNP_{MP}): Gross National Product at market price is Gross Domestic Product at market price plus net factor income from abroad. **GNP_{MP}** is the money value of all final goods and services produced in the domestic territory of a country during a year plus Net factor income from abroad. i.e.,

$$GNP_{MP} = GDP_{MP} + NFIA$$

Where,

GNP_{MP} = Gross National Product at market price
GDP_{MP}= Gross Domestic Product at market price
NFIA= Net factor income from abroad

Net Factor Income from Abroad (NFIA): Net factor income from abroad is the difference between the income received from abroad for rendering factor services by the normal residents of the country to the rest of the world and income paid for the factor services rendered by non-residents in the domestic territory of a country.

Net Domestic Product at Market Prices (NDP_{MP}): Net Domestic Product at market prices is the net market value of all the final goods and services produced in domestic territory of a country during a year. Net market value of the goods is equal to the market value of goods minus depreciation.

$$NDP_{MP} = GDP_{MP} - D \text{ (or CCA)}$$

Where,

NDP_{MP}= Net Domestic Product at market prices

GDP_{MP}= Gross Domestic Product at market price

D = Depreciation

CCA= Capital Consumption Allowances

Net National Product at Market Price (NNP_{MP}): Net National Product at Market Prices is the net market value of all the final goods and services produced by the normal residents of a country during a year.

$NNP_{MP} = GNP_{MP} – D$

Where,

NNP_{MP} = Net National Product at Market Prices

GNP_{MP} = Gross National Product at market price

D = Depreciation

Gross Domestic Product at Factor Cost (GDP_{FC}): It is the sum of net value added at factor cost by all the producers in the domestic territory of a country and the consumption of fixed capital during an accounting year. i.e.,

GDP_{FC} = Domestic Factor Income + Consumption of Fixed Capital

$GDP_{FC} = GDP_{MP} – IT + S$

Gross National Product at Factor Cost (GNP_{FC}): It is the difference between the GNP_{MP} and net indirect taxes. It is the sum of net domestic factor income, consumption of fixed capital and net factor income from abroad. Symbolically,

$GNP_{FC} = GNP_{MP} – IT + S$

GNP_{FC} = Domestic Factor Income + NFIA + Consumption of fixed capital.

Net Domestic Product at Factor Cost (NDP_{FC}): Net domestic income is the income generated in the form of wages, rent, interest and profit in the domestic territory of a country by all the producers (normal and non- normal residents) in an accounting year. In other words,

$NDP_{FC} = NDP_{MP} – IT + S$

Where;

IT = Indirect Taxes; and
S = Subsidies.

Net Indirect Tax: The difference between IT and S is known as net indirect tax.

Net National Product at Factor Cost (NNP_{FC}): Net National Product at the factor cost is the sum total of net value added at factor cost by all the normal residents producer enterprises of a country during a year. Symbolically,

$NNP_{FC} = NDP_{FC} + NFIA$

It is also expressed as the sum of domestic factor income and net factor income from abroad. *i.e.*,

NNP_{FC} = Net Domestic Income + NFIA

Net National Product at Factor Cost (NNP_{FC}) is also known as *National Income.*

Personal Income: Personal income is sum of all kinds of income received by the individuals from all sources.

Private Income: It refers to the income which accrues to individuals from whatsoever source, within the domestic territory of a country and abroad.

Distinction between Private Income and Personal Income: Private income includes all the payments which accrue to individuals from whatever sources while personal income includes only those payments which are actually received by the individuals.

Personal Disposable Income: It refers to that part of personal income which is actually available to households for consumption and saving. In other words,

Personal Disposable Income = Personal Income – (Direct Taxes + Fines, Fees, etc. + Social Security Contributions by Employees)

Net National Disposable Income: It is the sum of national income, net indirect taxes and other current transfers from the rest of the world. In other words,

Net National Disposable Income = National Income + Net Indirect Taxes + Net Capital Transfers from the rest of the World

Per Capita Income (PCI): It is the average income of the normal residents of a country. Symbolically,

$$PCI = \frac{National\ Income\ (NNP\ at\ Factor\ Cost)}{Population}$$

Real Income: The income measured in physical term or in terms of the quantity of goods and services. It is calculated at some base year.

