

Chapter 2

National Income Accounting

Learning Objectives :

After learning this chapter you will understand :

- **National Income Accounts.**
- **Gross Domestic Product.**
- **GDP v/s GNP.**
- **The Product Approach.**
- **The Expenditure Approach.**
- **The Income Approach.**
- **Saving and Wealth**
 - ✓ **Private Saving,**
 - ✓ **Government Saving,**
 - ✓ **National Saving.**
- **Real v/s Nominal GDP.**
- **Price Indices.**
- **Interest Rates**
 - ✓ **Nominal Interest Rates,**
 - ✓ **Real Interest Rates,**
 - ✓ **Expected Real Interest Rate.**

Basic Concepts

1. **Introduction :** Accurate measurement of economic activity is important as a basis for sound decision making. No-one would sensibly attempt to drive a car without reliable information about its direction and speed. Likewise, governments and others (especially businesses) affected by economic information would be unwise to make decisions in the absence of sound information about the state of the economy. Clearly decisions will be different according to whether the economy is in a boom period or in a recession, or whether it is growing or declining in size.

In this Chapter we will study the standard methods used throughout the world to measure and track the level of economic activity. While slight differences in terminology and conventions exist between the methods used in some countries, all have the same underlying principles and general construction for arriving at estimates of economic activity at the national or aggregate level. The procedures involved are commonly known as *national income accounting*.

2. **National Income Accounts :** The National income accounts are an accounting framework used in measuring current economic activity. Almost all countries have some form of official national income accounts. The national income accounts are based on the idea that the amount of economic activity that occurs during a period of time can be measured in terms of :

- (i) the amount of output produced, excluding output used up in intermediate stages of production, known as the *product approach*;
- (ii) the incomes received by the producers of goods and services, known as the *income approach*;
- (iii) the expenditure incurred by the consumers for purchasing the final goods and services produced, known as the *expenditure approach*.

Since the total value of goods and services produced is ultimately translated into incomes for the factors of production that produced the output, and since total income ultimately is either spent or saved we can measure the flow of national income around the economy in any one of three ways. Collectively, these methods of measuring the flow of economic activity are referred to as *national income accounting*.

In theory, each method of measurement should provide the same money value for the size of economic activity because they should measure the same flow of income around the economy, albeit at different points in the flow. In other words, national income measured by the output method should equal national income measured by the income or expenditure methods. As the output method measure *national output*, the income method measure *national income* and the expenditure method measures *national expenditure*, it follows that :

$$\text{National Output} = \text{National Income} = \text{National Expenditure}$$

3. **Gross Domestic Product (GDP) :** *The total market value of all final goods and services produced within a given period by factors of production located within a country* is known as Gross Domestic Product. GDP is a critical concept. Just as an individual firm needs to evaluate the success or failure of its operations each year, so the economy as a whole needs to assess itself. GDP, as a measure of the total production of an economy, provides us with a country's economic report card.

Why Is Domestic Product “Gross”?

“Gross” means before subtracting the depreciation of capital. The opposite of “gross” is “net,” which means after subtracting the depreciation of capital.

Depreciation is the decrease in the value of a firm's capital that results from wear and tear and obsolescence. The total amount spent both buying new capital and replacing depreciated capital is called *gross investment*. The amount by which the value of capital increases is called *net investment*. Net investment equals gross investment minus depreciation.

For example, if an airline buys 5 new airplanes and retires 2 old airplanes from service, its gross investment is the value of the 5 new airplanes, depreciation is the value of the 2 old airplanes retired, and net investment is the value of 3 new airplanes.

4. **The Product Approach :** The product approach defines a nation's GDP, or gross domestic product, is the market value of the final goods and services produced within a country in a given time period.

How the Government Calculates GDP

We can note some important facts with respect to the definition of GDP and how the Government calculates it:

- **Market Value :** GDP is measured using market values, not quantities. When looking at individual firms or industries, we typically measure output in terms of quantities, such as the number of copies of Windows produced by Microsoft, the number of automobiles produced by Ford, or the number of Big Macs sold by McDonald's. But in measuring total production, we can't just add the quantity of software to the quantity of automobiles to the quantity of hamburgers, and so on because the result would be a meaningless number. Instead, we use market prices and take the value in dollar terms of all the goods and services produced. In addition to being convenient, market prices also tell us how much consumers value a particular good or service. If pears sell for \$0.50 each and plums sell for \$1.00 each, then the market prices tell us that consumers value a plum twice as much as a pear.
- **Final Goods and Services :** GDP includes only the market value of final goods and services. In measuring GDP, we include only the value of final goods and services. A *final good or service* is one that is purchased by its final user and is not included in the production of any other good or service. It contrasts with an *intermediate good or service*, which is an item that is produced by one firm, bought by another firm, and used as a component of a

final good or service. Examples of final goods are a hamburger purchased by a consumer and a machine tool purchased by Ford. Some goods and services, though, become part of other goods and services; they are intermediate goods or services. For example, McDonald's does not produce the buns it uses in making Big Macs. McDonald's purchases the buns from suppliers, so the buns are an intermediate good. In calculating GDP, the government includes the value of the Big Mac but not the value of the bun. If we included the bun, we would be double counting: The value of the bun would be counted once when McDonald's buys it and again when McDonald's sells the Big Mac to a consumer.

- **Within a Country :** GDP measures production within a country. GDP measures production within a country regardless of who does the production. For example, Toyota is a Japanese automobile company, but it has assembly plants in Indiana, Kentucky, Texas and Mississippi. The automobiles produced at these plants count as part of U.S. GDP because they were produced within the borders of the United States even though Toyota is a Japanese company.
- **Current Production :** GDP includes only current production. GDP includes only production that takes place during the indicated time period. For example, the sale of a used car would not be included because the production of the car would have already been counted in an earlier period, when the car was first sold. If we counted the sale of a used car, that would be double counting the car: first when it was initially produced and again when it was resold. Also, GDP does not count transactions in which money or goods changes hands but in which no new goods and services are produced. Sales of stocks and bonds are not counted in GDP. These exchanges are transfers of ownership of assets, either electronically or through paper exchanges, and do not correspond to current production. However, what if you sell the stock or bond for more than you originally paid for it? Profits from the stock or bond market have nothing to do with current production, so they are not counted in GDP. However, if you pay a fee to a broker for selling a stock of yours to someone else, this fee is counted in GDP because the broker is performing a service for you. This service is part of current production.
- **Imputed Values :** GDP includes some imputed values. The government uses market values for goods and services in computing GDP, but in some cases where there is no market for a good or service, the value has to be imputed, or estimated. For example, the rent paid for an apartment or a house is the value of housing services the apartment or house provides. But many people own their own homes, so there is no rent that can be used to value the housing services they receive. The Government has to impute a value for the rental services generated by owner-occupied housing. Similarly, many government services, such as police and fire services, do

not have a market price. The Government imputes the value of these services as being equal to the cost of providing them.

- **In a Given Period of Time :** In a Given Time Period GDP measures the value of production in a given time period—normally either a quarter of a year—called the quarterly GDP data—or a year—called the annual GDP data.
- **Excluding Some Goods :** The Government does not count some types of production. The Government does not attempt to impute values for some goods or services that are produced outside the market, such as the services a homemaker provides to the homemaker's family. The Government also does not impute a value for goods and services produced in the underground economy, which refers to buying and selling that is not recorded either to avoid tax payments or because the goods and services—for example, cocaine or heroin—are illegal. Clearly these market transactions are part of the economy, but information on the underground economy is so imperfect that the government does not include estimates of it in the official GDP data. Most economists believe that the government's decision not to impute values for some goods and services does not present a problem in using GDP data. Typically, we are most interested in using GDP to measure changes in total production over a relatively brief period of time—say, several years. It is unlikely that the total value of goods and services—such as the services of homemakers or goods and services sold in the underground economy—that are not counted by the government changes much over a short period. So, our measures of the changes in total production would not be much different, even if the government were able to impute values for every good and service.

5. **GDP Versus GNP :**

Gross National Product (GNP) : The total market value of all final goods and services produced within a given period by factors of production owned by a country's citizens, regardless of where the output is produced.

