

# **E-Learning Module**

## **Module-III**

**B.A./ B.Sc. ECONOMICS (GENERAL)**

**SEMESTER-II**

**Course: ECON—G-CC-T-04**

**Course Title: Principles of Macroeconomics - I**

### **National Income Accounting & Determination of GDP**

By-

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#### **1.1 Genesis of Macroeconomics:**

In the 1930s, two events stimulated the study of macroeconomics. First, the Great Depression demonstrated that the assumption of full employment (with constant output) was untenable. During Great Depression, there was mass unemployment. Prices and output fell to rock bottom levels. Thus, the Great Depression proved that the assumption of full employment of resources as a normal situation of an economy was wrong. The Great Depression showed that unemployment rate and aggregate output were variable. Economist, therefore, felt the need to study the factors which determine the level of output and employment.

Second, in 1936 John Maynard Keynes published, 'The General Theory of Employment, Interest and Money'. Keynes showed that unemployment could exist for long periods. He analyzed the causes for unemployment and depression. Many economists accepted Keynesian economics or Keynesian theory. The publication of his book and subsequent adoption of his view are often referred to as the Keynesian Revolution. The modern macroeconomics is thus born.

##### **1.1.1 What is Macro Economics?**

The term 'macro' is derived from '*makros*' meaning large. Macroeconomics analyses the large aggregates such as national output, total employment, total consumption, total investment, and the general price level. Macroeconomics is, therefore, called the economics of aggregates. Macro analysis assumes that the distribution of output and relative prices are constant. It treats total output and the general price level as variable and attempts to explain how they are determined.

## **1.2 Problems dealt in Macroeconomics:**

### **1. Level of Output and Employment:**

Macroeconomics explains why at sometimes as little as very tiny per cent of the labour force is unemployed and at other times why as much as very high per cent are left out of workforce<sup>1</sup>. This theorization is a manifestation of the '*Theory of Output and Employment*'.

### **2. Fluctuations in Level of Output and Employment:**

Macroeconomics explains why the total output of goods and services grows at a certain average rate per annum in one decade and at an average of different rate in another. This explanation corroborates with the '*Theory of Trade cycles*'.

### **3. Changes in the General Price level:**

Macroeconomics provides explanation for a sharp rise in the price level in one period and a fall in another period. This epitomizes '*The Theory of Inflation*'.

### **4. Economic Development:**

In macroeconomics, we analyze the problems and theories of development. This may be termed as '*Theory of Economic Growth*'.

### **5. Theories of Distribution:**

There are macroeconomic theories of distribution. These theories try to explain how the national output is distributed among the factors of production. This conjecture is referred to as the '*Theory of Factor Distribution*'.

## **1.3 National Income Accounting:**

The importance of national income flows from the fact that it is the source from which people, as owners of factors of production, receive income. It gives the measure of economic performance of a nation. The conception helps us to see the interdependence of the resources that create wealth and of the persons who consume it.

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<sup>1</sup> There is a conceptual difference between workforce and labourforce, in which we are often perplexed. Labourforce takes into account both the actual and willing working persons; whilst, workforce considers only the persons who are actually employed and not the persons who are willing. Thus, Labourforce-Workforce= Size of unemployed of the economy.

At the outset, we cite certain accounting definitions-

### **1.3.1 Gross Domestic Product (GDP):**

GDP is the money value of all the final goods and services produced in the domestic territory of a country during an accounting year. There are millions of goods with different shapes and sizes produced each year. Each one is measured in different units. For example, cloth is measured in metres, milk is measured in litres and food grains in kilograms. In addition, there are different types of services such as those of doctors, engineers, teachers, lawyers etc. Hence, they have to be reduced to common measure. This common measure is money. The value of all goods and services is measured in money. We multiply the quantity of each good with its price and add all such products. This gives us a single measure of the final goods and services produced in a country in a year.

### **1.3.2 Net Domestic Product (NDP):**

GDP provides the measure of the total production of final goods and services in the economy. It includes some producer goods which are made to replace the existing producer goods that depreciating or wearing out. If a machine lasts for ten years, we can say that one-tenth of it is used up every year. The machine must be replaced by a new machine immediately after its lifetime. If cost of replacement is deducted from the GDP, we will get the Net Domestic Product.

