National Income Accounting

Difference between Final Goods and Intermediates Goods, Stock and Flow Variables

Objectives

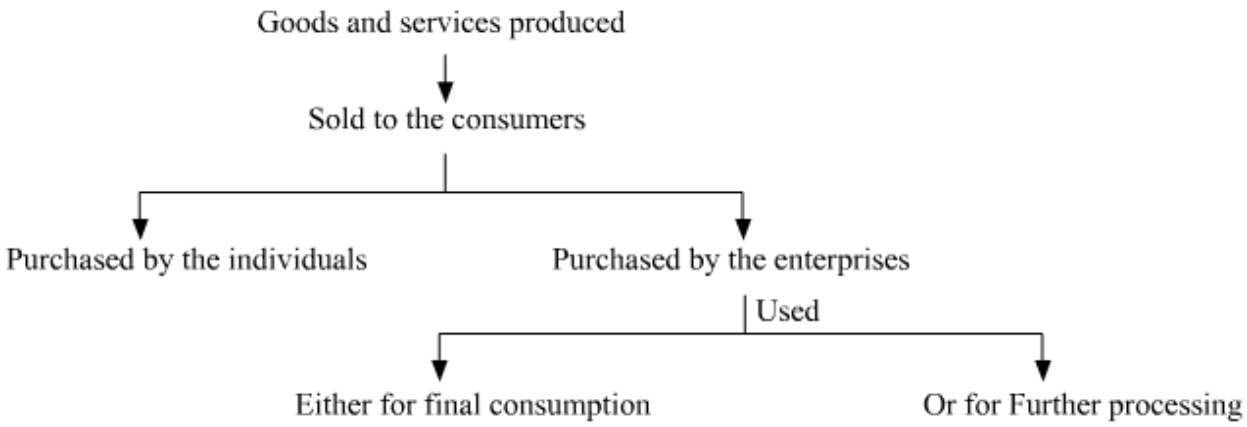
After going through this chapter, you shall be able to understand the following concepts.

- Categorisation of Goods and Services Produced in an Economy as Final Goods and Intermediate Goods
- Concept of Flow Variables and Stock Variables

Introduction

In an economy, through the production process various types of goods and services are produced. These goods and services produced are then sold to the consumers who in turn can either be individuals or enterprises. Further, the goods purchased by these entities can either be for final consumption or for further processing (i.e. to be used as inputs in the production process of other goods).

The flow of goods and services in the economy can be summarised as follows.



Classification of Goods and Services

The goods and services can be classified on the basis of ***Use and Purchaser of goods and services.***

On the Basis of Use and Purchaser
Based on the use (final consumption or further processing), the goods produced can be classified into the following two broad categories.

1. Final Goods
2. Intermediate Goods

Final Goods

Final goods refer to those goods and services that are meant for final consumption by the consumers. In other words, such goods are ready for the final use. This implies that they need not pass through any further stages of production i.e. no further transformation is required for these goods to make them consumable. Such goods have already crossed the boundary line of the production. These goods are generally not meant for resale by the purchaser.

For example, a packet of cotton balls at a retail shop is a final good. Such cotton is ready to be used by the consumers for various purposes without any requirement of further value addition. Similarly, a car at a showroom is a final good, ready to be driven out on the roads.

On the Basis of Purchaser
Final goods can either be purchased by the consumers (households) or producers (firms). Therefore, ***based on the purchaser***, the ***final*** goods can be classified into the following two categories.

1. Final Consumer Goods/Consumption Goods
2. Final Producer Goods/Capital Goods

i. Final Consumer Goods/Consumption Goods

Consumption goods refer to those final goods that are purchased by the consumers (households) to satisfy their wants. These goods are not used for the production of other goods and services.

Based on the value and the time period for which they can be used, consumption goods can be further classified into the following three categories.

1. Consumer Durables

2. Consumer Non-Durables

3. Consumer Semi-Durables

4. *Consumer Durables*- Consumer durables refer to those consumption goods that can be used for a longer time period. These goods generally have a high market value. Also, during the course of consumption, these goods are used more than once and repeatedly. For example, a car, a computer, etc.

5. *Consumer Non-Durables*- Consumer non-durables refer to those consumption goods that are meant only for immediate consumption. As against consumer durables, consumer non durables generally carry a low market value and can be used only once. For example, fruits, vegetables, milk, etc.

6. *Consumer Semi-Durables*: Consumer semi-durables refer to those consumption goods that can be used for a longer period of time (but less than the durables). These goods carry a relatively high market value than consumer non-durables and can be used more than once before getting finished. For example, clothes, shoes, pen, etc.

   Other than the above mentioned three categories, a fourth category of consumption goods can also be defined as that of ***services***.

1. *Services:* As against the other consumption goods, services are non-material in nature. However, they satisfy human wants directly. For example, services of a doctor, services of a teacher, etc.

   ii. Final Producer Goods/Capital Goods

   Capital goods refer to those final goods that are purchased by the producers (firms) for using them in the process of production. These goods enable the production to take place and thus, act as a fixed asset for the producers.

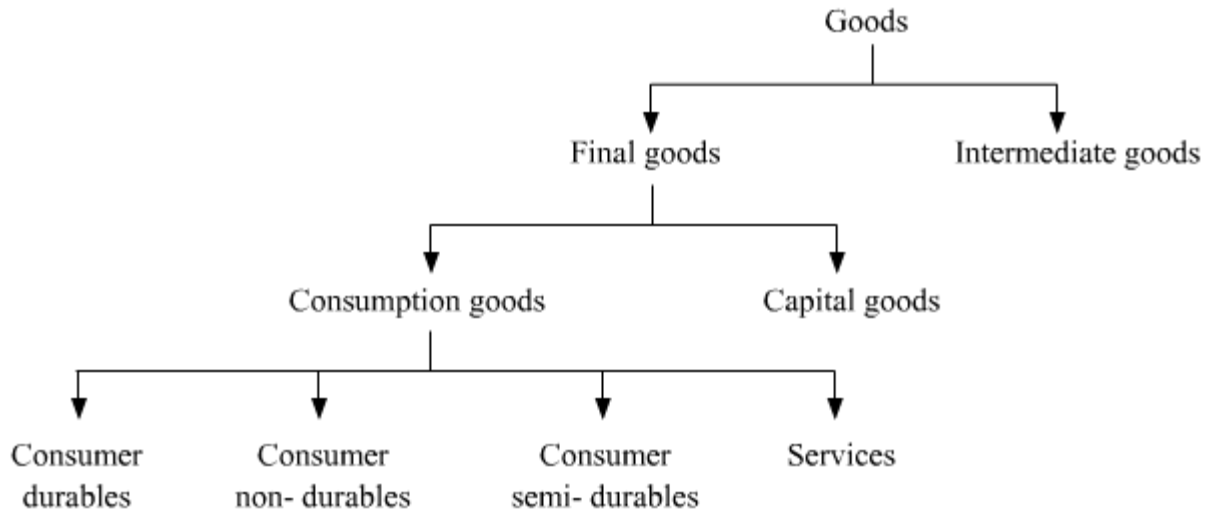
   These goods form an important part of the process of production. They are durable in nature and undergo wear and tear only after a long period of time and with repeated use. Also, generally these goods carry a high market value. For example, machinery, etc.

   2. Intermediate Goods

   Intermediate goods refer to those goods that are not readily consumed as final consumption by the consumers. These goods are used only as inputs/raw materials in the production process. In other words, intermediate goods undergo further transformation.

   Such goods have still not crossed the boundary line of production and further value addition to them is required before they are ready to be used by the final user. For example, a log of wood purchased by a furniture industry is an intermediate good. This log of wood has to be processed as chair or table before it can be used by the final consumer.

   The following diagram summarises the categorisation of goods.



Final Goods *versus* Intermediate Goods

Basis of Difference	Final Goods	Intermediate Goods
1. Use	Final goods are ready for final consumption.	Intermediate goods are not ready for final consumption and are used only as raw material and inputs.
2. Further Processing	They do not require any further processing.	They pass through the stages of production and undergo transformation.
3. Production Boundary Line	These goods have crossed the boundary line of production and no further value addition is required.	These goods have still not crossed the boundary line of production and further value addition to them is required.
4. Resale	These goods are not meant for resale.	These goods are resold for production of others goods.
5. Inclusion in National Income	The money values of these goods are included in the estimation of national income.	The money values of these goods are not included in the estimation of national income.
6. Examples	For example, cotton purchased by a consumer for personal consumption is a final good.	For example, cotton purchased by a textile industry for making cloth is an intermediate good.

Note

Although we can broadly classify goods as final goods and intermediate goods, it can sometimes happen that the same goods can be treated as both final good as well as intermediate good.

For example, flour if purchased by a household will be considered as a final good. However, if the same flour is purchased by a bread producing industry, it would be

treated as an intermediate good.

Similarly, if milk is purchased by a household, then it is treated as a final good. As against this, if it is purchased by a sweets producing firm to make sweets, it would be considered as an intermediate good.

Stock Variables and Flow Variables

A variable is quantity that is likely to change over time. In other words, a variable assumes different values over different points of time. Various variables used in the study of economics, can be divided into the following two categories.

1. Stock variables
2. Flow variables

Stock Variables

A variable is said to be a stock variable, if it is measured at a ***particular point of time***. Such variables do not have an element of time attached with them. In other words, they are measured only at a single point of time. For example, capital balance as on March 31, 2010.

Flow variables

A variable is said to be a flow variable, if it is measured ***over (during) a period of time***. Since such variables are measured over a time interval, it can be said that they have an element of time attached to them. For example, income earned during the month of March.

A More Familiar Example for Stock and Flow

An example of stock can be the amount or level of water in a tank. At any point of time the amount or the level of water in a tank can be measured. Similarly, the capital is also a stock variable, as the capital can also be measured at any point of time.

Now, if water is flowing out of the tank through a tap, then the level of water will change over time. The difference in the water level over an interval of time say between 9:00 to 9:30 is an example of a flow variable. Similarly, net investment gives the difference in the investment level over a period of time.

Difference between Stock Variable and Flow Variable

Basis of Difference	**Stock Variables**	**Flow Variables**

Definition	A stock variable is measured at a particular point of time. For example, bank balance as on October 01, 2010 is Rs 5000.	A flow variable is measured over an interval of time. For example, interest earned on bank deposits for 1 year, i.e. from October 01, 2009 to September 30, 2010.
Time Element	They do not have an element of time attached to them	They have an element of time attached to them such as 1 year, 6 months, 10 days, etc.
Nature	These are static in nature.	These are dynamic in nature.
Examples	Capital, Bank deposits, Water in a tank.	Capital formation, Interest on Capital, Water flowing in a stream.

