Part I

DETERMINATION OF NATIONAL INCOME

One of the most important issues of macroeconomics is determination of output and price levels, which is done through National Income Estimates. The output level of an economy closely links with the levels of employment and economic well-being of the households.

Chapter 1

NATIONAL INCOME ACCOUNTING

1.1 INTRODUCTION

National Income Accounting (NIA) is a book keeping system that a national government uses to measure the level of the country's economic activity in a given time period. According to the Central Statistical Organization (CSO),

"National Income is the sum total of factor incomes generated by the normal residents of a country in the form of wages, rent, interest and profit in an accounting year."

National income accounting facilitates the task of measurement as it provides a set of procedures and techniques for measurement of income and output at aggregate level in a particular accounting year (Year-wise calculation makes comparison easier).

1.2 USEFULNESS AND SIGNIFICANCE OF NATIONAL INCOME ESTIMATES

- Provides broad conceptual & accounting structure for analyzing and evaluating performance of an economy thereby serving as an indicator of the economic development of that economy.
- Helps in analyzing the income distribution and the detection of possible inequalities in the distribution of said income.
- Helps in determination of composition and structure of national income in terms of different sectors of the economy.
- Provides a quantitative basis for macroeconomic modelling which includes framing and evaluation of government's economic policies.
- Enable the government to determine the allocation of the country's resources under the different heads of development.

1.3 NATIONAL INCOME ACCOUNTING METHODS

PRODUCT SIDE METHOD	INCOME SIDE METHOD	EXPENDITURE SIDE METHOD
Measures production based on the concept of value addition **Seed → Plant → Fruit → Pulp → Juice**	Measures the distribution of the proceeds from sales between factors of production	Measures the final sale of goods and services

Using Gross Domestic Product | Using Gross National Product

Figure 1.3(a): Concepts of National Income

1.4 GROSS DOMESTIC PRODUCT

"GDP is the sum total of 'value additions' by all producing units in the domestic territory including the value additions by foreign owned firms."

The GDP is one of the primary indicators used to assess the health of a country's economy. It is a measure of the market value of all final economic goods & services produced within the nation's geographic borders over a specified period of time. The term 'Gross' used here implies that GDP is measured gross of Depreciation. Further, 'Domestic' implies resident production units. *However, GDP excludes transfer payments, financial transactions & unreported output generated through illegal transactions.* It is worth noting that transfer payments are payment made or income received in which no good or services are being paid for, e.g. benefit payment or subsidy.

1.5 GDP AT MARKET PRICE (GDP_{MP})

GDP_{MP} is the sum total of Gross Value Added (GVA) in production/generation of all goods & services within the country in a given period of time. Under this the value of goods & services is determined by common measuring unit of money because *measurement based on money enables in finding the aggregate of various products by converting them in terms of rupees.*

$$\boldsymbol{GDP_{MP} = Value\ of\ output\ in\ domestic\ territory - Value\ of\ consumption}$$

$$\Rightarrow \boldsymbol{GDP_{MP}} = \sum(\boldsymbol{Value\ added})$$

Note:

- *The value of only final goods and services would be included while calculating GDP.*
- *Intermediate goods used for the production of other goods are not counted as it will result in the problem of double counting. The intermediate goods may be either transformed or used up during the production process.*
- *GDP includes all production activities recognized by System of National Accounts (SNA) commonly known as 'Production Boundary'. Production Boundary is essential for defining the scope and coverage of the accounting system.*
- *The economic activities include all human activities which result in creation of goods and services which are valued and exchanged at market price.*
- *National Income measurement includes only those goods and services which are produced during a given period of time.*
- *During the production process 2 types of goods are used namely capital goods and inventory investment. Additions to inventory stocks of final goods and materials are included in GDP.*

1.6 NOMINAL GDP VS REAL GDP

Nominal GDP is GDP evaluated at current market price whereas Real GDP is a macroeconomic measure of the value of economic output adjusted for price changes (i.e. inflation or deflation). The main difference between nominal and real values is that real values are adjusted for inflation or deflation, while nominal values are not. As a result, nominal GDP will often appear higher than real GDP.

