CONCEPTS AND METHODS TO MEASURE NATIONAL INCOME

ESTIMATION OF NATIONAL INCOME - PRE-INDEPENDENCE AND AFTER INDEPENDENCE

TRENDS OF NATIONAL INCOME OVER THE YEARS

NATIONAL INCOME IN INDIA
NATIONAL INCOME

According to the National Income Committee (1949), “A national income estimate measures the volume of commodities and services turned out during a given period counted without duplication”.

Thus, national income measures the net value of goods and services produced in a country during a year and it also includes net earned foreign income. In other words, a total of national income measures the flow of goods and services in an economy.

In India, National income estimates are related with the financial year (April 1 to March 31).
Concepts of National Income India

1. Gross Domestic Product (GDP) - is the total money value of all final goods and services produced within the geographical boundaries of the country during a given period of time.

As a conclusion, it must be understood while domestic product emphasizes the total output which is raised within the geographical boundaries of the country; national product focuses attention not only on the domestic product, but also on goods and services produced outside the boundaries of a nation. Besides, any part of GDP which is produced by nationals of a country, should be included in GNP.

\[ GDP = C + I + G + (X - M) \]

Gross National Product Formula (GNP): Gross National Product refers to the money value of total output or production of final goods and services produced by the nationals of a country during a given period of time, generally a year.
As we include all final goods and services produced by nationals of a country during a year in the calculation of GNP, we include the money value of goods and services produced by nationals outside the country.

Hence, income produced and received by nationals of a country within the boundaries of foreign countries should be added in Gross Domestic Product (GDP) of the country. Similarly, income received by foreign nationals within the boundary of the country should be excluded from GDP.

In Gross National Product Equation Form:

\[ \text{GNP} = \text{GDP} + X - M \]

\[ M = \text{Income received by foreign nationals from within the country.} \]

If \( X = M \), then \( \text{GNP} = \text{GDP} \).

Similarly, in a closed economy \( X = M = 0 \), then also \( \text{GNP} = \text{GDP} \).
2. Net National Product Formula (NNP): NNP is obtained by subtracting depreciation value (i.e., capital stock consumption) from GNP.

In NNP Equation Form:

NNP at factor cost or National Income = NNP at Market price – (Indirect Taxes – Subsidy) = NNPMP – Indirect Tax + Subsidy.

Personal Income: Personal income is that income which is actually obtained by nationals. Personal income is obtained by subtracting corporate taxes and payments made for social securities provisions from national income and adding to it government transfer payments, business transfer payments and net interest paid by the government.

In Personal Income Equation Form:

Personal Income = National income – undistributed profits of Corporations – payments for social security provisions –
- corporate taxes + government transfer payments + Business transfer payments + Net interest paid by government. It should always be kept in mind that personal income is a flow concept.

- **Disposable Personal Income**: When personal direct taxes are subtracted from personal income the obtained value is called disposable personal income (DPI).

**In Disposable Personal Income Equation Form:**

\[ \text{[Disposal Personal Income]} = \text{[Personal Income]} - \text{[Direct Taxes]} \].

Symbolically: National Income = Total Rent + Total Wages + Total Interest + Total Profit.
METHODS OF MEASURING NATIONAL INCOME

According to Simon Kuznets, national income of a country is calculated by following mentioned three methods:

1. Product Method: S. Kuznets gave a new name to this method, i.e., product service method. In this method, net value of final goods and services produced in a country during a year is obtained, which is called total final product. This represents Gross Domestic Product (GDP). Net income earned in foreign boundaries by nationals is added and depreciation is subtracted from GDP.

2. Income Method: In this method, a total of net incomes earned by working people in different sectors and commercial enterprises are obtained. Incomes of both categories of people – paying taxes and not paying taxes are added to obtain national income.

\[
\text{GDP} = \text{WAGES/SALARIES} + \text{RENT} + \text{INTEREST} + \text{PROFIT}
\]
For adopting this method, sometimes a group of people from various income groups is selected and on the basis of their income national income of the country is estimated. In a broad sense, by income method national income is obtained by adding receipts as total rent, total wages, total interest and total profit.

○ **3. Consumption Method**: It is also called expenditure method. Income is either spent on consumption or saved. Hence, national income is the addition of total consumption and total savings. For using this method, we need data related to income and savings of the consumers. Generally reliable data of saving and consumption are not easily available. Therefore, expenditure method is generally not used for estimating national income.

