

## Unit 1 - National Income and Related Aggregates (Introductory Macroeconomics)

- **Macroeconomics:** It studies the behaviour of the economy as a whole. It studies national aggregates like Aggregate Demand, Aggregate Supply, National Income etc. It also studies national economic problems like inflation, unemployment, poverty and the issues connected with economic growth and economic development.
  - Main tools of Macroeconomics are aggregate demand and aggregate supply (macroeconomic variables)
  - Main subject matter of Macroeconomics is to determine income and employment level of the economy.
  - Examples of Macroeconomic studies – Estimation of national income, Determination of income and employment level of the economy, Government budget etc.

- **Basic concepts in Macroeconomics:**

National income accounting is a branch of macroeconomics of which estimation of national income and related aggregates are a part. National income and related aggregates are basically measures of production activity. Production activity of the production units located within the economic territory is domestic product. Gross domestic product, net domestic product are some examples. Whereas Production activity of the residents of an economic territory is national product. GNP, NNP, are some examples

(i) **ECONOMIC TERRITORY**

According to the United Nations System of National Accounts,

**Economic (or Domestic) territory is the geographical territory administered by a government within which persons, goods and capital circulate freely.**

The above definition is based on the criterion ‘freedom of circulation of persons, goods and capital’ Clearly, those parts of the political frontiers of a country where the government of that country does not enjoy the above ‘freedom’ are not to be included in economic territory of that country. One example is embassies. Government of India does not enjoy the above freedom in the foreign embassies located within India. So, these are not treated as a part of economic territory of India. They are treated as part of the economic territory of their respective countries. For example, the U.S. embassy in India is a part of economic territory of the U.S.A. Similarly, the Indian embassy in Washington is a part of economic territory of India.

**Scope**

Based on ‘freedom’ criterion, the scope of economic territory is defined to cover:

- (i) Political frontiers including territorial waters and air space.
- (ii) Embassies, consulates, military bases, etc. located abroad, but excluding those located within the political frontiers.
- (iii) Ships, aircrafts etc. operated by the residents between two or more countries
- (iv) Fishing vessels, oil and natural gas rigs, etc. operated by the residents in the international waters or other areas over which the country enjoys the exclusive rights or jurisdiction.

(ii) **RESIDENT**

**Resident Vs. Citizen**

Note that citizen (or national) and resident are two different terms. This does not mean that a citizen is not a resident, and a resident not a citizen. A person can be a citizen as well as a resident, but it is not necessary that a citizen of a country is necessarily the resident of that country. A person can be a citizen of one country and at the same time a resident of another country. For example, A NRI, Non-resident Indian is citizen of India but a resident of the country in which he lives. A large number of Indian nationals have settled in U.S.A., Australia,

etc. as residents (and not as nationals) of these countries. For India, they are Non-residents Indians (NRI) but continue to remain Indian nationals.

Citizenship is basically a legal concept based on the place of birth of the person or some legal provisions allowing a person to become a citizen. On the other hand, resident ship is basically an economic concept based on the basic economic activities performed by a person.

### **Definition**

A resident is defined as follows:

**A resident, whether a person or an institution, is one whose centre of economic interest lies in the economic territory of the country in which he lives or is located.**

The 'centre of economic interest' implies two things: (i) the resident lives or is located within the economic territory and (ii) the resident carries out the basic economic activities of earnings, spending and accumulation from that location.

### **Implications**

**National product includes production activities of residents irrespective of whether performed within the economic territory or outside it.** In comparison, **Domestic product includes production activity of the production units located in the economic territory irrespective of whether carried out by the residents or non-residents.**

### **From Domestic Product to National Product**

The concept of domestic product is based on the production units located within economic territory, operated both by residents and non-residents. The concept of national product is based on residents, and includes their contribution to production both within and outside the economic territory. Normally, in practical estimates, domestic product is estimated first. National product is then derived from the domestic product by making certain adjustments.

**National product is derived in the following way:**

$$\begin{aligned} \text{National product} &= \text{Domestic product} \\ &+ \text{'residents' contribution to production outside the economic territory} \\ &- \text{'non-residents' contribution to production inside the economic territory} \end{aligned}$$

In practical estimates the 'residents' contribution outside the economic territory is called 'factor income received from abroad'. The 'non-residents' contribution inside the economic territory is called 'factor income paid to abroad'. Therefore,

$$\begin{aligned} \text{National product} &= \text{Domestic product} \\ &+ \text{Factor income received from abroad} \\ &- \text{Factor income paid to abroad.} \end{aligned}$$

'Factor income received from abroad' is added to domestic product because this contribution of residents is in addition to their contribution to domestic product. 'Factor income paid to abroad' is subtracted because this part of domestic product, does not belong to the residents. By subtracting 'factor income paid' from 'factor income received' from abroad, we get a net figure '**Net factor income from abroad**' popularly abbreviated as **NFIA**.

$$\begin{aligned} \text{National product} &= \text{Domestic product} + \text{Net factor income from abroad} \\ &= \text{Domestic product} + \text{NFIA} \end{aligned}$$

**Net Factor Income from Abroad (NFIA):** It refers to the difference between factor income earned by the normal residents of the country from the rest of the world in the form of wages and salaries, rent, interest and profits (dividends and retained earnings) and similar payments made to the normal residents of other countries (i.e. non-residents) within the domestic territory.

$$\text{Net Factor Income from Abroad} = \text{Factor Income from Abroad} - \text{Factor Income paid Abroad}$$

**Components of NFIA:** There are three components of NFIA –

- i. Net compensation of employees
- ii. Net income from property and entrepreneurship
- iii. Net retained earnings of resident companies abroad

$$\text{NFIA} = \begin{matrix} \text{Net compensation of employees} \\ + \text{Net income from property and entrepreneurship} \\ + \text{Net retained earnings of resident companies abroad} \end{matrix}$$

**Significance of NFIA:** It is the difference between the national aggregates and the domestic aggregates. The national concept is inclusive of NFIA whereas the domestic concept excludes it.

$$\text{National Income} = \text{Domestic Income} + \text{NFIA}$$

• **Difference between Domestic Income and National Income:**

<b>Domestic Income</b>	<b>National Income</b>
It refers to the sum of factor incomes generated by all the production units located within the domestic territory of a country during an accounting year.	It refers to the sum of factor incomes earned by the normal residents of the country within or outside the domestic territory of a country during an accounting year.
$\text{NDP}_{\text{FC}} = \text{NNP}_{\text{FC}} - \text{NFIA}$	$\text{NNP}_{\text{FC}} = \text{NDP}_{\text{FC}} + \text{NFIA}$
It does not include NFIA.	It includes NFIA.

