CHAPTER 6

DETERMINATION OF NATIONAL INCOME
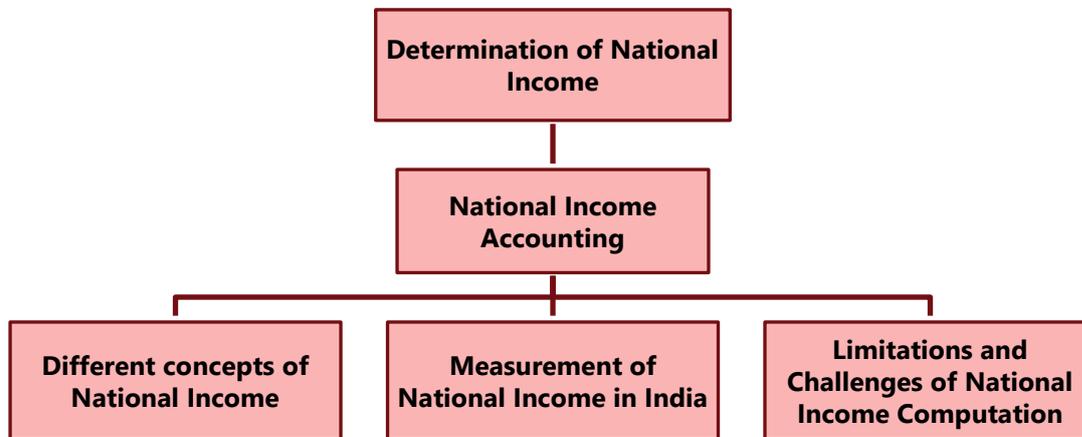
UNIT - 1: NATIONAL INCOME ACCOUNTING

LEARNING OUTCOMES

After studying this Chapter, you will be able to understand:

♦ Define national income

♦ Explain the usefulness and significance of national income estimates

♦ Differentiate among the various concepts of national income

♦ Describe the different methods of calculation of national income

♦ Outline measurement of national income in India

♦ Describe the system of regional accounts in India

♦ Identify the challenges involved in national income computation.

CHAPTER OVERVIEW

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│  Determination of National  │
│           Income            │
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│     National Income         │
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1.1 NATIONAL INCOME ACCOUNTING

National Income Accounting, pioneered by the Nobel prize-winning economists Simon Kuznets and Richard Stone, is the system of macro-economic accounts from the stage of production of goods and services to the stage of their final disposal. Like any other accounting system , the national income accounts first define concepts and then construct measures corresponding to these concepts . National Accounts help us to understand how the various transactions from the stage of production of goods and services to the stage of their final disposal are interrelated and give us an idea of the working of an economy. It helps to meet the needs of Government, private analysts, policy makers and decision takers.

The Central Statistical Organisation (CSO) in the Ministry of Statistics and Programme Implementation (MoSP&I) is responsible for the compilation of National accounts statistics. At the State level, State Directorates of Economics and Statistics (DESs) have the responsibility of compiling their State Domestic Product and other aggregates.

1.2 USEFULNESS AND SIGNIFICANCE OF NATIONAL INCOME ESTIMATES

National income accounts are fundamental aggregate statistics in macroeconomic analysis and are extremely useful, especially for the emerging and transition economies.

♦   businesses to forecast the future demand for their products.

♦ The estimates of national income show the composition and structure of national income in terms of different sectors of the economy, the periodical variations in them and the broad sectoral shifts in an economy over time.

♦ Sectoral contribution to National Income information is used by the government to decide various sector-specific development policies to increase growth rates.

♦ National income statistics also provide a quantitative basis for macroeconomic modelling and analysis, for assessing and choosing economic policies and for objective statements as well as evaluation of governments' economic policies.

♦ National income estimates throw light on income distribution and the possible inequality in the distribution among different income categories . It facilitates the process of comparisons of structural statistics, such as ratios of investment to growth , taxes proceeds and fiscal deficit , or government expenditures to GDP.

♦ International comparisons in respect of incomes and living standards assist in determining eligibility for loans, and/or other funds or conditions under which such loans, and/ or funds are made available.

♦ Combined with financial and monetary data, national income data provides a guide to make policies for growth and inflation.

1.3 DIFFERENT CONCEPTS OF NATIONAL INCOME

We begin our discussion with the basic measure of output -Gross Domestic Product, or GDP. The production side of the economy transforms inputs, such as labour and capital, into output, GDP. Inputs such as labour and capital are called factors of production, and the payments made to factors, such as wages and interest payments, are called factor payments.

1.3.1 Gross Domestic Product

Nominal GDP or GDP$_{MP}$

Gross domestic product (GDP) is the value of all final goods and services produced in the country within a given period. It includes the value of goods produced, such as houses and mobiles, and the value of services, such as telecom, health, insurance. The output of each of these is valued at its market price, and the values are added together to get GDP$_{MP}$

Nominal GDP or GDP at Current Prices in Q1 2022-23 is estimated at ₹ 64.95 lakh crore, as against ₹ 51.27 lakh crore in Q1 2021-22, showing a growth of 26.7 percent as compared to 32.4 percent in Q1 2021-22
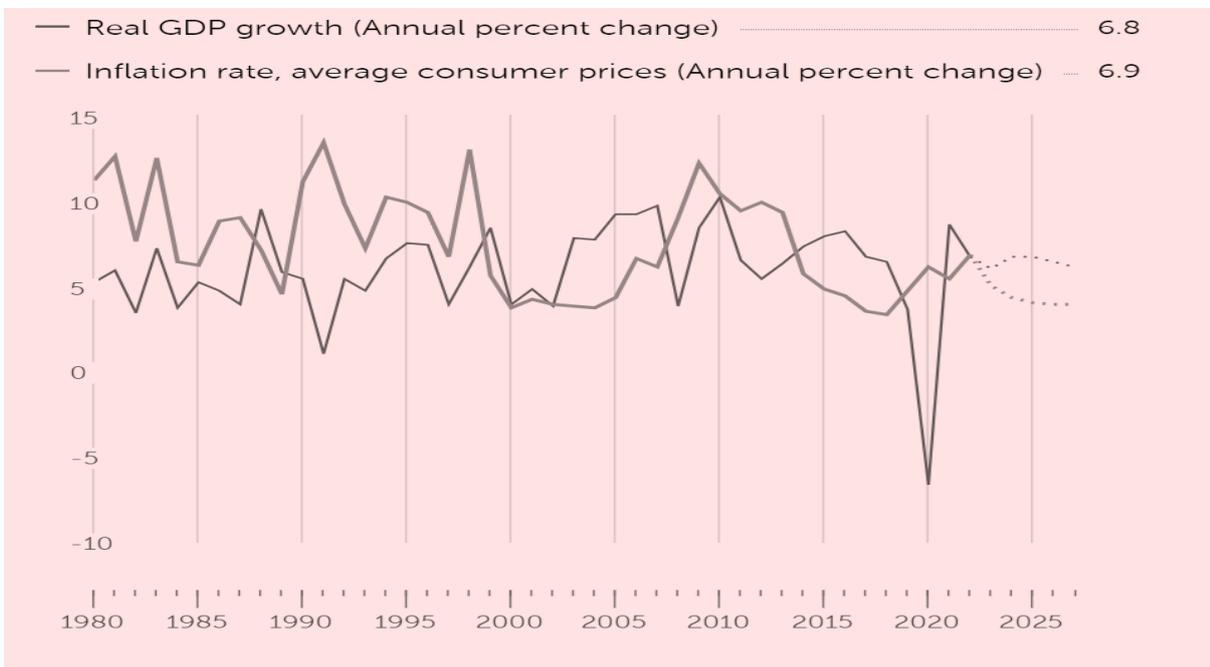
Real GDP

Nominal GDP increases over time for two reasons:

1.   The production of most of goods increases over time

2.   The prices of most goods also increase over time.

If our goal is to measure production and its change over time, we need to eliminate the effect of increasing prices on our measure of GDP. That's why real GDP is constructed as the sum of the quantities of final goods times constant (rather than current prices)

Real GDP or Gross Domestic Product (GDP) at Constant (2011-12) Prices in Q1 2022-23 is estimated to attain a level of ₹ 36.85 lakh crore, as against ₹ 32.46 lakh crore in Q1 2021-22, showing a growth of 13.5 percent as compared to 20.1 percent in Q1 2021-22

REAL GDP GROWTH RATE AND INFLATION RATE

Source IMF Data Mapper Oct 2022 https://www.imf.org/en/Countries/IND

GDP Deflator

The calculation of real GDP gives us a useful measure of inflation known as GDP deflator. The GDP deflator is the ratio of nominal GDP in a given year to real GDP of that year.

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

The GDP deflator, as the name implies, can be used to 'deflate' or take inflation out of GDP. In other words, the GDP deflator is a price index used to convert nominal GDP to real GDP

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

The deflator measures the current level of prices relative to the level of prices in the base year. Since nominal GDP and real GDP must be the same in the base year, the deflator for the base year is always 100.

As you know, inflation is a closely monitored aspect of macroeconomic performance and a significant variable guiding macroeconomic policy. Using the GDP deflator, the inflation rate between two consecutive years can be compute using the following procedure:

$$\text{Inflation rate in year 2} = \frac{\text{GDP deflator in year 2 - GDP deflator in year 1}}{\text{GDP deflator in year 1}} \times 100$$

GDP Deflator in India is expected to reach **154.87 points** by the end of 2022, according to Trading Economics global macro models and analysts expectations. In the long-term, the India GDP Deflator is projected to trend around **167.94** points in 2023 and **175.67** points in 2024, according to econometric models.

Inflation Rate in 2023 = (167.94 - 154.87) / 154.87 * 100

Inflation Rate in 2023 as compared to 2022 will be 8.439 percent.

Numerical Illustrations

ILLUSTRATION 1

Find out GDP Deflator? Interpret It

			(In Billion Rs.)
Years	**Nominal GDP**	**Real GDP**	**GDP Deflator**
2014	500	500	100
2015	800	650	123.08
2016	1150	800	143.75
2017	1300	950	136.84
2018	1550	1190	130.25
2019	1700	1240	137.10

SOLUTION

A deflator above 100 is an indication of price levels being higher as compared to the base year. From years 2015 through 2019, we find that price levels are higher than that of the base year, the highest being in the year 2016.If the GDP deflator is greater than 100, then nominal

GDP is greater than real GDP. If the GDP deflator next year is less than the GDP deflator this year, then the price level has fallen; if it is greater, price levels have increased.

ILLUSTRATION 2

The nominal and real GDP respectively of a country in a particular year are ₹3000 Crores and ₹4700 Crores respectively. Calculate GDP deflator and comment on the level of prices of the year in comparison with the base year.

SOLUTION

Nominal GDP =   ₹ 3000 Crores

Real GDP   =   ₹ 4700 Crores

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

$$\frac{3000}{4700} \times 100 = 63.83$$

The price level has fallen since GDP deflator is less than 100 at 63.83.

ILLUSTRATION 3

Find nominal GDP if real GDP = 450 and price index = 120

SOLUTION

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

$$\text{Nominal GDP} = 450 \times \frac{120}{100} = 540$$

ILLUSTRATION 4

Suppose nominal GNP of a country in 2010 is given at ₹600 Crores and price index is given as base year 2010 is 100. Now let the nominal GDP increases to ₹1200 Crores in 2018 and the price index rises to 110, find out real GDP?

SOLUTION

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

$$= 1200 \ \frac{100}{110} = 1090.9 \text{ Crores}$$

Net Domestic Product

As you know capital wears out, or depreciates, while it is being used to produce output, Net Domestic Product (NDP) is equal to **GDP minus depreciation**. NDP thus comes closer to measuring the net amount of goods and services produced in the country in a given period of time. It is the total value of production minus the value of capital used up in producing that output. Other considerations such as asset obsolescence and complete destruction are also taken into account by the NDP.

$$\text{NDP }_{MP} = \text{GDP }_{MP} - \text{Depreciation}$$

As you are aware, the basis of distinction between 'gross' and 'net' is depreciation or consumption of fixed capital.

Gross = Net + Depreciation or Net = Gross – Depreciation

1.3.2 Gross National Product (GNP)

Gross National Product (GNP) is a measure of the market value of all final economic goods and services, produced within the domestic territory of a country by normal residents during an accounting year including net factor incomes from abroad. It is the total income earned by a nation's permanent residents (called nationals). It differs from GDP by including income that our citizens earn abroad and excluding income that foreigners earn here. Profits earned by Apple from its Indian manufacturing operations is part of India's GDP but these profits are part of USA's GNP.

Gross National Product (GNP) is evaluated at market prices and therefore it is in fact Gross National Product at market prices (GNP $_{MP}$).

GNP $_{MP}$ = GDP $_{MP}$ + Factor income earned by the domestic factors of production employed in the rest of the world **-** Factor income earned by the factors of production of the rest of the world employed in the domestic territory.

GNP $_{MP}$ = GDP $_{MP}$ + Net Factor Income from Abroad

GDP $_{MP}$ = GNP $_{MP}$ – Net Factor Income from Abroad (NFIA)

NFIA is the difference between the aggregate amount that a country's citizens and companies earn abroad, and the aggregate amount that foreign citizens and overseas companies earn in that country.

NFIA = Net compensation of employees + Net income from property and entrepreneurship + Net retained earnings

If Net Factor Income from Abroad is positive, then GNP**MP** would be greater than GDP**MP**.

You might have noticed that the distinction between 'national' and 'domestic' is net factor income from abroad.

> **National = Domestic + Net Factor Income from Abroad**

1.3.5 Net National Product at Market Prices (NNP$_{MP}$)

Net National Product at Market Prices (NNP$_{MP}$) is a measure of the market value of all final economic goods and services, produced by normal residents within the domestic territory of a country including Net Factor Income from Abroad during an accounting year excluding depreciation.