○ In India, a combination of production method and income method is used for estimating national income.
ESTIMATES OF NATIONAL INCOME IN INDIA

- No specific attempts were made for estimating national income in India during pre-independence era. In 1868, the first attempt was made by Dadabhai Naoroji.
- He, in his book ‘Poverty and Un-British Rule in India’, estimated Indian per capita annual income at a level of 20. Some other economists followed it and gave various estimates of Indian national income.

<table>
<thead>
<tr>
<th>Estimated by</th>
<th>Year of Estimate</th>
<th>National Income Rs. (crore)</th>
<th>Per capita income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dadabhai Naoroji</td>
<td>1867-68</td>
<td>340</td>
<td>20</td>
</tr>
<tr>
<td>Wadia and Joshi</td>
<td>1913-14</td>
<td>1067</td>
<td>44</td>
</tr>
<tr>
<td>Shah &amp; Khambabata</td>
<td>1921-22</td>
<td>2364</td>
<td>74</td>
</tr>
<tr>
<td>V.K.R.V. Rao</td>
<td>1931-32</td>
<td>1689</td>
<td>62</td>
</tr>
<tr>
<td>Ministry of Commerce</td>
<td>1945-46</td>
<td>6234</td>
<td>198</td>
</tr>
</tbody>
</table>
Methods of Measuring National Income before Independence

- **Non-scientific Method:**
  - Dadabhai Naoroji, Shah and Khambata, Wadia and Joshi and certain others first estimated the value of agriculture production.
  - And a certain percentage of it was added as the value of non-agriculture production.
Scientific Method:

Dr. V.K.R.V. Rao was the first person to adopt a scientific procedure for the estimation of national income in 1931.

He divided Indian Economy into two parts:

(i) Agriculture Sector: agriculture, forests, fishing and hunting.
(ii) Corporate Sector: industries, construction, transport, and public services.

Dr. Rao used mixed method for estimation of national income.

Product Method for estimating income in the agriculture sector.

Income Method for estimating income in the corporate sector.

Net factor Income earned from abroad was added to the income of both these sectors to obtain national income.
Difficulties and Limitations

- No Government Agency:
  - All estimates were prepared at personal level.
- Incomplete and unreliable data
- Different methods
  - Choice of methods depended upon the preference of the person concerned.
- Different geographical areas
  - The income of the country was estimated on the basis of data collected from different geographical areas.
- Based on the current prices
Estimates of National Income after Independence

- After independence, the government of India in 1949, appointed National Income Committee
- Under the chairmanship of Prof. P.C. Mahalanobis
- Prof. Gadgil and Dr. V.K.R.V. Rao were two other members of the committee.
- The committee presented its first report in 1951.
- According to the first report of this committee, National Income of India was Rs. 8,710 Crore and Per Capita income was Rs.225 in 1948-49.
- This report discussed
  - Details of methods for the estimation of data on National Income
  - Various sources and limitations of data on national income
- Since 1955, the National Income estimates are being prepared by Central Statistical Organization.
National income includes the contribution of three sectors of the economy primary Sector (Agriculture, Forest, Fisheries, Mining), Secondary Sector (Industries – Manufacturing and Construction) and Tertiary Sector (Trade, Transport, Communications, Banking, Insurance, Real Estate, Community and Personal Services).

**CSO and NSSO to be Merged**

- The government is planning to merge Central Statistical Organization (CSO) and National Sample Survey Organization (NSSO) for promoting statistical network in the country. The newly merged unit will be named as National Statistical Organization (NSO). The head of the organization will be designated as ‘Chief of Statistician of India’ and will be having the rank of Chief.
Estimates of National Income by Central Statistical Organization (CSO)

1. Conventional Series:
   - Between 1952-1967, same methods of national income estimates were adopted as recommended by National Income Committee.
   - 1948-49 was taken as base year
   - After 1966, CSO discontinued the publication of conventional series

2. First Revised Series
   - In 1967, certain major changes introduced by CSO.
   - 1960-61 was taken as base year instead of 1948-49
   - Economic activities were classified into three different sectors, viz., Primary, Secondary and Tertiary Sector
3. Second Revised Series
   - CSO introduced this series in 1978
   - 1970-71 taken as base year instead of 1960-61

4. Third Revised Series
   - CSO introduced this series in 1988
   - 1980-81 taken as base year instead of 1970-71

5. Fourth Revised Series
   - Introduced in 1999
   - 1993-94 taken as base year
   - Important methodological changes were introduced

6. Fifth Revised Series
   - Adopted in 2004-05
   - Base year was 1999-2000

7. New Series
   - Adopted in 2009-10
   - Base year was 2004-05
Difficulties in Measuring National Income in India

- Non-monetized Sector
- Lack of distinct differentiation in economic activities
- Conceptual problems
- Black money
- Inter-regional differences
- Non-availability of data about certain incomes
- Mass Illiteracy
- Difficulty in obtaining data about income
- Difficulties of sampling technique
- Misc. difficulties
India ranks second worldwide in farm output.