1.7 GROSS NATIONAL PRODUCT AT MARKET PRICE (GNP_{MP})

Gross National Product is an estimate of total value of all final goods and services, gross of depreciation, produced within the domestic territory in a given period of time by the means of production owned by Country's residents including Net Factor Income from abroad.

$$\boldsymbol{GNP_{MP} = GDP_{MP} + Net\ Factor\ Income\ from\ aroad}$$

Or

$$\boldsymbol{GDP_{MP} = GNP_{MP} - Net\ Factor\ Income\ from\ abroad}$$

The term 'National' is a broader concept and refers to normal residents within or outside the domestic territory of a country. Therefore,

$$\boldsymbol{National = Domestic + Net\ Factor\ Income\ from\ abroad}$$

E.g. GNP includes earnings of Indian Corporations overseas and Indian residents working overseas; but GDP does not include the same.

1.8 NET DOMESTIC PRODUCT AT MARKET PRICE (NDP_{MP})

NDP_{MP} is a measure of the market value of all final goods and services produced within the domestic territory of a country by normal residents/non-residents during an accounting year, calculated by deducting depreciation from the GDP_{MP}. *Net Domestic Product accounts for capital that has been consumed over the year during the process of production in the form of vehicle/machinery deterioration or depreciation.*

$$\boldsymbol{NDP_{MP} = GDP_{MP} - Depreciation \quad \Rightarrow \quad NDP_{MP} = NNP_{MP} - Net\ Factor\ Income\ from\ abroad}$$

The basis of distinction between gross and net is the factor of depreciation or consumption of fixed capital. Hence,

$$\boldsymbol{Gross = Net + Depreciation \quad \Rightarrow \quad Net = Gross - Depreciation}$$

1.9 NET NATIONAL PRODUCT AT MARKET PRICES (NNP_{MP})

NNP_{MP} is a measure of the market value of all final goods and services produced *by normal residents* within the domestic territory of a country during an accounting year including net factor income from abroad and excluding depreciation.

$$\boldsymbol{NNP_{MP} = GNP_{MP} - Depreciation}$$

$$\boldsymbol{\Rightarrow NNP_{MP} = GDP_{MP} + Net\ Factor\ Income\ from\ abroad - Depreciation}$$

1.10 GROSS DOMESTIC PRODUCT AT FACTOR COST (GDP_{FC})

GDP_{FC} is the sum total of the gross value added in the various economic activity. GDP_{FC} represents the total cost of factors i.e. Labor, Capital and Entrepreneurship. Factor Cost and Market Price are two different concepts.

MARKET VALUE OF THE GOODS AND SERVICES INCLUDES INDIRECT TAXES	
Taxes on Products like Excise Duties, Custom Duty, GST etc.	Taxes on Production like Factory License Fee, Local Taxes, Pollution Tax etc. unrelated with the quantum of production. *Irrespective of the quantum of production*

Figure 1.10(a): Classification of Indirect Taxes

1.10.1 DETERMINATION OF GDP_{FC}

Step 1	$\boldsymbol{Market\ Price = Factor\ Cost + \boxed{Net\ Indirect\ Taxes}} \rightarrow Indirect\ Taxes - Subsidies$ Subsidies is a sum of money granted by State/Public body to help an industry to keep a check on the price of commodity or service.
Step 2	$\boldsymbol{Market\ Price = Factor\ Cost + Indirect\ Taxes - Subsidies}$
Step 3	Rearranging equation in Step 1 $\Rightarrow$ $\boldsymbol{Factor\ Cost = Market\ Price - Net\ Indirect\ Taxes}$
Step 4	$\boldsymbol{Factor\ Cost = Market\ Price - Indirect\ Taxes + Subsidies}$
Step 5	$\boldsymbol{GDP_{FC} = GDP_{MP} - Indirect\ Taxes + Subsidies}$
Step 6	$\boldsymbol{GDP_{FC} = Compensation\ of\ Employees + Operating\ Surplus + Mixed\ Income\ of\ selfemployed + Depreciation}$ $where, \quad Operating\ Surplus = Rent + Interest + Profit$