Relation Between GDP and GNP : Gross national product (GNP) is the value of final goods and services produced by residents of a country, even if the production takes place outside that country. GDP measures the production of goods and services within the borders of a country, and GNP measures the production of goods and services by factors of production owned by a country's citizens. For example, the Korean firm Hyundai owns factories in the India, so the value of the cars produced in those factories is included in Indian GDP. The profits received by the Korean owners of Hyundai in exchange for the factors of production they supply, however, have to be subtracted from Indian GNP and added to Korean GNP.

So, GDP and GNP are related by the following identity :

$$GDP = GNP - NFP.$$

We may define **net factor payments from abroad (NFP)** as the income paid to domestic factors of production by the rest of the world minus income paid to foreign factors of production by the domestic economy.

Difference between Gross Domestic Product and Gross National Product.

Gross Domestic Product		Gross National Product	
1.	It is the money value of the goods and services produced within the domestic territory of an economy.	1.	It refers to money value of the final goods and services produced by the normal residents of a country.
2.	It is a geographical concept.	2.	It is an economic concept.
3.	It is a narrower concept.	3.	It is a wider concept.
4.	It can be obtained by subtracting NFP from the GNP.	4.	It can be obtained by adding NFP to the GDP.

6. **The Expenditure Approach :** The expenditure approach measures GDP as the sum of consumption expenditure (C), investment (I), government expenditure on goods and services (G), and net exports of goods and services (NX).

Symbolically, we express the expenditure approach to measuring GDP as

$$Y = C + I + G + NX$$

Where, Y = GDP,

C = Consumption,

I = Investment, and

NX = Net exports of goods and services.

This expression is an identity because it assigns all expenditures on final goods and services into one of the four categories. It is known as income-expenditure identity. We next briefly review some important points about the four categories of expenditures :

Consumption : Consumption is the purchase of new goods and services by households. Consumption includes the purchase of all new goods and services by household regardless of which country the goods or services were originally produced in. There are three categories of consumption expenditure :

Durable goods : Durable goods are tangible goods with an average life of three years or more, such as cars, toys, and televisions.

Nondurable goods : Nondurable goods are shorter-lived goods, such as food and clothing.

Services : Services are consumed at the time and place of purchase, such as haircuts, healthcare, and education. In the United States, as in most other high-income countries, the fraction of services in consumption has risen relative to goods.

As people's incomes rise, they tend to buy relatively less food, clothing, and other goods and relatively more healthcare and other services.

Investment : Investment, as we use the term in economics, refers to the purchase of new capital—housing, plants, equipment, and inventory. The economic use of the term is in contrast to its everyday use, where investment often refers to

purchases of stocks, bonds, or mutual funds. Investment is divided into three categories Fixed investment, Residential investment and Inventories.

Fixed investment is spending by firms on new factories, office buildings, and machinery used to produce other goods.

Residential investment is spending by households or firms on new single-family and multi-family homes.

Changes in business inventories are also included in investment. *Inventories* are goods that have been produced but not yet sold. For example, if Ford produces 3,65,000 Mustangs in the United States during 2012 but sells only 3,50,000, then the 15,000 unsold Mustangs as investment spending by Ford in the “changes in business inventories” category. In effect, it is assumed that Ford “purchased” the Mustangs from itself.

When we speak of “investments” in the national income accounts, however we are generally referring to investment by the private sector *I*; for simplicity we include government investment with other government purchases of goods and services, *G*.

Government Purchases : Government purchases are spending by federal, state, and local governments on newly produced goods and services. Some government purchases represent consumption spending, as when the government pays the salaries of teachers or FBI agents. Other government purchases represent investment spending, as when the government buys new structures, such as bridges and school buildings, or equipment, such as aircraft carriers. Purchases of this type allow the government to provide services—such as education or national defense—in the future.

It is important to note that government purchases do not include transfer payments, which are one of the largest components of the government’s budget. **Transfer payments** are payments by the government to individuals for which the government does not receive a new good or service in return. Examples of transfer payments include Social Security payments to retired and disabled people, Medicare payments to provide healthcare services for people 65 years and older, unemployment insurance payments to unemployed workers, and pension payments to retired government workers.

Net Exports : Net exports is the value of all exports of goods and services minus the value of all imports of goods and services. When exports are greater than imports, net exports are positive, and the country runs a *trade surplus*. When exports are less than imports, net exports are negative, and the country runs a *trade deficit*. When exports equal imports, net exports are zero, and the trade deficit is zero.

Table 2.1 shows the values of each of the major categories of expenditures, as well as their important subcategories for a hypothetical economy :

Table 2.1 : Expenditure Approach to Measure GDP

	Billions of Rs.	Percentage of GDP
Consumption	10,349.1	70.6%
Durable goods	1,089.4	7.4
Nondurable goods	2,336.3	15.9
Services	6,923.4	47.2
Investment	1,827.5	12.5
Business fixed investment	1,415.3	9.7
Structures	383.5	2.6
Equipment and software	1,031.8	7.0
Residential investment	340.5	2.3
Changes in business inventories	71.7	0.5
Government purchases	3,000.2	20.5
Federal	1,214.3	8.3
National defense	817.7	5.6
Nondefense	396.6	2.7
State and local	1,786.0	12.2
Net exports	-516.4	-3.5
Exports	1,837.5	12.5
Imports	2,353.9	16.1
Gross domestic product	14,660.4	100.0%

7. **The Income Approach :** The income approach measures GDP by summing the incomes that firms pay households for the services of the factors of production they hire—wages for labor, interest for capital, rent for land, and profit for entrepreneurship.

The National Income is the sum of following eight types of income :

1. **Compensation of employees** is the payment for labor services. It includes net wages and salaries (called “take-home pay”) that workers receive plus taxes withheld on earnings plus fringe benefits such as Social Security and pension fund contributions.
2. **Proprietors’ income** is the income earned by the owner-operator of a business, which includes compensation for the owner’s labor, the use of the owner’s capital, and profit.
3. **Rental income** is the payment for the use of land and other rented resources. Some miscellaneous types of income, such as royalty income paid to authors, recording artists etc. are also included in this category.
4. **Corporate profits** are the profits of corporations, and represent the remainder of corporate revenue after wages, interest, rents and other costs have been paid. Corporate profit has three components Dividend paid to households, Undistributed profits and Corporate tax.
5. **Net interest** is the interest households receive on loans they make minus the interest households pay on their own borrowing.

6. **Taxes on Production and imports** include indirect business taxes such as sales and excise taxes that are paid by businesses to Federal, State and local governments as well as customs duties and taxes on residential real estate and motor vehicle licenses paid by households.

7. **Net business current transfer payments**, it includes charitable donations, insurance payments, FDIC insurance premiums paid by banks and legal settlements.

8. **Current surplus of government enterprises** is essentially the profit of businesses that are owned by governments such as water, electric and sewer companies etc.

To explain this lets have a table showing national income for a hypothetical economy.

TABLE 2.2 GDP : The Income Approach

Item	Amount (billions of Rs.)	Percentage of GDP
Compensation of employees	7,929	54.92
Net interest	924	6.4
Rental income	299	2.1
Corporate profits	1,210	8.4
Proprietors' income	<u>1,050</u>	<u>7.3</u>
(Total) National Income	11,412	79.04
Plus Indirect taxes less subsidies	<u>1,127</u>	<u>7.8</u>
<i>Equals</i> Net National Product at market price	12,539	87
Plus Depreciation	<u>1,860</u>	<u>12.8</u>
<i>Equals</i> Gross National Product at market price	14,399	99.74
Less Factor income received from the rest of world	809	5.6
Add Factor payments to the rest of world	<u>667</u>	<u>4.6</u>
<i>Equals</i> GDP (income approach)	<u>14,257</u>	<u>98.75</u>
Plus Statistical discrepancy	<u>180</u>	<u>1.2</u>
<i>Equals</i> GDP (expenditure approach)	<u>14,437</u>	<u>100.0</u>

The sum of factor incomes equals net domestic income at factor cost. GDP equals net domestic income at factor cost plus indirect taxes less subsidies plus depreciation.

GDP measured by the income approach was Rs. 14,437 billion. This amount is Rs. 180 billion less than GDP measured by the expenditure approach—a statistical discrepancy of Rs. 151 billion or 1.2 percent of GDP.