Depreciation

Objectives

After going through this chapter, you shall be able to understand the following concepts

- Concept of Depreciation
- Concept of Gross Investment and Net Investment
- Other Concepts Related to Depreciation

Depreciation

During the process of production, along with the raw materials and inputs, various fixed assets such as machinery, tools, etc. are also used. However, during the course of production the fixed assets undergo wear and tear (may be due to the natural forces such as rain, weather, etc, or due to their regular and continuous use, or with the passage of time). This wear and tear reduces the value of fixed assets of the business entities. This phenomenon of lowering of value of fixed assets during the production process is termed as ***Depreciation***.

Thus, Depreciation can be described as the reduction in the value of fixed assets in use due to the factors such as, normal wear and tear, passage of time, technological changes, deterioration due to natural forces such as rain, weather, etc.

Factors Responsible for Depreciation

The various factors that cause depreciation can be broadly grouped into the following two categories.

1. Expected Factors
2. Unexpected Factors

Expected Factors
These are the factors that are generally expected by the business entities. In other words, every firm expects some depreciation due to these factors. Such factors include:

a. ***Normal wear and tear***- With continuous usage, the machinery is exposed to normal wear and tear.

b. ***Change in Technology***- With the advent of new and advanced technology, the machinery using old technology becomes obsolete. Thus, the old machinery requires replacement.

c. ***Change in demand***- With the coming up of new and advanced technology, the demand pattern generally shifts in favour of products using the new technology. Thus, the old product, equipments and the machinery using the older technology need to be replaced by the new ones.

Unexpected Factors

These are the factors that are generally not expected by the business entities. Such factors include:

a. *Natural Calamities* such as earthquake, flood, etc.

b. *Change in the Market Situations* such as recession, depression, etc.

Hence, due to the above explained factors some part of the new capital assets/goods goes into the replacement or repairing of the existing capital stock. This part of the capital that takes account of expected and unexpected lowering of value of capital is called Deprecation.

Gross Investment and Net Investment

Final output produced in an economy during an accounting year comprises of various types of final goods and services such as consumer goods, capital goods, etc. That part of final output that consists of capital goods (machinery, tools, etc.) is known as Gross Investment (or total investment). However, some part of gross investment goes into the replacement of the old and deteriorated capital (depreciation). This forms the basis of distinction between the Gross Investment and Net Investment.

To estimate the value of Net Investment, depreciation is to be subtracted from the value of Gross Investment. That is, Net Investment refers to the total value of investment in the capital goods after taking account of depreciation. Algebraically,

Net Investment = Gross Investment – Depreciation

Related Concepts of Depreciation

Consumption of Fixed Capital- It refers to the lowering of the value of fixed assets while it is in use. It is inclusive of the expected lowering of capital value. It implies depreciation that occurs on account of factors such as normal wear and tear, change in technology, change in the demand patterns.

Capital Loss- It refers to the lowering of the value of fixed assets while it is not in use. It implies depreciation that occurs unexpectedly due to factors such as natural calamities, change in market situation, etc.

Current Replacement Cost

Current Replacement Cost refers to the value of depreciation that is estimated for all the producing units in an economy during an accounting year.

Circular Flow of Income in Two-Sector, Three-Sector Model and Four-Sector Model

Objectives

After going through this chapter, you shall be able to understand the following concepts.

- Meaning and Types of Circular Flow
- Circular Flow Model in a Two-Sector Economy
- Concept of Injections and Leakages
- Circular Flow Model in a Three-Sector-Economy
- Circular Flow Model in a Four-Sector Economy
- Significance of Circular Flow

Meaning of Circular Flow

In an economy, various sectors such as households, firms, government and foreign sectors work simultaneously. These sectors function with mutual interdependence. There is a continuous flow of expenditure and income and that of goods and services among these sectors. For example, households receive income from the firms. They in turn, spend this income on the goods and services produced by the firms. Thus, the expenditure of the households becomes the income of the firms.

Such a continuous flow of income and expenditure or the flow of goods and services among different sectors in the economy is called the ***circular flow of income***. The flow is circular in a sense that, since human wants are unlimited, so demand is a continuous process. This suggests that in order to satisfy the never ending demand, production (realisation of income) is also a continuous process. This in turn, again leads to generation of demand and so on. Thus, a circular process continues and is vicious.

Some Important Terms Related to Circular Flow

1. ***Factors of Production***- Factors of production refer to the inputs/resources that are required for the production of goods and services. The factors of production can be broadly classified into three categories namely, land, labour and capital. Out of the three factors, land and labour are the primary factors of production while, capital forms the secondary factor of production.

2. ***Factor Payments***- Factor payments refer to the income received by the factors of production in return for the services provided by them in the production process. Specifically, land owner receives rent, labour receives wages, capital owner receives interest and entrepreneur receives profit.

3. ***Sectors***- The economy can be divided into the following three major sectors.

a. *Households*- Household refers to a single individual/group of individuals who is/are the consumers of goods and services. Households are also the owners of factors of production and render their services in the production process in exchange of factor incomes.

b. *Firms*- Firms refer to the economic units that undertake the production process. They hire and employ the factors of production and make payments to them in return of the services received.

c*. Government*- Similar to the firms, the government also participates in the production process. They employ factors of production from the households and makes payments to them in return of their services. The government receives payment from both the firms and the households in the form of taxes (direct taxes and indirect taxes).

It also makes payment to the households in the form of transfer payments (payments made without use of factor services) such as pensions, scholarships, etc. Similarly, it also makes payments to the firms in the form of subsidies (compensation to firms for lowering the prices).

Types of Circular Flow

We can classify the circular flows in an economy into the following two categories.

1. Real Flow/Product Flow

2. Money Flow/Income Flow

Real Flow- Household sector provides factor services i.e. land, labour and capital to the firms and the firms in turn provide them with the produced goods and services. This flow of factor services from the household sector to the firms and the corresponding flow of

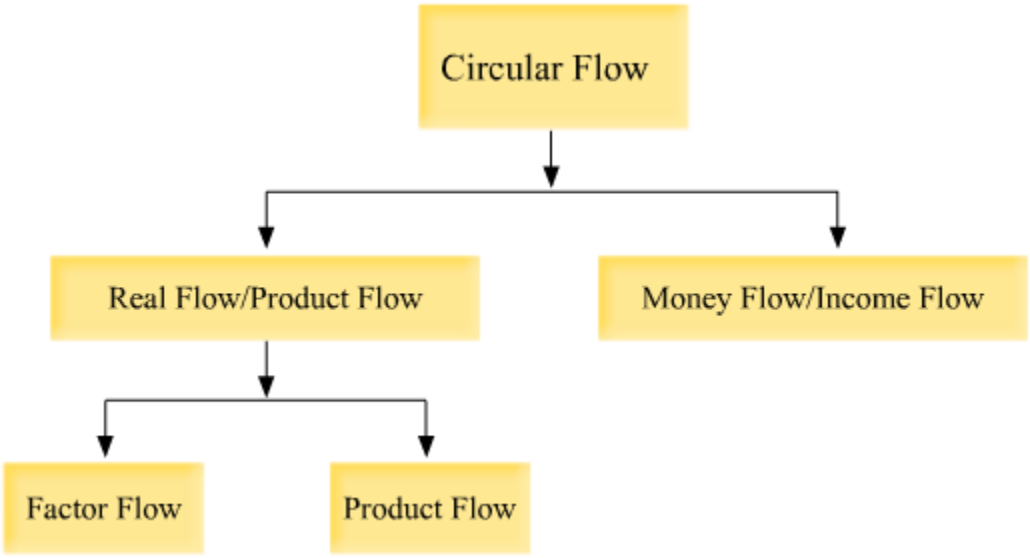
goods and services from the firms to the households is called the real flow. Thus, it can be said that the product flow consists of the following two parts.

a. *Factor Flow* (flow of factor services) from the household to the firms

b. *Product Flow* (flow of goods and services) from the firms to the households.

Money Flow- In every modern economy, money is the medium of exchange. When the households provide factor services to the firms, in return they receive factor payments. Land receives rent, labour receives wages and capital receives interest. In other words, the households receive money income in return of their factor services. The factor payments received by the household is then spent on goods and services produced by the firms. This expenditure on goods and services forms the money income of the firms. Thus, there is a circular flow of money/income between the households and the firms.

The types of circular flow are summarised in the following diagram.



Circular Flow Model in a Two-Sector Economy

Assumptions of the Model

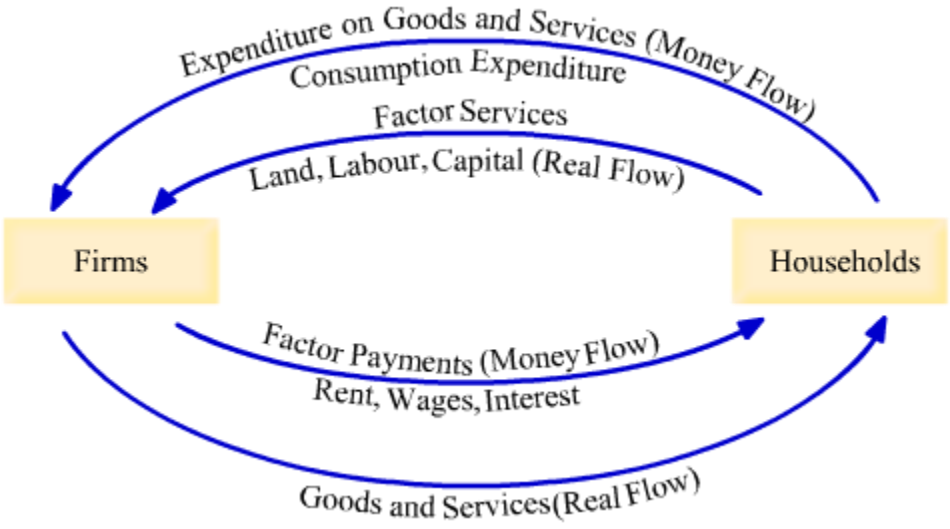
The circular flow model in a two-sector economy is based on the following assumptions.

1. The economy consists of only two sectors namely, the households and the firms.

2. It is assumed that there is no government sector in the economy, so no taxes and transfer payments.

3. The economy considered is a closed economy i.e. it is assumed that there is no foreign sector. In other words, there is no external trade in the form of imports and exports.

4. The households spend the entire income received on the goods and services. In other words, it is assumed that there is no saving in the economy.



The above diagram depicts a two-sector circular flow model.

The inner arrow in the upper part of the diagram shows that the household sector provides factors services in the form of land, labour and capital to the firms. In return of the factor services provided, they receive factor payments from the firms in the form of rent, wages and interest (as shown by the upper most arrow). With the income received, households incur consumption expenditure on the goods and services provided to them by the firms (as shown by the lower most arrow).