**Intermediate Products and Final Products**

Goods and services purchased by a production unit from other production units with the purpose of reselling or with the purpose of using them completely during the same year are called **intermediate products**. The expenditure on them is called **intermediate cost or intermediate consumption**.

Goods and services purchased for consumption, i.e., for satisfaction of wants, and for investment are called **final products**. Expenditure on them is called **final expenditure**.

- **Difference between Final Goods and Intermediate Goods:**

<b>Final Goods</b>	<b>Intermediate Goods</b>
These are those goods and services which are <b>used either for consumption</b> by the consumers <b>or for investment</b> by the firms.	These are those goods and services which are purchased during the year by one production unit from other production units and <b>are either completely used up or resold, during the same year.</b>
They do not undergo any further transformation in the <u>production process</u>	They undergo transformation in the production process.
They are <b>included</b> in the estimation of the national income.	They are <b>not included</b> in the estimation of the national income.
E.g.: Milk purchased by a consumer for immediate consumption, Machine purchased by a firm.	E.g.: Coal used in factory for further production, Milk purchased by dairy shop for resale

- **Difference between Consumption/ Consumer Goods and Capital Goods:**

<b>Consumption Goods</b>	<b>Capital Goods</b>
These are those final goods and services which are used for the satisfaction of wants by the consumers.	These are those final goods and services which are used for producing other goods and services.
They are classified as: <ul style="list-style-type: none"> <li><input type="checkbox"/> Durable goods: which yield services over time like washing machine etc.</li> <li><input type="checkbox"/> Non-durable goods: completely used up at the moment of consumption like food items (bread), electricity, domestic services etc.</li> </ul>	These are usually durable in nature and can be used over a commendable period of time like buildings, machinery etc.
E.g.: Car purchased by a consumer.	E.g.: Car purchased by a taxi driver or travel agency (firm).

**Note:**

- **The same good can be a consumption good and capital good depending upon the end (ultimate) use of the good.** For example: Car purchased by a household is a consumption good since it is purchased for the direct satisfaction of wants by the consumer whereas car purchased by a taxi driver/ firm is a capital good since it is purchased for the production (investment) purpose.
- **All capital goods are producer goods but all producer goods are not capital goods.** Single use producer goods like raw materials, coal, wood etc. which are completely used up in production process are known as intermediate goods whereas durable use producer goods like plant, machinery etc. which are repeatedly used in the production process for several years are called capital goods.
- **A commodity can be an intermediate as well as final good depending upon its nature of use (purpose for use).** If good is used for either consumption or investment, it is a final good. However, if it is used for resale or 'used up' for further production in the same year, it is an intermediate good.

For example: Bread purchased by a household is a final (consumption) good as it is used for consumption purpose whereas bread purchased by a restaurant owner to make sandwiches is treated as an intermediate good as it is completely used up in the production process.

If the same bread is purchased by a bakery shop for further sale to the consumers then also it is treated as an intermediate good as it is used for resale in the same year.

- **Not all purchases by production unit from other production units are intermediate products** because not all of them are either completely used up or resold in the same year. For example, machines, tools vehicles, buildings etc. purchased are not intermediate goods. They are final goods i.e. fixed assets/ capital goods, durable use producer goods purchased by production units for own use i.e. for investments.
- **Government services (education, health etc.) are treated as final goods** and therefore included in the estimation of national income.
- **All goods and services acquired by consumers for their own use are treated as final goods. Similarly, all durable goods acquired by producers are also treated as final goods/ capital goods** (part of capital formation).
- **Durable goods like trucks, aircrafts, weapons of destruction like tanks purchased by the government for military purposes are treated as raw materials i.e. intermediate goods, used for providing defence services.**
- **Goods meant for resale in the year of production itself by dealer are intermediate goods.** However, at the end of the year when these goods remain unsold, they constitute unsold stock and are considered as addition to the stock or inventory investment which is treated as part of final goods.

• **Difference between Stocks and Flows:**

Stocks	Flows
It refers to that variable whose magnitude is measured at a particular point of time.	It refers to that variable whose magnitude is measured over a period of time.
It is a static concept which does not have time dimension.	It is a dynamic concept which have a time dimension as its magnitude can be measured over a period of time.
E.g.: Capital, Money supply, Inventory, National wealth etc.	E.g.: National Income. Investment, Savings, Capital formation, Change in inventories etc.

• **Difference between Factor Income and Transfer Income:**

Factor Income	Transfer Income
It refers to the income received by the factors of production for rendering factor services in production process. It is bilateral in nature.	It refers to the income received by recipients without rendering any productive services in return i.e. without a 'quid-pro-quo'. It is unilateral in nature.
It is <b>included</b> in the estimation of the national income.	It is <b>not included</b> in the estimation of the national income
E.g.: Wages, Rent, Interest and Profit	E.g.: Scholarships, Old age pension (not retirement pension), Subsidies, Unemployment allowances, Taxed paid by households and enterprises etc.

**Investment or Capital formation:**

*It refers to the addition made to the stock of capital of the economy during a period of time.*

**Components of Investment:** There are two components of investment:

(i) Investment in fixed capital i.e. durable producer goods is called **fixed investment** and (ii) Investment in stocks of raw materials, semi-finished goods and finished goods (inventories) is called **inventory investment**, also called change in stock. For example:

$$\text{Gross Investment} = \text{Gross fixed investment} + \text{Inventory investment/ Change in stock}$$

$$\text{Change in stock (Change in Inventories)} = \text{Closing stock} - \text{Opening stock}$$

Investment can be looked up in two forms: (i) Gross Investment and (ii) Net Investment. A distinction is made between Gross Investment and Net Investment on the basis of depreciation.

$$\text{Gross Investment} - \text{Net Investment} = \text{Depreciation}$$

### **Depreciation or Consumption of fixed capital or Replacement cost of fixed assets** –

*It refers to fall in the value of fixed assets due to normal wear and tear, passage of time and foreseen (expected) obsolescence.*

- By normal wear and tear, we mean, fall in the value of fixed assets due to normal use in production resulting in decrease in the production capacity of fixed assets.
- The value of fixed assets also decreases with passage of time, even if they are not being put to use in the business. Natural factors like rain, wind, weather etc. contribute to fall in their value.
- The value of fixed assets decreases due to expected obsolescence i.e. due to change in technology or change in demand for goods and services.