Nominal income: The income measured in term of current price.

GDP Deflator: It is nominal GDP (current price) divided by real GDP (base year price).

$$GDP\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} \times 100$$

Measurement of National Income

National income worked as important indicators to measure the level of economic growth and welfare of the country. National income data facilitate the formulation of plans and fixing the targets of development. National incomes also narrate the picture of saving, investment, distribution of national income, consumption and employment level of the country. For this overall these aspects we need national income and related estimates.

Methods of Measurement of National Income

There are three methods of the measurement of the national income. They are as follows:

1. **Value Added Method or *Product Method***
2. **Income Method or *Factor income in production process***
3. **Expenditure Method**

1- VALUE ADDED METHOD OR *PRODUCT METHOD:*

Steps for the Estimation of National Income by Value Added or Product Method

1) Estimating the value of Gross Domestic Product of the different sectors of an economy.
2) Determining the cost of Materials and services provided by the sectors
3) Determining the net value added of the domestic product and
4) Adding the factor income from abroad.

Example1:

Let's go through a simple example to illustrate the calculation of National Income using the Value-Added Method or Product Method. Assume there are three stages of production: agriculture, manufacturing, and retail.

1. **Agriculture Stage:**
   - Gross Value of Output (GVO): $10,000 (value of all crops produced)
   - Value of Intermediate Consumption (VIC): $2,000 (cost of seeds, fertilizers, etc.)
   - Net Value Added at Agriculture Stage: $10,000 - $2,000 = $8,000
2. **Manufacturing Stage:**
   - Gross Value of Output (GVO): $20,000 (value of processed goods)
   - Value of Intermediate Consumption (VIC): $5,000 (cost of raw materials, energy, etc.)
   - Net Value Added at Manufacturing Stage: $20,000 - $5,000 = $15,000
3. **Retail Stage:**

- Gross Value of Output (GVO): $30,000 (value of goods sold to consumers)
- Value of Intermediate Consumption (VIC): $10,000 (cost of maintaining the retail store, packaging, etc.)
- Net Value Added at Retail Stage: $30,000 - $10,000 = $20,000

Now, to calculate the National Income, we sum up the net value added at each stage:

National Income = {Net Value Added at Agriculture} + {Net Value Added at Manufacturing} +{Net Value Added at Retail}

National Income = $8,000 + $15,000 + $20,000 = $43,000

So, using the Value-Added Method, the National Income in this hypothetical economy is $43,000. This method ensures that we consider the value added at each stage of production without double-counting intermediate goods.

Precautions while estimating National Income through Value Added Method

A. Net Increase in stocks should be included.
B. Own account production of fixed assets by all the producer enterprises should be included.
C. Non- marketed goods and services for self-consumption should not be included.
D. Imputed rent of owner occupied houses should be properly counted and included.
E. Sales and purchase of second hand goods should not be included.
F. The brokerage or commission of second hand should be included because it is productive services rendered by them.
G. Trading of stocks and bonds should not count in the estimation of national income because it does not represent the production of new assets.

2- INCOME METHOD:

According to the income method, national income is estimated by adding incomes earned by all factors of production for their factor services during a year. The factor services include land, labour, capital and enterprises. These factor services received the income against their services. The factors income distributed as follow:

Factors of Production	Factors Income
1. Land	1. Rent
2. Labor	2.Wages or Salaries
3. Capital	3.Interest
4. Enterprises	4. Profit

Steps of Income Method

I. **Identifying the producer enterprises which employ factors of production**

This is the first step. All the producer enterprises are divided into three main sectors: primary, secondary and tertiary sector.