8. **Statistical Discrepancy** : The gap between the expenditure approach and the income approach is called the statistical discrepancy and it is calculated as the GDP expenditure total minus the GDP income total. There are various reasons of discrepancies for example, if a waiter doesn't report all his tips when he fills out his

income tax return, they get missed in the income approach but they show up in the expenditure approach when he spends his income. So the sum of expenditures might exceed the sum of incomes. Also the sum of expenditures might exceed the sum of incomes because some expenditure items are estimated rather than directly measured.

9. **Private Disposable Income :** The amount of income which the private sector has to spend is known as the private disposable income. The private disposable income may be computed as :

$$\text{Private disposable income} = Y + \text{NFP} + \text{TR} + \text{Int} - T$$

Where,

Y	=	Gross domestic product (GDP)
NFP	=	Net factor payments from abroad
TR	=	transfers from the government
Int	=	Interest payments on the government's debt.
T	=	Taxes.

10. **Net Government Income :** The part of the GDP that is not at the disposal of the private sector is the net income of the government sector. So, the net government income may be computed as :

$$\text{Net government income} = T - \text{TR} - \text{INT}$$

Where,

T	=	Taxes paid by the private sector,
TR	=	Transfer payments by the government,
INT	=	Interest on government's debt.

11. **Inclusions and Exclusions :** Some of the major items whether included or excluded in national income are as follows:

- (1). **Construction of a new house.**
Yes, it will be included in the national income as it is a part of capital formation and leads to production of goods and services in the economy.
- (2). **Winning of a lottery prize.**
No, it will not be included in the national income as it does not add to the flow of goods and services in the economy.
- (3). **Increase in the prices of stocks lying with a trader.**
No, it will not be included in the national income as it does not amount to any flow of goods.
- (4). **National debt interest. Or Interest on public debt.**
No, it is not included in the national income as it is the interest paid on loans taken by government to meet its consumption purposes.
- (5). **Rent-free house given to an employee by an employer.**
Yes, it is included in the national income by Income Method since it is a part of 'wages in kind' paid to employees.
- (6). **Profit earned by foreign banks in India**
No, It is not included in national income. it is included in GDP, however it is not included in the GNP as it is a part of the factor income paid abroad. It is subtracted from GDP to get GNP.
- (7). **Purchases by foreign tourists. OR Food purchased by a foreign tourist at a hotel in New Delhi.**

Yes, purchases by foreign tourists are 'exports' and, therefore, they are included in the national income through the Expenditure Method.

- (8). **Rent received by Indian residents on their buildings rented out to foreigners in India.**

Yes, it will be included in the national income as it is a part of the factor income from abroad.

- (9). **Payment of fees to a lawyer engaged by a firm.**

No, it is not included. It is an intermediate expenditure for the firm because it involves purchase of services by one production unit (firm) from another production unit (lawyer). So, it is deducted from the value of output of the firm to arrive at the value added. So, it is not included in national income.

- (10). **Free medical facilities by the employer. OR Free boarding and lodging provided to a domestic servant.**

Yes, It will be included in national income as these free services are part of compensation to employees.

- (11). **Gifts received from abroad. OR Gift received from employer.**

No, it is not included in National income as gifts received are transfer incomes.

- (12). **Profits of Reliance Industries from its chemicals business in Australia.**

Yes, it will be included in the national income as it is a part of the factor income from abroad. It is not included in GDP but it is included in GNP.

- (13). **Salaries received by Indian residents working in Russian Embassy in India.**

Yes, it will be included in the national income as it is a part of factor income from abroad.

- (14). **Subsidized lunch served to workers in a factory. OR Firm incurred expenditure on medical treatment of employee's family.**

Yes, it is a part of the compensation of employees and, therefore, it will be included in the national income.

- (15). **Old age pension**

No, it will not be included in the national income as it is a transfer payment made by the government and a transfer income for the receiver.

Note : Old age pension must not be confused with retirement pension. Old age pension is not included in national income as it is a transfer payment. On the other hand, retirement pension is included in national income as it is a part of compensation of employees.

- (16). **Durable goods purchased by a household. OR Purchase of car by a household.**

Yes, it will be included in the national income as it is a part of the private final consumption expenditure.

- (17). **Profits earned by an Indian bank from its branches abroad.**

Yes, they will be included in the national income as they are a part of the factor income from abroad.

- (18). **Earnings of shareholders from the sale of shares.**

No, it will not be included in the national income as it is a financial claim and does not contribute to any productive activity.

- (19). **Expenditure on advertisement by a firm. OR Commodities used in scientific research.**

No, it will not be included in the national income as it is a part of intermediate consumption expenditure.

- (20). **Petrol used in police vehicles.**

Yes, it will be included in national income as it is a part of government final consumption expenditure..

- (21). **Financial help received by flood victims.**

No, it will not be included in the national income as it is a transfer income.

- (22). **Purchase of a machine by a factory. OR Purchase of a new taxi by a taxi-driver.**

Yes, it will be included in the national income as it is a part of the gross domestic capital formation.

- (23). **Royalty**
Yes, it will be included in the national income as royalty is a productive income.
- (24). **Commission on sale of second-hand goods. OR Brokerage payment on sale of shares.**
Yes, it will be included in the national income as it is the income of a middleman for his productive services to various parties.
- (25). **Dividend received by an Indian from his investment in shares of a foreign company.**
Yes, it will be included in the national income as it is factor income from abroad.
- (26). **Purchase of raw materials by a production unit. OR Milk purchased by a Sweet shop to make milk-cake.**
No, it will not be included in the national income as it is a part of the intermediate consumption expenditure.
- (27). **Earnings of a self-employed doctor having a clinic at his own residence.**
Yes, it will be included in the national income as it is a mixed income.
- (28). **Money received from sale of second-hand goods. OR Money received by government from sale of a public sector firm to a private owner.**
No, it will not be included in the national income because receipts from the sale of secondhand goods are by virtue of transfer of an already existing object.
- (29). **Imputed rent of self occupied houses.**
Yes, it will be included in the national income as these houses have rental value.
- (30). **Contribution to provident fund by employer. OR Value of interest foregone on loans provided by employer to employee.**
Yes, it will be included in the national income as it is a part of the compensation to employees.
- (31). **Wheat grown by a farmer but used entirely for family's consumption.**
Yes, it is included in the national income because it adds to the current flow of goods and services. Therefore, its imputed value should be included.
- (32). **Expenditure on the construction of a flyover by the government.**
Yes, it will be included in the national income as it is a part of gross domestic capital formation.
- (33). **Commission received by a dealer from the buyer and seller of a house.**
Yes, it will be included in the national income as it is the income of the dealer for his productive services.
- (34). **Growing vegetables in a kitchen garden of the house.**
No, it will not be included in the national income as it is difficult to estimate the value of production (It is a non-market transaction).
- (35). **Services rendered by family members to each other**
No, it will not be included in the national income as it is difficult to determine the value of services provided by family members to each other.
- (36). **Expenditure by government in providing free education. OR Expenditure on free services provided by government.**
Yes, it will be included in the national income as it is a part of the government final consumption expenditure.
- (37). **Insurance premium paid by employees. OR Fees received from student.**
Yes, it is included in the national income as it is a part of the private final consumption expenditure.
- (38). **Mineral wealth of a nation.**
It is a part of National wealth and is not included in national income. However, that part of mineral wealth which has been extracted during the current year will be included in national income under the product method.
- (39). **Value of wood purchased for manufacturing a table. OR Expenditures on the purchase of cold drinks by a school canteen from the manufacturer. OR Transport expenses by a firm.**
No, it will not be included in the national income as it is a part of intermediate consumption expenditure.
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- (40). **Purchase of equipment's for installation in a factory.**
Yes, it will be included in the national income as it is a part of capital formation.
- (41). **Payment of wealth tax. OR Payment of Death duty.**
No, it will not be included in the national income as it is a compulsory transfer payment to the government.
- (42). **Entertainment tax received by the government.**
No, it will not be included in the national income as it is an indirect tax and a compulsory transfer payment received by the government.
- (43). **Salaries paid to Russians working in Indian Embassy in Russia.**
No, it is not included in the national income as it is a part of the factor income paid abroad. It is subtracted from domestic income to get national income.
- (44). **Capital gains to Indian residents from sale of shares of a foreign company.**
No, capital gains will not be included in the national income as they do not add to the current flow of goods and services in the economy.
- (45). **Dheeraj works in USA and sends money to his family in India.**
No, it will not be included in the national income as it is a transfer payment.
- (46). **Destruction of building due to an earthquake.**
No, it will not be included in the national income as it will not affect national product directly.
- (47). **HP uses its own new Laptops in its office for self-consumption.**
Yes, it is included in the national income as it adds to current flow of goods and services. Therefore, imputed value of laptops should be included.
- (48). **Purchase of a truck to carry goods by a production unit.**
Yes, it will be included in the national income as it is a part of the gross domestic capital formation.
- (49). **Direct purchase made abroad by government.**
Yes, it will be included in the national income as it is a part of the government final consumption expenditure.
- (50). **Earning from a part time job in McDonalds by a student.**
Yes, it is included in the national income as it is an income received for productive services.
- (51). **Receipt from sale of property, inherited from a relative.**
No, it will not be included in the national income as receipt from sale of such property is by virtue of transfer of an already existing object.
- (52). **Entertainment allowance to an employee for entertaining business guests.**
No, it will not be included in the national income as it is intermediate consumption expenditure of the business.
- (53). **Expenditure on the purchase of shares of a new company. OR Sale of bonds by a company.**
No, it will not be included in the national income as it is a financial claim and does not contribute to any productive activity.
- (54). **Goods lying within the production boundary.**
No, such goods will not be including ' in national income as goods lying within the production boundary are intermediate goods.
- (55). **Money received by a family in India from relatives working abroad.**
No, it will not be included in the national income as it is a transfer receipt.
- (56). **Dividend received by a foreigner from investment in shares of an Indian company.**
No, it is not included in the national income as it is a part of factor income paid abroad. It is subtracted from domestic income to get national income.
- (57). **Expenditure by father on marriage of his daughter.**
No, it will not be included in the national income as it does not add to current flow of goods and services.
- (58). **Expenditure on the purchase of an old house. OR Purchase of house by the tenant.
OR Purchase of rented factory building by the factory owner.**