**Significance of Depreciation:** It is used to differentiate between gross and net value of the same aggregates. The term gross is inclusive of depreciation whereas the term net excludes it.

$$\text{Gross value} = \text{Net value} + \text{Depreciation}$$

For example:

$$\text{GDP}_{\text{MP}} - \text{Depreciation} = \text{NDP}_{\text{MP}}$$

$$\text{Value of Depreciation} = \frac{\text{Value of fixed asset}}{\text{Expected life span of fixed years (No. of years)}}$$

**Capital loss:** It refers to loss in value of fixed assets due to unforeseen obsolescence, natural calamities (like floods, earthquakes), thefts, accidents etc. No such provision is made in case of capital loss as it is an unexpected loss. It hampers the production process.

## **Gross vs. Net Investment**

- (i) **Gross Investment:** It refers to the total addition to the existing stock of capital during a given period of time before making allowance for depreciation. (Capital stock consists of **fixed assets and unsold stock**. Fixed assets include plant, machinery, equipments etc. and unsold stock include unsold stock of finished and semi-finished goods as well as raw materials. It is also called **inventories**.) Gross investment is inclusive of depreciation.
- (ii) **Net Investment:** It refers to the actual addition made to the capital stock of an economy during a given period of time after making allowances for depreciation. Net Investment is a measure of the net availability of new capital after taking into account the wear and tear and foreseen obsolescence of the existing capital.

## **Net Indirect Taxes (NIT):**

*It is the difference between Indirect taxes paid by the producers and subsidies received by them from the government.*

$$\text{NIT} = \text{Indirect Tax} - \text{Subsidies}$$

**Indirect Taxes:** It refers to those taxes which are imposed by the government on production and sale of goods and services, in which 'liability to pay' and 'burden of tax' lies on different persons. For example: GST.

**Subsidies:** These are the financial assistance given by the government to the firms/ enterprises on the production of certain commodities. It is given to promote exports or to encourage production of certain goods and services or to sell goods at a price lower than the market price.

The effect of indirect tax is to increase the market price of the product whereas the subsidies reduce the market price of goods.

**Significance of NIT:** NIT is the difference between Factor Cost and Market Price. Aggregates expressed in market price are converted into their factor cost by deducting NIT from it and vice-versa.

$$\text{GDP}_{\text{FC}} = \text{GDP}_{\text{MP}} - \text{Net Indirect Taxes}$$

## **Market Price Vs Factor Cost:**

Market Price refers to the price at which product is actually sold in the market. It includes the indirect taxes and excludes the subsidies.

**Factor Cost** refers to the amount paid to factors of production for their contribution in the production process.

$$\text{Market Price} = \text{Factor Cost} + \text{Indirect Tax} - \text{Subsidies}$$

$$\text{GDP}_{\text{FC}} = \text{GDP}_{\text{MP}} - \text{Indirect Tax} + \text{Subsidies}$$

- **Indirect tax is subtracted from and subsidies are added to the domestic product at market price to arrive at domestic product at factor cost**

The market price of a good includes indirect taxes levied on good but does not include the subsidy, if any, paid by the government. The indirect tax, paid by the buyer is deducted because it ultimately goes to the government and not to the production units. Subsidy is opposite of indirect tax. It is paid by the government to production units, and is over and above the market price. This adds to the value of contribution of production units. Therefore, it is added to the market price.

**Net Exports (Exports – Imports):** It refers to the difference between exports and imports of goods and services. Exports are included in the estimation of National Income because it is an expenditure on domestic product of a country by foreign countries. Even though it is an expenditure by the non-residents, it is a final expenditure.

Imports are the expenditure on domestic products of foreign countries. Private Final Consumption Expenditure, Government Final Consumption Expenditure, Gross Domestic Capital Formation, all contain import components (a portion each of these expenditures consist of imports). Since it is not possible to identify expenditure on imports in these components individually. Therefore, a single estimate of imports by the country as a whole is deducted from exports as it is an expenditure on domestic product of foreign countries. This neutralises import element in PFCE, GFCE and GDCF.

### **National Income Aggregates**

There are many aggregates in national income accounting. The basic among these is Gross Domestic Product at Market Price ( $GDP_{MP}$ ). By making adjustments in  $GDP_{MP}$ , we can derive other aggregates like Net Domestic product at Market Price ( $NDP_{MP}$ ) and NDP at factor cost ( $NDP_{FC}$ ).

#### **Net Domestic Product**

Why is  $GDP_{MP}$  called gross?  $GDP_{MP}$  is final products valued at market price. This is what buyers pay. But this is not what production units actually receive. Out of what buyers pay the production units have to make provision for depreciation and payment of indirect tax like excise, sales tax, etc. This explains why  $GDP_{MP}$  is called 'gross'. It is called gross because no provision has been made for depreciation. However, if depreciation is deducted from the GDP, it becomes Net Domestic Product (NDP). Therefore,

$$GDP_{MP} - \text{Depreciation} = NDP_{MP}$$

#### **Domestic product at Factor Cost**

*Why is  $GDP_{MP}$  called 'at market price'?*

Out of what buyers pay, the production units have to make payments of indirect taxes, if any. Sometimes production units receive subsidy on production. This is in addition to the market price which production units receive from the buyers. Therefore, what production units actually receive is not the 'market-price' but 'market price - indirect tax + subsidies' This is what is actually available to production units for distribution of income among the owners of factors of production. Therefore, market price - indirect tax (I.T.) + subsidies = Factor payments (or factor costs).