> **NNP $_{MP}$ = GNP $_{MP}$ – Depreciation**
>
> **NNP $_{MP}$ = NDP $_{MP}$ + Net Factor Income from Abroad**
>
> **NNP $_{MP}$ = GDP $_{MP}$ + Net Factor Income from Abroad – Depreciation**

1.3.6 Gross Domestic Product at Factor Cost (GDP$_{FC}$)

Gross domestic product (GDP) at factor cost is **GDP at market prices minus net indirect taxes**. The money value of output produced within a country's domestic limits in a year, as received by the factors of production, is measured by GDP at factor cost.

Thus, we find that the basis of distinction between market price and factor cost is net indirect taxes (i.e., Indirect taxes - Subsidies).

> **Market Price = Factor Cost + Net Indirect Taxes**
>
> **= Factor Cost + Indirect Taxes – Subsidies**

> **Factor Cost = Market Price - Net Indirect Taxes**
>
> **= Market Price - Indirect Taxes + Subsidies**

> **Gross Domestic Product at Factor Cost (GDP$_{FC}$)**
>
> **= GDP $_{MP}$ – Indirect Taxes + Subsidies**
>
> **= Compensation of employees**
>
> **+ Operating Surplus (rent + interest+ profit)**
>
> **+ Mixed Income of Self- employed**
>
> **+ Depreciation**

GDP at Factor Cost

Industry	₹ in crore) Gross Domestic Product		Percentage change over previous year
	Previous Year	**Present Year**	
	Q2	**Q2**	**Q2**
1. agriculture, forestry and fishing	131,550	135,789	3.2
2. mining and quarrying	25,509	24,774	-2.9
3. manufacturing	187,763	192,849	2.7
4. electricity, gas and water supply	22,894	25,137	9.8
5. construction	91,556	95,489	4.3
6. trade, hotels, transport and communication	311,166	342,080	9.9
7. financing, ins., real est. and business services	208,644	230,627	10.5
8. community, social and personal services	169,390	180,511	6.6
GDP at factor cost	**1,148,472**	**1,227,254**	**6.9**

Factor Cost vs Basic Price vs Market Price

At this stage, we need to clearly understand the difference between the concepts: 'market price' and 'factor cost and Basic Price

GDP at Basic Price excludes any taxes on products the producer receives from the purchaser and passes on to the government (Eg: GST or Sales Tax or Services Tax) but includes any subsidies the producer receives from the government and uses to lower the prices charged to purchasers. In simple terms, the basic price is the subsidised price without tax.

Basic price = factor cost + Production taxes – Production subsidy

Relationship between Factor Cost and Basic Price:

Factor cost + production tax – production subsidies = Basic prices.

Relationship between Basic Price and Market Price:

Basic Price + Product tax – Product Subsidy = Market Price.

Note: Thus, market price includes both product tax as well as production tax while excluding both product and production subsidies.

1.3.7 Net Domestic Product at Factor Cost (NDP$_{FC}$)

Net Domestic Product at Factor Cost (NDP$_{FC}$)is defined as the total factor incomes earned by the factors of production. In other words, it is sum of domestic factor incomes or domestic income net of depreciation.

As mentioned above, market price includes indirect taxes imposed by government.   We have to deduct indirect taxes and add the subsidies in order to calculate that part of domestic product which actually accrues to the factors of production. The measure that we obtain so is called Net Domestic Product at factor cost.

> **NDP$_{FC}$ = NDP $_{MP}$ – Net Indirect Taxes**
>
> **= Compensation of employees**
>
> **+ Operating Surplus (rent + interest+ profit)**
>
> **+ Mixed Income of Self- employed**

1.3.8 Net National Product at Factor Cost (NNP$_{FC}$)or National Income

National Income is defined as the factor income accruing to the normal residents of the country during a year. It is the sum of domestic factor income and net factor income from abroad. In other words, national income is the value of factor income generated within the country plus factor income from abroad in an accounting year.

NNP$_{FC}$ = National Income = FID (factor income earned in domestic territory) + NFIA.

If NFIA is positive, then national income will be greater than domestic factor incomes.

1.3.9 Per Capita Income

The GDP per capita is a measure of a country's economic output per person. It is obtained by dividing the country's gross domestic product, adjusted by inflation, by the total population. It serves as an indicator of the standard of living of a country.

1.3.10 Personal Income

While national income is income earned by factors of production, Personal Income is the income received by the household sector including Non-Profit Institutions Serving Households. Thus, national income is a measure of income earned and personal income is a measure of actual current income receipts of persons from all sources which may or may not be earned from productive activities during a given period of time. Examples of this include transfer payments such as social security benefits, unemployment compensation, welfare

payments etc. Individuals also contribute income which they do not actually receive; for example, undistributed corporate profits and the contribution of employers to social security. Personal income excludes retained earnings, indirect business taxes, corporate income taxes and contributions towards social security. Households receive interest payments from the firms and governments; they also make interest payments to firms and governments. As such, the net interest paid by households to firms and government is also deducted from national income. Personal income forms the basis for consumption expenditures and is derived from national income as follows:

> **PI = NI + income received but not earned – income earned but not received.**
>
> **PI = NI - Undistributed profits – Net interest payments made by households – Corporate Tax +Transfer Payments to the households from firms and government.**

An important point to remember is that national income is not the sum of personal incomes because personal income includes transfer payments (eg. pension) which are excluded from national income. Further, not all national income accrues to individuals as their personal income.

1.3.11 Disposable Personal Income (DI)

Disposable personal income is a measure of the amount of the money in the hands of the individuals that is available for their consumption or savings. Disposable personal income is derived from personal income by subtracting the direct taxes paid by individuals and other compulsory payments made to the government.

> **DI = PI - Personal Income Taxes – Non tax payments**

Apart from the above aggregates, a few other aggregates are reported in India. These reflect the amount of goods and services the domestic economy has at its disposal. Two more concepts need to be understood, namely:

1. **Net National Disposable Income**

   Net National Disposable Income **(**NNDI) = Net National Income + other net current transfers from the rest of the world (Receipts less payments)

   Net National Disposable Income (NNDI) = NNI + net taxes on income and wealth receivable from abroad + net social contributions and benefits receivable from abroad.

2. **Gross National Disposable Income (GNDI)** = NNDI + CFC = GNI + other net current transfers from the rest of the world (Receipts less payments)

   (Other Current Transfers refer to current transfers other than the primary incomes)

(For a detailed explanation of concepts please refer 'Glossary of Main Terms' Apr 1, 2020 - National Accounts Statistics-Sources & Methods, 2007, MOSPI)

Domestic Income may be categorized into:

1. Income from domestic product accruing to the public sector which includes income from property and entrepreneurship accruing to government administrative departments and savings of non-departmental enterprises.

2. Income from domestic product accruing to private sector = NDP_{FC} - Income from property and entrepreneurship accruing to government administrative departments - Savings of non-departmental enterprises.

1.3.12 Private Income

Private income is a measure of the income (both factor income and transfer income) which accrues to private sector from all sources within and outside the country.

Private Income = Factor income from net domestic product accruing to the private sector + Net factor income from abroad + National debt interest + Current transfers from government + Other net transfers from the rest of the world.

Numerical Illustrations

ILLUSTRATION 5

From the following data, calculate NNP_{FC}, NNP_{MP}, GNP_{MP} and GDP_{MP}.

Items	₹ in Crores
Operating surplus	2000
Mixed income of self-employed	1100
Rent	550
Profit	800
Net indirect tax	450
Consumption of fixed capital	400
Net factor income from abroad	-50
Compensation of employees	1000

SOLUTION

GDP_{MP} = Compensation of employees + mixed income of self-employed + operating surplus + depreciation + net indirect taxes

(Note: operating surplus = rent+ profit + interest)

$$=1000 + 1100 + 2000 + 400 + 450 = 4950$$

$GNP_{MP} = GDP_{MP} + NFIA = 4950 + (-50) = 4900$

$NNP_{MP} = GNP_{MP}$ P consumption of fixed capital $= 4900 – 400 = 4500$

NNP_{FC} or NI $= NNP_{MP} – NIT = 4500 – 450 = = 4050$ Crores

ILLUSTRATION 6

From the following data, estimate National Income and Personal Income.

Items	₹. in Crores
Net national product at market price	1,891
Income from property and entrepreneurship accruing to government administrative departments	45
Indirect taxes	175
Subsidies	30
Saving of non-departmental enterprises	10
Interest on National debt	15
Current transfers from government	35
Current transfers from rest of the world	20
Saving of private corporate sector	25
Corporate profit tax	25

SOLUTION

National Income = Net national product at market price – Indirect taxes + Subsidies

= 1,891 – 175 + 30 = 1746crores

Personal Income = National income – Income from property and entrepreneurship accruing to government administrative departments – Saving of non-departmental enterprises + National debt interest + Current transfers from government + Current transfers from rest of the world – Saving of private corporate sector – Corporate profit tax

= 1746 – 45 –10+ 15 + 35 + 20 – 25 – 25

= 1711 Crores

ILLUSTRATION 7

Calculate the aggregate value of depreciation when the GDP at market price of a country in a particular year was ₹ 1,100 Crores. Net Factor Income from Abroad was ₹ 100 Crores. The value of Indirect taxes – Subsidies was ₹ 150 Crores and National Income was ₹ 850 Crores.

SOLUTION

Given

GDP_{MP} = 1100 Crores, NFIA = 100 Crores, NIT =150 Crores, NNP_{FC} = 850 Crores

∴ GDP_{FC} = GDP_{MP}- NIT = 1100 – 150 = 950

GNP_{FC} = GDP_{FC}+ NFIA = 950 + 100 = 1050

NNP_{FC} = GNP_{FC}- Depreciation

850   = 1050- Depreciation

Depreciation = 1050 – 850 = 200 Crores.

ILLUSTRATION 8

On basis of following information, calculate NNP at market price and Disposable personal income

Items	₹ in Crores
NDP at factor cost	14900
Income from domestic product accruing to government	150
Interest on National debt	170
Transfer payment by government	60
Net private donation from abroad	30
Net factor income from abroad	80
Indirect taxes	335
Direct taxes	100
Subsidies	262
Taxes on corporate profits	222
Undistributed profits of corporations	105

SOLUTION

NNP at Market price   = NNP at factor cost +indirect tax-subsidies

Where NNP at factor cost   = NDP_{FC} + NFIA

$$= 14900 + 80 = 14980$$

Therefore, NNP $_{MP}$ = Therefore, NNP $_{MP}$ = 14980 + 335 − 262 = 15053

Disposable personal income (DI) = PI- Personal income tax

PI = NI + income received but not earned − income earned but not received
= 14980+ 170+60 +30 -150 -222- 105 = 14763

Therefore, DI= 14763- 100 = 14663 Crores

1.4 MEASUREMENT OF NATIONAL INCOME IN INDIA

1.4.1 The Circular Flow of Income

Circular flow of income refers to the continuous circulation of production, income generation and expenditure involving different sectors of the economy. There are three different interlinked phases in a circular flow of income, namely: production, distribution and disposition as can be seen from the following figure.

Figure 1.1.1

Circular Flow of Income
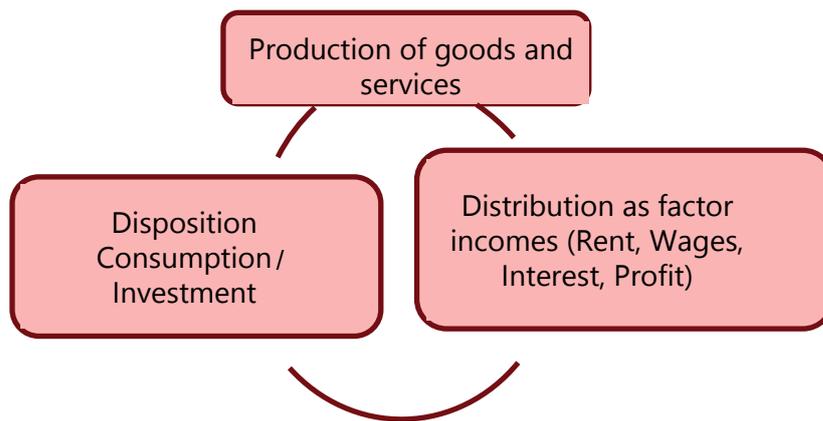
(i)   In the production phase, firms produce goods and services with the help of factor services.

(ii)   In the income or distribution phase, the flow of factor incomes in the form of rent, wages, interest and profits from firms to the households occurs

(iii)   In the expenditure or disposition phase, the income received by different factors of production is spent on consumption goods and services and investment goods. This expenditure leads to further production of goods and services and sustains the circular flow.

These processes of production, distribution and disposition keep going on simultaneously and enable us to look at national income from three different angles namely: as a flow of production or value added, as a flow of income and as a flow of expenditure. Each of these different ways of looking at national income suggests a different method of calculation and requires a different set of data. The details in respect of what is measured and what data are required for all three methods mentioned above are given in the following table.

Table 1.1.1

Data requirements and Outcomes of Different Methods of National Income Calculation

Method	Data required	What is measured
Phase of Output: Value added method (Product Method)	The sum of net values added by all the producing enterprises of the country	Contribution of production units
Phase of income: Income Method	Total factor incomes generated in the production of goods and services	Relative contribution of factor owners
Phase of disposition: Expenditure method	Sum of expenditures of the three spending units in the economy, namely, government, consumer households, and producing enterprises	Flow of consumption and investment expenditures

Corresponding to the three phases, there are three methods of measuring national income. They are: Value Added Method (alternatively known as Product Method); Income Method; and Expenditure Method.