No, it will not be included in the national income because payment for purchase of secondhand goods is due to transfer of an already existing object.

- (59). **Insurance money received from Oriental Insurance due to destruction of factory due to fire.**

No, it is not included in the national income because it is a transfer receipt.

- (60). **Interest paid by banks on deposits by individuals. OR Payment of interest by a government firm. OR Payment of interest by a firm**

Yes, it will be included in the national income as such interest is paid on loan taken for productive purpose. It is a factor payment by a producer.

- (61). **Interest received on loans given to a friend for purchasing a car. OR Interest payment on loan taken by an individual to buy a motor cycle. OR Payment of interest on a loan taken by an employee from the employer.**

No, it will not be included in the national income because it is a non-factor receipt as the loan is not used for production but for consumption.

- (62). **Interest received on loan given to a foreign company in India.**

Yes, it will be included in national income as it is a part of factor income from abroad.

- (63). **Interest received on debentures.**

Yes, it will be included in the national income as such interest received is a factor income because debenture is a sort of loan taken by a production unit.

- (64). **Expenditure on improvement of fixed capital asset. OR Expenditure on construction of a house. OR Expenditures on adding a floor to the building.**

Yes, it will be included in the national income as it is a part of capital formation.

It must be noted that any expenditure on repairs of fixed assets will not be included in national income.

- (65). **Scholarship given to Indian students studying in India by a foreign company. OR Expenditure by the Government on scholarships to students.**

No, it will not be included in the national income as it is a transfer payment.

- (66). **Value of bonus shares received by shareholders of a company.**

No, it will not be included in the national income as such bonus shares are mere paper claims and do not contribute to the production of goods and services.

- (67). **Pension paid after retirement.**

Yes, it is a part of the compensation of employees and, therefore, it will be included in the national income.

- (68). **Expenditure on maintenance of building. OR Expenditure on maintenance by a firm.**

No, it will not be included in the national income as it is a part of intermediate consumption expenditure.

- (69). **Payment of interest on borrowings by general government.**

No, it will not be included in national income because it is a non-factor payment as general government borrows only for consumption purpose.

- (70). **Family members working free on farm owned by family.**

No, because these services are not rendered for any commercial activity but out of love.

- (71). **Payment of bonus by a firm.**

Yes, it will be included in the national income as it is a part of the compensation to employees.

- (72). **Purchase of tractor by a farmer.**

Yes, it will be included in the national income as it is a part of the capital formation or investment by the farmer.

- (73). **Expenditure on fertilizers by a farmer.**

No, it will not be included in the national income as it is intermediate cost for the farmer and deducted from value of output while arriving at national income.

- (74). **Purchase of furniture by a firm.**

Yes, it will be included in the national income as it is a part of the capital formation or investment by the firm.

- (75). *Expenditure on education of children by a family.*
Yes, it is included in the national income as it is a part of the private final consumption expenditure.
- (76). *Payment of electricity bill by a school.*
No, it will not be included in the national income as it is intermediate cost for the school and deducted from value of output while arriving at national income.
- (77). *Payment of excise duty by a firm.*
No, it will not be included in the national income as it is an indirect tax paid by the firm.
- (78). *Festival gift from an employer.*
No, it will not be included in the national income as it is merely a transfer payment.
- (79). *Contribution to provident fund by employees.*
No, it is not included in the national income because such contribution is made by the employees from compensation of employees only. So, it is not separately included in the estimation of national income.
- (80). *Expenditure on repairs of fixed assets*
No, As expenditures incurred on the repair of fixed assets is an intermediate cost therefore it will not be included in the national income.

Exercise 1

Theory Questions

Q1. What are the limitations of GDP concepts? [Eco. (H) 2009]

Or

Q Give reasons why GDP concepts, though highly useful as a measure of economic activity, has limitations as a measure of welfare. [Eco. (H) 2011]

Ans. There are many limitations to using GDP as a way to measure current income and production. Major ones include :

- (i) **Changes in quality and the inclusion of new goods** - higher quality and/or new products often replace older products. Many products, such as cars and medical devices, are of higher quality and offer better features than what was available previously. Many consumer electronics, such as cell phones and DVD players, did not exist until recently.
- (ii) **Leisure/human costs** - GDP does not take into account leisure time, nor is consideration given to how hard people work to produce output. Also, jobs are now safer and less physically strenuous than they were in the past. Because GDP does not take these factors into account, changes in real income could be understated.
- (iii) **Underground economy** - Barter and cash transactions that take place outside of recorded marketplaces are referred to as the underground economy and are not included in GDP statistics. These activities are sometimes legal ones that are undertaken so as to avoid taxes and sometimes they are outright illegal acts, such as trafficking in illegal drugs.
- (iv) **Harmful Side Effects** - Economic "bads", such as pollution, are not included in GDP statistics. While no subtractions to GDP are made for their harmful effects, market transactions made in an effort to correct the bad effects are added to GDP.

- (v) **Non-Market Production** - Goods and services produced but not exchanged for money, known as "nonmarket production", are not measured, even though they have value. For instance, if you grow your own food, the value of that food will not be included in GDP. If you decide to watch TV instead of growing your own food and now have to purchase it, then the value of your food will be included in GDP.

Q2. What is the net factor payment to the rest of the world? Explain why this item is added when using the income approach to calculate GDP. [Eco. (H) 2007]

Ans. We may define **net factor payments from abroad (NFP)** as the income paid to domestic factors of production by the rest of the world minus income paid to foreign factors of production by the domestic economy. The factor income earned by the foreigners in the country should not be added in the national income of the country so the factor payments to rest of the world are subtracted from the GDP. Also, since the factor income earned by domestic factors is a part of the national income so the factor incomes from the rest of the world are added to the GDP. Hence, for computing national income the net factor payments from abroad are added to the GDP.