1.11 NET DOMESTIC PRODUCT AT FACTOR COST (NDP_{FC})

NDP_{FC} is the total factor income earned by the factors of production. It is the sum total of domestic factor income or domestic income net of depreciation.

$$\boldsymbol{NDP_{FC} = NDP_{MP} - Net\ Indirect\ Taxes}$$

Or

$$\boldsymbol{NDP_{FC} = Compensation\ of\ Employees + Operating\ Surplus + Mixed\ Income\ of\ self\ employed}$$

$$where,\quad \boldsymbol{Operating\ Surplus = Rent + Interest + Profit}$$

1.12 NET NATIONAL PRODUCT AT FACTOR COST (NNP_{FC}) OR NATIONAL INCOME

National Income is the total net value of all goods and services produced within a nation over a specified period of time, representing the sum of wages, profits, rents, and interest payments to residents of the nation.

$$\begin{aligned} \boldsymbol{NNP_{FC}} &= \boldsymbol{National\ Income} \\ &= \boldsymbol{Factor\ Income\ earned\ in\ Domestic\ territory(FID)} \\ &\quad + \boldsymbol{Net\ Factor\ Income\ From\ Abroad(NFIA)} \end{aligned}$$

1.13 PER CAPITA INCOME

Per capita income measures the average income earned per person in a given area (city, region, country, etc.) in a specified year. $Per\ Capita\ Income = Area's\ total\ income \div Area's\ total\ population$

1.14 PERSONAL INCOME (PI)

In Economics, personal income refers to an individual's total earnings from all sources which may or may not be earned from productive activities during a given period of time. In other words, it is the sum total of all the incomes received by all individuals or households during a given period.

$$\boldsymbol{PI = NI(National\ Income) + Income\ Received\ but\ not\ earned - Income\ Earned\ but\ not\ received}$$

Note: *Income earned but not received are part of Personal Income but not National Income; hence must be subtracted from NI.*

1.15 DISPOSABLE PERSONAL INCOME (DPI)

DPI is total amount of money available in hands of individuals for their consumption or savings.