1.4.2 Value Added Method or Product Method

National income by value added method is the sum total of net value added at factor cost across all producing units of the economy. The value added method measures the contribution of each producing enterprise in the domestic territory of the country in an accounting year and entails consolidation of production of each industry less intermediate purchases from all other industries. This method of measurement shows the unduplicated contribution by each industry to the total output. This method involves the following steps:

Step1. Identifying the producing enterprises and classifying them into different sectors according to the nature of their activities

All the producing enterprises are broadly classified into three main sectors namely:

(i)   Primary sector,

(ii)   Secondary sector, and

(iii)   Tertiary sector or service sector

These sectors are further divided into sub-sectors and each sub-sector is further divided into commodity group or service-group.

Step 2. Estimating the gross value added (GVA_{MP}) by each producing enterprise (This is the same as GDP_{MP})

> **Gross value added (GVA $_{MP}$) = Value of output – Intermediate consumption**
>
> **= (Sales + change in stock) – Intermediate consumption**

(Note that imports are included in the value of intermediate consumption if total purchases are given. If domestic purchases are specifically mentioned, then imports will also be added. Also, sales include exports, if domestic sales are separately mentioned, exports need to be added)

Step 3. Estimation of National income

For each individual unit, Net value added is found out.

> **∑ (GVA $_{MP}$) – Depreciation = Net value added (NVA $_{MP}$)**

By adding net value-added or net products of all the sub-sectors of a sector, we get the value-added or net product of that sector. For the economy as a whole, we add the net products contributed by each sector to get Net Domestic Product. We subtract net indirect taxes and add net factor income from abroad to get national income.

> **Net value added (NVA $_{MP}$) – Net Indirect taxes = Net Domestic Product (NVA $_{FC}$)**

> **Net Domestic Product (NVA $_{FC}$) + (NFIA) = National Income (NNP $_{FC}$)**

The values of the following items are also included:

(i)   Own account production of fixed assets by government, enterprises and households.

(ii)   Imputed value of production of goods for self- consumption, and

(iii)   Imputed rent of owner occupied houses.

(iv)   Change in stock(inventory)

1.4.3 Income Method

Production is carried out by the combined effort of all factors of production. The factors are paid factor incomes for the services rendered. In other words, whatever is produced by a producing unit is distributed among the factors of production for their services.

Under Factor Income Method, also called Factor Payment Method or Distributed Share Method, national income is calculated by summation of factor incomes paid out by all production units within the domestic territory of a country as wages and salaries, rent, interest, and profit. By definition, it includes factor payments to both residents and non-residents.

Thus,

NDP_{FC} = Sum of factor incomes paid out by all production units within the domestic territory of a country

---

NNP_{FC} or National Income= Compensation of employees

+ Operating Surplus (rent + interest+ profit)

+ Mixed Income of Self- employed

+ Net Factor Income from Abroad

Only incomes earned by owners of primary factors of production are included in national income. Thus, while wages of labourers will be included, pensions of retired workers will be excluded from national income. Compensation of employees includes, apart from wages and salaries, bonus, dearness allowance, commission, employers' contribution to provident fund and imputed value of compensation in kind. Non-labour income includes rent (actual and imputed), royalty, interest on loans availed for productive services, dividends, undistributed profits of corporations before taxes, and profits of unincorporated enterprises and of government enterprises.

(Note: Interest paid by the government on public debt, interest on consumption loans and interest paid by one firm to another are excluded.

Profit =Corporate taxes+ dividend retained+ earnings)

While using income method, capital gains, windfall profits, transfer incomes and income from sale of second-hand goods and financial assets and payments out of past savings are not included. However, commissions, brokerages and imputed value of services provided by owners of production units will be included as these add to the current flow of goods and services.

Usually it is difficult to separate labour income from capital income because in many instances people provide both labour and capital services. Such is the case with self-employed people

like lawyers, engineers, traders, proprietors etc. In economies where subsistence production and small commodity production is dominant, most of the incomes of people would be of mixed type. In sectors such as agriculture, trade, transport etc. in underdeveloped countries (including India), it is difficult to differentiate between the labour element and the capital element of incomes of the people. In order to overcome this difficulty a new category of incomes, called 'mixed income' is introduced which includes all those incomes which are difficult to separate.

1.4.4 Expenditure Method

In the expenditure approach, also called Income Disposal Approach, national income is the aggregate final expenditure in an economy during an accounting year.

$$GDP_{MP} = \sum \text{Final Expenditure}$$

In this approach to measuring GDP which considers the demand side of the products, we add up the value of the goods and services purchased by each type of final user mentioned below.

1.   **Final Consumption Expenditure**

(a)   Private Final Consumption Expenditure (PFCE)

To measure this, the volume of final sales of goods and services to consumer households and non-profit institutions serving households acquired for consumption (not for use in production) are multiplied by market prices and then summation is done. It also includes the value of primary products which are produced for own consumption by the households, payments for domestic services which one household renders to another, the net expenditure on foreign financial assets or net foreign investment. Land and residential buildings purchased or constructed by households are not part of PFCE. They are included in gross capital formation. Thus, only expenditure on final goods and services produced in the period for which national income is to be measured and net foreign investment are included in the expenditure method of calculating national income.

(b)   Government Final Consumption Expenditure

Since the collective services provided by the governments such as defence, education, healthcare etc. are not sold in the market, the only way they can be valued in money terms is by adding up the money spent by the government in the production of these services. This total expenditure is treated as consumption expenditure of the government. Government expenditure on pensions, scholarships, unemployment allowance etc. should be excluded because these are transfer payments.

2. **Gross Domestic Capital formation**

Gross domestic fixed capital formation (Gross Investment) is that part of country's total expenditure which is not consumed but added to the nation's fixed tangible assets and stocks. It consists of the acquisition of fixed assets and the accumulation of stocks. The stock accumulation is in the form of changes in stock of raw materials, fuels, finished goods and semi-finished goods awaiting completion. Thus, gross investment includes final expenditure on machinery and equipment and own account production of machinery and equipment, expenditure on construction, expenditure on changes in inventories, and expenditure on the acquisition of valuables such as, jewellery and works of art.

3. **Net Exports**

Net exports are the difference between exports and imports of a country during the accounting year. It can be positive or negative.

How do we arrive at national income or NNP_{FC} using the expenditure method?

$GDP_{MP} = C + GDFC + NX$

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

$GNP_{FC} = GNP_{MP} - NIT$

$NNP_{FC} = GNP_{FC} -$ Depreciation

Ideally, all the three methods of national income computation should arrive at the same figure. When the national income of a country is measured separately using these methods, we get a three dimensional view of the economy. Each method of measuring GDP is subject to measurement errors and each method provides a check on the accuracy of the other methods. By calculating total output in several different ways and then trying to resolve the differences, we will be able to arrive at a more accurate measure than would be possible with one method alone. Moreover, different ways of measuring total output give us different insights into the structure of our economy.

Income method may be most suitable for developed economies where people properly file their income tax returns. With the growing facility in the use of the commodity flow method of estimating expenditures, an increasing proportion of the national income is being estimated by expenditure method. As a matter of fact, countries like India are unable to estimate their national income wholly by one method. Thus, in the agricultural sector, net value added is estimated by the production method, in the small scale sector net value added is estimated by the income method and in the construction sector net value added is estimated by the expenditure method.

Numerical Illustrations

ILLUSTRATION 9

Calculate National Income by Value Added Method with the help of following data-

Particulars	₹ (in Crores)
Sales	700
Opening stock	500
Intermediate Consumption	350
Closing Stock	400
Net Factor Income from Abroad	30
Depreciation	150
Excise Tax	110
Subsidies	50

SOLUTION

$NVA_{(FC)}$	= GDP $_{(MP)}$ –Depreciation +NFIA- Net Indirect Tax
Where GVA$_{(MP)}$	= Value of output- intermediate consumption
Value of Output	= Sales+ change in stock
	= 700+ (400-500)=600
GVA$_{(MP)}$	= 600 – 350= 250
Therefore NI	= 250-150 +30-(110-50)
	= 70 Crores

ILLUSTRATION 10

Calculate the Operating Surplus with the help of following data-

Particulars	₹ in Crores
Sales	4000
Compensation of employees	800
Intermediate consumption	600
Rent	400
Interest	300

Net indirect tax	500
Consumption of Fixed Capital	200
Mixed Income	400

SOLUTION

GVA_{MP} = Gross Value Output$_{MP}$ – Intermediate consumption

= (Sales + change in stock) – Intermediate consumption

= 4000-600 = 3400

GDP_{MP} = GVA_{MP} = 3400 Crores

NDP_{MP} = GDP_{MP} – consumption of fixed capital

= 3400 – 200

= 3200 Crores

NDP_{FC} = NDP_{MP} – NIT

= 3200 – 500 = 2700 Crores

NDP_{FC} = Compensation of employees + Operating surplus + Mixed income

2700 = 800 + Operating Surplus + 400

Operating surplus = 1500 Crores

ILLUSTRATION 11

Calculate national income by value added method.

Particulars	(₹ in crores)
Value of output in primary sector	2000
Intermediate consumption of primary sector	200
Value of output of secondary sector	2800
Intermediate consumption of secondary sector	800
Value of output of tertiary sector	1600
Intermediate consumption of tertiary sector	600
Net factor income from abroad	-30
Net indirect taxes	300
Depreciation	470

SOLUTION

GDP_{MP} = (Value of output in primary sector - intermediate consumption of primary sector) + (value of output in secondary sector - intermediate consumption of secondary sector) + (value of output in tertiary sector - intermediate consumption of tertiary sector)

Value of output in primary sector	=	2000
- Intermediate consumption of primary sector	=	200
+ Value of output in secondary sector	=	2800
- Intermediate consumption in secondary sector	=	800
+ Value of output in tertiary sector	=	1600
- Intermediate consumption of tertiary sector	=	600
GDP_{MP} =		₹ **4800 Crores**

$NNP_{FC} = GDP_{MP} + NFIA - NIT - Depreciation$

NNP_{FC} = National income = 4800+(-30)-300-470   = **4000 Crores**

ILLUSTRATION 12

Calculate Net Value Added by Factor Cost from the following data

Items	*₹ in Crores*
Purchase of materials	*85*
Sales	*450*
Depreciation	*30*
Opening stock	*40*
Closing stock	*30*
Excise tax	*45*
Intermediate consumption	*200*
Subsidies	*15*

SOLUTION

GVA_{MP} = Sales + change in stock - Intermediate consumption

= 450 + (30-40) -200

= 240 Crores

NVA_{MP} = GVA_{MP} – Depreciation

NVA_{MP} = 240-30 = 210 Crores

NVA_{FC} = NVA_{MP} – (indirect tax - subsidies)

= 210 – (45 -15) = 180Crores

ILLUSTRATION 13

Calculate NI with the help of Expenditure method and income method with the help of following data:

Items	₹ in Crores
Compensation of employees	1,200
Net factor income from Abroad	20
Net indirect taxes	120
Profit	800
Private final consumption expenditure	2,000
Net domestic capital formation	770
Consumption of fixed capital	130
Rent	400
Interest	620
Mixed income of self-employed	700
Net export	30
Govt. final consumption expenditure	1100
Operating surplus	1820
Employer's contribution to social security scheme	300

SOLUTION

By Expenditure method

GDP_{MP} = Private final consumption expenditure + Government final consumption expenditure + Gross domestic capital formation (Net domestic capital formation+ depreciation) + Net export

= 2000 + 1100 + (770+ 130) + 30= 4030Crores

NNP_{FC} or NI   = GDP_{MP}- depreciation + NFIA – NIT

                    =   4030 – 130 + 20 – 120= 3800 Crores

By Income method

NNP_{FC} or NI   =   compensation of employees+ operating surplus+ Mixed income of self-employed + NFIA

                    =   1200+ 1820+ 700+ 20= 3740Crores

ILLUSTRATION 14

From the following data calculate (a) Gross Domestic Product at Factor Cost, and (b) Gross Domestic Product at Market price

Items	₹ in Crores
Gross national product at factor cost	61,500
Net exports	(-) 50
Compensation of employees	3000
Rent	800
Interest	900
Profit	1,300
Net indirect taxes	300
Net domestic capital formation	800
Gross domestic capital formation	900
Factor income to abroad	80

SOLUTION

(a)   **GDP at factor cost** =   NDP at factor cost + Depreciation

                                  =   Compensation of employees+ Rent+ Interest + Profit + Mixed income+ (Gross domestic capital formation - Net domestic capital formation)

                                  =   ₹ 3,000 + ₹ 800 + ₹ 900 + ₹ 1,300 + (₹ 900 - ₹ 800)

                                  =   ₹ 6100 Crores

(b) **Gross Domestic Product at Market Price**

= GDP at factor cost + Net Indirect taxes = ₹ 6100 + ₹ 300

= 6400 Crores

ILLUSTRATION 15

Calculate NNP$_{FC}$. By expenditure method with the help of following information -

Items	*₹ in Crores*
Private final consumption expenditure	*10*
Net Import	*20*
Public final consumption expenditure	*05*
Gross domestic fixed capital formation	*350*
Depreciation	*30*
Subsidy	*100*
Income paid to abroad	*20*
Change in stock	*30*
Net acquisition of valuables	*10*

SOLUTION

Calculation of national income by expenditure method:

GDP$_{MP}$ = Government final consumption expenditure (Public final consumption expenditure) + Private final consumption expenditure + Gross domestic capital formation (Gross domestic fixed capital formation + change stock + Net acquisition of valuables) + Net export (Note: As net import is 20, hence, net export is -20)

= 5 +10 + [350 + 30 +10]+(- 20) = 5+10+390-20 = 385 Crores

NNP$_{FC}$ = GDP$_{MP}$ – Depreciation + Net factor income from abroad (Income from abroad – Income paid to abroad) – Net Indirect tax (Indirect tax – subsidies)

= 385 – 30 + [0 – 20] – [0-100] = 385 – 30 – 20 + 100 = 435 Crores.