Agriculture and allied sectors like forestry, logging and fishing accounted for 17% of the GDP and employed 49% of the total workforce in 2014.

As the Indian economy has diversified and grown, agriculture's contribution to GDP has steadily declined from 1951 to 2011, yet it is still the largest employment source and a significant piece of the overall socio-economic development of India.

Crop yield per unit area of all crops has grown since 1950, due to the special emphasis placed on agriculture in the five-year plans and steady improvements in irrigation, technology, application of modern agricultural practices and provision of agricultural credit and subsidies since the Green Revolution in India.
However, international comparisons reveal the average yield in India is generally 30% to 50% of the highest average yield in the world.

The states of Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Andhra Pradesh, Telangana, Bihar, West Bengal, Gujarat and Maharashtra are key contributors to Indian agriculture.
## Trends in National Income and Per Capita Income

<table>
<thead>
<tr>
<th>Years</th>
<th>National Income at Current Prices (Rs. in Crore)</th>
<th>National Income at 2004-05 Prices (Rs. in Crore)</th>
<th>Per Capita Income at Current Prices (Rs.)</th>
<th>Per Capita Income at 2004-05 Prices (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951-51</td>
<td>9,152</td>
<td>2,04,924</td>
<td>255</td>
<td>5,708</td>
</tr>
<tr>
<td>1960-61</td>
<td>15,593</td>
<td>3,09,045</td>
<td>359</td>
<td>7,121</td>
</tr>
<tr>
<td>1970-71</td>
<td>40,135</td>
<td>4,37,719</td>
<td>742</td>
<td>8,091</td>
</tr>
<tr>
<td>1980-81</td>
<td>1,21,129</td>
<td>5,83,548</td>
<td>1,784</td>
<td>8,594</td>
</tr>
<tr>
<td>1990-91</td>
<td>4,56,409</td>
<td>9,67,773</td>
<td>5,440</td>
<td>11,535</td>
</tr>
<tr>
<td>2000-01</td>
<td>17,00,467</td>
<td>16,48,018</td>
<td>16,688</td>
<td>16,172</td>
</tr>
<tr>
<td>2010-11</td>
<td>63,25,038</td>
<td>42,68,715</td>
<td>53,331</td>
<td>35,993</td>
</tr>
<tr>
<td>2011-12</td>
<td>73,99,935</td>
<td>45,72,075</td>
<td>61,564</td>
<td>38,037</td>
</tr>
</tbody>
</table>
## Annual growth rate of National Income and Per Capita Income

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan</td>
<td>3.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Second Plan</td>
<td>4.1</td>
<td>2.0</td>
</tr>
<tr>
<td>Third Plan</td>
<td>2.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Fourth Plan</td>
<td>3.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Fifth Plan</td>
<td>5.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Sixth Plan</td>
<td>5.4</td>
<td>3.2</td>
</tr>
<tr>
<td>Seventh Plan</td>
<td>5.8</td>
<td>3.6</td>
</tr>
<tr>
<td>Eighth Plan</td>
<td>6.7</td>
<td>4.6</td>
</tr>
<tr>
<td>Ninth Plan</td>
<td>5.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Tenth Plan</td>
<td>7.8</td>
<td>6.1</td>
</tr>
<tr>
<td>Eleventh Plan</td>
<td>7.9</td>
<td>6.5</td>
</tr>
<tr>
<td>Twelfth Plan (2012-13)</td>
<td>5.0</td>
<td>3.7</td>
</tr>
</tbody>
</table>
## Comparison of Per Capita Income of India with other Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Per Capita Income on Exchange Rate Basis (U.S. Dollars) (Year 2011)</th>
<th>Per Capita Income on Purchasing Power Parity Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>48,620</td>
<td>48,820</td>
</tr>
<tr>
<td>Japan</td>
<td>44,900</td>
<td>35,330</td>
</tr>
<tr>
<td>UK</td>
<td>37,780</td>
<td>35,950</td>
</tr>
<tr>
<td>China</td>
<td>4,940</td>
<td>8,390</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>2,580</td>
<td>5,520</td>
</tr>
<tr>
<td><strong>India</strong></td>
<td><strong>1,420</strong></td>
<td><strong>3,640</strong></td>
</tr>
<tr>
<td>Pakistan</td>
<td>1,120</td>
<td>2,870</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>780</td>
<td>1,940</td>
</tr>
<tr>
<td><strong>World Average</strong></td>
<td><strong>9,514</strong></td>
<td><strong>11,560</strong></td>
</tr>
</tbody>
</table>
### Percentage share of different sectors in GDP of different nations (year 2010)