With the help of this circular flow model, we can estimate the national income for the economy. National income can either be measured by aggregating the income of all the factors of production (inner arrow of the lower part) or by aggregating the expenditure incurred by all the sectors (upper most arrow).

In this simple two-sector model, we observe that the ***aggregate spending of the economy (consumption expenditure) equals the aggregate income earned by the factors of production (factor payments)***.

Now let us consider what will happen ***if at any point of time the aggregate spending exceeds the aggregate income in the economy*** (either through borrowings or any other source).

As the aggregate spending exceeds the aggregate income, this implies that the firms face a greater demand for the goods and services. To meet this extra demand, the firms will produce more goods and services. Thus, to expand the production they will employ additional factors of production. This implies that they will make extra factor payments. The amount of this extra payment by the firms (equal to the income of the households) will be equal to the value of extra goods and services produced. Thus, the extra income generated in the subsequent round will be equal to the extra expenditure incurred in the first phase. Hence, we see that a rise in the expenditure in the economy leads to a rise in the income.

Circular Flow Model in Two-Sector Economy with *Financial System*

In the simple two-sector economy model, it was assumed that the households spend their entire income on the goods and services. In other words, it was assumed that the households do not save. However, in reality the households do save a part of their income for various purposes such as future needs, unforeseen expenses, etc. Also, firms apart from the production of goods and services also incur investment expenditure on items such as new plants, machinery, equipment, etc.

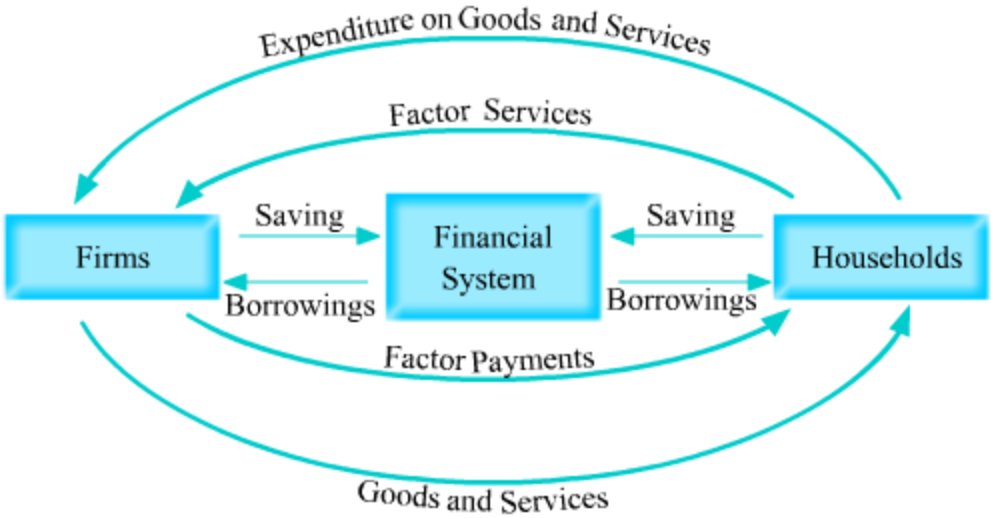
Now to incorporate this reality, we expand our simple two-sector model to include a financial system.

A financial system has the following ***features***.

1. Financial system/capital market includes various financial institutions such as banks, which act as the link between the savers and investors in the economy.

2. All the savings of the households as well as of the firms go into the financial system. In other words, it is assumed that no part of the saving remains ideal.

3. The borrowing requirements of both the firms as well as the households are met by the financial system. In other words, the firms and the households can borrow from the financial system.



The above diagram depicts the circular flow in a two-sector model with financial system.

The household sector provides the firms with the factor services in return of which they receive factor payments. On the other hand, the firms provide the households with the produced goods and services and in return; the firms get money as prices of goods and services (forms the consumption expenditure of the households).

Now ***with the inclusion of the financial sector, the factor payments are no longer equal to the consumption expenditure***. ***Rather, a part of the factor payments received by the household is kept as saving (in bank accounts) with the financial system, which in turn is then used as investment when the banks lend to the firms.***

Leakages and Injections

Leakages

Leakages refer to those variables that cause a withdrawal of money from the circular flow of income. In this regard, saving is treated as leakage as it takes money out from the circular flow system. Leakages reduce the level of economic activity and thus, reduce the size of the circular flow.

Injections

Injections refer to those variables that cause addition to the circular flow of income. Investment can be treated as injection in the sense that it puts money back into the circular flow. As opposed to leakages, injections raise the level of economic activity and the size of the circular flow.

Algebraic Representation of Distribution of Income and Expenditure

We know that the factor payments received by the households are either used as consumption expenditure or kept as savings. That is,

$$Y = C + S \qquad (1)$$

where,

Y represents Factor Income

C represents Consumption Expenditure

S represents Saving

For an economy to remain in a stable state (equilibrium), the volume of injections must be equal to the volume of leakages. That is,

Injections = Leakages

Thus in a two sector model, saving must be equal to the investment, so that the economy is in equilibrium.

Savings = Investment

S* = *I **(Equilibrium Condition)**

If *S* > *I*, then this implies that the circular flow will ***contract*** and the level of economic activity will ***fall***.

If *S* < *I*, then this implies that the circular flow will ***expand*** and the level of economic activity will ***rise***.

Therefore, for a stable economic activity, the level of savings and investment must be equal

Substituting *I* for *S* in equation (1)

Y = *C* + *I* ... (2) {as *S* = *I*}

Equation (1) shows that income in terms of *factor incomes* while the equation (2) shows income in terms of *aggregate expenditure*.

From equation (1) and equation (2) we can infer

$$C + S \equiv Y \equiv C + I$$

This is also called the ***Triple-Identity***

Circular Flow Model in a Three-Sector Economy

In the three-sector model, we expand our simple two-sector model to include another sector namely, the Government sector. Thus, now our model comprises of the following three sectors in the economy.

1. Households

2. Firms

3. Government

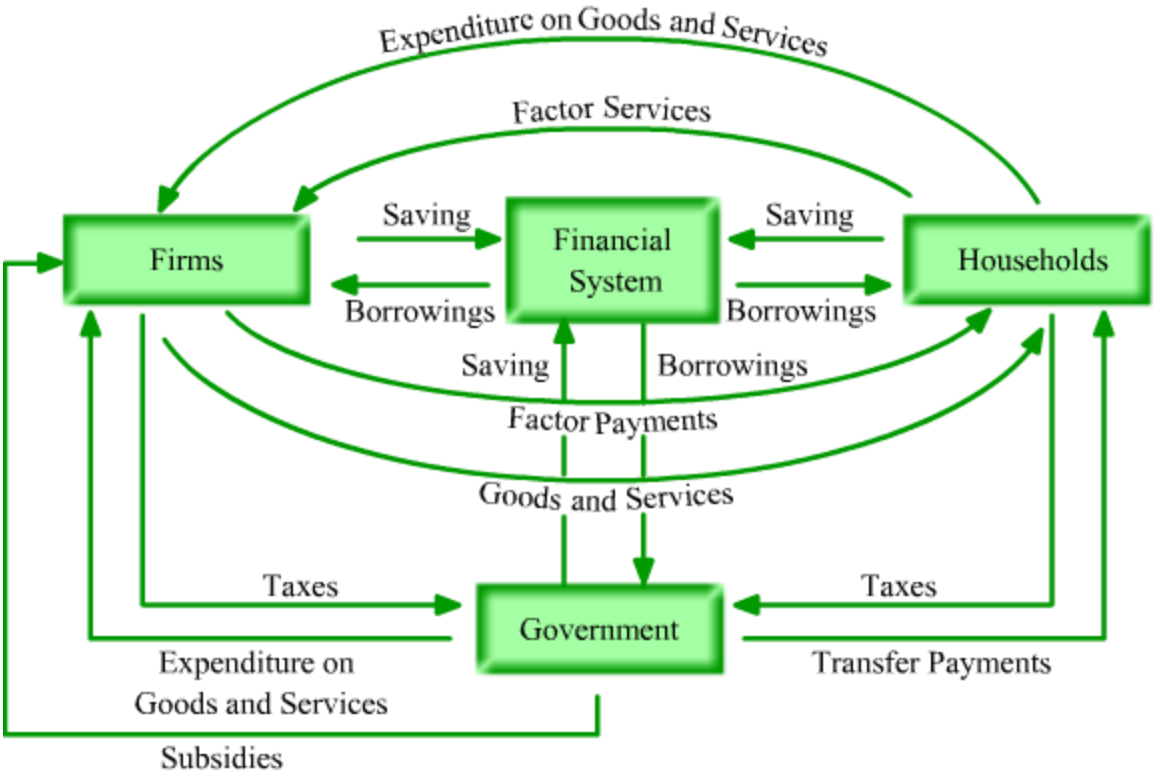
The Government sector interacts with the household sector, the firms and the financial system in the following manner.

1. ***Households and Government***- The Government receives taxes from the households and in turn render services, which enhances the welfare of the society. The government also offers transfer payments such as pensions, etc. to some households that do not have the purchasing power.

2. ***Firms and Government***- The Government also receives taxes from the firms and in turn offers those subsidies (compensation to the firms for lowering the prices). The Government also provides the market to firms by purchasing the goods and services produced by the firms.

3. ***Financial Sector and Government***- The Government borrows from the financial sector as well as invests funds in the financial sector.

The relationship of the government with the other three sectors is depicted by the following diagram.



Injections and Leakages in Three-Sector Model

Leakages- Besides saving, in a three-sector model, the taxes are also a part of leakages. This is because taxes reduce the volume of income flow in an economy.

Injections- Besides investment, in a three-sector model, the government expenditure forms a part of injections. This is because government expenditure increases the volume of income flow in an economy.

Therefore, the national income in the three-sector model becomes a sum of consumption (*C*), savings (*S*) and taxes (*T*).

$Y = C + S + T$

If an economy in a three-sector model is at equilibrium, then it implies that the volume of leakages must be equal to the volume of injections. That is,

Leakages	≡	Injections
$S + T$	≡	$I + G$

That is, the ***triple-identity in the three-sector model*** becomes:

$$C + S + T \equiv Y \equiv C + I + G$$

Circular Flow Model in a Four-Sector Economy

In the four sector model, apart from the three sectors, households, firms and the government, we introduce another sector, called the 'external sector' or ‘foreign sector’. In other words, the presence of foreign sector implies that the economy is an open economy. We can analyse that the activities of the external sector with the rest of the sectors in the following manner.

1. ***Firms and the External Sector***- Firms deal with the external sector through exports and imports. Exports refer to the goods and services that are produced domestically but sold to the foreign countries. On the other hand, imports refer to the goods and services that are produced by the foreign country and are purchased by the native country.

Firms ***receive payments for exports*** from the rest of the world (ROW) and ***makes payment for imports*** to the rest of the world (ROW).