1.5 THE SYSTEM OF REGIONAL ACCOUNTS IN INDIA

Regional accounts provide an integrated database on the innumerable transactions taking place in the regional economy and help decision making at the regional level. At present, practically all the states and union territories of India compute state income estimates and

district level estimates. State Income or Net State Domestic Product (NSDP) is a measure in monetary terms of the volume of all goods and services produced in the state within a given period of time (generally a year) accounted without duplication. Per Capita State Income is obtained by dividing the NSDP (State Income) by the midyear projected population of the state.

The state level estimates are prepared by the State Income Units of the respective State Directorates of Economics and Statistics (DESs). The Central Statistical Organisation assists the States in the preparation of these estimates by rendering advice on conceptual and methodological problems. In the preparation of state income estimates, certain activities such as railways, communications, banking and insurance and central government administration, that cut across state boundaries, and thus their economic contribution cannot be assigned to any one state directly are known as the 'Supra-regional sectors' of the economy. The estimates for these supra regional activities are compiled for the economy as a whole and allocated to the states on the basis of relevant indicators.

1.6　GDP AND WELFARE

Can the GDP of a country be taken as an index of the welfare of people in that country? There are many reasons to dispute the validity of GDP as a perfect measure of well-being. In fact, GDP measures our ability to obtain many requirements to make our life better; yet leave out many important aspects which ensure good quality of life for all. GDP measures exclude the following which are critical for the overall wellbeing of citizens.

(a) Income distributions and, therefore, GDP per capita is a completely inadequate measure of welfare. Countries may have significantly different income distributions and, consequently, different levels of overall well-being for the same level of per capita income.

(b) Quality improvements in systems and processes due to technological as well as managerial innovations which reflect true growth in output from year to year.

(c) Productions hidden from government authorities, either because those engaged in it are evading taxes or because it is illegal (drugs, gambling etc.).

(d) Nonmarket production (with a few exceptions) and Non-economic contributors to well-being for example: health of a country's citizens, education levels, political participation, or other social and political factors that may significantly affect well-being levels.

(e) The disutility of loss of leisure time. We know that, other things remaining the same, a country's GDP rises if the total hours of work increase.

(f)   Economic 'bads' for example: crime, pollution, traffic congestion etc which make us worse off.

(g)   The volunteer work and services rendered without remuneration undertaken in the economy, even though such work can contribute to social well-being as much as paid work.

(h)   Many things that contribute to our economic welfare such as, leisure time, fairness, gender equality, security of community feeling etc.,

(i)   Both positive and negative externalities which are external effects that do not form part of market transactions

(j)   The distinction between production that makes us better off and production that only prevents us from becoming worse off, for e.g. defence expenditures such as on police protection. Increased expenditure on police due to increase in crimes may increase GDP but these expenses only prevent us from becoming worse off. However, no reflection is made in national income of the negative impacts of higher crime rates. As another example, automobile accidents result in production of repairs, output of medical services, insurance, and legal services all of which are production included in GDP just as any other production.

1.7   LIMITATIONS AND CHALLENGES OF NATIONAL INCOME COMPUTATION

There are innumerable limitations and challenges in the computation of national income. The task is more complex in underdeveloped and developing countries. Following are the general dilemmas in measurement of national income.

There are many conceptual difficulties related to measurement which are difficult to resolve, such as:

(a)   lack of an agreed definition of national income,

(b)   accurate distinction between final goods and intermediate goods,

(c)   issue of transfer payments,

(d)   services of durable goods,

(e)   difficulty of incorporating distribution of income,

(f)   valuation of a new good at constant prices, and

(g)   valuation of government services

Other challenges relate to:

(a)   Inadequacy of data and lack of reliability of available data,

(b)   presence of non-monetised sector,

(c)   production for self-consumption,

(d)   absence of recording of incomes due to illiteracy and ignorance,

(e)   lack of proper occupational classification, and

(f)   accurate estimation of consumption of fixed capital

SUMMARY

♦   National income accounts are extremely useful for analyzing and evaluating the performance of an economy, knowing the composition and structure of the national income, income distribution, economic forecasting and for choosing economic policies and evaluating them.

♦   Gross domestic product (GDP $_{MP}$) is a measure of the market value of all final economic goods and services, gross of depreciation, produced within the domestic territory of a country during a given time period gross of depreciation.

♦   Capital goods (business plant and equipment purchases) and inventory investment— the net change in inventories of final goods awaiting sale or of materials used in the production are counted in GDP

♦   To eliminate the effect of prices, in addition to computing GDP in terms of current market prices, termed 'nominal GDP' or GDP at current prices,the national income accountants also calculate 'real GDP 'or GDP at constant prices which is the value of domestic product in terms of constant prices of a chosen base year.

♦   GNP $_{MP}$ = GDP $_{MP}$ + Net Factor Income from Abroad

♦   NDP $_{MP}$ = GDP $_{MP}$ - Depreciation

♦   NDP $_{MP}$ =NNP $_{MP}$ - Net Factor Income from Abroad

♦   NNP $_{MP}$ = GNP $_{MP}$ - Depreciation

♦   Market Price = Factor Cost + Net Indirect Taxes= Factor Cost + Indirect Taxes – Subsidies

♦   Gross Domestic Product at Factor Cost (GDP$_{FC}$) = GDP $_{MP}$ – Indirect Taxes + Subsidies

♦   Net Domestic Product at Factor Cost (NDP$_{FC}$)is defined asthe total factor incomes earned by the factors of production.

♦   Net National Product at Factor Cost (NNP$_{FC}$)or National Income

   NNP$_{FC}$ = National Income = FID (factor income earned in domestic territory) + NFIA.

♦   Personal income is a measure of the actual current income receipt of persons from all sources. Disposable Personal Income (DI) that is available for their consumption or savings DI = PI - Personal Income Taxes

♦   Circular flow of income refers to the continuous interlinked phases in circulation of production, income generation and expenditure involving different sectors of the economy.

♦   Product Method or Value Added Method is also called Industrial Origin Method or Net Output Method and entails the consolidation of the production of each industry less intermediate purchases from all other industries.

♦   Under income method, national income is calculated by summation of factor incomes paid out by all production units within the domestic territory of a country as wages and salaries, rent, interest, and profit. Transfer incomes are excluded.

♦   Under the expenditure approach, also called Income Disposal Approach, national income is the aggregate final expenditure in an economy during an accounting year composed of final consumption expenditure (private& government), gross domestic capital formation and net exports.

TEST YOUR KNOWLEDGE

Multiple Choice Type Questions

1.   The concept of 'resident unit' involved in the definition of GDP denotes

   (a)   A business enterprise which belongs to a citizen of India with production units solely situated in India

   (b)   The unit having predominant economic interest in the economic territory of the country for one year or more irrespective of the nationality or legal status

   (c)   A citizen household which had been living in India during the accounting year and one whose economic interests are solely in India

   (d)   Households and business enterprises composed of citizens of India alone living in India during the accounting year

2.   Read the following statements and answer the following question.

   I.   Intermediate consumption consists of the value of the goods and services consumed as inputs by a process of production,

II. *Intermediate consumption excludes fixed assets whose consumption is recorded as consumption of fixed capital.*

(a) *Only I is true*

(b) *Both I and II are true*

(c) *Only II is true*

(d) *Neither I nor II is true*

3. *Gross Domestic Product (GDP) of any nation*

   (a) *excludes capital consumption and intermediate consumption*

   (b) *is inclusive of capital consumption or depreciation*

   (c) *is inclusive of indirect taxes but excludes subsidies*

   (d) *None of the above*

4. *Read the following statements*

   I. *'Value added' refers to the difference between value of output and purchase of intermediate goods.*

   II. *'Value added' represents the contribution of labour and capital to the production process.*

   (a) *Statements I and II are incorrect*

   (b) *Statements I and II are correct*

   (c) *Statement I is correct and II is incorrect*

   (d) *Statement II is correct and I is incorrect*

5. *Non-economic activities are*

   (a) *those activities whose value is excluded from national income calculation as it will involve double counting*

   (b) *those which produce goods and services, but since these are not exchanged in a market transaction they do not command any market value*

   (c) *those which do not involve production of goods and services as they are meant to provide hobbies and leisure time activities*

   (d) *those which result in production for self consumption and therefore not included in national income calculation*

6. *Which of the following does not enter into the calculation of national income?*

   (a) *Exchange of previously produced goods*

(b)   Exchange of second hand goods

(c)   Exchange of stocks and bonds

(d)   All the above

7.   Which of the following enters into the calculation of national income?

(a)   The value of the services that accompany the sale

(b)   Additions to inventory stocks of final goods and materials

(c)   Stocks and bonds sold during eth current year

(d)   (a) and (b) above

8.   Gross National Product at market prices GNP $_{MP}$ is

(a)   GDP $_{MP}$ + Net Factor Income from Abroad

(b)   GDP $_{MP}$ - Net Factor Income from Abroad

(c)   GDP $_{MP}$ - Depreciation

(d)   GDP $_{MP}$ + Net Indirect Taxes

9.   Choose the correct statement

(a)   GNP includes earnings of Indian corporations overseas and Indian residents working overseas; but GDP does not include these

(b) NNP_{FC} = National Income = FID (factor income earned in domestic territory) – NFIA.

(c)   Capital goods and inventory investment are excluded from computation of GDP

(d) NDP_{MP} = GDP_{MP} + Depreciation

10.   The basis of distinction between market price and factor cost is

(a)   net factor income from abroad

(b)   net indirect taxes (i.e., Indirect taxes - Subsidies)

(c)   net indirect taxes (i.e., Indirect taxes + Subsidies)

(d)   depreciation (consumption of fixed capital)

11.   If net factor income from abroad is positive, then

(a)   national income will be greater than domestic factor incomes.

(b)   national income will be less than domestic factor incomes.

(c)   net exports will be negative

(d)   domestic factor incomes will be greater than national income

12.   The GDP per capita is

(a)   a measure of a country's economic output per person

(b)   actual current income receipts of persons

(c)   national income divided by population

(d)   (a)and (c) above

13.   Which of the following is an example of transfer payment?

(a)   Old age pensions and family pensions

(b)   Scholarships given to deserving diligent students.

(c)   Compensation given for loss of property due to floods

(d)   All the above

14.   Mixed income of the self -employed means

(a)   net profits received by self -employed people

(b)   outside wages received by self- employed people

(c)   combined factor payments which are not distinguishable,

(d)   wages due to non- economic activities

15.   Which of the following is added to national income while calculating personal income?

(a)   Transfer payments to individuals

(b)   Undistributed profits of corporate

(c)   Transfer payments made to foreigners
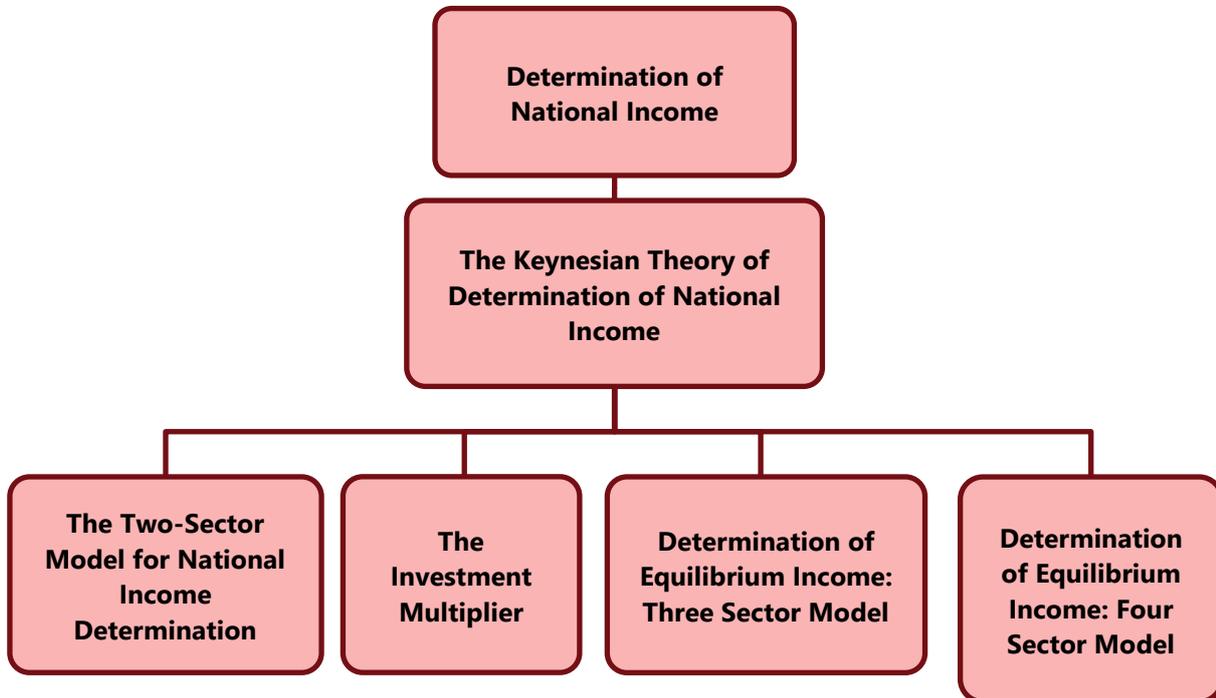
(d)   Mixed income of self employed

ANSWERS

1.	**(b)**	2.	**(b)**	3.	**(b)**	4.	**(b)**	5.	**(b)**
6.	**(d)**	7.	**(d)**	8.	**(a)**	9.	**(a)**	10.	**(b)**
11.	**(a)**	12.	**(d)**	13.	**(d)**	14.	**(c)**	15.	**(a)**

UNIT - 2: THE KEYNESIAN THEORY OF DETERMINATION OF NATIONAL INCOME

LEARNING OUTCOMES

After studying this Unit, you will be able to understand:

♦ Define Keynes' concept of equilibrium aggregate income

♦ Describe the components of aggregate expenditure in two, three and four sector economy models

♦ Explain national income determination in two, three and four sector economy models

♦ Illustrate the functioning of multiplier, and

♦ Outline the changes in equilibrium aggregate income on account of changes in its determinants.

