

National Income Accounting

Definition: Gross Domestic Product (GDP)

GDP is the measure of the market value of all final goods and services produced in a country during a year. GDP equals the money values of all consumption and investment goods, government purchases and net exports to other lands.

GDP is used for many purposes, but the most important one is to measure the overall performance of an economy.

Nominal GDP or GDP at current prices: If we measure GDP for a particular year using the actual market prices of that year; this gives us the nominal GDP.

Real GDP or GDP at constant prices: When GDP is measured in a set of constant or invariant prices, then we get the real GDP.

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

So, what is GDP deflator?

GDP deflator: To obtain real GDP, we divide nominal GDP by a price index known as the GDP deflator.

Gross National Product (GNP)

GNP is the total final output produced with inputs owned by the residents of a country during a year. So, GNP is the market value of all products and services produced in one year by labor and property supplied by the citizens of a country.

Gross Domestic Product (GDP) from product side is sum of four major components:

1. Personal consumption expenditure on goods and services (C)
2. Gross private domestic investment (I)
3. Government expenditure on goods and services (G)
4. Net exports (\bar{X})

$$GDP = C + I + G + \bar{X}$$

Gross Domestic Product (GDP) from the cost side is sum of following major components:

1. Wages, interests, rents and profits
2. Indirect business taxes
3. Depreciation

$$\begin{aligned} GDP &= w + r + R + P \\ &\quad + \text{Indirect business taxes} \\ &\quad + \text{Depreciation} \end{aligned}$$

GNP: The total market value of all final goods and services produced in a year.

NNP: Net national product is obtained by deducing the depreciation of capital goods from gross national product.

$$NNP = GNP - Depreciation$$

National Income at market price means the market value of all final goods and services after providing for depreciation.

National Income at factor cost means the sum of all incomes earned by resource supplies for their contribution of land, labor, capital and entrepreneurial ability which go into the year's net production.

National Income at factor cost

= Net National Product – Indirect taxes + Subsidies.

Personal Income is the sum of all incomes actually received by all individuals or households during a given year.

$$PI = NI - \text{Social security contributions} - \text{corporate Income taxes} - \text{Undistributed corporate profits} + \text{Transfer payments}$$

Disposable Income (DI): After paying the personal taxes from personal income what remains is called Disposable income.

$$DI = PI - \text{Personal Taxes}$$

Net Economic Welfare (NEW): One of the earliest approaches involved the development of a more meaningful measure of national output called net economic welfare or NEW.

NEW is based upon GDP, makes two major changes. First, NEW excludes many components of GDP that do not contribute to individual well-being, and second, some key consumption items are omitted from GDP are included in NEW.

Net economic welfare (NEW) is an adjusted measure of total output that includes only consumption and investment items that contribute directly to economic well-being.

$$\text{NEW} = \text{GDP} - \text{depreciation} + \text{leisure time value} \\ \text{or self-doing activities} + \text{underground activities} - \\ \text{pollution (or environmental damage) and dis-} \\ \text{amenities.}$$

Measurement of Inflation:

As we already know, maintaining stable prices is an important macroeconomic goal along with maintaining stable employment. This goal is attained, if the overall price level can be prevented from rising or falling too rapidly. The common measure of the price level is a price index known as the **Consumer Price Index (CPI)**. It measures the cost of a fixed basket of goods consumed by a typical urban household. The contents of this basket are determined usually by conducting periodic household surveys among urban consumers. Price indexes are then constructed by calculating the cost of this basket of goods (and services) for different years as prices change. Each of the index numbers expresses the cost of the market basket of goods relative to the cost of the same basket in some base period.

Suppose that the base period is year 1990 and that the cost of the fixed basket of goods in 1990 prices is \$550. Assume further that the cost of the same basket in year 1995 is \$660. This means that the cost of the basket of goods is 20% higher in 1995. The index number for the base year is conventionally set at 100. Therefore, to reflect a 20% increase in prices (since

the quantities are unchanged between 1990 and 1995), the index for 1995 must be set at 120. The following relationship may be used to calculate CPI for any given year.

$$\text{CPI in the given year} = \frac{\text{Cost of the basket in the given year}}{\text{Cost of the basket in the base year}} \times 100$$

Applying the above rule to our example,

$$\begin{aligned}\text{CPI for 1995} &= \frac{\text{Cost of the basket in 1995}}{\text{Cost of the basket in 1990}} \times 100 \\ &= \frac{\$660}{\$550} \times 100 = 120\end{aligned}$$

Notice that CPI is a pure number (unit free).