2. ***Households and External Sector***- Households provides factor services to the external sector and in return receives factor payments from the external sector. The household sector also receives transfer payments from the rest of the world in the form of gifts and remittances of foreign exchange, etc.

Note: While dealing with the external sector we consider net payments made to the external sector and net receipts from the external sector. That is, we consider Net Factor Payments and Net Transfer Payments.

Net Factor Payments

Net factor payments refers to the difference between the factor payments received by the households from the rest of the world (ROW) and factor payments made to the rest of the world .i.e.

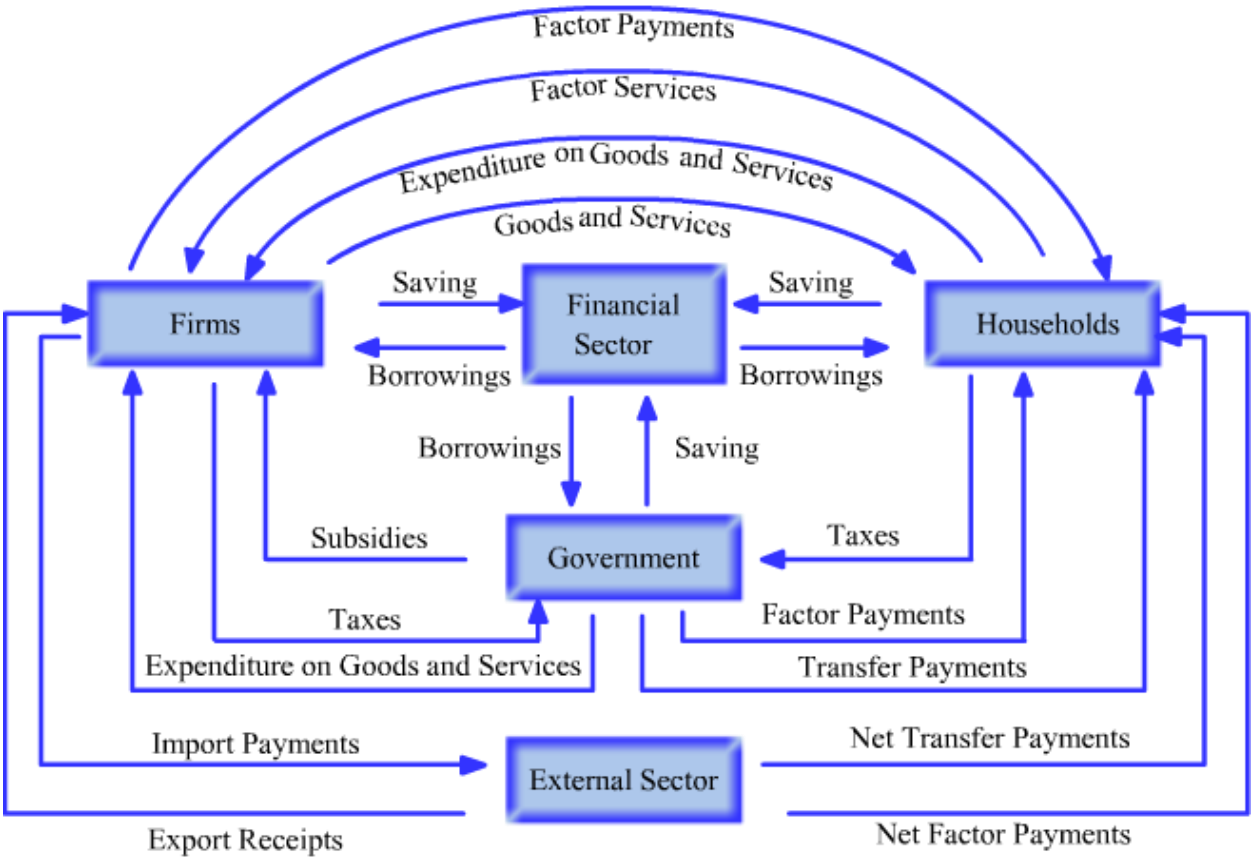
Net Factor Payments = Factor Payments received by the household sector from ROW – Factor Payments made to ROW.

Net Transfer Payments

Similar to net factor payments, net transfer payments refers to the difference between the transfer payments received from the ROW and transfer payments made to the ROW. i.e.

Net Transfer Payments = Transfer Payments received from ROW – Transfer Payments made to ROW.

Circular flow in a four-sector model is depicted by the following diagram.



Injections and Leakages in Four-Sector Model

Leakages- Besides saving and taxes, in a four-sector model, the imports are also a part of leakages. This is because imports withdraw the money out of the economy, thereby, reduce the volume of income flow in the economy.

Injections- Besides investment and government expenditure, in a four-sector model, the exports form a part of injections. This is because exports lead to money inflow, thereby, increases the volume of income flow in the economy.

If an economy in a four-sector model is at equilibrium, then it implies that the volume of leakages must be equal to the volume of injections. That is,

$$\text{Leakages} \equiv \text{Injections}$$
$$S + T + M \equiv I + G + X$$

That is, the ***triple-identity in the four-sector model*** becomes:

$$C + S + T + M \equiv Y \equiv C + I + G + X$$

Significance of the Circular Flow

The study of circular flow is an important part of macroeconomics due to the following reasons.

1. ***Helps in the Estimation of National Income***

National Income can be estimated with the help of circular flow by aggregating the components of either the product side of the flow or the expenditure side of the flow. In other words, national income can be estimated by either aggregating the income of all the factors of production or by aggregating the expenditure incurred by all the sectors on the goods and services.

Note: The national income estimated will be equal, whether it is calculated by aggregating either the income side or by aggregating the expenditure side of the circular flow.

2. ***Helps in Understanding the Interdependence between Different Sectors***

Circular flow helps in understanding how the various sectors of an economy are mutually interdependent and work together. In other words, it helps in understanding the link between the different sectors in the economy.

3. It ***helps in getting a picture of the level of economic activity of the major players*** (producers and consumers) of the economy.

4. ***Injections and Leakages***

The circular flow helps in estimating the types and levels of injections and leakages prevalent in the economy.

Macro Economic Aggregates

Objective

After going through this chapter you shall be able to understand some of the basic concepts and important definitions related to National Income Accounting.

Concept of Economic Territory/Domestic Territory

We often think of domestic territory of a country as the political boundary of that particular country. However, in the National Income Accounting, domestic territory of a country includes not only its political frontier but also used in a wider sense to include the following components.

1. Political frontier of the country including the air and water territory.

2. Embassies, consulates and military bases of a country that is located abroad. However, embassies, consulates and military bases of other countries located in the domestic country are **not** included in the domestic territory. For example, the Embassy of Japan located in India does not form a part of the domestic territory of India. However; the embassy of India located in Japan forms a part of the domestic territory of India.

3. Ships, aircrafts, etc. operated by the residents of a country between different countries of the world.

4. Fishing vessels, oil and natural gas rigs operated by the residents in the international waters, where the country enjoys the exclusive rights of exploitation. For example, fishing boats operated by Indian fishermen in the oceans (international water) are part of the domestic territory of India.

Concept of Normal Residents of a Country

Normal residents of a country refer to the individuals or institutions that are the residents of that country (for one or more years) and who's centre of economic interest i.e. earning, spending and accumulation of wealth, etc. lies within the economic territory of that country.

Note: Although international or foreign institutions such as embassies are **not** a part of the domestic territory, however; the citizens of a country working in these institutions are treated as normal residents of the country. A similar point is that foreign citizens posted in the foreign military bases located in the domestic country are **not** to be treated as normal residents of the domestic country.

National Income

National Income can be defined as the total market value of all the final goods and services (in terms of money) produced within the domestic territory during an accounting year.

Concept of Net Factor Income from Abroad (NFIA)

Sometimes, it happens that the citizens of a country are temporarily residing abroad (such as Indians living in U.S.A) and similarly foreign citizens are temporarily residing in the domestic country (such as a German citizen residing in India). Such citizens earn factor incomes in the country in which they are residing. Net factor income from abroad refers to the difference between the income earned by the citizens of the domestic country residing abroad and the incomes earned by the foreign citizens residing in the domestic country. That is,

NFIA = Factor Income Earned from Foreign – Factor Income Paid to the Foreigners

NFIA serves as the basis of distinction between the National Income and the Domestic Income.

National Income = Domestic Income + NFIA
i.e. $NNP_{FC} = NDP_{FC} + NFIA$

NFIA comprises of the following three components.

1. *Net Compensation of Employees*- It refers to the difference between the compensation earned by the domestic country citizens residing abroad and that earned by the foreign citizens residing in the domestic country.

2. *Net Retained Income from Property and Entrepreneurship*- Net income from property and entrepreneurship refers to the difference between the income earned in the form of rent, interest and profit by the normal residents of a country (in foreign) and similar payments made to the rest of the world.

3. *Net Retained Earnings of the Resident Companies Abroad*- Retained earnings refer to the undistributed profits of a company. It is that portion of the profit that the company has saved after all the payments. Net retained earnings refer to the difference between the retained earnings of the domestic companies located abroad and the retained earnings of the foreign companies located in the domestic territory.

Concepts of Gross Income and Net Income

Depreciation forms the basis of distinction between the Gross Income and the Net Income. Gross Income is inclusive of depreciation, while, Net Income does not include depreciation.

Net Income = Gross Income – Depreciation

In other words, to arrive at an estimate of Net Income, we need to deduct depreciation from the value of the Gross Income.

Concept of National Income at Market Price and National Income at Factor Cost

We can express National Income/Output either ***in terms of market prices*** or ***in terms of factor cost***.

When National Income is expressed ***in terms of market prices***, indirect taxes and subsidies are taken into account. While, subsidies tend to lower the market price on the other hand, the indirect taxes tend to raise the market price. The resultant is known as ***National Income at Market Prices, i.e.*** **(*NNP_{MP}*)**.

When National Income is expressed ***in terms of factor cost***, the impact of subsidies and indirect taxes is not taken into consideration. The resultant is known as ***National Income at Factor Costs, i.e.*** **(NNP_{FC})**.

National Income at Market Prices (NNP_{MP}) = National Income at Factor Costs (NNP_{FC}) + (Indirect Taxes – Subsidies)

or, National Income at market prices (NNP_{MP}) = National income at factor prices (NNP_{FC}) + Net Indirect Taxes

where,

Net Indirect Taxes = ***Indirect Taxes*** – ***Subsidies***

It should be noted that while Indirect taxes are added to the NNP_{FC} as they raise the market price, whereas, subsidies are subtracted because they lower the market price.