UNIT OVERVIEW

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                    ┌─────────────────────┐
                    │   Determination of  │
                    │   National Income   │
                    └─────────────────────┘
                               │
                    ┌─────────────────────┐
                    │ The Keynesian Theory of │
                    │ Determination of National │
                    │       Income        │
                    └─────────────────────┘
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        ┌──────────────┬───────────┴───────────┬──────────────┐
┌──────────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
│ The Two-Sector │ │     The      │ │ Determination of │ │ Determination │
│ Model for National │ │ Investment   │ │ Equilibrium Income: │ │ of Equilibrium │
│     Income     │ │ Multiplier   │ │ Three Sector Model │ │ Income: Four  │
│ Determination  │ │              │ │              │ │ Sector Model  │
└──────────────┘ └──────────────┘ └──────────────┘ └──────────────┘
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2.1   INTRODUCTION

In the previous unit on National Income Accounting, we have discussed the importance of (GDP) to estimate the macro fundamentals of the country. In this unit, we shall focus on two issues namely, the factors that determine the level of national income and the determination of equilibrium aggregate income and output in an economy.

The Great Depression of the 1930's, was the greatest economic crisis the western world had experienced. The classical economist of the time had no well developed theory that would explain persistent unemployment nor any policy prescriptions to solve the problem. Many economists then recommended government spending as a way of reducing unemployment, but they had no macroeconomic theory by which to justify their recommendations. The history of modern macroeconomics was revolutionised in 1936, with the publication of John Maynard Keynes's General Theory of Employment, Interest, and Money.

The General Theory of Employment, Interest, and Money was more than a treatise for economists. It offered clear policy implications, and they were in tune with the times of the

Great Depression. Keynes introduced many of the building blocks of modern macroeconomics:

1. The relation of consumption to income, and the multiplier, which explains how shocks to aggregate demand can be amplified and lead to larger shifts in output.

2. Liquidity Preference (the term Keynes gave to the demand for money), which explains how monetary policy can affect interest rates and aggregate demand.

3. The importance of expectations in affecting consumption and investment; and the idea that shifts in expectations are a major factor behind shifts to demand and output.

The Keynesian theory of income determination is presented in three models:

(i)   The two-sector model consisting of the household and the business sectors,

(ii)   The three-sector model consisting of household, business and government sectors, and

(iii)   The four-sector model consisting of household, business, government and foreign sectors

Before we attempt to explain the determination of income in each of the above models, it is pertinent that we understand the concept of circular flow in an economy which explains the functioning of an economy.

2.2   CIRCULAR FLOW IN A SIMPLE TWO-SECTOR MODEL

Concept of circular flow

The circular flow model demonstrates how money moves through society. Money flows from producers to workers as wages and flows back to producers as payment for products. In short, an economy is an endless circular flow of money. That is the basic form of the model, but actual money flows are more complicated. Economists have added in more factors to better depict complex modern economies. These factors are the components of a nation's GDP or national income. For that reason, the model is also referred to as the circular flow of income model.

The basic purpose of the circular flow model is to understand how money moves within an economy. It breaks the economy down into two primary players: households and corporations. It separates the markets that these participants operate in as markets for goods and services and the markets for the factors of production.

Households own all factors of production and they sell their factor services to earn factor incomes which are entirely spent to consume all final goods and services produced by business firms. The business firms are assumed to hire factors of production from the

households; they produce and sell goods and services to the households and they do not save. There are no corporations, corporate savings or retained earnings. The total income produced, *Y,* accrues to the households and equals their disposable personal income Y**d** i.e., *Y* = Yd.

In the figure 1.2.1, the circular flow of income and expenditure which presents the working of the two- sector economy is illustrated in a simple manner.

Figure 1.2.1

Circular Flow in a Two Sector Economy
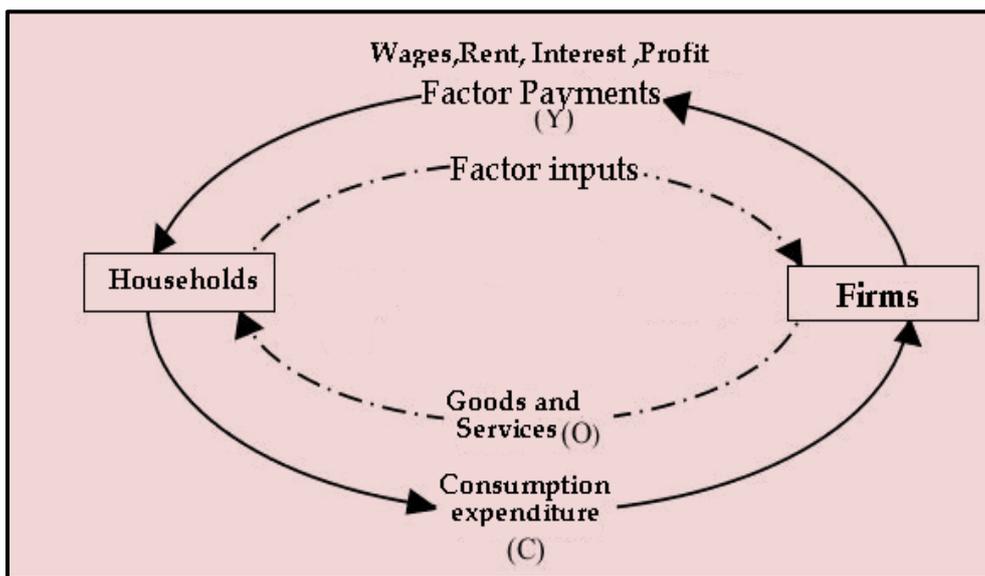
The circular broken lines with arrows show factor and product flows and present 'real flows' and the continuous line with arrows show 'money flows' which are generated by real flows. Real flows refer to the flow of the actual goods or services, while money flows refer to the payments for the services (wages, for example) or consumption payments.There are no injections into or leakages from the system. Since the whole of household income is spent on goods and services produced by firms, household expenditures equal the total receipts of firms which equal the value of output.

> Factor Payments = Household Income = Household Expenditure = Total Receipts of Firms = Value of Output.

Before we go into the discussion on the equilibrium aggregate income and changes in it, we shall first try to understand the meaning of the term 'equilibrium' (defined as a state in which there is no tendency to change; or a position of rest). Output is at equilibrium level when the quantity of output produced is equal to the quantity demanded. Logically, an economy can

be said to be in equilibrium when the production plans of the firms and the expenditure plans of the households match.

Having understood the working of the two-sector model and the meaning of equilibrium output, we shall now have the formal presentation of the theory of income determination in a two-sector model which is the simplest representation of the key principles of Keynesian economics. In the theoretical model of the economy, the ex ante values of different variables should be our primary concern. Before we discuss the Keynesian theory of income determination, let us look at the basic concepts, definitions and functions used in his theory of income determination.

2.3   BASIC CONCEPTS AND FUNCTIONS

2.3.1 Aggregate Demand Function

Aggregate demand (AD) is what economists call total planned expenditure. In a simple two-sector economy, the ex ante aggregate demand (AD) for final goods or aggregate expenditure consists of only two components:

(i)   Ex ante aggregate demand for consumer goods (C), and

(ii)   Ex ante aggregate demand for investment goods (I)

$$AD = C + I \qquad (2.1)$$

Of the two components, consumption expenditure accounts for the highest proportion of the GDP. In a simple economy, the variable I is assumed to be determined exogenously and constant in the short run. Therefore, the short-run aggregate demand function can be written as:

$$AD = C + I \qquad (2.2)$$

Where $\overline{I}$ = constant investment.

From the equation (2.2), we can infer that, in the short run, AD depends largely on the aggregate consumption expenditure. We shall now go over to the discussion on consumption function.

2.3.2 The Consumption Function

Consumption function expresses the functional relationship between aggregate consumption expenditure and aggregate disposable income, expressed as:

$$C = f (Y) \qquad\qquad (2.3)$$

When income is low, consumption expenditures of households will exceed their disposable income and households dissave i.e. they either borrow money or draw from their past savings to purchase consumption goods. If the disposable income increases, consumers will increase their planned expenditures and current consumption expenditures rise, but only by less than the increase in income.

The specific form of consumption–income relationship termed the consumption function, proposed by Keynes is as follows:

$$C = a + bY \qquad\qquad (2.4)$$

$$MPC = \frac{\Delta C}{\Delta Y} = b \qquad (2.5)$$

where C = aggregate consumption expenditure; Y= total disposable income; a is a constant term which denotes the (positive) value of consumption at zero level of disposable income; and the parameter b, the slope of the function, (ΔC /ΔY) is the marginal propensity to consume (MPC) i.e. the increase in consumption per unit increase in disposable income.

Figure 1.2.2

The Keynesian Consumption Function
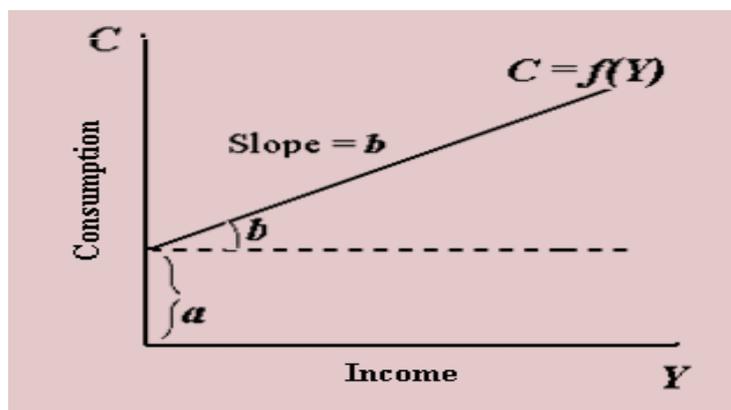
The consumption function shows the level of consumption (C) corresponding to each level of disposable income (Y) and is expressed through a linear consumption function, as shown by the line marked C = f(Y) in figure 1.2.2.

The Keynesian assumption is that consumption increases with an increase in disposable income, but that the increase in consumption will be less than the increase in disposable

income (b <1). i.e. 0 < b < 1. This fundamental relationship between income and consumption plays a crucial role in the Keynesian theory of income determination.

2.3.3 Relationship Between Income and Consumption

Just as marginal propensity to consume, the average propensity to consume is a ratio of consumption defining income consumption relationship. The ratio of total consumption to total income is known as the average propensity to consume (APC).

$$APC = \frac{Total\ Consumption}{Total\ Income} = \frac{C}{Y} \quad (2.6)$$

The table below shows the relationship between income and consumption

Table 1.2.1

Relationship between Income and Consumption

Income (Y) (₹ Crores)	Consumption (C) (₹ Crores)	Saving (₹ Crores)	APC (C/Y)	MPC (ΔC /ΔY)
0	50	-50	∞	-
100	125	-25	125/100 = 1.25	75/100 = 0.75
200	200	0	200/200 = 1.00	75/100 = 0.75
300	275	25	275/300 = 0.92	75/100 = 0.75
400	350	50	350/400=0.88	75/100 = 0.75
500	425	75	425/500=0.85	75/100 = 0.75

Note: The conventional Keynesian MPC is assumed to have a constant value less than 1.00 and usually greater than 0.50:

APC is calculated at various income levels. It is obvious that the proportion of income spent on consumption decreases as income increases. What happens to the rest of the income that is not spent on consumption? If it is not spent, it must be saved because income is either spent or saved; there are no other uses to which it can be put. Thus, just as consumption, saving is a function of disposable income: S=f(Y).

2.3.5 The Relationship Between Income, Consumption and Saving

Saving is also a function of disposable income. The saving function shows the functional relationship between national income (= disposable income in two sector model) and saving.

$$S = f(Y)$$

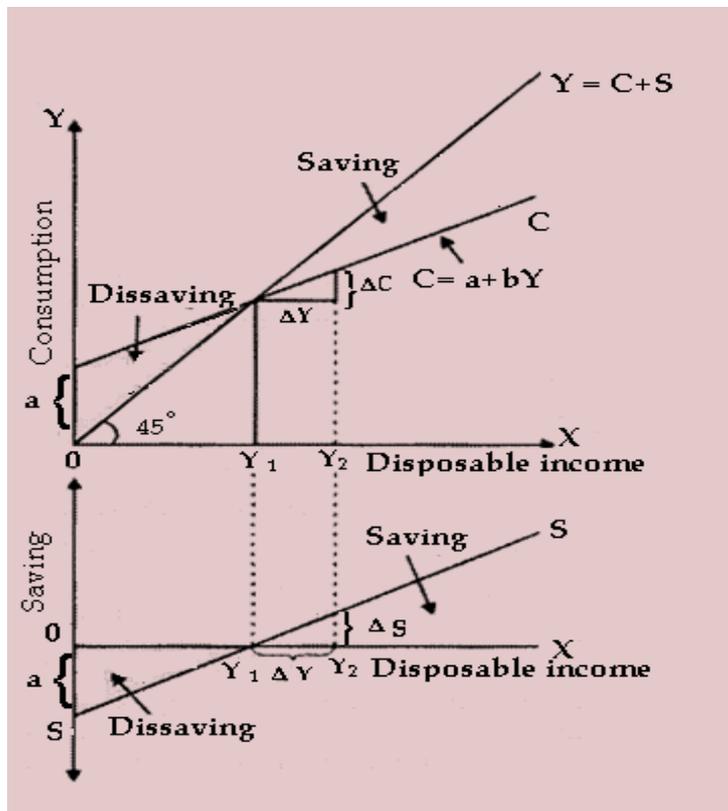This can be illustrated with the following table and diagram.

Table 1.2.2

Relationship between Income, Consumption and Saving

Disposable Income (Yd) (₹ Crores)	Consumption (C) (₹ Crores)	Saving (S) (₹ Crores)
0	20	-20
60	70	-10
120	120	0
180	170	10
240	220	20

Figure 1.2.3.