II. **Classification of Factor Incomes**

Factor incomes are generally classified into three groups

A. Compensation to the employees

B. Operating surplus (Rent +Interest+ Profit) and

C. Mixed Income of the self employed

III. **Estimating Factor Payments—**

Payment made by different individual enterprises to the factors of production for rendering factor services is known as **factor payments**.

Adding the factor payments by all enterprises in an individual sector, we get factor payment of that sector. By adding the incomes paid out to all the sectors of the domestic territory of the country, we get domestic factor income or the national income.

Example2:

Let's consider a simplified example with three main income components:

1. **Compensation of Employees (Wages and Salaries):**
   - Wages and Salaries: $30,000
2. **Gross Profits for Incorporated Firms:**
   - Corporate Profits: $20,000
3. **Gross Profits for Non-incorporated Firms:**

- Business Profits: $10,000

4. **Taxes (minus Subsidies):**
   - Taxes: $5,000
   - Subsidies: $1,000

Now, the National Income using the Income Method is calculated as follows:

National Income = {Compensation of Employees} + {Gross Profits for Incorporated Firms} + {Gross Profits for Non-incorporated Firms} + {Taxes} - {Subsidies}

National Income = $30,000 + $20,000 + $10,000 + ($5,000 - $1,000)

National Income = $64,000

In this example, the National Income using the Income Method is $64,000. This method focuses on the total income earned by individuals and businesses in the economy, providing a different perspective compared to the Value Added Method

Precautions while estimating National Income through Income Method

A. All government expenditure on transfer payments, such as Unemployment benefits, old age Pensions, scholarships etc. should not be included. This is because they are received without rendering any productive services.
B. Value of imputed rent owner-occupied houses should be included.
C. Incomes earned through illegal activities like smuggling, tax evasion etc. should not be included.
D. Windfall gains like lottery income should not be included.
E. Money received for sale and purchase of second hand goods and bonds and share should not be included in factor income.

The Income Method is another approach used to calculate National Income. It involves adding up all the incomes earned by factors of production within an economy. The main components include compensation of employees, gross profits for incorporated and non-incorporated firms, and taxes (minus subsidies).

3- EXPENDITURE METHOD:

According to the expenditure method, the gross domestic product (GDP) is the sum total of all final expenditure on various goods and services within domestic territory of the country, during a year. The main components of the final expenditure are as follows:

I. Private Final Consumption Expenditure(C)
II. Investment Expenditure (I)
III. Government purchase of goods and services(G)
IV. Net Exports (X-M) Where, X for exports and M for Imports

Mathematically the expenditure method to calculate the national income written as

Y= C+I+G+(X-M) + Net Factor Income from Abroad

Where;

Y is the National Income
C is the Private Consumption Expenditure
I is the Investment Expenditure
G is the Government Purchases of the goods and services
X-M is the net Exports

Example3:

The formula you provided,

Y=C+I+G+(X−M)+Net Factor Income from Abroad,

Represents the calculation of Gross National Income (GNI). GNI is the total income earned by a country's residents, including income generated domestically and net income received from abroad.

Let's break down the components with a hypothetical example:

Consumption (C):

Personal consumption expenditures on goods and services: $50,000

Investment (I):

Business investments in machinery and equipment: $20,000

Government Spending (G):

Government expenditures on goods and services: $30,000

Exports (X) and Imports (M):

Exports of goods and services: $25,000

Imports of goods and services: $15,000

Net Factor Income from Abroad:

Net income earned from foreign investments and labor: $5,000 (positive if the country receives more income from abroad than it pays, negative if the country pays more)

Now, plug these values into the formula:

GNI = $50,000 + $20,000 + $30,000 + ($25,000 - $15,000) + $5,000

NFIA

GDP

GNI = $110,000

In this example, the Gross National Income (GNI) is $110,000. The formula considers consumption, investment, government spending, net exports (exports minus imports), and net factor income from abroad. Net factor income from abroad accounts for the difference between the income earned by the country's residents from foreign investments and the income paid to foreign investors within the country.