Related Aggregates of National Income

In the following section we will explore various related aggregates of National Income such as GDP_{MP}, GNP_{FC}, NDP_{FC}, NNP_{MP}, NDP_{MP}, NNP_{MP}, National Disposable Income, Gross Disposable Income, Personal Income, Private Income and Personal Disposable Income.

Gross Domestic Product at Market Prices (*GDP_{MP}*)

GDP_{MP} refers to the market value of all the final goods and services produced ***within the domestic country*** during an accounting year ***inclusive of depreciation***. It is a gross concept as depreciation is not taken into account in its estimation. Also, *GDP* is limited to the domestic territory, thus, excludes *NFIA*.

Exclusion from GDP

The following items are ***not included*** in the estimation of Gross Domestic Product.

i. Income accruing from illegal activities such as, gambling, lotteries, etc.

ii. Black money (i.e. income that is not recorded in the books of accounts)

iii. Transfer payments such as, scholarship, pensions, etc.

iv. Income accruing from the monetary transactions i.e. capital gains, income from shares and debentures, etc.

v. Market value of the second hand goods.

Gross National Product at market prices (*GNP_{MP}*)

Unlike *GDP*, the scope of *GNP* is not only confined to the domestic territory of a country. In fact, *GNP* takes into account all the goods and services produced by the normal residents of a country ***both within the domestic territory as well as outside the country***. In other words, *GNP* is inclusive of *NFIA*.

As we know, *NFIA* is the basis of distinction between the Domestic Income and the National Income, so

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

It should be noted that ***NFIA can take both positive value as well as negative value***. If *NFIA* is ***positive***, then it implies that GNP_{MP} would be greater than GDP_{MP}. On the contrary, if *NFIA* is ***negative***, then it implies that GNP_{MP} would be less than GDP_{MP}.

Net National Product at Market Prices (*NNP_{MP}*)

Net National Product at the market prices (NNP_{MP}) refers to the total market value of all the final goods and services produced by the normal residents of a country ***both within the domestic territory as well as outside the country***. ***NNP_{MP} excludes depreciation*** but ***includes NFIA***. That is,

$NNP_{MP} = GNP_{MP} – Depreciation$

Net Domestic Product at Market Prices (*NDP_{MP}*)

Net Domestic Product at the market prices (NDP_{MP}) refers to the total market value of all the final goods and services produced ***within the domestic territory by normal residents as well as non-residents***, during an accounting year ***excluding depreciation***.

$NDP_{MP} = GDP_{MP} – Depreciation$

Net Domestic Product at Factor Cost or Domestic Income (*NDP_{FC}*)

NDP_{FC} refers to the ***aggregate factor income*** earned by all the factors of production, in the form of rent, wages, interest and profits.

As we know, National Income at factor cost do not includes subsidies and indirect taxes, so to arrive at NDP_{FC} from NDP_{MP}, net indirect taxes is subtracted from NDP_{MP}. That is,

$NDP_{FC} = NDP_{MP} – Net\ Indirect\ Taxes$

= ***$NDP_{MP} – Indirect\ taxes + Subsidies$***

Gross Domestic Product at Factor Cost (*GDP_{FC}*)

GDP_{FC} refers to the ***aggregate factor income*** earned by all the factors of production, in the form of rent, wages, interest and profit and ***including depreciation***.

***GDP_{FC}* = *NDP_{FC}* + Depreciation**

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

NNP_{FC} refers to the ***aggregate of all factor incomes*** earned by those factors of production that are ***normal residents of a country both within the domestic territory as well as abroad***.

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

Gross National Product at Factor Cost (*GNP_{FC}*)

GNP_{FC} refers to the ***aggregate of all factor incomes*** earned by the normal residents of country during an accounting period including depreciation.

GNP_{FC}* = *NNP_{FC}* + *Depreciation.

National Disposable Income

As we know, National Income is the aggregate of all factor incomes earned by the factors of production that are normal residents of a country. However; not all the income earned by the factors of production is available for consumption or saving rather, some part of the income earned goes are paid as taxes to the government.

This part of income (taxes) is subtracted from the National Income to arrive at National Disposable Income. On the contrast, some part of income is received in the form of transfer payments (i.e. income received but not in return for factor services) such as, scholarships, pensions, etc.

Transfer payments add to the income of a person, thereby, are added to the National Income to arrive at an estimate of National Disposable Income. Thus, we can define National Disposable Income as that portion of National Income that is available to the all the normal residents of a country for consumption and savings.

National Disposable Income = National Income + Net Indirect Taxes + Net Transfer Payments from Rest of the World (ROW)

Private Income

Private Income refers to the income accruing to the private sector from all the sources including both the productive sources (i.e. earned income) as well as the unproductive resources (i.e. unearned income/transfer payments from government or from the rest of the world).

An important component that is included in the private income is '***Interest on National Debt'***. Sometimes to meet its consumption expenditure and administrative expenditure, the government takes loans from the public. Interest on National Debt is the interest paid by the government on such loans and borrowings.

Private Income includes the following components.

Private Income = Income from NDP that goes to the private sector + NFIA + Net Transfer Payments from the Government and ROW + Interest on National Debt

National Income *versus* Private Income

National Income	Private Income
1. Transfer Payments are **not** included in the estimation of National Income.	1. Transfer payments are included in the estimation of Private Income.
2. Interest on National Debt is **not** a component of National Income.	2. Interest on National Debt forms a component of Private Income.
3. National Income includes the income accruing to both public sector as well as private sector.	3. Private Income includes income accruing only to the private sector.

Private Income *versus* Factor Income from NDP accruing to the Private Sector

Private Income	Factor Income from NDP accruing to the Private Sector
1. Private Income is a national concept and includes NFIA.	1. Factor Income from NDP accruing to the private sector is a domestic concept and does **not** include NFIA.
2. It includes both the factor incomes as well as the transfer payments.	2. It includes only the factor incomes and does **not** include transfer payments.

3. Interest on National Debt forms a part of private income.	3. Interest on National Debt does **not** form a part of the factor income from NDP accruing to the private sector.

Personal Income

Personal Income refers to the total income ***actually received*** by an individual/household from all the sources (i.e. factor incomes and current transfers).

Private Income of an individual is not the same as Personal Income.

This is because some part of the profit that is retained by the firms as undistributed profits (corporate savings) is not distributed as factor incomes to the households, thus, do not form a part of the Personal Income.

Similarly, some part of the profits earned by the companies is paid as taxes (corporate tax), thus, do not form a part of income accruing to the individuals/households.

Such undistributed profits and corporate taxes are deducted from the Private Income to get an estimate of Personal Income

Personal Income = ***Private Income – Corporate Savings – Corporate Tax***

Personal Income *versus* Private Income

Private Income is a broader concept than Personal Income.

The key point of distinction between the two is that while, ***Private Income includes corporate taxes as well as corporate savings, Personal Income excludes both of these components***.

National Income *versus* Personal Income

National Income	Personal Income
1. Transfer Payments are **not** included in the estimation of National Income.	1. Transfer Payments are included in the estimation of Personal Income.
2. Interest on National Debt does **not** form a component of National Income.	2. Interest on National Debt is a component of Personal Income
3. National Income includes domestic product accruing to the government.	3. Personal Income does **not** include domestic product accruing to the government.

4. Corporate savings and corporate tax form a part of National Income.	4. Corporate savings and corporate taxes are excluded from the estimation of Personal Income.

Personal Disposable Income

Personal Disposable Income refers to that part of Personal Income that is ***actually available to households for consumption or for saving***. Similar to the firms, the individuals also pay taxes and other payments (such as fees and fines) to the government. Such payments are deducted from the Personal Income to arrive at an estimate of Personal Disposable Income. This is because such payments are **not** available to the individuals for consumption or saving.

Personal Disposable Income = Personal Income – Direct Personal Taxes – Miscellaneous Receipts of the Government (fees and fines)

Personal Income versus Personal Disposable Income

Personal Disposable Income is a fraction of Personal Income. While Personal Income is the income that is actually received by the individuals from all the sources, Personal Disposable Income is that part of the Personal Income that remains with the individuals after paying taxes, fees, fines, etc to the government.

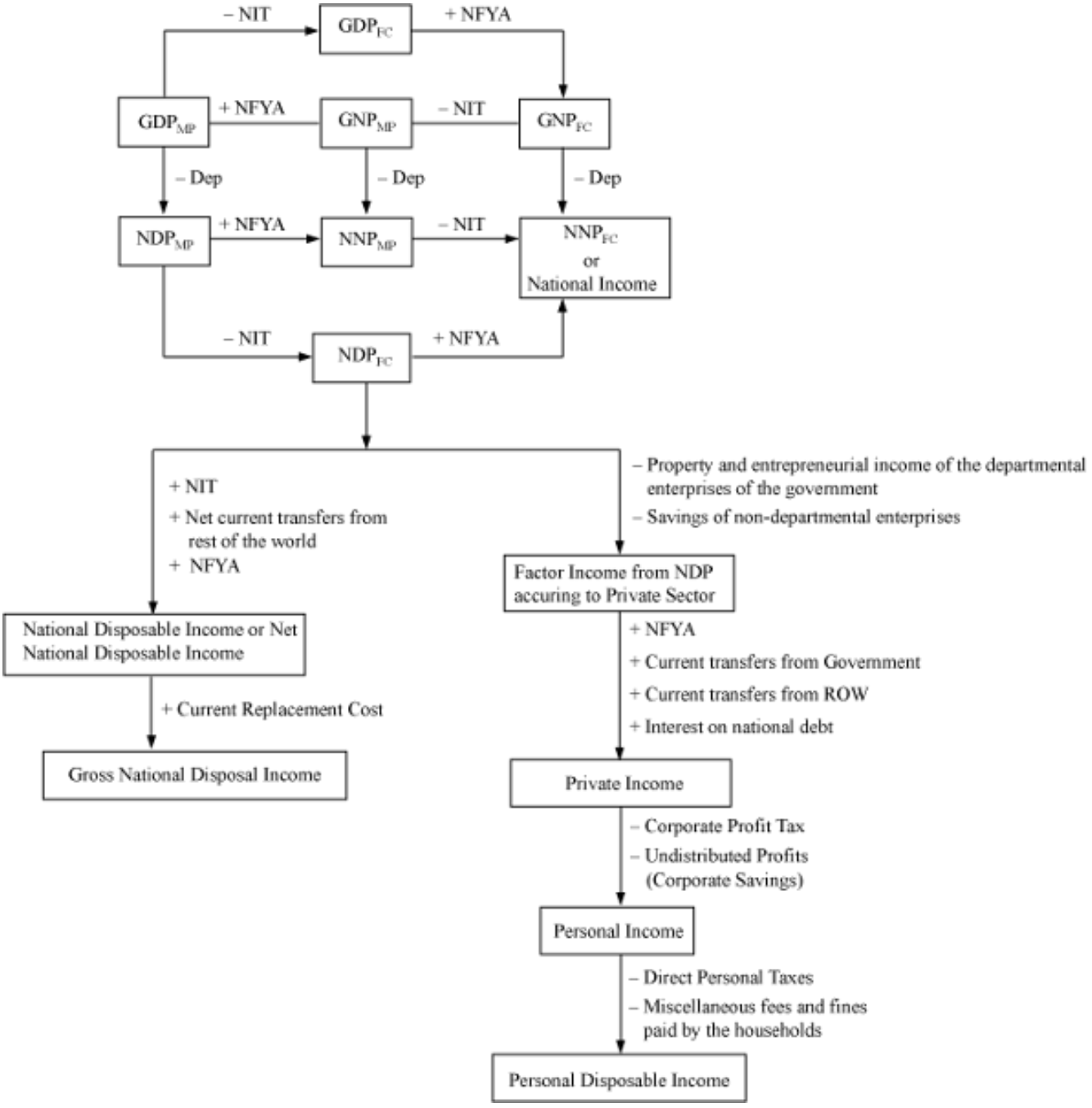
IMPORTANT FORMULAE

1. Gross = Net + Depreciation

   or Net = Gross – Depreciation

1. National = Domestic + Net Factor Income from Abroad
2. Domestic = National – Net Factor Income from Abroad
3. Market price = Factor cost + Net Indirect Taxes
4. Factor cost = Market price – Net Indirect Taxes
5. Net Indirect Taxes = Indirect Taxes – Subsidies

The following flow chart explains the formula for finding out different national income aggregates.