By making adjustment of indirect tax and subsidies we derive GDP at factor cost ( $GDP_{FC}$ ) from  $GDP_{MP}$ .

$$GDP_{MP} - \text{Indirect Tax} + \text{Subsidies} = GDP_{FC}$$

or  $GDP - \text{Net Indirect Tax} = GDP_{FC}$

#### **Net Domestic Product at Factor Cost**

If we make adjustment of both the net I.T and depreciation (also called consumption of fixed capital) we get one more aggregate called Net Domestic Product at Factor Cost ( $NDP_{FC}$ ).

$$GDP_{MP} - \text{Indirect Tax} + \text{Subsidies} - \text{Depreciation} = NDP_{FC}$$

or

$$NDP_{FC} + \text{Indirect Tax} - \text{Subsidies} + \text{Depreciation} = GDP_{MP}$$

### Net National Product at Factor Cost ( $NNP_{FC}$ ) or National Income

Net factor income from abroad (NFIA) provides the link between NDP and NNP. Therefore,

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

or

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

Similarly,

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

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

### Summing up

The three crucial adjustments required for deriving one aggregate from the other are:

- Gross - Depreciation = Net
- Market price - Indirect Tax + Subsidies = Factor cost
- Domestic + NFIA = National
- **Circular Flow of Income**  
*It refers to cycle of generation of income in the production process, its distribution among the factors of production and finally, its circulation from households to firms in the form of consumption expenditure on goods and services by firms.*
- **Principles of circular flow of income:**
  1. Receipts and payments across different sectors are always equal.
  2. Corresponding to each real flow in one direction there is a money flow of income in the opposite direction.

**Circular Flow of Income in a Two Sector Economy:** Two sector model consists of production sector/ firms and household sector. Households are the owners of factors of production and supply factor services to firms. The firms in return make factor payments, So, factor payments flow from firms to households.

Household spend the entire income on purchase of goods and services produced by firms. Thus, consumption expenditure flows from households to firms, completing the circular flow of income.

- **Types of Circular Flows:** There are two types of circular flows: (i) Real flow and (ii) Money flow
  - i. **Real Flow (Physical/ Product flow):** It refers to flow of factor services from households to firms and the corresponding flow of goods and services from firms to households.
  - ii. **Money Flow (Income/ Nominal flow):** It refers to flow of money in the form of factor payments from firms to households. and the corresponding flow of consumption expenditure from households to firms for purchase of goods and services produced by the firms.

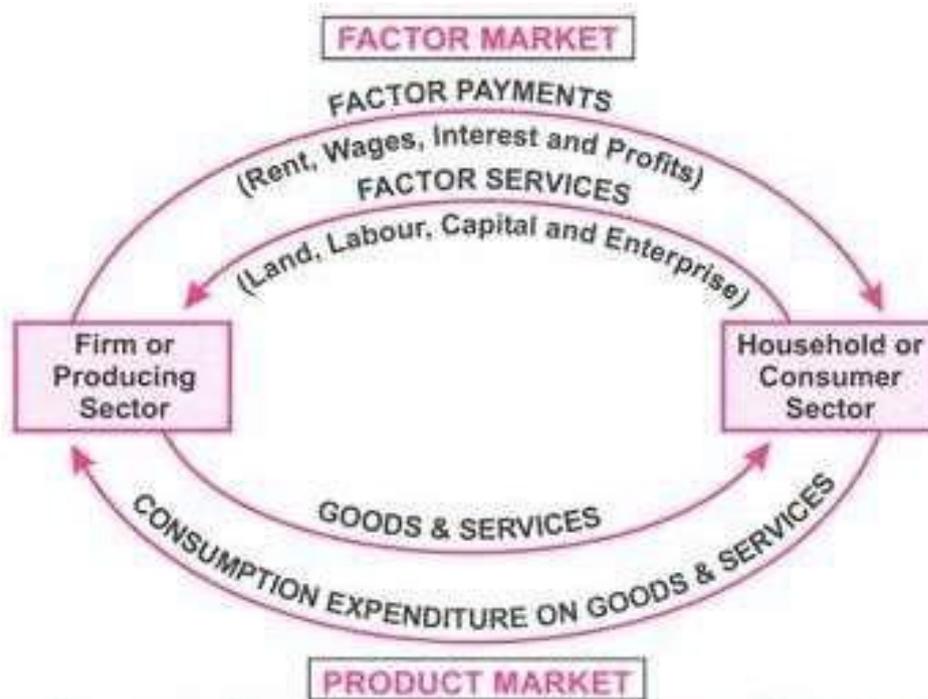
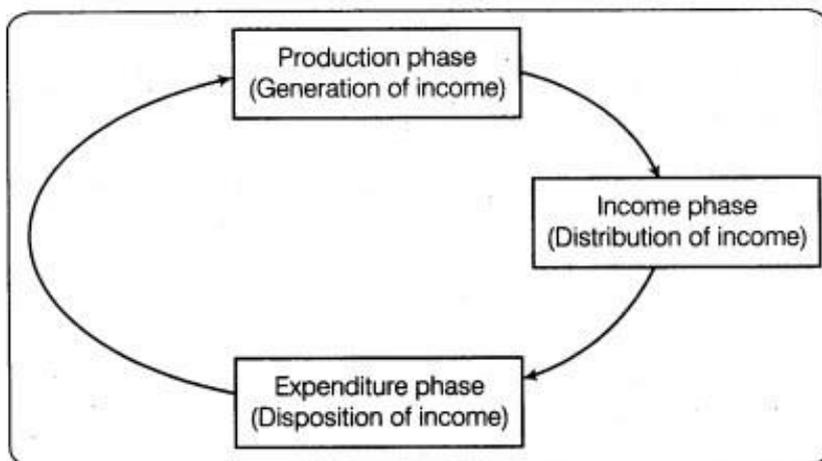


Diagram showing real flows (inner arrows) and money flows (outer arrows)

Conclusion:

- Total production of goods and services by firms = Total consumption of goods and services by households
  - Factor payment by firms = Factor income of households
  - Total consumption expenditure by households = Total income of firms
  - Real flow = Money flow
- **Leakages** refer to withdrawal of money from the circular flow. They are those flow variables which reduce the flow of income. For e.g. Savings, Taxes imposed by the government, Imports etc.
  - **Injections** refer to the introduction of income into the circular flow. They are those flow variables which increase the flow of income. in the process of production/ in the process of income generation in an economy. For e.g. Investments, Government expenditure, Exports etc.
  - **Phases of Circular Flow of National Income:** There are three phases (Production, Distribution and Expenditure) in the circular flow of income.