- Q3. Define National Income. **[Eco. (H) II Sem. 2015]**
- Q4. There are some computers which are functional but they are scrapped as newer models replace these obsolete computers. Should they be included in depreciation? Give reasons? **[Eco. (H) II Sem. 2013]**
- Q5. Are interest payments on National Debt counted as part of GDP? Give reasons. **[Eco. (H) II Sem. 2013]**
- Q6. In calculation of GDP from expenditure approach, exports are added and imports are subtracted. Explain. **[Eco. (H) II Sem. 2014]**
- Q7. What are inventories? How are they treated as – final or intermediate good – in National income accounting? **[Eco. (H) II Sem. 2016]**
- Q8. How does GDP differ from GNP? If a country employs many foreign workers, which is likely to be higher : GDP or GNP? **[Eco. (H) II Sem. 2019]**
- Q9. Briefly explain the following concepts:
GDP and GNP **[GE II Sem. 2019]**
- Q10. Why are market values used to measure GDP? Explain with example. **[GE II Sem. 2019]**
- Q11. Differentiate between intermediate and final goods. Under which category, are “Capital Goods” included? **[GE II Sem. 2021]**

Conceptual Problems

- Q1. State True or False. Give reasons for your answer :
- (i) Domestic financial assets held by the domestic residents are part of national wealth of the domestic country.
- (ii) Indian capital and labour used abroad to produce output are included in India's Gross National Product. **[Eco. (H) II Sem. 2015]**

Ans.

- (i) True, because national wealth is to be understood as comprising the assets of the residents within the national territory.
- (ii) True, because $GNP = GDP + \text{Receipts of Factor income from rest of the world} - \text{Payment of Factor income to rest of the world}$.

Q2. Explain how you would treat the following transactions in National Income Accounts ; **[Eco. (H) II Sem. 2015]**

- A. Mr X's total investment in shares was Rs. 10,000. With increase in stock market, the investment at the end of the year is now worth Rs. 15,000.
- B. Tata motors buys machinery worth Rs. 1,000 domestically.

Ans. A. The increase in the value of shares is not included in calculation of GDP, because it does not amount to any flow of goods and services in the economy.

B. Yes, it will be included in the national income as it is a part of capital formation and leads to production of goods and services in the economy.

Q3. Determine the contribution of each of the following transactions to the current year's GDP. Explain your answer. **[Eco. (H) II Sem. 2016]**

- (i) Mr. X purchases a 10 year old apartment for Rs. 50 lakhs. The broker's fee is 5%.
- (ii) A homemaker takes up a job that will pay Rs. 1,40,000 over a year. She also pays Rs. 24,000 over the year for professional house keeping services.
- (iii) Your neighbour has won Rs. 1 lakh in the state lottery, to be paid to him immediately.
- (iv) A Korean company builds a factory in Haryana for Rs. 10 crores using only local labour and materials.
- (v) The government buys defense equipment worth Rs. 2 crores.

Ans. (i) The sale or purchase of old assets is not included in GDP but any brokerage paid on such transaction is included in GDP. Thus the broker's fee 10% of 50 lakhs, *i.e.* Rs. 5 lakhs, would be included in GDP.

(ii) Since income from Job and income from professional house keeping services are factor incomes, thus both of them will be included in calculation of GDP.

(iii) Lottery winnings do not represent the sale or production of final goods and services. Therefore, they are not included in GDP. In this case, lottery winnings would be treated like a transfer payment.

(iv) Building of factory is included in calculation of GDP using product method.

(v) Purchase of defense equipment by government is government expenditure, so it is included in calculation of GDP using expenditure method.

Q4. The following data is given for an economy for the year 2016. How each of the following transactions would affect the GDP and why? **[Eco. (H) II Sem. 2019]**

- (i) Rs. 10 lakh is paid as interest on the national debt.
- (ii) Ice cream maker began the year with Rs. 5,000 worth of milk in his factory and at the end of the year he is holding Rs. 5,500 worth of milk.

Q5. Which of the following transactions are included in the calculation of India's GDP? Give Reasons in support of your answer: [GE II Sem. 2019]

- (i) Interest on National Debt.
- (ii) Commission charged by a real estate agent.

Ans. (i) It will not be included in national income because it is treated as transfer payment.
 (ii) It will be included in national income because it is a payment for productive services rendered.

Numerical Problems

Q1. You are given the following information about an economy :

Consumption function, $C = 1000 + 0.5(Y - T)$

Investment, $I = \text{Rs. } 2,000$ crores.

Government expenditure, $G = \text{Rs. } 1000$ crores.

Taxes, $T = 1,000$ crores.

(i) Find the equilibrium level of GDP without taxes.

(ii) Find the equilibrium level of GDP with taxes.

[Eco. (H) 2008]

Ans. (i) Rs. 8,000, (ii) Rs. 7,000

Q2. Calculate the NNP at Factor Cost from the following information :

GDP	6,000
Receipts of factor income from rest of the world	150
Payments of factor income to rest of the world	225
Depreciation	800
Indirect taxes minus subsidies	700
Corporate profits	1200
Dividends	600
Transfer payments to persons	1,300
Personal taxes	1,500

[Ans. 4425]

[Eco. (H) 2007]

Q3. The company 'X' sells mixed fruit shakes for Rs. 54,000, using apples, bananas and grapes that it buys from another firm for Rs. 20,000. It pays Rs. 1,000 in taxes, and Rs. 3,000 to its workers as wages. What is its value added?

[Eco. (H) II Sem. 2015]

Q4. A farmer grows a bushel of wheat & sells it to a miller for Rs. 1.00. The miller turns the wheat into flour & then sells the flour to a baker for Rs. 3.00. The baker uses the flour to make bread & sells the bread to households for Rs. 6.00. The households eat the bread. What is the value added in each stages of production? What is GDP?

Q5. Ram grows apples and oranges. Last year he harvested 1800 apples and 900 oranges. He values 1 orange with 3 apples. In exchange for helping him, he gave Mohan 600 apples and 300 oranges, all of which were consumed by Mohan. Ram, set aside 200 oranges to help with next year's harvest. What is total consumption in terms of oranges?

[Eco. (H) II Sem. 2016]

- Q6. Consider an economy that consists only of those who bake bread and those who produce its ingredients. Suppose that this economy's production is as follows: 1 million loaves of bread (sold at Rs. 2.00 each); 1.2 million pounds of flour (sold at Rs. 1.00 per pound) and 100,000 pounds each of yeast, sugar & salt (all sold at Rs. 1.00 per pound). The flour yeast, sugar & salt are sold only to bakers, who use them exclusively for the purpose of making bread.
- Calculate the total income of the economy.
 - How much value is added to the flour, yeast, sugar & salt when the bakers turn into bread?

- Q7. Imagine an economy with only two business firms, XYZ Ltd. And ABC Ltd. The XYZ Ltd. owns wheat farm. It sells some of its wheat production directly to the public and rest to ABC Ltd., which produces and sells bread. The following table shows the transactions of each business during a year:

S. No.	Particulars	Amount (Rs.)
XYZ Ltd. Transactions		
1.	Wages paid to employees	60,000
2.	Tax paid to government	20,000
3.	Revenue received from the sale of Wheat	
(i)	Wheat sold to public	40,000
(ii)	Wheat sold to ABC Ltd.	1,00,000
ABC Ltd. Transactions		
1.	Wages paid to employees	10,000
2.	Tax paid to government	8,000
3.	Wheat purchased from XYZ Ltd.	1,00,000
4.	Revenue received from sale of bread	1,60,000

Calculate GDP using product method.

[GE II Sem. 2019]

Multiple Choice Questions (MCQ's)

- Q1. Choose the correct answer and give brief reason(s) for your choice.
Government services
- Are excluded from the measurement of GDP.
 - Are valued at their Cost of Production for including in GDP.
 - Taxes are used to value the contribution of Government services.
 - The government tries to estimate the market value of Government services and uses this to measure the government's contribution to GDP.

[Eco. (H) II Sem. 2013]

- Q2. Net National Income at factor price is :

[HU MA Eco. Ent. 2010]

- Gross national income at market prices – depreciation – direct taxes
- Gross national income at factor prices – depreciation – indirect taxes
- Gross national income at market prices – depreciation – indirect taxes
- Gross national income at factor prices – depreciation – direct taxes

[Ans. (c)]

Q3. To calculate Gross National Income, you need to know all of the following EXCEPT:

- (a) gross fixed capital formation. (b) capital depreciation.
 (c) consumption expenditure. (d) net income from abroad.