The Consumption and Saving Function

In figure 1.2.3, the consumption and saving functions are graphed. The saving function shows the level of saving (S) at each level of disposable income (Y). We know that consumption at zero level of income is positive (equal to a), and as such there should be dissaving also of the same magnitude. By definition, national income $Y = C + S$, Therefore, $S = Y - C$.

The slope of the saving function is the marginal propensity to save. If a one-unit increase in disposable income leads to an increase of 'b' units in consumption, the remainder (1 - b) is the increase in saving. The marginal propensity to save is the increase in saving per unit increase in disposable income.

(MPS) , s = 1-c

Saving is an increasing function of the level of income. In other words, saving increases as income rises.

$$\text{MPS} = \frac{\Delta S}{\Delta Y} = 1 - b \quad (2.7)$$

Marginal Propensity to Consume (MPC) is always less than unity, but greater than zero, i.e., 0 < b < 1 Also, MPC + MPS = 1; we have MPS 0 < b < 1. Thus, saving is an increasing function of the level of income because the marginal propensity to save (MPS) = 1- b is positive, i.e. saving increases as income increases.

Average Propensity to Save (APS)

The ratio of total saving to total income is called average propensity to save (APS). Alternatively, it is that part of total income which is saved.

$$\text{APS} = \frac{Total\ Saving}{Total\ Income} = \frac{S}{Y} \quad (2.8)$$

2.3.8 Aggregate Supply:

Ex ante or planned aggregate supply is the total supply of goods and services which firms in a national economy plan on selling during a specific time period. It is equal to the national income of the economy, which is either consumed or saved.

$$AS = C + S$$

Numerical Illustrations

ILLUSTRATION 1

What will be the value of average propensity to save when -

(i)   C = 200 at Y = 1,000

(ii)   S = 450 at Y = 1,200

SOLUTION

(i) $APS = \frac{S}{Y}$; S = Y − C = 1,000 − 200 = 800. Therefore, $APS = \frac{S}{Y} = \frac{800}{1000} = 0.8$

(ii)   When S = 450 and Y = 1,200; $APS = \frac{S}{Y} = 450/1200 = 0.375$

2.4   THE TWO-SECTOR MODEL OF NATIONAL INCOME DETERMINATION

In this section, we shall describe the two-sector model of determination of equilibrium levels of output and income in its formal form using the aggregate demand function and the aggregate supply function. The equilibrium level of income and output in the Keynesian framework is that level at which aggregate demand (C+ I) and aggregate supply (C + S) or output are equal. In other words, Investment is equal to Savings.
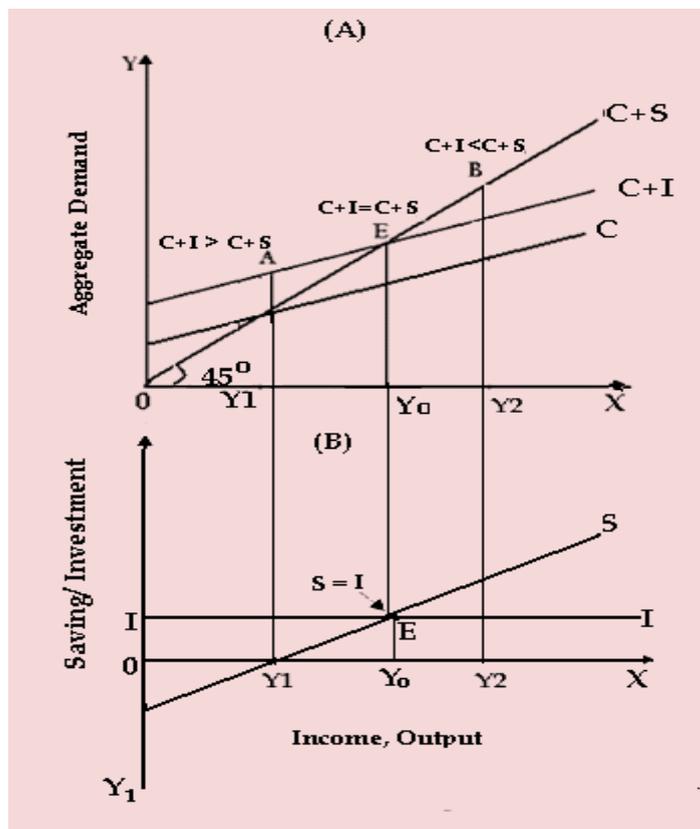
C + I = C + S

or

I = S   (2.9)

Figure 1.2.4

Determination of Equilibrium Income: Two Sector Model

In figure 1.2.4, the aggregate demand curve is linear and positively sloped indicating that as the level of national income rises, the aggregate demand (or aggregate spending) in the

economy also rises. The aggregate expenditure line is flatter than the 45-degree line because, as income rises, consumption also increases, but by less than the increase in income. The 45-degree line illustrates every single point at which planned aggregate expenditure, measured on the Y, or vertical axis, is equal to planned aggregate production, which is measured on the X, or horizontal axis. In other words, all points on the 45° line indicate that aggregate expenditure equal aggregate output; i.e. (C+I) is equal to Y or (C+S). Therefore, the line maps out all possible equilibrium income levels.

For all points below the 45-degree line, planned aggregate expenditure is lesser than GDP and for all points above the 45-degree line; planned aggregate expenditure is greater than GDP. we would like equilibrium to occur at potential GDP i.e. at the level of full employment. Only at point E and at the corresponding equilibrium levels of income and output Y_O does aggregate demand exactly equals output. At that level of output and income, planned spending precisely matches production.

You may bear in mind the basic point that according to Keynes, aggregate demand will not always be equal to aggregate supply. Aggregate demand depends on the households' plan to consume and to save. Aggregate supply depends on the producers' plan to produce goods and services. In other words, **aggregate supply** represents **aggregate value expected by business firms** and **aggregate demand represents their realised value**. For the aggregate demand and the aggregate supply to be equal so that equilibrium is established, the households' plan must coincide with producers' plan. At equilibrium, expected value equals realised value. However, Keynes held the view that that there is no reason to believe that:

(i)   consumers' consumption plan always coincides with producers' production plan, and

(ii)   that producers' plan to invest matches always with households' plan to save.

Putting it differently, there is no reason for C + I and C + S to always be equal.

The investment function (*I*) is shown in panel B of the figure, equilibrium, planned investment equals savings Above the equilibrium of income Y_0, saving (the distance between the 45 degree line and the consumption schedule) exceeds planned investment, while below equilibrium level of income Y_0 , planned investment exceeds saving.

The equality between saving and investment can be seen directly from national income accounting . Since income is either spent or saved, Y = C+S. Without government and foreign trade, aggregate demand equals consumption plus investment, Y=C+I. Putting the two together, we have C+S = C+I, or S=I.

If the leakages are greater than the injections, then national income will fall, while if injections are greater than leakages, national income will rise. The national income will be in equilibrium only when intended saving is equal to intended investment. If there is any deviation from

equilibrium, i.e. planned saving is not equal to planned investment, the process of readjustment will bring the economy back to equilibrium.

2.4.1 Equilibrium with Unemployment or Inflation

An important point to remember is that Keynesian equilibrium with equality of planned aggregate expenditures and output need not take place at full employment. If the aggregate expenditure line intersects the 45-degree line at the level of potential GDP, then there is full employment equilibrium. There is no recession, and unemployment is at the natural rate. But there is no guarantee that the equilibrium will occur at the potential GDP level of output. The economy can settle at any equilibrium which might be higher or lower than the full employment equilibrium.

(i)   Deflationary Gap

If the aggregate demand is for an amount of output less than the full employment level of output, then we say there is deficient demand. Deficient demand gives rise to a 'deflationary gap' or 'recessionary gap'. Recessionary gap also known as 'contractionary gap' arises in the Keynesian model of the macro economy when the equilibrium level of aggregate production achieved in the short-run falls short of what could be produced at full employment. Recessionary gap occurs when the economy is in a business-cycle contraction or recession.

Figure 1.2.5
Deficient Demand - Deflationary Gap

(C+I)
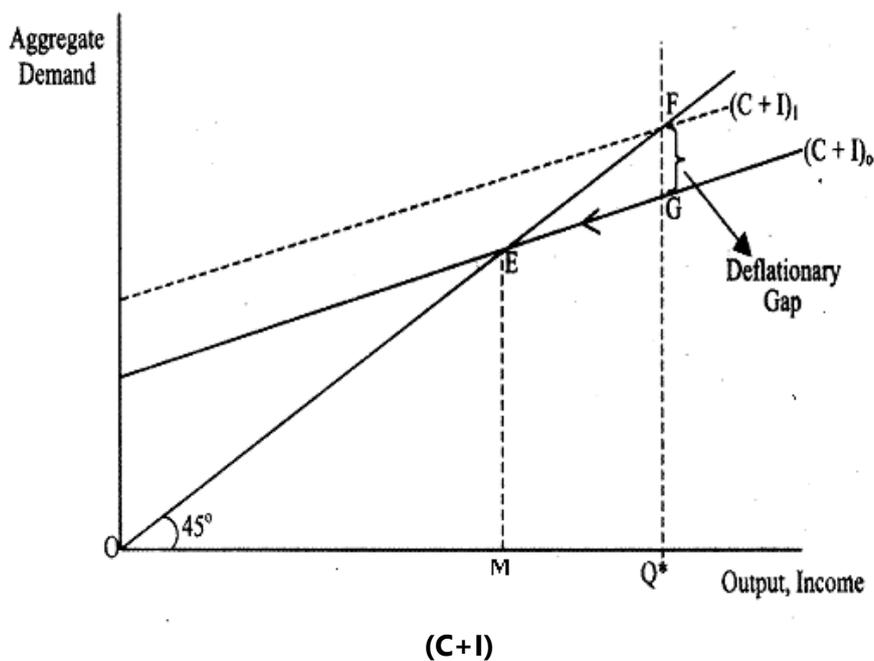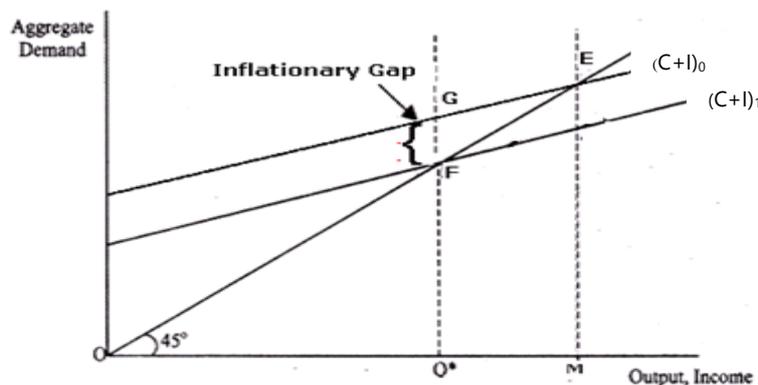
In figure 1.2.5, OQ* is the full employment level of output. For the economy to be at full employment equilibrium, aggregate demand should be Q*F. If the aggregate demand is Q*G, it represents a situation of deficient demand. The resulting deflationary gap is FG. Firms will experience unplanned build-up of inventories of unsold goods and they will respond by cutting production and employment leading to decrease in output and income until the under-employment equilibrium is reached at E.

(ii) Inflationary Gap

If the aggregate demand is for an amount of output greater than the full employment level of output, then we say there is excess demand. Excess demand gives rise to 'inflationary gap' which is the amount by which actual aggregate demand exceeds the level of aggregate demand required to establish the full employment equilibrium. This is the sort of gap that tends to occur during a business-cycle expansion and sets in motion forces that will cause demand pull inflation.

Figure 1.2.6
Excess Demand - Inflationary Gap

In figure 1.2.6, the economy will be at full employment equilibrium at F with OQ* full employment level of output and income. Suppose the aggregate demand is for Q*G, there is excess demand and the resulting inflationary gap FG. The real output will be constant, but the rise in the price level will cause an increase in the nominal output until the new equilibrium is reached at point E. Point E is an equilibrium point because the aggregate demand ME is equal to output OM. At the new equilibrium, real output, real income and employment will be the same; nominal output and income has increased due to inflation.

In the Keynesian model, neither wages nor interest rates will decline in the face of abnormally high unemployment and excess capacity. Therefore, output will remain at less than the full employment rate as long as there is insufficient spending in the economy. Keynes argued that this was precisely what was happening during the Great Depression.

Numerical Illustrations

ILLUSTRATION 2

Calculate marginal propensity to consume and marginal propensity to save from the following data about an economy which is in equilibrium:

National income = 2500, Autonomous consumption expenditure = 300, Investment expenditure = 100

SOLUTION

$Y = C + I$

By putting the value we get, $2500 = C + 100$

$C = 2500 - 100 = 2400$

$C = \bar{C} + bY$

$2400 = 300 + 2500\,b$

$2400 - 300 = 2500b$

$b = 0.84$; MPS $= 1 - $ MPC $= 1 - 0.84 = 0.16$

ILLUSTRATION 3

An economy is in equilibrium. Calculate national income from the following-

Autonomous consumption = 100; Marginal propensity to save= 0.2; Investment expenditure= 200

SOLUTION

$Y = C + I$

$Y = \bar{C} + MPC\,(Y) + I$ where MPC $= 1 - $MPS

$Y = 100 + 0.8Y + 200 = 300 + 0.8Y$

$Y - 0.8Y = 300$

$0.2Y = 300$,

$Y = 1500$

ILLUSTRATION 4

Suppose the consumption of an economy is given by C = 20+ 0.6 Y and investment I= 10+ 0.2 Y. What will be the equilibrium level of National Income?

SOLUTION

$Y = C + I = 20 + 0.6\,Y + 10 + 0.2\,Y$

$Y = 30 + 0.8\,Y$

Y- 0.8 Y = 30

Y= 150

ILLUSTRATION 5

Suppose the consumption function C= 7+ 0.5Y, Investment is ₹ 100, Find out equilibrium level of Income, consumption and saving?