Different phases of circular flow of income

**In Production (Income Generation Phase)**, firms produce goods and services with the help of factor services. Production of goods and services by firms causes generation of income.

**In Income Distribution Phase**, factor income (wages, rent, interest and profits) flow from firms to households according to their contribution to production.

**In Expenditure Phase**, the income received by factors of production is spent on the goods and services produced by firms.

In this way, income generated in production units reach back to the production units and make the circular flow complete.

**Conclusion**: *Value of output produced = Value of income distributed = Value of expenditure incurred in the economy.*

***Accordingly, there are three methods of estimating National Income: Value added method, Income method and Expenditure method***

### **Industrial Classification**

It general practice all the production units of the economic territory are grouped into three broad groups: Primary sector, Secondary sector and Tertiary sector.

- **Primary Sector** consists of all production units producing goods by exploiting natural resources like land, water, subsoil assets etc.
- **Secondary Sector** consists of all production units which are engaged in transforming one physical good into another physical good.
- **Tertiary Sector** consists of all production units producing services.

### **METHODS OF ESTIMATION OF NATIONAL INCOME (NNP<sub>FC</sub>) AND OTHER RELATED AGGREGATES**

There are three methods of estimation of national income: production (value added), income distribution and final expenditure methods.

**1) Production Method (Value Added Method)**: It refers to the method of calculating national income which takes into account, the actual contribution of each producing unit in the production process in an economy.

*Value added refers to the difference between the total value of output of a firm and the value of intermediate consumption.*

$$\text{Value Added} = \text{Value of Output} - \text{Intermediate Consumption}$$

Value added is a measure of contribution of a production unit to domestic product. It is, in fact, the addition to the value of raw materials (intermediate goods) by a firm by virtue of its production activities. It is the contribution of an enterprise to the current flow of goods and services.

In this method we first find out Gross Value Added at Market Price (GVA<sub>MP</sub>) in each sector and then take their sum to arrive at GDP<sub>MP</sub>.

$$\text{Sum total of GVA}_{MP} \text{ by all the sectors} = \text{GDP}_{MP}$$

$$\text{GVA}_{MP} = \text{Gross Value of Output at Market Price} - \text{Intermediate Consumption}$$

$$\text{Value of Output} = \text{Sales} + \text{Change in Stock}$$

Then we make adjustments to arrive at national income or  $NNP_{FC}$

- $GDP_{MP} - \text{Consumption of fixed capital} = NDP_{MP}$
- $NDP_{MP} - \text{Indirect Tax} + \text{Subsidies} = NDP_{FC}$
- $NDP_{FC} + NFIA = NNP_{FC}$

### **Problem of Double Counting**

*It means counting the value of a product more than once in the estimation of National Income.*

The problem of double counting arises when the value of intermediate goods is counted in the estimation of national income along with the value of final goods and services.

A commodity passes through various stages of production before reaching the final stage. When value of output is taken at each stage, it is likely to include cost of inputs more than once. This leads to the problem of double counting. It results in the overestimation of national income. For example: In the table given below the final good is bread, which passes through various stages of production before it is purchased by the consumer for final consumption.

Stages of production (1)	Value of output (2)	Value of intermediate consumption (3)	Value added (4) = (2 - 3)
Farmer (sells wheat to) ↓	400	0	400
Miller (sells flour to) ↓	600	400	200
Baker (sells bread to) ↓	800	600	200
Shopkeeper (sells to consumer) ↓	<b>900</b>	800	100
Total	2700	1800	<b>900</b>

It is clear from the above table that Gross value of output is Rs. 2700 (= 400 + 600 + 800 + 900). This is not the actual value of physical output because in this the value of wheat, value of services of miller and value of baker services is counted more than once. The value of final good i.e. bread is Rs. 900.

#### **Two ways to avoid the problem of double counting –**

- a) Consider only the value of final goods and services in the estimation of national income.
- b) Consider the value added instead of value of total output produced in the estimation of national income.

(As in case of above example, value added by Farmer (Rs. 400), Miller (Rs. 200), Baker (Rs. 200) and Shopkeeper (Rs. 100) is taken and sum of value added by all production units equal to **Rs. 900** which should be included in the estimation of national income.)

#### **Precautions to be taken while estimating national income using Value added method**

- (i) Value of intermediate goods should not be included in the estimation of national income because value of these goods is already included in the value of final goods. If they are included again, it will lead to double counting.

- (ii) Own account production means output produced by production units for self-consumption and investment should be included. For example, output produced by farmers for self-consumption. Imputed value of production of goods for self-consumption should be included as they contribute to the current output. These goods are like those produced for the market; they are not simply sold because of their need by the producers themselves.
- (iii) Imputed rent of the owner-occupied houses should be included in national income because all houses have rental value, no matter they are self-occupied or rented one.
- (iv) Imputed value of free services produced by general government and private non-profit institutions serving households must be taken into account. If it is not done, it will lead to underestimation of total output consequently of national income.
- (v) Production of services for self-consumption (domestic services) like services of house wife, kitchen gardening etc. are not included in the national income since it is difficult to measure their market value. These services are produced and consumed at home and never enter the market place and are termed as non-market transactions.
- (vi) Output of only newly produced goods i.e. goods produced in the current year should be included in the total output of that year. Sale and purchase of second hand goods and property should not be included because they were included in the year in which they were produced. They do not add to the current flow of goods and services (i.e. not a part of the current year production). However, any commission or brokerage on sale or purchase of such goods will be included in the national income as it is a productive service.