Methods of Calculating National Income

Objectives

After going through this chapter you shall be able to understand the following methods of measuring the national income.

- Value-added Method

- Income Method
- Expenditure Method
- Also, various precautions that are to be taken care-off while estimating National Income by all the methods.

Introduction

We know that in an economy there is a continuous cycle of production, generation of income and expenditure on the produced goods and services. The process of production leads to generation of income. The income received by the factors of production leads to rise in their demand for goods and services thus, leads to rise in the total expenditure. This rise in the expenditure then again leads to rise in the production and so on.

In the study of circular flow we analysed that the National Income can be estimated in the following three ways.

1. Aggregate of all factor incomes flowing from the firms to the households (i.e. by aggregating the rent, wages, interest and profit earned in the economy)

2. Total market value (in monetary terms) of all final goods and services produced by the firms during an accounting year.

3. Aggregate of all expenditure incurred by various sectors on the final goods and services produced by the firms.

Based on the above three ways of looking at the National Income, there exists following three ***methods of measuring National Income***.

1. Value-Added/Product Method

2. Income Method

3. Expenditure Method

Value-Added/Product Method of Measuring National Income

The value-added approach measures the national income by estimating the contribution made by each of the producing units in the economy to the total production within the domestic territory during an accounting year.

Concept of Value Added

A production process involves different stages of production. The production involves the use of various factor inputs (land, labour, capital, entrepreneur) as well as non-factor

inputs (such as raw material, transportation, etc).

The use of such factor inputs and non-factor inputs in the production is referred as ***intermediate consumption***. With the use of inputs, the goods undergo transformation and thereby, value is added at each successive stage of production. ***Value added on a good refers to the increase in the value of good at each successive stage of production***.

Algebraically, Value Added is the difference between the total value of the output and the total value of the intermediate consumption.

Value Added = Total Value of Output – Total Value of Intermediate Consumption

Let us analyse the two components of Value Added in detail.

Total Value of Output

Total value of output refers to the total market value (in monetary terms) of all goods and services produced by all firm during an accounting year. Algebraically, the total value of output is the product of quantity of output sold by the firm and price charged per unit of the output. That is,

Value of Output = Quantity Sold × Price per unit

However, sometimes it might happen that the actual demand in the market is ***lesser*** than what the firms had estimated (planned). In other words, the total output produced by a firm is not equal to its total sales. Thus, some of the output produced remains unsold.

Such unsold output adds to the firms' stock of inventories as closing stock. On the contrast, at times, it might happen that the actual demand in the market is ***greater*** than the estimated demand. Therefore, in such a situation the stock of inventories gets reduced.

Hence, the change in stock (addition to or subtraction from the stock) is added to the total sales to get the total value of output.

Change in Stock is calculated as the difference between the opening stock and the closing stock of output.

Change in Stock = Closing Stock – Opening Stock

Value of Output = Value of Sales + Value of Change in Stock

Value of Intermediate Consumption

Value of intermediate consumption refers to the value of all the non-factor inputs or secondary inputs that are used in the process of production. That is, in simple words, value of intermediate consumption refers to the cost of inputs that are used in the production of a good and service.

Numerical Illustration of Value Added

The following schedule depicts the value of output, value of intermediate consumption and value added at each successive stage of production of clothes.

Value Added at Different Stages of Production of Clothes

Production Unit	**Value of Output (Rs) A**	**Value of Intermediate Consumption (Rs) B**	**Value Added (Rs) (A – B)**
Cotton farmer	500	100	400
Weaver	700	500	200
Textile Industry	900	700	200
Retailer	1100	900	200
Total	**3200**	**2200**	**1000**

The production process of cloth starts from growing cotton, then weaving of cotton, then final stitching and ironing of finished cloth as shirts, trousers, etc. The finished cloth is then send to the retailer, who finally sells it to the final consumers. Let us now analyse the value addition to a piece of cloth at each successive stage of production.

The production of cotton by the farmer involves intermediate cost (such as seeds, fertilisers, etc.) of Rs 100. The cotton farmer further sells the output to the weaver for Rs 500. Thus, the value added by the cotton farmer is Rs 400 (i.e. Rs 500 – Rs 100). The weaver purchases cotton for Rs 500 and sells weaved cotton to the textile industry for Rs 700.

The value added by the weaver is Rs 200 (i.e. Rs 700 – Rs 500). The textile industry in turn sells the cloth to the retailer after stitching for Rs 900. Therefore, the value added at this stage of production is Rs 200 (i.e. Rs 900 – Rs 700). Then the retailer finally sells the final cloth to the consumers for Rs 1,100. The value added by the shopkeeper is Rs 200. Thus, the gross value added by all the producing units is Rs 1,000. That is,

Gross Value Added = Value Added by Cotton Farmer + Value Added by Weaver + Value Added by Textile Industry + Value Added by Retailer

= Rs 400 + Rs 200 + Rs 200 + Rs 200 = Rs 1,000

In this way, the Gross Value Added can be calculated for all the industries/sectors (namely primary sector, secondary sector and tertiary sector) within the domestic territory.

The gross value added by all the producing units in the domestic territory during an accounting year is called Gross Domestic Product at market prices (GDP_{MP}.)

Having estimated GDP_{MP}, we can arrive at National income ***(NNP_{FC})*** with the help of some related aggregates in the following manner.

GDP_{MP} = GVA_{MP} by the primary sector + GVA_{MP} by the secondary sector + GVA_{MP} by the territory sector

$GDP_{MP} = GVA_1 + GVA_2 + ... + GVA_n$

where,

GVA_1 represents Gross Value Added by the first firm

GVA_2 represents Gross Value Added by the second firm

GVA_n represents Gross Value Added by the n^{th} firm

$$GDP_{MP} = \sum_{i=1}^{n} GVA_i$$

GDP_{MP} – Depreciation = NDP_{MP}

NDP_{MP} – Net Indirect Taxes = NDP_{FC}

$$NDP_{FC} + NFIA = NNP_{FC} \text{ (National Income)}$$

To summarise,

Gross Value Added at Market Prices (GDP_{MP}) – Depreciation – Net Indirect Taxes + NFIA = National Income (NNP_{FC})

Precautions Regarding Calculation of National Income by Value-Added Method

1. ***Value of the sale and purchase of second hand goods are not included*** in the national income of the current accounting year. This is because the value of these goods was included in the national income in the accounting year in which they were produced. Thus, if the value of these goods is also included in the current year, then it will lead to the problem of double counting of the value of such goods.

2. Although the value of the second hand goods are not included in the national income, but ***the brokerage/commission*** paid to facilitate the sale or purchase of these goods ***is included in estimation*** *of the value added*.

3. Only the value of final goods and services are included in the estimation of *value added and* ***value of intermediate goods is not included*** *in the national income*. This is because the value of intermediate goods is already reflected in the value of the final goods.

4. At times, the producer/firm keeps a certain portion of the output for self consumption. Such a ***portion of production that is retained for self consumption should also be included*** *in the estimation of the value added*.

5. Similarly, *the* ***imputed rental value of the owner occupied houses/land should also be taken into account***. This is because all houses/land, whether owner-occupied or rented-out have a rental value.

6. Some of the *services that are meant for* ***self consumption*** such as the ***services of the housewives, a farther teaching his own child*** *are* ***not included in the national income***. This is because it is difficult to estimate the market value of such services.

Difficulties Involved in the Calculation of National Income by Value Added Method- Problem of Double Counting

One of the major problems involved in the estimation of national income by the value added method is the problem of ***double counting***. Double counting refers to a situation where the value of a good is taken into account (counted) more than once. Such a problem occurs because for every producer, the commodity he sells is the final commodity. Thus, if every time the value of the good is taken into account, then it will lead to the estimation of the value of the product more than once.

For instance, in the example of production of cloth, for the cotton farmer cotton is the final product and he sells it for Rs 500. Thus, for him the cost of the final output is Rs 500. Similarly for the weaver, who sells weaved cotton for Rs 700, weaved cotton is the final product and cost of the final output is Rs 700. Next, the textile producer converts the weaved cotton into cloth and sells it to retailer for Rs 900, for him the cloth is the final product and cost of the final output is 900. The retailer then sells the cloth for Rs 1100.

The total value of the final output in the process is Rs 3,200 (i.e. Rs 500 + Rs 700 + Rs 900 + Rs 1,100). But, in this manner, the value of cotton is counted four times, value of thread three times and that of cloth twice.
In other words, there is an ***overestimation of the value of the goods produced***.

Efforts must be taken to reduce double counting by considering only the value added by each production unit and considering only the final goods and services (i.e. excluding intermediate consumption) in the estimation of the national income.

Income Method of Measuring National Income

According to the Income Method, national income is estimated by aggregating all the factor incomes (in the form of wages, rent, interest and profits) paid to the owners of factors of production (land, labour, capital and enterprise) within the domestic territory in an accounting year.

Factor Incomes

Factor incomes refer to the income received by the factors of production in return for the services provided by them in the production process. The factor incomes can be broadly classified into the following three categories.

1. ***Compensation of Employees***: Compensation of employees refers to the remuneration paid to the employees/labours for rendering their services in the production process. Such compensation can take the following forms.

a. Wages and salaries paid in cash.

b. Compensation paid in kind (such as medical facilities, food facilities, etc.)

c. Employer's contribution to the social security schemes such as pension fund, provident fund, etc.