$$\boldsymbol{DPI = PI - Personal\ Income\ Taxes}$$

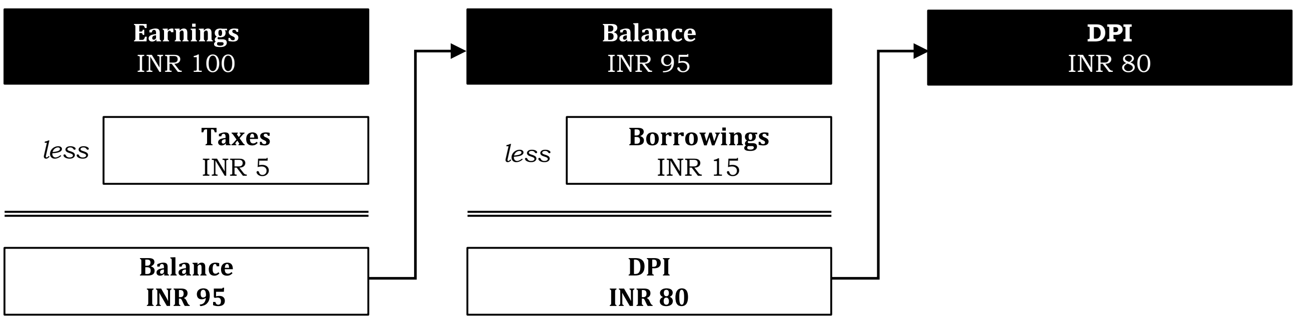

Figure 1.15(a) Calculation of DPI

1.16 MEASUREMENT OF NATIONAL INCOME IN INDIA

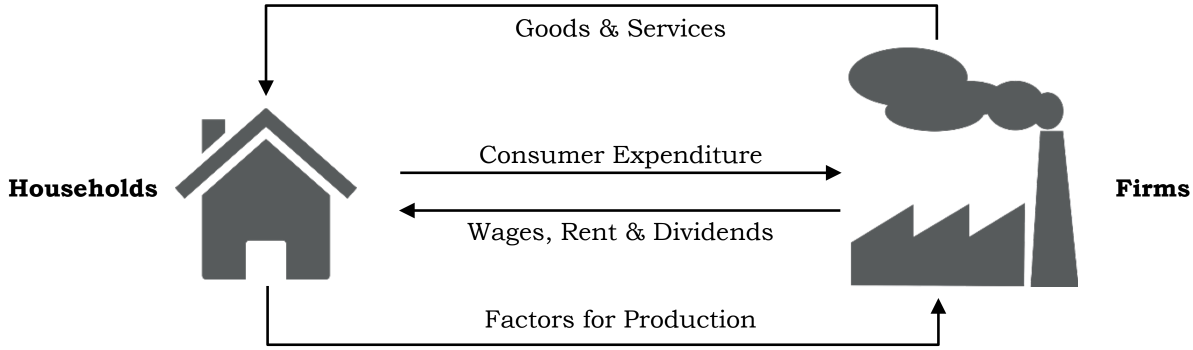

Figure 1.16(a): The Circular Flow of Income

The circular flow of income and spending shown in Figure 1.16(a) explains the connection between the different sectors of economy. This can also be understood as below:

Phase I

Production
The firms produce goods and services with the aid of factor services

Phase II

Income/Distribution
The factor income flows in the form of rent, wages, interest and profits from firms to the households.

Phase III

Expenditure/Disposition
The income earned is spent on consumption goods/services and investment goods. This expenditure leads to further production of goods and services thereby sustaining the circular flow.

Figure 1.16(b): The Circular Flow of Income

From Figure 1.16(b), there are 3 methods for the measurement of National Income namely:

- Value Added Method
- Income Method
- Expenditure Method

1.17 METHODS OF NATIONAL INCOME CALCULATION

1.17.1 VALUE ADDED METHOD (VAM) OR PRODUCT METHOD

National Income determination by Value Added Method is the sum total of net value added at factor cost of each producing unit in the production process in a domestic territory corresponding to an accounting year. Here, Value Added refers to the addition of value to the raw material (Intermediate Goods) by a firm, by virtue of its productive activities. It is the contribution of an enterprise to the current flow of goods and services. It is calculated as the difference between value of output and value of intermediate consumption.

E.g. Baker needs flour to make bread. He purchased flour worth INR 500 from the miller. By virtue of its productive activities, converted the flour into bread, and sold it at INR 700. Hence, the value addition is INR 200.

Steps involved in determination of National Income under VAM are shown in Figure 1.17.1(a)

Step I

Identification & Classification of Producing Enterprises

a) Primary Sector	b) Secondary Sector	c) Tertiary/Service Sector
• Fishing	• Finished goods	• Banking
• Farming	• Exported	• Marketing
• Mining	• Domestic sale	• Technical services

Step II

Estimation of the Gross Value Added by each Producing Enterprise

$GVA_{MP} = Value\ of\ Output - Intermediate\ Consumption$

$GVA_{MP} = (Sales + Change\ in\ stock) - Intermediate\ Consumption$

Step III

Estimation of National Income is the Net Value added by each individual Unit

$\sum GVA_{MP} - Depreciation = NVA_{MP}$

Figure 1.17.1(a): Value Added Method for National Income Calculation

National income of the economy as a whole is the addition of the net products contributed by each sector after subtracting net indirect taxes and adding net factor income from abroad.

$$NVA_{MP} - Indirect\ Taxes = NVA_{FC}$$

Subsequently,

$$NVA_{FC} + NFIA = National\ Income$$

In the above derived value of National Income, the following are also added:

- Own Account Production of Fixed Assets held by Government, Enterprises & Households
- Production for self-consumption, and
- Imputed Rent of owner occupied dwellings.
  (Imputed value means the value of an item for which actual values are not available.)