<table>
<thead>
<tr>
<th>Country</th>
<th>Primary Sector (Agriculture)</th>
<th>Secondary Sector (Industry)</th>
<th>Tertiary Sector (Services)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>1</td>
<td>28</td>
<td>71</td>
</tr>
<tr>
<td>USA</td>
<td>1</td>
<td>20</td>
<td>79</td>
</tr>
<tr>
<td>UK</td>
<td>1</td>
<td>21</td>
<td>78</td>
</tr>
<tr>
<td>Japan</td>
<td>1</td>
<td>28</td>
<td>71</td>
</tr>
<tr>
<td>China</td>
<td>10</td>
<td>47</td>
<td>43</td>
</tr>
<tr>
<td>India</td>
<td>18</td>
<td>27</td>
<td>55</td>
</tr>
<tr>
<td>Pakistan</td>
<td>22</td>
<td>25</td>
<td>53</td>
</tr>
<tr>
<td>World Average</td>
<td>3</td>
<td>26</td>
<td>71</td>
</tr>
</tbody>
</table>
## Contribution of Different Regions in Net Domestic Product of India (2010-11)

<table>
<thead>
<tr>
<th>State (High Income States)</th>
<th>Net Domestic Product (Rs. In Crore)</th>
<th>% share in NDP of India</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Maharashtra</td>
<td>9,82,452</td>
<td>15.3</td>
</tr>
<tr>
<td>2. Uttar Pradesh</td>
<td>5,36,297</td>
<td>8.4</td>
</tr>
<tr>
<td>3. Andhra Pradesh</td>
<td>5,31,139</td>
<td>8.3</td>
</tr>
<tr>
<td>4. Tamil Nadu</td>
<td>5,07,571</td>
<td>7.9</td>
</tr>
<tr>
<td>5. Gujarat</td>
<td>4,40,942</td>
<td>6.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State (Low Income States)</th>
<th>Net Domestic Product (Rs. In Crore)</th>
<th>% share in NDP of India</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assam</td>
<td>92,970</td>
<td>1.5</td>
</tr>
<tr>
<td>2. Jharkhand</td>
<td>1,00,117</td>
<td>1.6</td>
</tr>
<tr>
<td>3. Chhattisgarh</td>
<td>1,02,918</td>
<td>1.6</td>
</tr>
<tr>
<td>4. Orissa</td>
<td>1,68,403</td>
<td>2.6</td>
</tr>
<tr>
<td>5. Bihar</td>
<td>1,83,970</td>
<td>2.9</td>
</tr>
</tbody>
</table>

| All India                 | 64,03,939                         | 100                     |
Because of different areas and different population size of different states, NDP is not a good criteria to measure Regional Imbalances or Inter-regional Variations.

So Per Capita Income is a better criteria to measure Regional Imbalances
<table>
<thead>
<tr>
<th>State (High Income States)</th>
<th>Per Capita Income (Rs.p.a.)</th>
<th>State (Low Income States)</th>
<th>Per Capita Income (Rs.p.a.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Goa</td>
<td>1,59,244</td>
<td>1. Bihar</td>
<td>18,928</td>
</tr>
<tr>
<td>2. Haryana</td>
<td>94,464</td>
<td>2. Uttar Pradesh</td>
<td>26,903</td>
</tr>
<tr>
<td>3. Maharashtra</td>
<td>87,686</td>
<td>3. Assam</td>
<td>30,569</td>
</tr>
<tr>
<td>4. Tamil Nadu</td>
<td>75,449</td>
<td>4. Jharkhand</td>
<td>31,993</td>
</tr>
<tr>
<td>5. Gujarat</td>
<td>75,115</td>
<td>5. Madhya Pradesh</td>
<td>32,253</td>
</tr>
</tbody>
</table>
## Trends in Inter-State Variations in Per Capita Income