[Ans. (b)]

Q4. Given the Gross Domestic Product (GDP) at basic prices cost we can calculate the GDP at market prices by:

- (a) adding indirect taxes and adding subsidies.
 (b) adding indirect taxes and subtracting subsidies.
 (c) subtracting indirect taxes and subtracting subsidies.
 (d) subtracting indirect taxes and adding subsidies.

[Ans. (b)]

Q5. To obtain a measure of Net National Income from Gross Domestic Product it is necessary to:

- (a) add net income from abroad and add capital depreciation.
 (b) add net income from abroad and deduct capital depreciation.
 (c) deduct net income from abroad and add capital depreciation.
 (d) deduct net income from abroad and deduct capital depreciation.

[Ans. (b)]

Basic Concepts

1. **National Wealth** : The Value of assets minus the value of liabilities is called wealth. National wealth refers to the total value of wealth possessed by the citizens of a nation at a set point in time. An important determinant of wealth is the rate of saving.

2. **Private Saving** : Saving on the part of individuals is private saving, i.e., the part of private disposable income that is not spent on consumption is private saving. So, using the private disposable income the private saving may be computed as :

$$S_{pvt} = \text{private disposable income} - \text{consumption}$$

$$= (Y + NFP + TR + INT - T) - C$$

3. **Government Saving** : The government saving may be defined as the difference between the net government income and government purchases.

$$S_{govt} = \text{net government income} - \text{government purchases}$$

$$= (T - TR - INT) - G$$

Government savings are also known as **budget surplus**. When government savings are negative we call them **budget deficit**.

4. **National Saving** : A country's national savings is the sum of private and public savings. It is generally equal to a nation's income minus consumption government purchases. National savings equals private savings and government savings, so national savings can be obtained as :

$$\begin{aligned}
 S &= S_{pvt} + S_{govt} \\
 &= [(Y + NFP + TR + INT - T) - C] + (T - TR - INT) - G \\
 &= Y + NFP - C - G
 \end{aligned}$$

5. **Uses of Private Savings :** If the current account balance of an economy, say USA is positive then the foreigners have to pay more than what they receive from the USA. To make up the difference they either borrow from the US private savers or sell their assets to US private savers. But if the current account balance of an economy, say India, is negative then the payments to be made by India are more than the money received by Indians from foreigners. So India must borrow from foreigners or sell to foreigners some of Indian assets. In this case foreigners use their saving to lend to India. This can be shown as :

$$\begin{aligned}
 S &= S_{pvt} + S_{govt} \\
 &= Y + NFP - C - G
 \end{aligned}$$

And we know that, $Y = C + I + G + NX$

Therefore,

$$\begin{aligned}
 S &= (C + I + G + NX) + NFP - C - G \\
 &= I + NFP + NX \\
 &= I + CA
 \end{aligned}$$

$$\begin{aligned}
 \text{Now, } S_{pvt} &= S - S_{govt} \\
 &= I + CA - S_{govt}
 \end{aligned}$$

Where, $-S_{govt}$ is the budget deficit.

Exercise 2

Theory Questions

- Q1. How can the National wealth of a country be increased? What role do National Savings play in increasing National wealth? [Eco. (H) II Sem. 2013]
- Q2. Derive the three measures of Saving, that is National Saving, Private Saving and Government Saving. Suppose the government deficit increases, then at least of the following three or a combination of them must happen; (i) Private saving must increase, (ii) Investment must fall, (iii) The current account balance must fall. Explain. [Eco. (H) II Sem. 2014]
- Q3. "Increase in National Savings leads to increase in National Wealth." Explain. [Eco. (H) II Sem. 2015]
- Q4. What are the uses of Private Savings? [Eco. (H) II Sem. 2019]
- Q5. How can National Savings, Private Savings and Government Savings be calculated? What will happen if government deficit increases? [GE II Sem. 2019]

Numerical Problems

- Q1. National Savings are equal to [Eco. (H) II Sem. 2013]
- (1) $C + S + T$
 - (2) $GDP + C + G$
 - (3) $GDP + NFP$
 - (4) $GDP + NFP - C - G$

Where,

C = Consumption

S = Saving

T = Taxes

GDP = Gross Domestic Product

NFP = Net factor payments from abroad

G = Government Purchases

Q2. You are given the following data about an economy :

GNP	=	400
Govt. transfer payments to domestic private sector	=	25
Int. payments from the govt. to domestic pvt. Sector	=	30
Taxes	=	120
Gross private domestic consumption	=	80
Govt. purchases of goods and services	=	60
Factor income from rest of the world	=	14
Factor payments to rest of the world	=	18

Find :

- (i) GDP, (ii) Private Savings, (iii) Govt. savings,
(iv) National Savings

[Ans. (i) 404, (ii) 255, (iii) 5, (iv) 260]

Q3. Given the following for the economy of a country :

[Eco. (H) 2007]

Consumption function, $C = 85 + 0.5Y_d$,

Investment, $I = 85$,

Government expenditure, $G = 60$,

Taxes, $T = -40 + 0.25Y$.

- (i) Solve for equilibrium income and consumption.
(ii) How much does the govt. collect in net taxes when the economy is in equilibrium.
(iii) What is the government's budget deficit or surplus?

[Ans. (i) $Y = 400$, $C = 255$, (ii) 60, (iii) 0]

Q4. The following specifications are given for an economy :

[Eco. (H) 2009]

Consumption, $C = 250 + 0.75Y_d$,

Government expenditure, $G = 150$,

Investment, $I = 80$,

Taxes, $T = 200$

Y_d = disposable income.

Find the equilibrium level of income (Y), consumption (C) and private saving.

[Ans. $Y = 1320$, $C = 1090$, $S = 30$]

Q5. Consider the economy described by the following functions :

Consumption, $C = 350 + 0.8Y_d$,

Government expenditure, $G = 210$,

Investment, $I = 120$,

Taxes, $T = -50 + 0.2Y$

Y_d = disposable income.

- (i) Calculate the equilibrium level of income. Find the budget surplus.
(ii) Suppose the tax rate t increases to 0.25, what will be the new equilibrium level of income? What is the new budget surplus?

[Eco. (H) 2010]

[Ans. (i) $Y = 2,000$, $BS = 140$, (ii) $Y = 1800$, $BS = 190$]

Q6. Given the following information : [Eco. (H) II Sem. 2013]

Investment $I = 50$	Government Purchases $G = 40$	Gross National Product $GNP = 400$	Current Account Balance $CA = -20$
Tax $T = 100$	Transfer Payment $TR = 30$	Interest Payment on Government Debt $INT = 20$	Net Factor Payments from Abroad $NFP = -5$

Compute,

- (1) GDP (Gross Domestic Product)
- (2) NX (net exports)
- (3) Consumption
- (4) S_{pvt} (Private Saving)
- (5) S_{govt} (Government Saving)

Q7. From the following information, calculate GDP, Private Disposable Income and Private Savings ; [Eco. (H) II Sem. 2014]

Consumption	Rs. 4,000
Compensation of employees	Rs. 5,300
Rental Income of Persons	Rs. 500
Proprietor's Income	Rs. 800
Corporate Profits	Rs. 700
Net Interest	Rs. 400
Indirect Business Taxes	Rs. 600
Depreciation	Rs. 900
Transfers Received from Government	Rs. 250
Interest Payment on Government Debt	Rs. 300
Direct Taxes	Rs. 650

Q8. Calculate GDP and National Savings from the following data :

[Eco. (H) II Sem. 2015]

Compensation of Employees	7937
Income of Self-employed	1006
Rental income	110
Corporate profits	1260
Indirect business taxes	994
Consumption of fixed capital	1747
Factor income received from rest of world	709
Payment of factor income to the rest of the world	567
Consumption	9765
Government spending	900

Q9. The following information pertains to an economy

Gross Domestic Private Investment	= 60
Govt. Purchases of goods and services	= 50
Gross National Product	= 300