1.17.2 INCOME METHOD

The income method measures national income from the side of payments made to the primary factors of production in the form of rent, wages, interest and profit for their productive services in an accounting year. In other words, whatever is produced by a producing unit is distributed among the factors of production for their services. Thus,

$$NNP_{FC} = Compensation\ of\ Employees + Operating\ Surplus + Mixed\ Income\ of\ self - employed + Net\ factor\ income\ from\ abroad$$

$$where\ , \quad Operating\ Surplus = Rent + interest + Profit$$

Note

- *Value of National Income should be same as the one calculated by Value Added Method.*
- *Only income earned by owners of primary factors of production is included.*
- *Transfer income is excluded.*

In order to overcome the difficulty of separation between labor income and capital income a new category of income called *Mixed Income* is introduced.

Example: Self Employed Class of People like Lawyers, Engineers, etc.

1.17.3 EXPENDITURE METHOD

The Expenditure Method is the most widely used approach for estimating GDP, which is a *measure of the economy's output produced within a country's border irrespective of the ownership as to means of production.* The GDP under this method is calculated by summing up all the expenditures made on final goods and services. There are four main aggregate expenditures that form part of GDP calculation which are:

- Consumption by households;
- Investment by businesses;
- Government spending on goods & services;
- Net exports (Total exports - Total imports)

1.17.3.1 FINAL CONSUMPTION EXPENDITURE

- Private Final Consumption Expenditure (PFCE) is defined as the expenditure incurred on final consumption of goods and services by the resident households and non-profit organizations serving households acquired for consumption and not for use in production. Further it also includes the value of primary products which are produced for own consumption by the households, payments for domestic services flowing from one household to another, the net expenditure on foreign financial assets or net foreign investment.
- Government Final Consumption Expenditure (GFCE) is an aggregate transaction amount on a country's national income accounts representing government expenditure on goods and services that are used for the direct satisfaction of individual needs or collective needs of members of the community. The collective services provided by the government such as defence, education, healthcare, etc. are not sold in the market, the only way they can be valued in money terms is by adding up the money spent by the government in the production of these services.

However, Government expenditure on pensions, scholarships, unemployment allowance, etc. should be excluded as these are transfer payments.

1.17.3.2 GROSS DOMESTIC CAPITAL FORMATION

GDCF is a measure of the total expenditure on investment by production units within the economic territories of a country. It can be defined as the sum of:

- Gross Domestic Fixed Capital formation
- Changes in inventories
- The net acquisition of valuables by enterprises and households. This includes machines, equipment, facilities or any other high value assets.

1.17.3.3 NET EXPORTS

Net Exports are the value of the country's total exports minus the value of its total imports. It is a measure used to calculate aggregate expenditures or the GDP of a country. It can be positive or negative.

1.18 LIMITATIONS AND CHALLENGES OF NATIONAL INCOME COMPUTATION

- Measuring the economic activity of entire country can never be done precisely; hence the curve, figures and values are not exact representatives.
- A rise in the level of National Income may not mean a rise in the living standards. This is because the rise may occur as a result of increased spending on items such as defence, which

do not improve living standards. Similarly, an increase in national income may be accompanied by a rise in undesirable externalities, such as pollution, or a fall in quality of goods.

- The extent of inflationary pressures can be calculated over a short period, say for one year, but it is much more difficult to do so in long period.
- There are many factors like leisure time, fairness, gender equality etc., which, directly or indirectly, affect the quality of life but are excluded from the determination of GNP.
- The work and services rendered voluntarily without remuneration in the economy are not included, even though such work and services contribute to social well-being as much as the paid work and services

PRACTICE QUESTIONS

- Differentiate between
  - Personal Income and Disposable Personal Income
  - Intermediate Goods and Final Goods
- Explain the Expenditure Method of calculation of National Income.
- Describe in brief the concept of National Income and explain the usefulness of National Income estimates.
- Explain the term Gross Domestic Product. Discuss in brief the methods of estimation of National Income.
- What are the limitations of National Income computation?

Notes