SOLUTION

Equilibrium Condition–

Y= C +I, Given C= 7+0.5Y and I= 100

Therefore Y= 7+0.5Y+ 100

Y- 0.5Y= 107

$Y= \dfrac{107}{0.5} = 214$

Y= C+I

214= C+100

C=114

S= Y- C =100

ILLUSTRATION 6

If the consumption function is C= 250 + 0.80 Y and I = 300. Find out equilibrium level of Y, C and S?

SOLUTION

$Y= \dfrac{1}{1-b} (a+ \bar{I})$ or Y = C+ I

$Y= \dfrac{1}{1-.80} (250+300) = 2750$

$C = a + \dfrac{b}{1-b} (a+ \bar{I})$ or C= 250 + 0.80 Y

C = 250+0.8(2750) C = 2450

S = Y-C where C = a+ bY

S = Y- (a + bY)

S= -a + (1- b) Y

= - 250 + (1 − 0.80)2750= 300

Or directly,

S=Y- C

S=2750 – 2450= 300.

ILLUSTRATION 7

If saving function S = -10 + 0.2Y and autonomous investment I = 50 Crores. Find out the equilibrium level of income, consumption and if investment increases permanently by ₹5 Crores, what will be the new level of income and consumption?

SOLUTION

S= I

-10 + 0.2Y = 50

   0.2Y = 50+ 10

      Y = 300 Crores

       C= Y- S

Where S= -10 + 0.2 (300) = 50

   C= 300-50 = 250 Crores

With the increase in investment by ₹ 5 Crores, the new investment will become equal to ₹ 55 Crores.

S = I

-10 + 0.2Y = 55

Y= 325 Crores

C= 270 Crores

ILLUSTRATION 8

Given the empirical consumption function C= 100+0.75Y and I = 1000, calculate equilibrium level of national income. What would be the consumption expenditure at equilibrium level national income?

SOLUTION

C= 100+0.75Y and I = 1000,

Y=C+I in equilibrium

Y= 100+0.75 Y + 1000 =>$Y = \frac{I}{1-0.75}$ (100+1000)

$Y= \frac{I}{1-0.75}$ (1100) = 1/0.25 (1100) = 4400.

Y=C + I; C= 4400 – 1000 = 3400

2.5   THE INVESTMENT MULTIPLIER

In this section we develop an answer to the following question: By how much does a one unit increase in autonomous spending raise the equilibrium level of income? There appears to be a simple answer. Since, in equilibrium , income equals aggregate demand , it would seem that a unit increase in autonomous demand or spending should raise equilibrium income by one unit . That is not correct. In Fact the effect of an increase in investment (upward shift in the investment schedule) causes an upward shift in the aggregate demand function. It is due to a process of multiple increases in equilibrium income due to increase in investment and how much increase occurs depends upon the marginal propensity to consume. The process of increase in national income due to increase in investment depicts the investment multiplier impact illustrated below.

Figure 1.2.7
Effect of Changes in Autonomous Investment
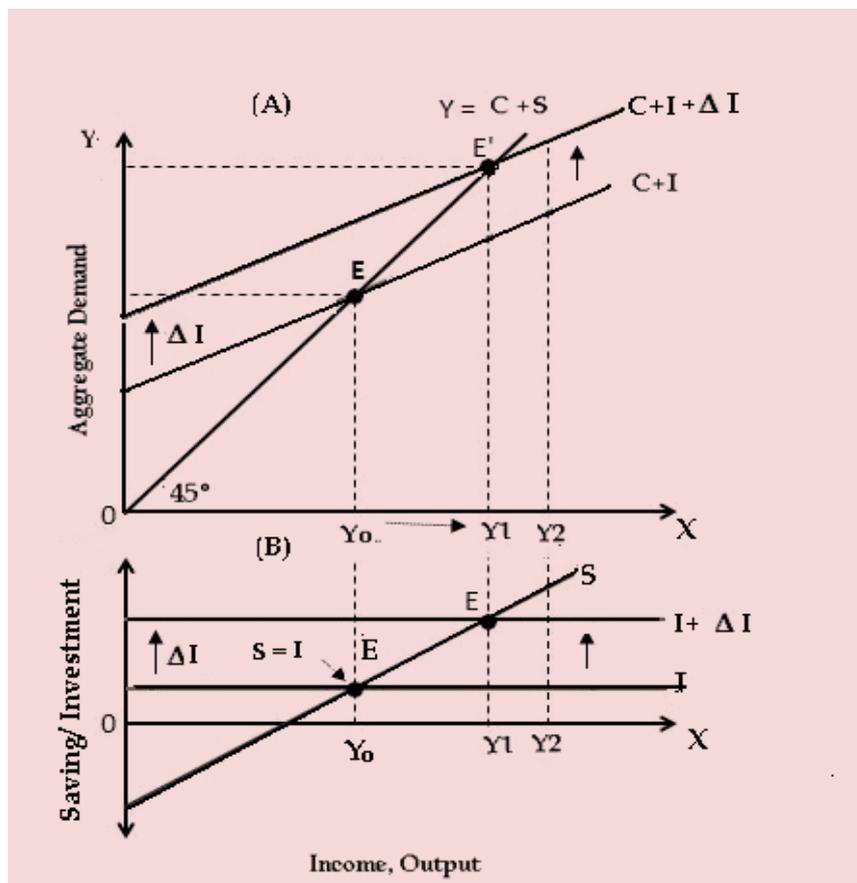
In the figure 1.2.7, an increase in autonomous investment by ΔI shifts the aggregate demand schedule from C+I to C+I+ΔI. Correspondingly, the equilibrium shifts from E to E[1]and the equilibrium income increases more than proportionately from Yo   to Y_1. Why and how does this happen? This occurs due to the operation of the investment multiplier.

Multiplier refers to the phenomenon whereby increase in investment expenditure will lead to a proportionately larger change (or multiple changes) in the equilibrium level of national income. The investment multiplier explains how many times the equilibrium aggregate income increases as a result of an increase in autonomous investment. When the level of investment increases by an amount, say ΔI, the equilibrium level of income will increase by some multiple amounts, Δ Y. The ratio of ΔY to ΔI is called the investment multiplier, k.

$$k = \frac{\Delta Y}{\Delta I} \qquad \qquad (2.11)$$

The size of the multiplier effect is given by Δ Y = k ΔI.

For example, if a change in investment of ₹ 2000 million causes a change in national income of ₹ 6000 million, then the multiplier is 6000/2000 =3. Thus multiplier indicates the change in equilibrium national income for each rupee change in the desired autonomous investment. Since the increase in national income (ΔY) is the result of increase in investment (ΔI), the multiplier is called 'investment multiplier.'

The process behind the multiplier can be compared to the 'ripple effect' of water. Let us assume that the initial disturbance comes from a change in autonomous investment (ΔI) of 500 units. The economy being in equilibrium, an upward shift in aggregate demand leads to an increase in national income which in a two sector economy will be, by definition, distributed as factor incomes. There will be an equal increase in disposable income. Firms experience increased demand   and as a response, their output increases. The process further continues as an   autonomous rise in investment leads to induced increases in consumer demand as income increases.

We find at the end that the increase in equilibrium income per rupee increase in investment is:

$$\frac{\Delta Y}{\Delta I} = \frac{1}{1-MPC} = \frac{1}{MPS} \qquad (2.12)$$

From the above, we find that the marginal propensity to consume (MPC) is the determinant of the value of the multiplier and that there exists a direct relationship between MPC and the value of multiplier. Higher the MPC more will be the value of the multiplier, and vice-versa. On the contrary, higher the MPS, lower will be the value of multiplier and vice-versa. The maximum value of multiplier is infinity when the value of MPC is 1 i.e. the economy decides

to consume the whole of its additional income. We conclude that the value of the multiplier is the reciprocal of MPS.

For example, if the value of MPC is 0.75, then the value of the multiplier as per (2.11) is:

$$\frac{1}{1-MPC} = \frac{1}{0.25} = 4$$

The multiplier concept is central to Keynes's theory because it explains how shifts in investment caused by changes in business expectations set off a process that causes not only investment but also consumption to vary. The multiplier shows how shocks to one sector are transmitted throughout the economy.

Increase in income due to increase in initial investment, does not go on endlessly. The process of income propagation slows down and ultimately comes to a halt. Causes responsible for the decline in income are called leakages. Income that is not spent on currently produced consumption goods and services may be regarded as having leaked out of the income stream. If the increased income goes out of the cycle of consumption expenditure, there is a leakage from the income stream which reduces the effect of multiplier. The more powerful these leakages are, the smaller the value of the multiplier. The leakages are caused due to:

1.   progressive rates of taxation which result in no appreciable increase in consumption despite increase in income

2.   high liquidity preference and idle saving or holding of cash balances and an equivalent fall in marginal propensity to consume

3.   increased demand for consumer goods being met out of the existing stocks or through imports

4.   additional income spent on purchasing existing wealth or purchase of government securities and shares from shareholders or bondholders

5.   undistributed profits of corporations

6.   part of increment in income used for payment of debts

7.   case of full employment additional investment will only lead to inflation, and

8.   scarcity of goods and services despite having high MPC

The MPC, on which the multiplier effect of increase in income depends, is high in underdeveloped countries; but ironically the value of multiplier is low. Due to structural inadequacies, increase in consumption expenditure is not generally accompanied by increase in production. E.g. increased demand for industrial goods consequent on increased income does not lead to increase in their real output; rather prices tend to rise.

An important element of Keynesian models is that they relate to short-period equilibrium and contain no dynamic elements. There is nothing like Keynesian macro-economic dynamics. When a shock occurs, for example when there is a change in autonomous investment due to change in some variable, one equilibrium position can be compared with another as a matter of comparative statics. There is no link between one period and the next and no provision is made for an analysis of processes through time.

Numerical Illustrations

ILLUSTRATION 9

In an economy investment expenditure is increased by ₹400 Crores and marginal propensity to consume is 0.8. Calculate the total increase in income and saving.

SOLUTION

MPC = 0.8; ΔI = 400 Crores

Multiplier (K)= 1 /1- MPC = 1 /1- 0.8 =1/ 0.2= 5

MPS= 1 - MPC = 1 − 0.8 = 0.2

Increase in income (ΔY) = K ×ΔI = 5 × 400=2,000 Crores

Increase in saving= ΔY × MPS = 2,000 × 0.2 = 400 Crores

ILLUSTRATION 10

An increase in investment by 400 Crores leads to increase in national income by 1,600 Crores. Calculate marginal propensity to consume.

SOLUTION

Increase in investment (ΔI) = 400 Crores

Increase in national income (Δ Y) = 1,600 Crores

Multiplier (K) =ΔY/ΔI = K= 1,600/ 400 = 4

We know, K= 1 /1 −MPC

4= 1 /1 -MPC

　⇨　MPC= 0.75

ILLUSTRATION 11

In an economy, investment is increased by Rs 600 Crores. If the marginal propensity to consume is 0.6, calculate the total increase in income and consumption expenditure.

SOLUTION

MPC = 0.6; ∆I = ₹ 600 Crores

Multiplier (K) = 1/ 1- MPC = 1/ 1 – 0.6 = 1/ 0.4 =25.

Increase in income (∆Y) = K × ∆I = 2.5 × Rs 600 Crores= ₹ 1,500 Crores

Increase in consumption (∆C) =∆Y × MPC = Rs1, 500Crores × 0.6 = ₹ 900 Crores.

ILLUSTRATION 12

Suppose in a country investment increases by ₹ 100 Crores and consumption is given by C = 10 + 0.6Y (where C = consumption and Y = income). How much increases will there take place in income?

SOLUTION

Multiplier = k = $\dfrac{1}{1-MPC}$ k = $\dfrac{1}{1-0.6}$ = 2.5

Substituting the value of k and ∆I value in ∆Y= k∆I

∆Y= 2.5 × 100= ₹ 250Crores

Thus, increase in investment by Rs 100 Crores will cause equilibrium income to rise by ₹ 250 Crores.

# 🕐 2.6   DETERMINATION OF EQUILIBRIUM INCOME: THREE SECTOR MODEL

Aggregate demand in the three sector model of closed economy (neglecting foreign trade) consists of three components namely, household consumption(C), desired business investment demand(I) and the government sector's demand for goods and services(G). Thus in equilibrium, we have

> **Y = C+I+G**   **(2.13)**

Since there is no foreign sector, GDP and national income are equal. As prices are assumed to be fixed, all variables are real variables and all changes are in real terms. To help interpret these conditions, we turn to the flowchart below. Each of the variables in the model is a flow variable.