### **1.3.3 Net National Product (NNP):**

While calculating NNP, the balance of payments position must be taken into account. Exports are a part of the NNP because they have to be paid for. Any surplus in the balance of payments must be added to and deficit must be deducted from the domestic product.  $NDP + \text{Net factor income from abroad} = \text{NNP}$ . Exports are a part of NNP because they are paid by foreigners. Imports must be deducted because they have to be paid for.

### **1.3.4 Net National Income at Market Prices:**

It is equal to NNP at factor cost + net indirect taxes. NNP at factor cost is equal to national income. It is equal to domestic factor income + net factor income earned from abroad + indirect taxes.

### **1.3.5 Private Income:**

Private income consists of factor incomes earned within the domestic territory and abroad by private enterprises and workers and current transfers from the government and rest of the world. Private Income= Factor income from net domestic product accruing to the private sector+ national debt interest +net factor income from abroad+ current transfers from government+ other current transfers from the rest of the world.

### **1.3.6 Personal Income:**

It is defined as the current income of persons or households from all sources. To arrive at personal income, we have to deduct undistributed profits and corporation tax paid by the enterprises. Personal Income= Net national income + transfer payments- (corporation taxes+ ploughed back profits).

### **1.3.7 Personal Disposable Income:**

It is equal to personal income- direct taxes paid+ miscellaneous payments to government. It is the income available with households for spending. People spend a part of the disposable income and save the rest.

### **1.3.8 Per capita Income:**

Per capital income is equal to national income divided by total population.

## **1.4 Measurement of National Income:**

There are three methods of measuring national income corresponding to the three phases. They are:

1. **Value Added Method**
2. **Income Method;** and
3. **Expenditure Method.**

We arrive at the same total whatever the method used.

### **1. Value Added Method:**

We have stated that the national product is the money value of all the final goods and services produced in a country during a year. To avoid double counting, we have to take the value of final goods and services only. There are three uses for a commodity, namely, final consumption, inter-mediate consumption (for example seeds, fertilizers, labour etc, used by a farmer in cultivation) and capital formation. There are only two final uses out of the three: final consumption and capital formation. The value of goods and services going into these two uses is to be calculated. A much easier way is to find out the value added at each stage of production by

every producing enterprise. That is how we can avoid double counting. Gross value added at each stage in the preparation of bread is shown below:

**Table 1: Value Added**

(value in Rupees)

<b>Name of the producer</b>	<b>Stage of production</b>	<b>Value of intermediate consumption</b>	<b>Value of output</b>	<b>Gross Value Added at each stage (5=4-3)</b>
(1)	(2)	(3)	(4)	(5)
Farmer	Wheat	Nil	300	300
Miller	Flour	300	500	200
Baker	Bread	500	700	200
Shopkeeper	Sale	700	800	100
<b>Total</b>		<b>1500</b>	<b>2300</b>	<b>800</b>

From the above table, it is clear that gross value added is equal to the sale price of bread to final consumer i.e. Rs. 800/-. The contribution made at each stage of production to the current flow of goods and services is gross value added by it, but not the value of output. The value of the final commodity is equal to the gross value added at market prices. This method involves the following steps:

- i. Identifying the producing enterprises and classifying them into industrial sectors according to their activities.
- ii. Estimating net value added by each producing enterprise as well as each industrial sector and adding up the net values added by all the sectors.

## **2. Income Method:**

The Income Method measures national income from the side of the payments made to the primary factors of production for their productive services in an accounting year. This method involves the following steps:

- (i) Identifying the producing enterprises which employ factor inputs;
- (ii) Classifying factor payments; and
- (iii) Estimating factor payments.

Classification of producing enterprises done for the value added method can be used for this method also. As we have already seen, factor payments are generally classified into the following groups:

- i. Compensation of employees;
- ii. Rent;
- iii. Interest;
- iv. Profits; and
- v. Mixed income of self-employed.

Income paid out by each producing enterprise can be measured by finding out the number of units of each input employed. The income paid out to all the factors of production in a particular industrial sector can be found out by adding the incomes paid out by each enterprise. By adding the incomes paid out by all the industrial sectors we get domestic factor income.

The following precautions are to be taken while estimating factor incomes:

- i. All transfer payments should be excluded- old-age pensions, unemployment benefits etc.
- ii. Value of production for self-consumption and imputed rent of owner-occupied houses have to be included.
- iii. Illegal incomes should not be included.
- iv. Windfall gains like lotteries should not be included.
- v. Corporation tax is a part of profits.