<table>
<thead>
<tr>
<th>State (Forward States)</th>
<th>1993-94 (Rs.)</th>
<th>2010-11 (Rs.)</th>
<th>State (Backward States)</th>
<th>1993-94 (Rs.)</th>
<th>2010-11 (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Goa</td>
<td>16,558</td>
<td>1,59,244</td>
<td>1. Bihar</td>
<td>3,037</td>
<td>18,928</td>
</tr>
<tr>
<td>3. Maharashtra</td>
<td>12,183</td>
<td>87,686</td>
<td>3. Assam</td>
<td>5,715</td>
<td>30,569</td>
</tr>
<tr>
<td>4. Gujarat</td>
<td>9,796</td>
<td>75,115</td>
<td>4. Madhya Pradesh</td>
<td>6,584</td>
<td>32,253</td>
</tr>
<tr>
<td>5. Kerala</td>
<td>7,938</td>
<td>71,434</td>
<td>5. Orissa</td>
<td>4,896</td>
<td>40,412</td>
</tr>
<tr>
<td>6. Punjab</td>
<td>12,710</td>
<td>68,998</td>
<td>6. Rajasthan</td>
<td>6,182</td>
<td>42,434</td>
</tr>
</tbody>
</table>
Main Causes of Inter-regional Variations in Per Capita Income

- **Difference in Growth rate**
  - High growth rate in Goa, Maharashtra, Haryana, Gujarat, Punjab
  - Low growth rate in Bihar, Orissa, Jharkhand, Uttar Pradesh

- **Difference in Agriculture Productivity**
  - During 2009, in Punjab 4,167 kg (per hectare)
  - In Haryana 3,400 kg
  - In Bihar 1,656 kg
  - In Orissa 1,402 kg

- **Percentage share in total Food grain Production**
  - In 2011-12, Punjab’s share was 11.01 % of the total
  - 7.4 % for Maharashtra
  - 3.24 % for Orissa
Difference in Net Irrigated Area
- In 2008-09, in Punjab & Haryana, 97.6 % and 85.3% respectively of the total agriculture area was irrigated.
- In Chhattisgarh, it was 26.8% and in Madhya Pradesh, 32.5 %

Difference in Industrial Development
- In 2009, in Maharashtra, per capita gross factory output was Rs.55,108
- In Gujarat, Rs.88,968
- In Bihar, Rs.3,120

Percentage of People Below poverty line
- 15.9 % in Punjab
- 9.5 % in HP
- 53.5 % in Bihar
- 37 % in Orissa

Growth rate of Population
- 8.17 % in Goa and 4.86 % in Kerala
- 25.07 % in Bihar and 20.09 % in UP
Main Features of National Income in India

- More dependence on agriculture
- Poor growth rate of Per Capita Income
  - Rapidly growing population neutralized the rise in national income
- Unequal Distribution
  - Top 10% population hold 31.1% of National Income and bottom 10% population hold just 3.6% of National Income
- More expenditure on food
  - 57% of income is spent on food in rural areas and 44% in urban areas in the year 2009-10
- Low Standard of Living
  - In year 2009-10, 29.8% of Population were living below poverty line based on Tendulkar methodology
- Low growth rate of National Income
  - During 1951-2012 period, growth rate of National Income is 5.1% p.a.
Unequal growth rate of different sectors
- In 2012-13, primary sector recorded growth rate of 1.8%, industrial sector 3.1%, and tertiary sector 6.6%

Difference in Income levels in Urban and Rural areas
- Income level in urban areas is twice that of rural areas

Regional disparity
- Only 6-7 states in the country have Per Capita Income more than the national average

More income in private sector
- In year, 2009-10, Private sector contributed 83.25% in N.I.

Increasing significance of Tertiary Sector
- In 1950-51, it was 24.5%, while in 2012-13, 59.3%
Causes of Low National Income of India

Economic Causes
- Low rate of Saving and Investment
- Backward technology
- Rapid increase in population
- More dependence on agriculture
- Inadequate industrial development
- Inadequate progress of Transport and Power
- Unbalanced growth of different regions

Social Causes
- Social Institutions
- Fatalism
- Illiteracy
Suggestions to Raise National Income of India

- Increase in Rate of Saving and Investment
- Modern Technology
- Check on Growth of Population
- Development of Agriculture
- Development of Industries
- Development of Transport and Power
- Balanced growth of All sectors
- More Social welfare services
- Education
- Development of Banking and Insurance
- Use of Natural Resources
- Growth of Foreign Trade
- Liberalization of the Economy
- Political Stability
Thank you