Precautions of Expenditure Method

A. Expenditure on second hand goods should not included
B. Expenditure on bonds and shares should not be included
C. All government expenditure on transfer payments, such as Unemployment benefits, old age Pensions, scholarships etc. should not be included.
D. Expenditure on all intermediate goods and services should not be included.

Formula: National Income Accounting:

$GDP_{MP} = C + I + G$

$GNP_{MP} = GDP_{MP} + NFIA$

$NDP_{MP} = GDP_{MP} – D$ (or CCA)

$NNP_{MP} = GNP_{MP} – D$

GDP_{FC} = Domestic Factor Income + Consumption of Fixed Capital

$GDP_{FC} = GDP_{MP} – IT + S$

$GNP_{FC} = GNP_{MP} – IT + S$

GNP_{FC} = Domestic Factor Income + NFIA + Consumption of fixed capital.

$NDP_{FC} = NDP_{MP} – IT + S$

$NNP_{FC} = NDP_{FC} + NFIA$

NNP_{FC} = Net Domestic Income + NFIA

Personal Income = Private Income – Corporate Taxes – Corporate Savings

Personal Disposable Income = Personal Income – (Direct Taxes + Fines, Fees, etc. + Social Security Contributions by Employees)

Net National Disposable Income = National Income + Net Indirect Taxes + Net Capital Transfers from the rest of the World

Personal Saving = Personal Disposable Income – Personal Consumption Expenditure

Gross Domestic Saving = Personal Savings + Private Corporate Savings + Public Savings.

$$PCI = \frac{National\ Income\ (NNP\ at\ Factor\ Cost)}{Population}$$

$$GDP\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} \times 100$$

$$percentage\ change = \frac{Value_2 - Value_1}{Value_1} * 100$$

$$growth\ rate\ of\ GDP = \frac{GDP_{2015} - GDP_{2014}}{GDP_{2014}} * 100$$

Example: Calculate GDP Growth Rate Euro Area Euro Area

	2014	2015
GDP	€ 10.1 trillion	€10.4 trillion

Growth rate of GDP = $\frac{10.4 - 10.1}{10.1}$ * 100 = 3.0 %

Table 1 Calculation of Nominal GDP in an "Apples-and-Oranges" Economy

(1)	(2)	(3)	(4)
Description	Price per kilogram (€)	Quantity (kilograms)	Contribution to nominal GDP [(2) × (3)] (€)
Year 1			
Apples	€1.00	100	€100
Oranges	€2.00	50	€100
			€200
Year 2			
Apples	€1.50	100	€150
Oranges	€2.00	75	€150
			€300

Calculating Real GDP:

- Constant-prices method (until the 1990s)
- Use prices from one particular year, the *base year*, to evaluate value of production in all years

- *Constant-Price Real GDP = Total production valued at base year prices*

✦ Chain-linked prices (since the 1990s)

- Real and nominal GDP are equal in the ***reference year***
- Yields a unique growth rate
- Computationally complex

Table 2 Calculation of Constant-Euro Real GDP

(1)	(2)	(3)	(4)
Description	Price per kilogram in base year (€)	Quantity (kilograms)	Contribution to real GDP [(2) × (3)] (€)
Year 1 (Base)			
Apples	**€1.00**	100	€100
Oranges	**€2.00**	50	€100
			€200
Year 2			
Apples	€1.00	100	€100
Oranges	€2.00	75	€150
			€250

*Bold type indicates base year *prices*

✓ *Nominal GDP grows faster than real GDP when prices are rising*

Inflation Rate: is the percentage change in the Consumer Price Index

Inflation Rate = $(CPI_2 - CP_1)/CPI_1 * 100$

Eg. : Let CPI1= 100 and CPI2= 125, then Inflation Rate= (125-100)/ 100 * 100 = 25 %