Compensation of employees includes income tax to be paid by the employees. While including the compensation of employees in the national income, income-tax to be paid by them should not be included separately.

### **1.5 Reconciliation of the three Methods:**

As we have seen from our discussion that these three methods are used to measure the same physical output. The result depends on data and estimation. The following table shows how the three methods of measuring Gross Domestic Product can be reconciled.

**Table 2: Reconciling Three Methods of Measuring GDP**

<b>Production Method</b>	<b>Income Method</b>	<b>Expenditure Method</b>
Net value added in the primary sector at factor cost.	Compensation of Employees. (Wages+ Salaries etc)	Private final consumption expenditure
+	+	+
Net value added in the Secondary Sector at factor cost	Operating surplus (Interest, rent, dividends, profits etc)	Government final consumption expenditure
+	+	+
Net value added in the Service Sector at factor cost	Mixed Income of Self-employed	Gross capital formation
+	+	+
Net Indirect Taxes (Int. Tax-Subsidy)	Net Indirect Taxes	Net exports of goods and services
<b>= GDP at Market prices</b>	<b>= GDP at Market prices</b>	<b>= GDP at Market prices</b>

**1.6 Money/Nominal and Real National Income:**

In national income accounts an important distinction is made between money or nominal magnitudes and real magnitudes. Data at current prices are in nominal terms and data expressed at some earlier base year prices are referred to as data at constant prices i.e. are expressed in real terms.

**1.7 Usefulness of National Income Accounting:**

We may state the usefulness of national income statistics as follows:

- 1) National income and per capita income indicate the level of development of the country.
  - 2) The rate of growth of national income indicates the rate of growth of an economy.
  - 3) By studying over a period of time the compositional changes in national income it is possible to detect the structural change that is taking place in an economy.
  - 4) In the preparation of economic plans national income accounts are very useful and necessary.
  - 5) Income distribution among factors of production and its trends over a period of time can be studied with the help of national income accounts.
  - 6) It is possible to map economic fluctuations which occur during a period of time with the help of national income data.
- Finally,
- 7) National income accounts are very useful in formulating fiscal and other economic policies.

## **1.8 Limitations of National Income Accounting in Under-developed countries:**

In under-developed countries like India, we face some special difficulties in estimating national income. Some of these difficulties are given below:

- 1) A great difficulty in estimating national income in under-developed countries like India arises because of the prevalence of non-monetized transactions so that a considerable part of the output does not come into the market at all. Agriculture, still being, in the nature of subsistence farming- a major part of output is consumed at the farm itself. The national statisticians, therefore, have to face the problem of finding a suitable measure for this.
- 2) Because of the illiteracy, most producers in India have no idea of the quantity and value of their output and do not follow the practice of keeping regular accounts. This makes the task of getting reliable information from a large number of petty producers all the more difficult.
- 3) In India, occupational specialization is still incomplete so that there is a lack of differentiation in economic functioning. For example, an individual may receive income partly from farm ownership, partly from manual work in Industry in the slack season. This makes the estimation of income more difficult.
- 4) In under-developed countries, both agricultural and industrial sector are unorganized and scattered. This does not admit easy calculation.
- 5) The greatest difficulty in the measurement of national income in underdeveloped countries is general lack of adequate statistical data. Inadequacy, non-availability and unreliability of statistics is a great handicap in measuring national income in these countries. Statistical information regarding agriculture and allied occupations, and household enterprises is not available. Even the statistical information regarding the enterprises in the organized sector is sketchy and unreliable. There is no accurate information available regarding consumption, investment expenditure and savings of either rural or urban population.