Current account Balance	= -30
Taxes	= 100
Govt. transfer payments to the domestic private sector	= 50
Interest payments from the Govt. to the domestic private sector	= 20
Factor incomes received from rest of the world	= 10
Factor payments made to rest of the world	= 15
Assuming government investment	= 0

Calculate

- (i) Private consumption expenditure
- (ii) Private savings and Government savings
- (iii) Establish the “Uses of Private Savings” Identity. **[Eco. (H) II Sem. 2016]**

Q10. From the following information, calculate GDP, Private Disposable Income and

Private Savings : **[GE II Sem. 2019]**

Consumption	= 4500
Compensation of employees	= 6300
Rental Income of Persons	= 600
Proprietor’s Income	= 900
Corporate Profits	= 700
Net Interest	= 400
Indirect Business Taxes	= 500
Consumption of Fixed Capital	= 1000
Transfers Received from Government	= 350
Interest Paid on Government Debt	= 200
Direct taxes	= 700

Q11. Given the following information (in crore rupees): **[Eco. (H) II Sem. 2021]**

Investment (I)	= 60
Government Purchases (G)	= 50
Gross National Product (GNP)	= 500
Current Account Balance	= -30
Tax (T)	= 100
Transfer Payment (TR)	= 40
Interest Payment on government debt	= 20
Net Factor payments from abroad (NFIA)	= -5

Compute:

1. GDP
2. Net Export
3. Consumption
4. Private Savings
5. Government Savings

Multiple Choice Questions (MCQ’s)

Q1. Choose the correct answer and give brief reasons for your choice :

In an open economy **[Eco. (H) II Sem. 2012]**

- (a) national savings are always equal to domestic investment
- (b) national savings equals domestic investment plus Current account balance
- (c) national savings equals domestic investment plus exports of the economy
- (d) national savings equals domestic investment plus statistical discrepancy

[Ans : (b)]

- Q2. If a country has a current account surplus then:
- Gross Domestic Product is greater than Gross National Income.
 - Gross Domestic Product is less than Gross National Income.
 - Gross Domestic Product is the same as Gross National Income.
 - we cannot say whether Gross Domestic Product differs from Gross National Income from this information.

[Ans : (d)]

Basic Concepts

- Real versus nominal GDP :** *Nominal GDP* is GDP evaluated at current market prices. Therefore, nominal GDP will include all of the changes in market prices that have occurred during the current year due to inflation or deflation. *Inflation* is defined as a rise in the overall price level, and *deflation* is defined as a fall in the overall price level. In order to abstract from changes in the overall price level, another measure of GDP called real GDP is often used. *Real GDP* is GDP evaluated at the market prices of some base year. For example, if 1990 were chosen as the base year, then real GDP for 1995 is calculated by taking the quantities of all goods and services purchased in 1995 and multiplying them by their 1990 prices.

Nominal GDP : Nominal GDP is the value of final goods and services produced in a given year when valued at the prices of that year. Nominal GDP is just a more precise name for GDP.

Real GDP : Real GDP is the value of final goods and services produced in a given year when valued at the prices of a reference base year.

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

- Price Indices :** A price index is a measure of the average of the prices of goods and services in one year relative to a base year. For example **GDP Deflator**. Using the statistics on real GDP and nominal GDP, one can calculate an implicit index of the price level for the year. This index is called the GDP deflator and is given by the formula :

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

The GDP deflator can be viewed as a conversion factor that transforms real GDP into nominal GDP. Note that in the base year, real GDP is by definition equal to nominal GDP so that the GDP deflator in the base year is always equal to 100.

- Consumer Price Index :** A consumer price index (CPI) measures changes in the price level of consumer goods and services purchased by households. The CPI in United States is defined by the Bureau of Labour Statistics as “a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services.”

CPI is a Better Measure than GDP Deflator

The GDP deflator is too broad a measure because it includes the prices of every good and service included in GDP. Economists and policymakers are usually interested in inflation as it affects the prices paid by the typical household. The typical household does not buy large electric generators or 40-story office buildings, among other goods whose prices are included in the GDP deflator. So, economists and policymakers often rely on the consumer price index, which includes only good and services consumed by the typical household. The consumer price index does a better job than the GDP deflator at measuring changes in the cost of living as experienced by the typical household.

4. **Inflation :** Economists measure the inflation rate as the percentage increase in the price level from one year to the next. By calculating the GDP deflator for two consecutive years, we get a measure of the inflation rate in the second year. In symbols, if P_t is the price level in the first year, P_{t+1} is the price level in the second year, and π_{t+1} is the inflation rate during the second year, then :

$$\text{Inflation rate} = \pi_{t+1} = \frac{P_{t+1} - P_t}{P_t} \times 100.$$

5. **Interest Rates :** A key economic variable in understanding the financial system is the interest rate. The interest rate is the cost of borrowing funds, usually expressed as a percentage of the amount borrowed. For example, if you borrow \$100 and have to pay back \$105 in one year, then you have paid \$5 in interest, and the interest rate on the loan is 5%, *i.e.*, $(\$5 / \$100) * 100 = 5\%$. Similarly, if you deposit money in a savings account or a certificate of deposit in a bank, the interest rate you earn is the return to your savings.
6. **Nominal Interest Rate :** The nominal interest rate is the stated interest rate you pay on a loan or receive on your savings, *i.e.*, it is the rate at which the nominal value of asset increases over time. The symbol for the nominal rate of interest is i .
7. **Real Interest Rates :** The real interest rate or the real rate of return on an asset is the rate at which the real value or purchasing power of the asset increases over time. The real interest rate is also defined as the nominal interest rate adjusted to remove the effects of inflation on the buying power of money. The real interest rate is approximately equal to the nominal interest rate minus the inflation rate. The symbol for the real rate of interest is r .

$$\begin{aligned} \text{Real interest rate} &= \text{nominal interest rate} - \text{inflation rate} \\ r &= i - \pi \end{aligned}$$

Because borrowers and lenders don't know with certainty what the inflation rate will be during the period of a loan, they don't know what the actual real interest rate will be. So, they must make borrowing or investing decisions on the basis of what they expect the real interest rate to be. To estimate the expected real interest rate, savers and borrowers must decide what they expect the inflation rate to be. Therefore, we can say that the expected real interest rate, r , equals the nominal interest rate, i , minus the expected rate of inflation, π^e :

$$r = i - \pi^e$$

Exercise 3

Theory Questions

Q1. Real GDP and not the nominal GDP is the correct measure of production of an economy. [Eco. (H) 2009]

Ans. Nominal GDP is GDP evaluated at current market prices. Therefore, nominal GDP will include all of the changes in market prices that have occurred during the current year due to inflation or deflation, *i.e.*, the value of total production as measured by GDP can increase either because the quantity of goods and services increases or because the prices used to value the quantities rise (or because some of both happen). For instance, if the quantities of every good and service remain the same, but all prices double, then the value of GDP will double.

Real GDP is the value of final goods and services produced in a given year when valued at the prices of a reference base year.

Because we are primarily interested in GDP as a measure of production, so we separate price changes from quantity changes by calculating a measure of production called real GDP. Hence we can say that, Real GDP and not the nominal GDP is the correct measure of production of an economy.

Q2. How is real GDP an important measure for assessing the economy's growth performance? [Eco. (H) II Sem. 2015]

Q3. What is the difference between real interest rate and the expected real interest rate? If expected real interest rate is greater than the real interest rate, then who gains; the borrower or the lender? [Eco. (H) II Sem. 2013]

Q4. Explain the concept of nominal interest rate, real interest rate and expected real interest rate. which interest rate is more important for assessing the decisions made by the lenders and borrowers? Give reasons for your answer. [Eco. (H) II Sem. 2015]

Q5. What is GDP deflator? How is it different from consumer price index? How does CPI inflation overstate the increase in cost of living? [Eco. (H) II Sem. 2021]

Numerical Problems

Q1. Consider a very simple economy that produces only four final goods and services : apples, plums, teeth whitening, and hamburgers. Assume that the base year is 2005. Use the information in the following table to calculate nominal and real GDP for 2005 and 2012.