## 2) Income Distribution Method

In this method we first estimate factor incomes paid out (i.e. distributed) to the owners of factors of production by the various industrial sectors. The sum of such factor payments equals Net value Added at Factor Cost (NVA<sub>FC</sub>) by that sector. Then we take sum total of NVA<sub>FC</sub> by all the sectors to arrive at NDP<sub>FC</sub> (Domestic Income). The components of NDP<sub>FC</sub> are:

1. Compensation of employees
  2. Rent and royalty
  3. Interest
  4. Profits
  5. Mixed income of self employed
- } = **Operating surplus (Income from property and entrepreneurship)**

System of National Accounts 1993, a joint publication of the United Nations and the World Bank, has elaborated the following components of Income method:

- (i) **Compensation of employees (COE):** It is defined as the total remuneration in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period. The main components of compensation of employees are:
  - a) **Wages and salaries in cash:** include daily, weekly or monthly etc. payments in cash including allowances such as house rent, conveyance allowances for travel to and from work, bonuses etc. **Wages and salaries in kind:** include goods and services provided by the employers to employees for satisfaction of wants of employees and their families like rent free accommodation, vehicles for personal use, imputed interest of interest free loans etc.
  - b) **Social security contributions by the employers** include **contribution of employers** towards social security schemes like casualty insurance, provident fund, gratuity and pension provisions etc. which benefit employees.
- (ii) **Rent** is defined as the amount receivable by a landlord from a tenant for the use of land.
- (iii) **Royalty** is defined as the amount receivable by the landlord for granting the leasing rights of sub-soil assets.
- (iv) **Interest** is defined as the amount payable by a production unit to the owners of financial assets in the production unit. The production unit uses these assets for production and in turn makes interest payment, imputed or actual.

- (v) **Profit** is a residual factor payment by the production unit to the owners of the production unit. It is the reward to the entrepreneur for his contribution to the production of goods and services. It has three components. (i) Corporate tax, (ii) Dividend and (iii) Retained earnings/ Undistributed Profits.

$$\text{Profits} = \text{Corporation Tax} + \text{Dividends} + \text{Retained earnings}$$

- (vi) **Mixed income of self-employed** – There are cases where total factors payment is estimable but not its different components. This problem arises mainly in case of self-employed people like doctors, chartered accountants, consultants, etc, and unincorporated enterprises (like retail traders, small shopkeepers, etc.). This factor payment is popularly called ‘Mixed income of the self-employed’. It is used for any income that has elements of more than one type of factor income. Mixed income arises for productive services of self-employed persons, whose income includes wages, rent, interest and profit and these elements cannot be separated from each other.

$$\text{NDP}_{\text{FC}} = \text{Compensation of employees} + \text{Rent and royalty} + \text{Interest} + \text{Profit} + \text{Mixed income (if any)}$$

There is another term used in factor payments. It is ‘**operating surplus**’. It is defined as the sum of rent and royalty, interest and profits. In that case:

$$\text{NDP}_{\text{FC}} = \text{Compensation of employees} + \text{Operating surplus} + \text{Mixed income of self employed}$$

Once we estimate  $\text{NDP}_{\text{FC}}$ , we can find  $\text{NNP}_{\text{FC}}$  or national income, by adding NFIA to it.

$$\text{NNP}_{\text{FC}} = \text{NDP}_{\text{FC}} + \text{NFIA}$$

### **Precautions to be taken while estimating national income using Income method**

- (i) National income includes only factor payments, i.e. payment for the services rendered to the production units by the owners of factors. Any payment for which no service is rendered is called a transfer, and not a production activity. Gifts, donations, charities etc are main examples. Since transfers are not a reward for production activity it should not be included in national income.
- (ii) Capital gain refers to the income from the sale of second hand goods like old cars, old house, machinery, buildings etc. These transactions are not a current production activity of the owners of these goods, they do not add to the current flow of goods and services in the economy. So, any income arising to the owners of such things is not a factor income hence not included.
- (iii) Income arising from the sale of financial assets like shares, bonds, debentures, government securities etc. will not be included as these transactions are not related to the production of goods and services. Any profit arising from the sale of these is capital gain which is not treated as factor payment. These financial assets are mere paper claims and involve a change in title only. (However, any commission or brokerage paid is the payment for services and must be included in factor payments.)
- (iv) Imputed value of services provided by owners of production units will be included. Imputed value of owner-occupied houses, interest on own capital, production for self-consumption, etc. will be included as these are productive activities and add to the flow of goods and services.
- (v) Windfall gains (like income from lotteries, horse race, etc.) are not included as there is no productive activity connected with them.

### **(3) Expenditure Method**

This method measures national income as sum total of final expenditures incurred by all the four sectors of the economy. Final expenditures are expenditures on goods and services for consumption and investment. This sum equals  $GDP_{MP}$ . These final expenditures are on the output produced by production units located within the economic territory of the country. Its main components are:

- (i) **Private final consumption expenditure (PFCE):** This is the sum of final consumption expenditure by households and private non-profit institutions serving households.
- (ii) **Government final consumption expenditure (GFCE):** This equals the imputed value of services produced and provided by general government free to the people.
- (iii) **Gross domestic capital formation (GDCF):** This equal the expenditure incurred on acquiring goods for investment by production units located within the domestic territory.

$$\text{Gross domestic capital formation} = \text{Gross domestic fixed capital formation} + \text{Change in stocks}$$

- (iv) **Net Exports (X-M):** This is the difference between export and imports of goods and services.

$GDP_{MP}$  is calculated as:

$$\begin{aligned} GDP_{MP} = & \text{Private final consumption expenditure (PFCE)} \\ & + \text{Government final consumption expenditure (GFCE)} \\ & + \text{Gross domestic capital formation (GDCF)} \\ & + \text{Net exports (X-M)} \end{aligned}$$

By making the usual adjustments we can arrive at national income:

$$NNP_{FC} = GDP_{MP} - \text{Consumption of fixed capital} - \text{Indirect Tax} + \text{Subsidies} + \text{NFIA}$$

### **Precautions to be taken while estimating national income using Expenditure method**

- (i) By definition the method includes only final expenditures, i.e. expenditure on consumption and investment. Intermediate expenditure is already a part of final expenditures. So, including intermediate expenditure like that on raw materials, etc, will mean double counting. It may lead to overestimation of national income. Therefore, proper identification of expenditure on intermediate products is necessary.
- (ii) Expenditure on second hand goods should not be included as it does not lead to any addition to the current flow of goods and services (they have already been accounted during the period of their production; they are not part of current production). However, any commission or brokerage paid in such transactions are treated as final expenditure because it is a payment for the services purchased.
- (iii) Expenditure on financial assets in the form of expenditure on buying shares, bonds, debentures, government securities etc will not be included as they are simply paper claims. It only leads to transfer of money from one person or institution to another person or institution. But any brokerage or service charged or paid in buying financial assets is treated as expenditure on buying services.
- (iv) Imputed expenditure on own account output like self-consumed output by farmers etc. must be counted as final expenditure and hence included. self-consumed services of owner-occupied houses, services got free from general government and non-profit making institutions serving households are other example They will be included as they are productive services.
- (v) A transfer payment is one against which no goods or service is rendered. For example: payment of gifts charities, donations, scholarships, taxes, old age pension, unemployment allowances etc. Such an expenditure is not concerned with production activity hence not included.