2. ***Operating Surplus***: Operating surplus refers to the income earned by the owners of land (property) and enterprise. Operating surplus can be classified into the following four categories.

a. *Rent*: Rent refers to the income earned from property

b. *Interest*: Income from property

c. *Royalty*: Income from property

d. *Profit*: Profit refers to the income generated from the entrepreneurship. Profit can further be categorised into the following three categories.

a. Dividends: Dividends refers to that part of the profits that is distributed to the shareholders.

b. Corporate Profit Tax: Corporate profit tax refers to that part of the profit that is paid as tax to the government.

c. Undistributed Profit: Undistributed profit refers to the part of the profit that is retained by the producers as savings for future needs. Undistributed profits are also known as Corporate Savings and Retained Earnings.

3. ***Mixed Income of Self-Employed***: Mixed income of self-employed refers to the incomes of the self-employed persons who use their own land, labour, capital and entrepreneurship to produce various goods and services. In such cases, factor incomes (rent, wages, profit and capital) cannot be separately estimated. Hence, the name mixed income.

The aggregate of all the factor incomes generated within the domestic territory during an accounting year gives an estimate of NDP_{FC} or Domestic Income.

Having estimated the domestic income **(*NDP_{FC}*)**, we can estimate national income ***(NNP_{FC})*** in the following manner.

NDP_{FC} + Net Factor Income from Abroad* (*NFIA*) = *NNP_{FC}* or N*ational Income

Precautions Regarding Calculation of National Income by Income Method

1. ***Transfer Earnings*** *such as old age pensions, unemployment allowances are* ***excluded*** from the estimation of the national income. While estimating the national income, *only earned income is included* and unearned income in the form transfer earnings is excluded.

2. ***Income from illegal activities*** such as theft, gambling, etc. ***should not be included*** in the estimation of national income.

3. ***Income from sale and purchase of second hand goods is not included*** in national income. However, ***commission/brokerage paid*** on sale and purchase of second hand goods should be ***included*** **i**n national income estimation.

4. Similarly, ***commission / brokerage*** *paid on sale and purchase of* ***shares and bonds*** *are also* ***included*** in the national income.

5. ***Windfall gains*** such as lotteries and capital gains are unearned income and thus, are ***not included*** in the estimation of the national income.

6. If profit as a whole is included in the national income estimation, then ***any of the individual components of profits should not be included separately***. Similarly, if compensation of employees as a whole is included then, ***any of the individual components of compensation of employees should not be included separately***.

7. ***Duties such as gift tax***, death duties, wealth tax, etc. ***should not be included*** in the national income estimation in the current accounting year. This is because such duties are paid out of the tax payers past savings or wealth and hence, should not be included in the national income estimation in the current accounting year.

Expenditure Method of Measuring National Income

According to the Expenditure method, National Income is measured in terms total expenditure on final goods and services produced in an economy during an accounting year.

The expenditure on final goods and services can be broadly classified into the following four categories.

1. ***Private Final Consumption Expenditure***: It refers to the expenditure incurred by all the individuals/households/other non-profit organisations on the final goods (both durable and non-durable) and services. It also includes the purchases of resident households made abroad.

However, it should be noted that the ***purchases of non-resident households*** in the domestic market are ***not included in the national income***. The following are the items that are included in the private final consumption expenditure.

a. Expenditure on currently produced goods and services.

b. Expenditure by resident households abroad.

c. In-kind compensation paid to the employees.

d. Gifts received in kind

e. Value of production retained for self-consumption

f. Imputed rent of the owner occupied houses.

2. ***Government Final Consumption Expenditure***: It refers to the expenditure incurred by the government on the final goods and services. The following are the items that are included in the government final consumption expenditure.

a. Compensation to employees paid by the government

b. Government purchases from abroad

c. Government purchases of the final goods and services from the domestic market

3. ***Investment Expenditure***: Every producer purchases final goods and services for themselves to use them further in the production process (such as the purchase of machinery). Such purchases (expenditure) by the producer are called the investment expenditure. Investment expenditure can further be classified into the following two categories.

a. *Gross Fixed Investment/Gross Domestic Fixed Capital Formation*: It refers to the expenditure that is incurred by the producers on the fixed assets such as plants and machinery. This can be further classified into the following three categories.

(i) Business Fixed Investment

(ii) Government Fixed Investment such as dams, bridges, etc.

(iii) Fixed Investment Expenditure by the households such as residential construction expenditure.

b. *Inventory Investment*: Inventory investment refers to the total value of the change in the stock during an accounting year. Algebraically,

Value of Change in Stock = (Closing Stock – Opening Stock) × Market Price of Stock

Generally, in the question, the value of opening stock and the closing stock are given in monetary terms (Rs), so in order to ascertain the change in the value of stock, we need to subtract opening stock from closing stock. The formula becomes

Change in Stock = Closing Stock – Opening Stock

4. ***Net Exports***: Net exports refers to the difference between the total exports and total imports of a country during an accounting year.

Exports refer to the sale of domestically produced final goods and services to ROW.

Imports refer to the purchase of final goods and services from abroad (ROW).

Net Exports= (Value of Exports – Value of Imports)

Note: Expenditure on imports is deducted from the total expenditure because imports expenditure is incurred on those final goods and services which are not part of the domestic production. Thus, they do not form a part of the GDP.

The aggregate of expenditure incurred on domestically produced goods and services during an accounting year gives an estimate of GDP_{MP}.

Having estimated GDP_{MP} we can estimate national income (NNP_{FC}) in the following manner.

GDP_{MP} – Depreciation = NDP_{MP}

NDP_{MP} – Net Indirect Taxes = NDP_{FC}

NDP_{FC} + $NFIA$ = NNP_{FC} (National Income)

To summarise,

GDP_{MP} – Depreciation – Net Indirect Taxes + NFIA = NNP_{FC}

Precautions Regarding Calculation of National Income by Expenditure Method

1. *Expenditure on only* ***final goods and services should be included*** *in the national income estimation* ***while intermediate consumption expenditure should not be included***.

2. Similarly, *expenditure on the* ***purchase of second hand goods should not be included*** *in the national income estimation of the current accounting year*. This is because they have already been included in the national income of the accounting year in which they were originally purchased.

3. *Expenditure on* ***shares and bonds is not included****.* This is because these are mere financial assets and do not reflect any production activity of the goods or services.

4. ***Imputed value of the goods and services produced for self consumption are included****.*

5. *Expenditure on* ***transfer payments by the government should not be included***. This because such payments are not related to any production activity in an economy.

Summary of the Three Methods of Estimating National Income

Value Added Method

Gross value added at market price = GVA_{MP} by the primary sector + GVA_{MP} by the secondary sector + GVA_{MP} by the tertiary sector

$$= GDP_{MP} \xrightarrow{(-)} \text{Depreciation} \rightarrow NDP_{MP} \xrightarrow{(-)} \text{Net Indirect Taxes} \rightarrow NDP_{FC} \xrightarrow{(+)} NFIA \rightarrow NNP_{FC}\ (\text{National Income})$$

Income Method

Compensation of employees + operating surplus + Mixed income of self employed

$$= NDP_{FC} (\text{Domestic income}) \xrightarrow{(+)} NFIA \rightarrow NNP_{FC}$$

Expenditure Method

$$\text{Private Final Consumption Expenditure} + \text{Govt. Final Consumption Expenditure} + \text{Investments Expenditure} + \text{Net Exports}$$
$$= GDP_{MP} \xrightarrow{(-)} \text{Depreciation} \rightarrow NDP_{MP} \xrightarrow{(-)} \text{Net Indirect Taxes} \rightarrow NDP_{FC} \xrightarrow{(+)} NFIA \rightarrow NMP_{FC}$$

Goods and Prices, GDP and Welfare

Objectives

After going through this chapter, you shall be able to understand the following concepts

- Real National Income/National Income at Constant Prices and at Current Prices
- Difference between Real *GDP* and Nominal *GDP*
- Price Indices- *GNP* Deflator, *CPI*, *WPI*
- *GNP as an Index of Economic Welfare*

Introduction

In the estimation of *GDP*/National Income, it was implicitly assumed that the prices of the goods and services remained constant during the period of accounting. However, in reality the prices do change continuously during an accounting year. The continuous fluctuations in prices make it difficult to compare the *GDP* of an economy between two different accounting periods and/or to compare *GDP* of two different economies.

For instance, suppose on comparing the *GDP* of an economy between two accounting periods, we found that the value of *GDP* has increased in the second accounting period. The increase in the *GDP* can be interpreted as increase in the total volume of production in the second period as compared to the first period.

Such interpretation would be inappropriate, if this increase in *GDP* is only because of the rise in the price level in the second period (with the volume of production remaining constant). This can be explained algebraically as:

$GDP_1 = P_1 \times Q_1$

$GDP_2 = P_2 \times Q_1$

If $P_2 > P_1$, then $GDP_2 > GDP_1$

Analysing both the equation, we can conclude that the increase in the *GDP* in the second period is only because of the rise in the prices in the second period, while the quantity of goods and services produced remained same.

Thus, a need arises for two different concepts of National Income- Real National Income and Nominal National Income.

Real National Income/National Income at Constant Prices

Real National Income also known as ***National Income at Constant Prices*** can be defined as the total market value of all the final goods and services produced in an economy during an accounting year as estimated with reference to the base year prices.

Base year refers to a normal and stable year in which there were no major disturbances in the economy due to the factors such as natural calamities, war, etc. During such a year the macroeconomic variables such as production and prices are believed to be normal i.e. without any major fluctuations.

With the help of the base year, we can make meaningful comparisons between *GDP* of any accounting period in relation to that of the base year. As the prices in the base year is assumed to be constant, so any increase or decrease in the *GDP* of a period in relation to that of in the base year can be regarded solely due to increase or decrease in the volume of production in that particular period.

Therefore, when *GDP* increases due to an increase in the volume of production only, assuming price to be constant, it is regarded as a ***real increase in GDP***. This is also known as Real *GDP* or National Income at Constant Prices.

Real *GDP* is represented as

$$Y^* = Q \times \bar{P}$$

$Y^* =$ Real GDP/GDP at constant prices
$Q =$ Total quantity/volume of goods and servies produced during an accounting year
$\bar{P} =$ Base year prices of goods and services

Real *GDP* is treated as an ***index of economic growth***. Rise in the value of Real *GDP* implies a higher economic growth rate (through increase in the volume of output), which in turn, implies that incomes of the people has increased, hence, an improvement in the standard of living of people of the economy.

Nominal National Income

Nominal National Income/National Income at Current Prices

Nominal National Income or National Income at current prices can be defined as the total market value of all the final goods and services produced in an economy during an

accounting year, as estimated with reference to the current year prices. Nominal National Income is also called the ***Monetary National Income***.