Product	2005		2012	
	Quantity	Price(Rs)	Quantity	Price(Rs)
Apples	200	0.50	220	0.60
Plums	90	0.40	85	0.35
Hamburgers	60	3.00	70	3.25
Teeth whitening	5	50.00	7	52.00

Calculate :

- (a) Nominal GDP for 2005,
- (b) Nominal GDP for 2012,

(c) Real GDP for 2012 using 2005 as base year,

(d) Real GDP for 2005 using 2005 as base year.

[Ans. : (a) Rs566, (b) Rs753.25, (c) Rs704, (d) Rs566]

Q2. Below are some data from the land of milk and honey.

Year	Price of Milk	Quantity of Milk	Price of Honey	Quantity of Honey
2010	\$1	100 quarts	\$2	50 quarts
2011	\$1	200	\$2	100
2012	\$2	200	\$4	100

(a) Compute nominal GDP, real GDP, and the GDP deflator for each year, using 2010 as the base year.

(b) Compute the percentage change in nominal GDP, real GDP, and the GDP deflator in 2011 and 2012 from the preceding year. For each year, identify the variable that does not change. Explain in words why your answer makes sense.

Q3. Consider the following data on U.S. GDP:

Year	Nominal GDP (in billions of dollars)	GDP Deflator (base year 2005)
2009	14,256	109.8
1999	9,353	86.8

(a) What was the growth rate of nominal GDP between 1999 and 2009? (Hint: The growth rate of a variable X over a N-year period is calculated as $100 \times [(X_{\text{final}}/X_{\text{initial}})^{1/N} - 1]$.)

(b) What was the growth rate of the GDP deflator between 1999 and 2009?

(c) What was real GDP in 1999 measured in 2005 prices?

(d) What was real GDP in 2009 measured in 2005 prices?

(e) What was the growth rate of real GDP between 1999 and 2009?

(f) Was the growth rate of nominal GDP higher or lower than the growth rate of real GDP? Explain.

Q4. What is inflation rate? If GDP Deflator rises from 100 in year one to 107 in year two and 115 in year three, what will be the inflation rate between year one and two and between year two and three.

If the nominal interest rate is 9% per annum during all these years, what will be the real rate of interest between year 1 and 2 and between year 2 and 3.

[Eco. (H) II Sem. 2012]

[Ans : Inflation rate between year 1 and 2 = 7%, between year 2 and 3 = 7.48%, Real interest rate between year 1 and 2 = 2%, between year 2 and 3 = 1.52%]

Q5. Given the following information about the US economy, how much did real GDP grow between 1980 and 1990? Between 1990 and 2000?

	1980	1985	1990	1995	2000
Nominal GDP (trillions)	\$2.80	\$4.21	\$5.80	\$7.40	\$9.96
GDP Deflator (1996 = 100)	57	73.7	86.5	98.1	106.9

[Ans. 36.5%, 38.95%]

- Q6. If there were three goods 1, 2 and 3 and p stands for price and q for output, then the prices and quantities in the base year (year 0) and current year (year 1) are given as : [Eco. (H) II Sem. 2012]

	q ₁	p ₁	q ₂	p ₂	q ₃	p ₃
Year 0	q ₁₀ = 4	p ₁₀ = 1	q ₂₀ = 5	p ₂₀ = 1	q ₃₀ = 2	p ₃₀ = 4
Year 1	q ₁₁ = 6	p ₁₁ = 4	q ₂₁ = 15	p ₂₁ = 3	q ₃₁ = 6	p ₃₁ = 2

Find the nominal expenditure and real expenditure. Also find the inflation rate of the economy and the weighted average of price increase. 7

- Q7. Suppose an economy produces only Sewing machines (SM) and Watches (W). Given the following information on production and prices of Sewing machines and Watches for two years

	Year One (Base Year)		Year Two	
	Quantity	Prices/Unit	Quantity	Prices/Unit
SM	300	2	200	3
W	200	1	180	2

- (1) What is the percentage change in Nominal GDP between year one and year two?
- (2) What is the percentage change in real GDP between year one and year two?
- (3) What is the increase in the overall level of prices as measured by the GDP deflator in these two years? [Eco. (H) II Sem. 2013]

- Q8. Suppose an economy produces only two goods X and Y. Quantities and prices per unit for the years 2011 and 2012 are given below

	2011		2012	
	Quantity	Price	Quantity	Price
X	15	80	20	100
Y	5	40	10	30

- (i) Calculate nominal GDP and Real GDP in both years, taking 2011 as base year.
- (ii) Calculate GDP deflator for both years.
- (iii) Calculate the rate of inflation of the economy.
- (iv) If the nominal rate of interest = 20% what is the real rate of interest of the economy? [Eco. (H) II Sem. 2014]

- Q9. The country of Myrule produced the following quantity of apples, bananas and potatoes, with the price of each listed in dollar : [Eco. (H) II Sem. 2015]

Year	1999 (Base Year)		2000	
	Quantity	Price	Quantity	Price
Bananas	3000	2	2000	3
Potatoes	6000	3	12000	2
Apples	8000	4	6000	6

- (A) What is the percentage change in Real GDP (Gross Domestic Product) between two years?

- (B) What is the increase in the overall level of prices as measured by the GDP deflator in these two years?
- (C) Based on the GDP deflator, what is the inflation rate from 1999 to 2000?
- Q10. Nominal GDP in a country was \$6890 billion in 2012 and \$7650 billion in 2013. The GDP deflator was 102.4 in 2012 & 105.6 in 2013. **[Eco. (H) II Sem. 2016]**
- (a) What is the inflation rate from 2012 to 2013?
- (b) What is the growth rate of real GDP from 2012 to 2013?
- Q11. If the GDP deflator for the year 2016 is 110 and the nominal GDP for year 2016 and year 2015 are 5500 and 3800 respectively, find the rate of growth of real domestic product keeping 2015 as base year. **[Eco. (H) II Sem. 2019]**
- Q12. The following data is given for two years output and prices for an economy:

Commodities	2011		2012	
	Quantity	Price	Quantity	Price
A	10	60	16	100
B	6	80	12	140

- Calculate the Nominal GDP, Real GDP and GDP deflator taking 2011 as base year. **[GE II Sem. 2019]**
- Q13. With the help of the data given below, calculate the rate of inflation for each year from 2014 to 2017 considering 2013 as base : **[GE II Sem. 2019]**
- | | | | | | |
|---------------|------|------|------|------|------|
| Year : | 2013 | 2014 | 2015 | 2016 | 2017 |
| CPI : | 60.0 | 61.5 | 65.0 | 64.5 | 66.0 |

Multiple Choice Questions (MCQ's)

- Q1. Choose the correct answer and give brief reasons for your choice :
The real interest rate is : **[Eco. (H) II Sem. 2012]**
- (a) Interest rate given by a commercial bank
- (b) Nominal interest rate minus inflation rate
- (c) Nominal interest rate plus inflation rate
- (d) None of the above
- [Ans : (b)]**
- Q2. If GNP deflator is raised by 40% then which of the following statement is correct? **[HU MA Eco. Ent. 2010]**
- (a) Nominal GNP increase by 40%
- (b) Real GNP will increase by 40%
- (c) Both nominal and real GNP will increase by 40%
- (d) Nominal GNP increase by 40% and real GNP decrease by 40%.
- [Ans : (d)]**
- Q3. To adjust GDP from market prices to factor cost : **[HU MA Eco. Ent. 2011]**
- (a) Add indirect taxes
- (b) Subtract subsidies
- (c) Deduct indirect taxes and subsidies
- (d) Deduct indirect taxes and add subsidies
- [Ans : (d)]**

- Q4. Which of the following best describes the distinction between real GDP and nominal GDP?
- (a) Nominal GDP is calculated by deflating real GDP; real GDP is unadjusted for inflation
 - (b) Nominal GDP is adjusted for changes in prices; real GDP is not adjusted for changes in prices
 - (c) Nominal GDP is calculated every year; real GDP is calculated only occasionally
 - (d) Nominal GDP uses current prices; real GDP uses constant prices

[Ans : (d)]

- Q5. If the total output of goods and services increases and the price index falls then the nominal Gross Domestic Product (GDP):
- (a) may rise or fall and real GDP will fall.
 - (b) will stay the same and real GDP will rise.
 - (c) will rise and real GDP will rise.
 - (d) may rise or fall and real GDP will rise.

[Ans : (d)]

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