**Difference between Nominal National Income (National Income at Current Prices) and Real National Income (National Income at Constant Prices):**

<b>Nominal National Income</b>	<b>Real National Income</b>
It refers to the money value of all final goods and services produced by the normal residents of a country in an accounting year and measured at current year prices.	It refers to the money value of all final goods and services produced by the normal residents of a country in an accounting year and measured at constant prices or the prices of base year.
It is affected by both change in price and quantity.	It is affected by change in quantity only.
It is not a good measure of economic growth of a country as it is affected by both change in physical output as well as price.	It is a true indicator of economic growth of a country

• **Difference between Nominal GDP (or GDP at Current Prices) and Real GDP (or GDP at Constant Prices):**

<b>Nominal GDP</b>	<b>Real GDP</b>
It refers to the market value of all final goods and services produced within the domestic territory of a country in a year and measured at current year prices.	It refers to the market value of all final goods and services produced within the domestic territory of a country in a year and measured at constant prices or the prices of base year.
The value of Nominal GDP changes when either the physical output or prices changes or both change simultaneously.	The value of Real GDP changes when only the volume of physical output changes.
It is not a good measure of economic growth of a country as it is affected by both change in physical output as well as price.	It is a better measure of economic growth of a country as it is affected by change in physical output only. It reflects the change in physical quantity of goods and services over the years.
It is not useful for making periodic comparisons in the physical output of goods and services over different years.	It is a better measure to make periodic comparisons in the physical output of goods and services over different years.
<b>Nominal GDP = <math>\sum</math> Current Year Quantity (Q<sub>i</sub>) x Current Year Price (P<sub>i</sub>)</b>	<b>Real GDP = <math>\sum</math> Current Year Quantity (Q<sub>i</sub>) x Base Year Price (P<sub>0</sub>)</b>

• **Determination of Nominal GDP and Real GDP:** Nominal GDP and Real GDP can be determined in the following manner

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Index}} \times 100$$

Or,

$$\text{Nominal GDP} = \frac{\text{Real GDP} \times \text{Price Index}}{100}$$

- **GDP Deflator:** GDP Deflator measures the average level of prices of all goods and services that make up the GDP. It is used to eliminate the effect of price changes and determine the real change in physical output.

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100 = \frac{\sum P_1 Q_1}{\sum P_0 Q_1} \times 100$$

(where 1 refers to current year and 0 refers to base year)

Or,

$$\text{Current Price Index (GDP Deflator)} = \frac{\text{National Income at Current Prices}}{\text{National Income at Constant Prices}} \times 100$$

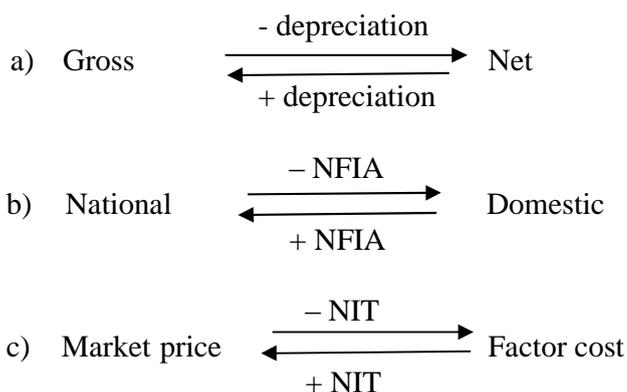
**GDP and Welfare:** GDP (Real GDP) is used as an index of **welfare of the people**. Welfare means sense of material well-being among the people. It is influenced by many factors like consumption level, the types of goods and services consumed (economic factors), environmental pollution, law and order situation (non-economic factors) etc. Higher GDP is generally taken as greater welfare of the people. However, GDP may not be taken as a satisfactory measure of economic welfare due to certain limitations. These are:

1. **Does not include the rate of growth of population:** Real GDP indicates overall performance of the country. But **Real GDP does not consider the changes in the population of a country**. The prosperity of the country is better judged by the per capita real GDP. The per capita real GDP equals total real GDP divided by population. An increase in per capita real GDP indicates increase in per capita availability of goods and services. If rate of growth of population is higher than the rate of growth of real GDP, then it will decrease the per capita availability of goods and services, which will adversely affect the economic welfare.
2. **Does not reflect distribution of GDP:** There is inequality in the distribution of income in the economy. GDP does not take into account changes in inequalities in the distribution of income. If with increase in per capita real income or GDP, the inequality in the distribution of income/ GDP increases i.e. rich becoming richer and poor becoming poorer, then it may lead to decline in welfare (because utility of a rupee of income to the poor is more than to the rich). In such a situation, if welfare rises, it may rise in less proportion as compared to rise in per capita GDP.
3. **Does not include non-economic or non-monetary exchanges:** There are many goods and services which contribute to economic welfare but are not included in the GDP. For example: services of housewives and other family members (leisure time activities) etc. These are non-monetary exchanges i.e. those exchanges and activities which are left out from the estimation of GDP or National Income on account of non-availability of data and problem of valuation. Since these activities do not command a price i.e. no price is attached to them, although they contribute to economic welfare.
4. **Does not include externalities:** Externalities refers to benefits or harms accompanying the production process for which no payment is made or received. They are excluded from the estimation of GDP. There are two types of externalities:
  - a) **Positive externalities** - These are the benefits that accompany the production process but for which no payment is received. They are not included in GDP although they result in increase in welfare. For example, construction of flyovers or highways reduces transport cost and journey time of its users who have not contributed anything towards its cost. Expenditure on construction is included