Measurement of Inflation: CPI Vs. GDP Deflator

Both the consumer Price Index (CPI) and the GDP deflator can be used to measure price level changes (inflation). As mentioned earlier, to get the GDP deflator for a given year we divide that year's nominal GDP by the real GDP of the same year.

$$\text{That is, GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

This deflator measures the change in prices between the base year and the current year.

For example, between 1998 and 2000,
the **rate of inflation**

$$\begin{aligned}\pi &= \frac{\text{Deflator index (2000)} - \text{Deflator Index (1998)}}{\text{Deflator Index (1998)}} \times 100 \\ &= \frac{127 - 100}{100} \times 100 \\ &= 27\%\end{aligned}$$

The price has gone up by 27%.

In exactly analogous fashion, the rate of inflation can be measured by using the CPI as follows

$$\text{Rate of inflation} = \frac{\text{CPI(given year)} - \text{CPI (last year)}}{\text{CPI (last year)}} \times 100$$

If, for example, CPI (given year) = 230 and CPI (last year) = 200, then the rate of inflation is,

$$\begin{aligned}&= \frac{230 - 200}{200} \times 100 \\ &= 15\%\end{aligned}$$

Economists generally prefer the GDP deflator as a measure of inflation to the Consumer Price Index. Note that the two indexes are based on different market baskets. The CPI basket is based on budget of the typical urban consumer. The GDP deflator, on the other hand, includes in its basket all goods and

services (including those newly produced and imported) on which the GDP is based. In addition, the latter basket includes investment goods as well government output. Therefore, the GDP deflator is the most comprehensive measure of inflation.

Methods of National Income Accounting

There are **three** methods of measurements of national income. These are: (a) Production or Output method; (b) Income method; and (c) Expenditure method.

Production or Output Method: This method approaches national income from output side. According to this method, the economy is divided into different sectors – such as agriculture, mining, manufacturing etc. Then the gross output is found out by adding up only the net values of all the production that has taken place in these sectors during a given year.

We include only final goods – goods ultimately bought and used by consumers.

The problem of double counting is faced in this method. As we said only final goods and services are

included. GDP excludes intermediate goods – goods that are used up to produce other goods.

To solve this problem, we may use value added system. **Value added** is the difference between a firm's sales and its purchases of materials and services from other firms.

$$GDP = p_1x_1 + p_2x_2 + \cdots + p_nx_n = \sum_{i=1}^n p_ix_i$$

Income Method: This method approaches national income from the distribution side. In other words, this method measures the national income after it has been distributed and appears as income earned or received by individuals of the country. Thus, according to this method, national income is obtained by summing up of the incomes of all individuals in the country.

$$\begin{aligned} GDP &= w + R + r + P \\ &= \text{wage} + \text{rent} + \text{interest} + \text{profit} \end{aligned}$$

This method of estimating national income has the great advantage of indicating the distribution of national income among different income groups such as landlords, capitalists, workers etc.

Expenditure Method: This method arrives at nation income by adding up all the expenditure made on goods and services during a year. Income can be either spent on consumer goods or investment goods. Thus, we can get national income by summing up all consumption expenditure and investment expenditure made by all individuals as well as the government of a country during a year. Hence, the national income is found by adding up

- (a) What private individuals spend on consumer goods and services? This is called personal consumption expenditure.
- (b) What private business spend on replacement, rewards and new investment? This is called gross domestic private investment.
- (c) What government spends on the purchases of goods and services, i.e., government expenditure; and
- (d) Exports minus imports. This is called net foreign investment.

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

Difficulties in Measuring National Income:

1. Non-monetized Sector
2. Lack of distinct differentiation in economic activities
3. Conceptual problems
4. Black money
5. Inter-regional differences
6. Non-availability of data about certain incomes
7. Mass Illiteracy
8. Difficulty in obtaining data about income
9. Difficulties of sampling technique
10. Misc. difficulties