Unlike Real *GDP*, any change in the value of Nominal *GDP* is solely because of the change in the prices. An increase in the Nominal *GDP* cannot be regarded as an index of economic growth. This is because the increase in the Nominal *GDP* is due to the increase in the price (inflation) and not because of increase in the production of goods and services.

Nominal *GDP* can be represented as follows.

$$Y = Q \times P$$

where,

Y represents Nominal *GDP*/*GDP* at current year prices.

Q represents Total quantity/volume of goods and services produced during an accounting year

P represents Current year prices of the goods and services

Difference between Real *GDP* and Nominal *GDP*

Real *GDP*	**Nominal *GDP***
1. Real *GDP* refers to the total market value of the output at the ***base year prices***.	1. Nominal *GDP* refers to the total market value of the output at the ***current year prices***.
2. The value of Real *GDP* can change only when the ***volume/quantity of output changes*** overtime.	2. The value of Nominal *GDP* can change only with change in the prices overtime.
3. It can be ***treated as an index of economic growth*** i.e. higher Real *GDP* implies higher economic growth.	3. It ***cannot be treated as an index of economic growth*** i.e. higher Nominal *GDP* does not implies higher economic growth, in fact, it indicates inflation.

Significance of Real *GDP*

1. Change in the Real *GDP* reflects a change in the quantity of goods and services produced. The change in the production of goods and services implies a change in the employment and income levels, thereby, indicating a change in the living standards of the people in an economy.

2. Real *GDP* can be regarded as an index of economic growth. This implies that higher (or lower) the Real *GDP* higher (or lower) the economic growth rate.

3. Real *GDP* facilitates in making inter-regional as well as international comparisons of the levels of production.

Conversion of Nominal *GNP* into Real *GNP*

We can convert Nominal National Income into Real National Income using the following formula.

$$\text{Real National Income} = \frac{\text{National Income at Current Price}}{\text{Price Index of Current Year}} \times \text{Price Index of Base Year}$$

We assume price index of the base year to be always equal to 100.

$$\text{Real National Income} = \frac{\text{National Income at Current Price}}{\text{Price Index of Current Year}} \times 100$$

Price Indices- Tools to Measure Changes in Price between Base Year and Current Year

The price indices are the tools to measure the changes in the price between the base year and the current period. The following are the three major price indices.

1. *GNP* Deflator
2. Consumer Price Index (*CPI*)
3. Wholesale Price Index (*WPI*)

***GNP* Deflator**

GNP deflator shows the movement/change in the price index between the base year and the current year. That is, it shows the changes in the level of *GNP* due to a change in the level of prices. If we calculate the value of Real *GNP* and Nominal *GNP* for the same accounting year, the quantity of output is constant and any difference in the values of Real *GNP* and Nominal *GNP* is due to the difference in the prices between the two periods.

GNP deflator reflects this difference in the level of prices.

$$GNP \text{ deflator} = \frac{\text{Nominal } GNP}{\text{Real } GNP} \times 100$$

Numerical Example

Consider a hypothetical economy that produces only a single commodity *x*.

Suppose, in the year 2000, 100 units of the commodity *x* were produced and the current year price is Rs 10 and the base year price was Rs 5.

Commodity	Quantity A	Current Year Price B	Base Year Price C	Nominal *GNP* (A×B)	Real *GNP* (A×C)
x	100	10	5	1,000	500

$$GNP\,\text{deflator} = \frac{1{,}000}{500} \times 100 = 200$$

This implies that the price of the commodity *x* in the current year is twice that of in the base year. That is, the price has increased twice between the two periods.

2. Consumer Price Index (*CPI*)

CPI represents the index of prices of a given set of commodities which are brought by the representative consumer set. In other words, *CPI* shows the movement in the retail prices of the goods and services.

It represents the cost of the commodity set in the current year as a percentage of the cost of the commodity set in the base year. A percentage change in *CPI* is used as a measure of inflation.

Numerical Example

Consider the following tabular example.

Commodity	**Quantity A**	**Base Year Price B**	**Cost of Purchasing in Base Year (A×B)**	**Current Year Price C**	**Cost of Purchasing in Current Year (A×C)**
A	100	10	1,000	12	1,200
B	100	5	500	10	1,000
C	100	10	1,000	15	1,500
Total			2,500		3,700

$$CPI = \frac{3700}{2500} \times 100 = 148$$

Wholesale Price Index (*WPI*)

Similar to *CPI*, *WPI* represents the index of wholesale prices (bulk prices) of the given set of commodities. In other word, *WPI* represents the movement of wholesale prices of the goods and services.

***GNP* and Welfare- *Can GNP be regarded as an index for country's welfare*?**

We often consider Real *GNP* as an index of economic welfare. A rise in Real *GNP* implies a rise in the output/volume of the goods and services produced in an economy.

In other words, a rise in the Real *GNP* implies greater availability of goods and services with the people and thus, a rise in the standard of living or welfare of the people. However, *GNP* as an index of welfare of an economy is imperfect and insufficient. The following observations can be made in this regard.

1. *Income Patterns*- It is possible that even with the rise in the Real *GNP*, the welfare of the people might not increase. The increase in the *GNP* may be a result of the increase in the income of a few individuals. On the other hand, the majority of people remain deprived of the benefits of the rise in the *GNP*. Hence, a rise in national income may lead to false interpretation of the social welfare.

2. *Composition of Output*: To know whether with the rise in Real *GNP* reflects a rise in the welfare of the economy, one need to consider the composition of the output produced that has led to the rise in the level of *GNP*. For example, the production of goods such as guns, narcotic drugs and high-end luxurious goods increases the monetary value of the production, but they do not add to the welfare of the majority of population.

3. *Non-Monetary Exchanges*: *GNP* does not take into account those transactions that are not expressed in monetary terms. In less developed countries, there are various non-monetary exchanges, particularly in the rural areas and household sector. Consequently, such transactions remain outside the domain of *GNP* leading to underestimation of the value of *GNP*. Thus, *GNP* cannot be regarded as an index of economic welfare, as it ignores the household and the volunteer sectors.

4. *Externalities*: Externalities refer to the cost or benefit of an activity by an economic agent for which it does not pay a price. For example, a factory producing goods emits poisonous smoke in the environment and dumps wastes into the water bodies causing air pollution and water pollution. In this case, the externality implies the negative effect on the health of the human beings and aquatic animals. But the firm is not charged for this appropriately, as there do not exist any market where externality can be traded.

An increase in the national income is associated with increased levels of pollution, accidents, disasters, shortage and depletion of natural resources, etc. These factors affect society's welfare and lead to ecological degradation. *GNP* fails to consider these

costs or valuation of such factors, consequently, does not reflect the loss in welfare due to the externalities.

5. ***Level of Population***: If the level of population in the country is high, then even with a high *GNP*, the per-capita consumption will remain low. This implies that the level of people's welfare remains low. As Real *GNP* ignores the size of population, so it fails to depict a true picture of economic welfare associated with rise in *GNP*.

6. ***Contributors to GNP***- It is possible that a large portion of *GNP* is contributed by a small section of people (few industrialists) or by a small geographical area. So, while a few enjoy a high standard of living, the welfare of the masses remains low.

Hence, we can conclude that GNP is neither a perfect nor a sufficient representative of the economic welfare of an economy.

Precautions Regarding Estimation of National Income

Objective

After going through this chapter, you shall be able to understand the various precautions that must be taken while estimating the National Income by any of the three methods- Value Added Method, Income Method and Expenditure Method.

Items to be EXCLUDED while estimating National Income

The following are an exhaustive list of items that are to be excluded from the estimation of National Income by any of the methods.

1. ***Unearned Income in the form of Transfer Payments***

The following are some of the common forms of transfer payments.

1. Unemployment allowances paid by the government
2. Financial help given to the war victims or victims of natural calamities
3. Money received by an individual from a relative working abroad
4. Old-age pension granted to the senior citizens
5. Scholarships paid by the government or any other institution
6. Gifts or donations given to NGOs or other non-profit organisations
7. Expenditure on children’s marriage by a parent
8. Payment of pocket money to children by parents

2. ***Leisure Activities or Activities meant for Self Consumption***

The following are some of the common forms of leisure activities or activities meant for self consumption.

1. Services of a housewife
2. Parents teaching their own children
3. Activities like growing vegetables in one's own garden
4. Voluntary work/service done for a community

3. ***Income from Illegal Activities such as theft, gambling, smuggling, black-marketing, etc.***

4. ***Windfall Gains*** such as lotteries are to be excluded from National Income.

5. ***Income from Sale of Second Hand Goods or Financial Assets*** such as income from the sale of old house furniture, resale of vehicle, etc. or financial assets such as bonds, debentures, etc.

6. ***Taxes/Duties paid out of Past Savings/Wealth*** such as death duty, gift tax, wealth tax, etc.

7. ***Capital Gains*** such as appreciation (rise in the value) of a land or property overtime, increase in the prices of stock, etc.

8. ***Income from Financial Transactions*** such as sale and purchase of shares, bonds, debentures, etc.

9. ***Expenditure on Intermediate Consumption*** such as expenditure on raw material purchased by an industry, expenses on electricity, water, etc. by a factory and industry

II. Items to be INCLUDED while estimating National Income

The following are the items that are to be included in the estimation of National Income by any of the methods.

1. ***Wages earned by the Resident Employees Working outside the Domestic Territory*** such as salaries received by Indian employees working in Canadian Embassy, salaries received by Indian employees working in foreign owned MNC, etc.

2. ***Profits earned by a Resident Institution/Organisation located outside the Domestic Territory*** such as profits earned by an Indian company located in Canada, profits earned by branch of domestic banks in foreign, etc.

3. ***Services that are provided Free of Cost by the Government*** such as free medical services, free food services for the poor, free education, street-lighting facilities, etc.

4. ***Commission/Brokerage paid on the Sale and Purchase of Second Hand Goods/Financial Assets***

5. ***Defence and Security Services provided by the Government***

6. ***Salaries paid to the Non-Residents working in the Domestic Territory*** such as salaries paid to a foreign specialist working in domestically-owned companies, etc.

7. ***Imputed Value of the Output meant for Self -Consumption*** such as imputed value of rent of the owner-occupied house (dwellings), value of the part of total produce kept by the producer for self-consumption, value of the finances provided by an entrepreneur for his own business, etc.

8. ***Employer's Contribution to the Social Security Funds*** such as provident fund, retirement fund, pension fund and other components of compensation paid by the employer on the behalf of the employees.

Important Note: ***Often students make a common mistake by overlooking the word Employer's in the last point. If it is 'Employer's Contribution towards Social Security Funds', then only it should be included in the National Income, otherwise, if it is Employees contribution, then it should not be included.***