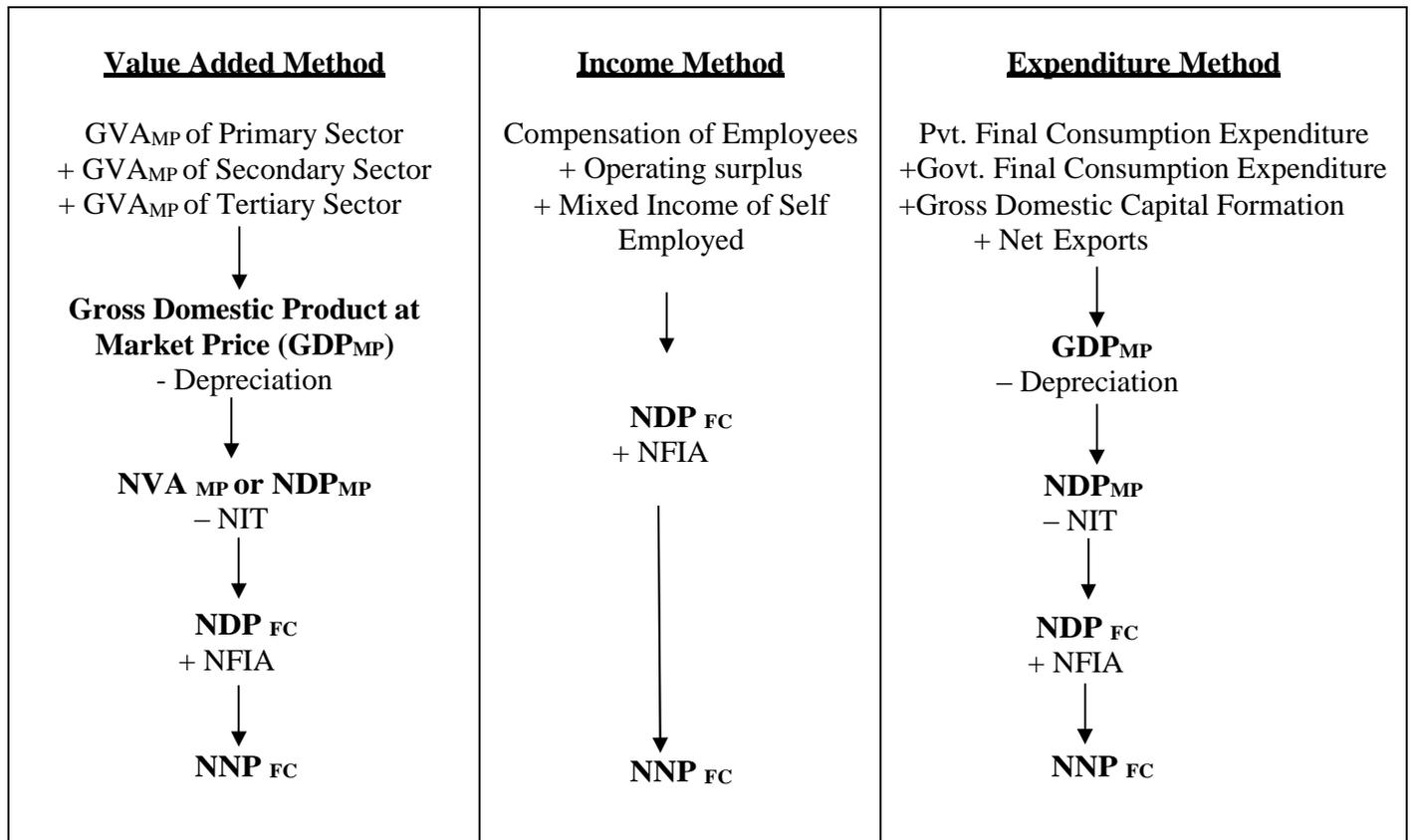
in GDP but not the positive effects flowing from it hence underestimating the welfare indicated by GDP.

- b) **Negative externalities**- These are the negative effects which accompany the production process and decrease the welfare of the people for which they are not penalized. For example: environmental pollution caused by industrial plants. The output produced by plants is included in GDP but decrease in welfare arising out of pollution of water and air caused by plants is not considered in the estimation of GDP. This pollution adversely affects the health of the people thus producing goods increases welfare but creating pollution decreases welfare. Therefore, taking only GDP as an index of welfare overstates the welfare.
5. **Does not consider change in prices:** If increase in GDP is due to increase in prices and not due to increase in physical output, then it will not be a reliable index of economic welfare.
6. **Composition of GDP:** GDP includes different types of products like clothes, food articles, police and military services, house etc. Some of these products contribute more to the welfare of the people like food, clothes etc. whereas other products like police services and military services etc. may comparatively contribute less and may not directly affect the standard of living of the people. Thus, if GDP increases, the increase in welfare may not be in the same proportion. Therefore, how much is the economic welfare, it should depend more on the types of goods and services produced and not simply how much is produced.
7. **Contribution of some products in GDP may be negative:** GDP include all final goods whether it is milk or liquor, some goods included in GDP measurement may reduce economic welfare. For example, liquor, cigarettes etc. because of their harmful effect on health. GDP includes only the monetary value of the products and not their contribution to welfare. Therefore, economic welfare depends not only on the volume of consumption but also on the type of goods and services consumed. This should be considered while drawing conclusion about economic welfare from GDP.

• **Important Conversions**



• **Three methods of measuring National Income**



• **Important formulas for solving numericals**

- Value Added** = Value of Output – Intermediate Consumption
- Value of Output** = Total Sales + Changes in Stocks (If the entire output is not sold)
- Value of Output** = Sales (If the entire output is sold)
- Total Sales** = Domestic Sales + Exports
- Changes in Stocks** = Closing stock - Opening Stock
- Value of Output** = Price x Quantity of output
- Net Domestic Capital Formation** = Net Domestic Fixed Capital Formation + Changes in stocks
- Gross Domestic Capital Formation** = Gross Domestic Fixed Capital Formation + Changes in stocks
- Compensation of Employees** = Wages and Salaries in Cash and Kind + Employer's contribution to social security schemes
- Operating Surplus** = Rent +Royalty+ Interest +Profits
- Profits** = Corporation Tax + Dividends + Undistributed Profits/ Retained Earnings/ Corporate Savings
- Net Exports** = Exports – Imports