## 1.9 Some Mathematical Illustrations:

### Example 1.

With the help of the information given below estimate-

(i) **GDPmp**, (ii) **NDPmp**, (iii) **NDPfc**. (Rs. in crores)

1. Government Consumption Expenditure	10,000
2. Pvt. Consumption Expenditure	30,000
3. Capital consumption allowance	3,500
4. Gross fixed capital formation	6,000
5. Increase in Stock	2,000
6. Net Indirect taxes	5,000
7. Export of Goods and Services	3,000
8. Import of Goods and Services	5,000

### Solution-

- (i)  $GDPmp = C + I + G + X - M$   
= Rs. (10,000 + 30,000 + 6,000 + 2,000 + 3,000 - 5,000) crores  
= Rs. 46,000 crores.  
C- Pvt. Consumption Expenditure.  
I- Gross fixed capital formation & Increase in Stock.  
G- Govt. Consumption Expenditure.  
X- Export of Goods and Services.  
M- Import of Goods and Services.
- (ii)  $NDPmp = GDPmp - \text{Capital consumption allowance}$   
= Rs. (46,000 - 3,500) crores  
= Rs. 42,500 crores.
- (iii)  $NDPfc = NDPmp - \text{Net Indirect taxes}$   
= Rs. (42,500 - 5,000) crores  
= Rs. 37,500 crores.

### Example 2.

From the information given below, work out **Private Income**.

- |                                                            |               |
|------------------------------------------------------------|---------------|
| 1. Income from domestic product accruing to pvt. Sector    | = Rs 1,53,838 |
| 2. National Debt Interest                                  | = Rs. 3,682.  |
| 3. Net factor income from abroad                           | = (-)975.     |
| 4. Current transfers from govt. administrative departments | = Rs. 4597.   |
| 5. Other current transfers from rest of the world          | = Rs. 2774.   |

### **Solution-**

By definition,

**Private Income**= Factor income from net domestic product accruing to pvt. Sector+ national debt interest+ net factor income earned from abroad+ current transfers from govt.+ other current transfers from rest of the world (net).

Hence,

$$\begin{aligned}\text{Private Income} &= \text{Rs. } (1,53,838+3,682-975+4,597+2,774) \\ &= \text{Rs. } 1,63,916.\end{aligned}$$

### **Example 3.**

With the help of information given below, estimate **Personal Income**.

- |                                                            |                |
|------------------------------------------------------------|----------------|
| 1. Income from domestic product accruing to private sector | = Rs. 80,000   |
| 2. National Debt Interest                                  | = Rs. 900      |
| 3. Savings of private sector                               | = Rs. 2000     |
| 4. Net factor income from abroad                           | = (-) Rs. 2110 |
| 5. Current transfer from govt. administrative departments  | = Rs. 1980     |
| 6. Corporation tax                                         | = (-) Rs. 1250 |
| 7. Net current transfers from the rest of the world        | = Rs. 980.     |

### **Solution-**

By definition,

**Personal Income**= Private Income-corporation tax- undistributed profit (savings) of private corporate sector and net retained earnings of foreign companies.

$$\begin{aligned}\text{First, calculate Private income} &= \text{Rs. } (80,000+900-2110+1980+980). \\ &= \text{Rs. } 81750.\end{aligned}$$

$$\begin{aligned}\text{Personal Income} &= \text{Rs. } (81,750-1250-2000) \\ &= \text{Rs. } 78500.\end{aligned}$$

### Possible Questions:

#### A. Short Answer Type Questions: (Marks: 2)

1. What do you understand by macroeconomics?
2. Name the famous book published by John Maynard Keynes in 1936 on the backdrop of Great Depression?
3. Define GDP, NDP, NNP, Pvt Income, Personal Income & Personal Disposable Income.
4. What is Net Indirect Tax?
5. What do you mean by transfer earnings? Give examples.
6. Explain, how could you derive NDP from GDP?
7. Differentiate between Nominal GNP and Real GNP.

#### B. Medium Answer type Question: (Marks: 5)

1. What is the difference between NNPmp and NNPfc?
2. What is Value Added Method? Explain.
3. What are the problems dealt in macroeconomics?
4. What are the usefulness of National Income accounting?
5. How could you reconcile between the three methods of measuring National Income?

#### C. Essay Types Question: (Marks: 10)

1. Describe the three methods of measuring national income.
2. Discuss the limitations of National Income accounting in under-developed countries.

#### Suggested Readings

Sl No.	Title	Author	Publisher
- 1 -	Principles of Economics 9th Edition	Karl E. Case, Ray C. Fair & Sharon Oster	Pearson Education India
- 2	Macroeconomics	A.V.Ranganadhachary	Kalyani Publishers, New Delhi
- 3 -	An Introduction to Positive Economics 8th Edition	Richard G. Lipsey & K. Alec Chrystal	Oxford University Press, India
4.	Principles of Macroeconomics, 2nd Edition	Soumyen Sikdar	Oxford University Press, India