Figure 1.2.8

Circular Flow in a Three Sector Economy
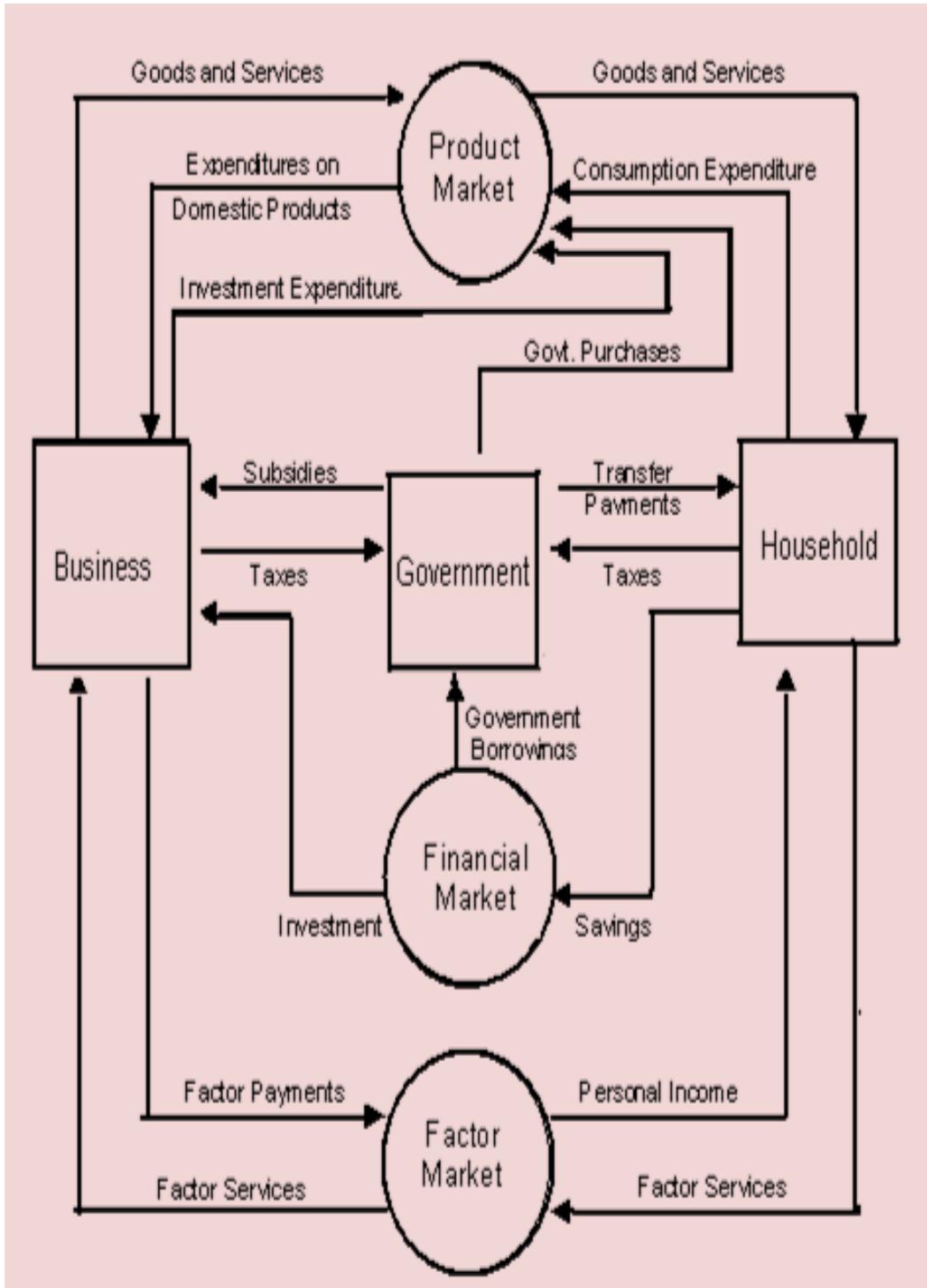
The three-sector, three-market circular flow model which accounts for government intervention highlights the role played by the government sector. From the above flow chart, we can find that the government sector adds the following key flows to the model:

i)   Taxes on households and business sector to fund government purchases

ii)   Transfer payments to household sector and subsidy payments to the business sector

iii)   Government purchases goods and services from business sector and factors of production from household sector, and

iv)   Government borrowing in financial markets to finance the deficits occurring when taxes fall short of government purchases

However, unlike in the two sector model, the whole of national income does not return directly to the firms as demand for output. There are two flows out of the household sector in addition to consumption expenditure namely, saving flow and the flow of tax payments to the government. These are actually leakages. The saving leakage flows into financial markets, which means that the part that is saved is held in the form of some financial asset (currency, bank deposits, bonds, equities, etc.). The tax flow goes to the government sector.

The leakages which occur in the household sector do not necessarily mean that the total demand must fall short of output. There are additional demands for output on the part of the business sector itself for investment and from the government sector. In terms of the circular flow, these are injections. The investment injection is shown as a flow from financial markets to the business sector. The purchasers of the investment goods, typically financed by borrowing, are actually the firms in the business sector themselves. Thus, the amount of investment in terms of money represents an equivalent flow of funds lent to the business sector.

The three-sector Keynesian model is commonly constructed assuming that government purchases are autonomous. This is not a realistic assumption, but it will simplify our analysis. Determination of income can also be explained with the help of aggregate demand and aggregate supply (figure 1.2.9)
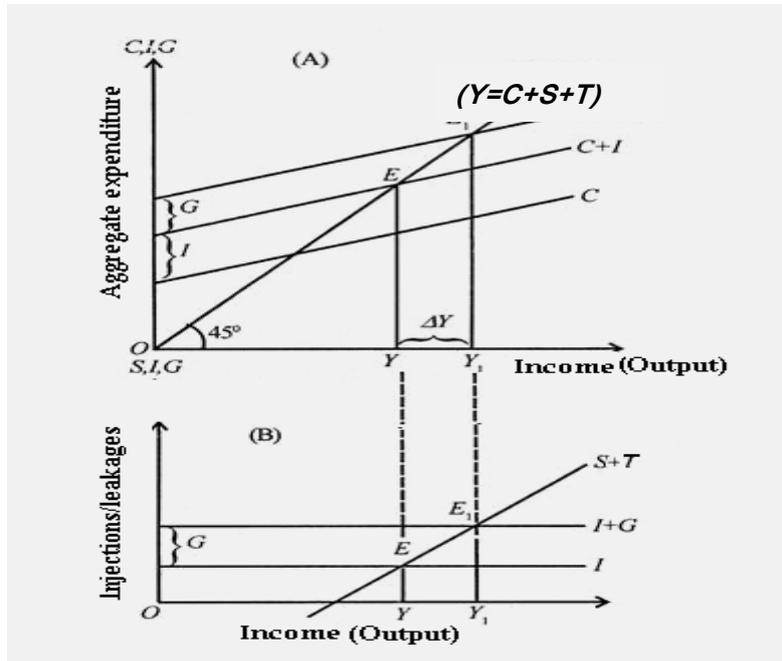
$$AD = C + I + G$$

$$AS = C + S + T$$

The equilibrium national income is determined at a point where both aggregate demand and aggregate supply are equal, that is,

$$AD = Y = AS$$

$$C + I + G = Y = C + S + T$$

Figure 1.2.9

Determination of Equilibrium Income: Three Sector Model

The variables measured on the vertical axis are C, I and G. The autonomous expenditure components namely, investment and government spending do not directly depend on income and are exogenous variables determined by factors outside the model. You may observe that in panel B of the figure 1.2.9, the lines that plot these autonomous expenditure components are horizontal as their level does not depend on Y. Therefore, C + I + G schedule lies above the consumption function by a constant amount.

The line S + T in the graph plots the value of savings plus taxes. This schedule slopes upwards because saving varies positively with income. Just as government spending, level of tax receipts (T) is decided by policy makers.

The equilibrium level of income is shown at the point E_1 where the (C + I + G) schedule crosses the 45° line, and aggregate demand is therefore equal to income (Y). In equilibrium, it is also true that the (S + T) schedule intersects the (I + G) horizontal schedule.

We shall now see why other points on the graph are not points of equilibrium. Consider a level of income below Y. We find that it generates consumption as shown along the consumption function. When this level of consumption is added to the autonomous expenditures (I + G), aggregate demand exceeds income; the (C + I + G) schedule is above the 45° line. Equivalently at this point I + G is greater than S + T, as can be seen in panel B of the figure 1.2.9. With demand outstripping production, desired investments will exceed actual investment and there will be an unintended inventory shortfall and therefore a tendency for

output to rise. Conversely, at levels of income above Y_1, output will exceed demand; people are not willing to buy all that is produced. Excess inventories will accumulate, leading businesses to reduce their future production. Employment will subsequently decline and output will fall back to the equilibrium level. It is only at Y that output is equal to aggregate demand; there is no unintended inventory shortfall or accumulation and, consequently, no tendency for output to change. An important thing to note is that the change in total spending, followed by changes in output and employment, is what will restore equilibrium in the Keynesian model, not changes in prices.

2.6.1 The Government Sector and Income Determination

We have seen above that the government influences the level of income through taxes, transfer payments, government purchases and government borrowing. A comprehensive discussion on the effect of government fiscal policy is beyond the scope of this unit; and therefore, we shall look into a few variables.

(i) Income Determination with Lump Sum Tax

We assume that the government imposes a lump sum tax, i.e. taxes that do not depend on income, has a balanced budget (G=T) and also that there are no transfer payments. The consumption function is defined as –

$C = a + b\,Y_d$

Where $Y_d = Y - T$ (disposable income), T = lump sum tax

$Y = a + b\,(Y - T) + I + G$

$Y = \dfrac{1}{1-b}\,(a-bT+I+G)$

Numerical Illustrations

ILLUSTRATION 13

Suppose we have the following data about a simple economy:

$C = 10 + 0.75Y_d$, I = 50, G = T = 20 where C is consumption, I is investment, Y_d is disposable income, G is government expenditure and T is tax.

(a)   Find out the equilibrium level of national income.

(b)   What is the size of the multiplier?

SOLUTION

(a)   Since G = T, budget of the government is balanced

Substituting the values of C, I and G in Y we have

Y=C+I+G

Y = a + bY$_d$ + I + G

Y= 10 + 0.75 (Y – 20) + 50 + 20

Y= 10 + 0.75 Y- 15 + 50 + 20

or, Y – 0.75 Y = 65

or, Y (1 – 0.75) = 65

or, 0.25 Y = 65

or, Y = 65 /.25 = 260

The equilibrium value of Y = 260

(b)   The value of the multiplier is = 1/ (1 – MPC) = 1/ (1 – b) = 1/ (1 – 0.75) = 1/0.25 = 4

(ii)   Income Determination with Lump Sum Tax and Transfer payments

The consumption function is defined as –

C = a + b Y$_d$

Where Y$_d$= Y- T+ TR where T is a lump sum tax and TR is autonomous transfer payments

C = a+ b (Y - T + TR)

Y= C+ I+ G

Y= a+ b (Y - T + TR) + I + G

Y= a +bY – bT +bTR + I + G

Y – bY= a – bT +bTR + I + G

Y(1-b)= a – bT +bTR + I + G

$$Y = \frac{1}{1-b}(a - bT + bTR + I + G)$$

ILLUSTRATION 14

Suppose the structural model of an economy is given –

C = 100+ 0.75 Yd; I = 200, G = T = 100; TR= 50, find the equilibrium level of income?

SOLUTION

Y= C+ I+ G

Y = 100+ 0.75 Yd + 200 + 100

Y= 100 + 0.75(Y– 100 + 50) + 200 + 100

Y = 100 + 0.75Y -75 + 37.5 +200 +100

Y = 1450

Or use Y = $\frac{1}{1-b}(a - bT + bTR + I + G)$ to calculate income.

(iii) Income Determination with tax as a function of Income

In (i) and (ii) above, we have analysed the effect of balanced budget with an autonomous lump sum tax. In reality, the tax system consists of both lump sum tax and proportional taxes. The tax function is defined as;

Tax function T = T̄ + t Y

Where T̄ = autonomous constant tax

t = income tax rate

T = total tax

The consumption function is

C = a + b Y_d

Where Y_d = Y- T or Y -T̄ - t Y

C= a+ b(Y- T̄ - t Y)

Therefore, the equilibrium level of national income can be measured as-

Y= C + I+ G

Y=a+bYd+I+G

Y=a+b(Y-T̄-tY)+I+G

Y = a +bY - bT̄ - b t Y + I + G

Y- bY + btY = a -bT̄ + I +G

Y (1- b+ bt) = a -bT̄ + I +G

Y = $\dfrac{1}{1-b(1-t)}$ (a -bT̄ + I +G)

Where $\dfrac{1}{1-b(1-t)}$ (represent the tax multiplier)

ILLUSTRATION 15

For a closed economy, the following data is given −

Consumption C = 75 + 0.5 (Y-T); Investment I = 80; Total tax T = 25 + 0.1Y; Government expenditure G = 100.

(a)   Find out equilibrium income?

(b)   What is the value of multiplier?

SOLUTION

a) $Y = C + I + G$

$Y = 75 + 0.5(Y - 25 - 0.1Y) + 80 + 100$

$Y(1 - 0.5 + 0.05) = 75 - 12.5 + 80 + 100$

$$Y = \frac{1}{1 - 0.5 + 0.05}(242.5)$$

$Y = 440.91$

b) $\text{Multiplier} = \dfrac{1}{1 - b(1 - t)} = 1/[1 - 0.5(1 - 0.1)] = 1.82$

(iv)   Income Determination with Tax (as a Function of Income), Government Expenditure and Transfer Payments

Here consumption function is written as $C = a + b(Y - \bar{T} - tY + TR)$

$Y = a + b(Y - \bar{T} - tY + TR) + I + G$

$$Y = \frac{1}{1 - b(1 - t)}(a - b\bar{T} + bTR + I + G)$$

ILLUSTRATION 16

Suppose C = 100 + 0.80 (Y - T + TR); I = 200; T = 25 + 0.1Y; TR = 50; G = 100

Find out equilibrium level of Income?

SOLUTION

$Y = C + I + G$

$Y = 100 + 0.80 (Y - T + TR) + I + G$

$Y = 100 + 0.80(Y - 25 - 0.1Y + 50) + 200 + 100$

$Y - 0.80 Y + 0.08 Y = 420$

$Y(1 - 0.8 + 0.08) = 420$

$Y = 1500$

2.7 DETERMINATION OF EQUILIBRIUM INCOME: FOUR SECTOR MODEL

The four sector model includes all four macroeconomic sectors, the household sector, the business sector, the government sector, and the foreign sector. The foreign sector includes households, businesses, and governments that reside in other countries. The following flowchart shows the circular flow in a four sector economy.

In the four sector model, there are three additional flows namely: exports, imports and net capital inflow which is the difference between capital outflow and capital inflow. The C+I+G+(X-M) line indicates the aggregate demand or the total planned expenditures of consumers, investors, governments and foreigners (net exports) at each income level.

Figure 1.2.10

Circular Flow in a Four Sector Economy
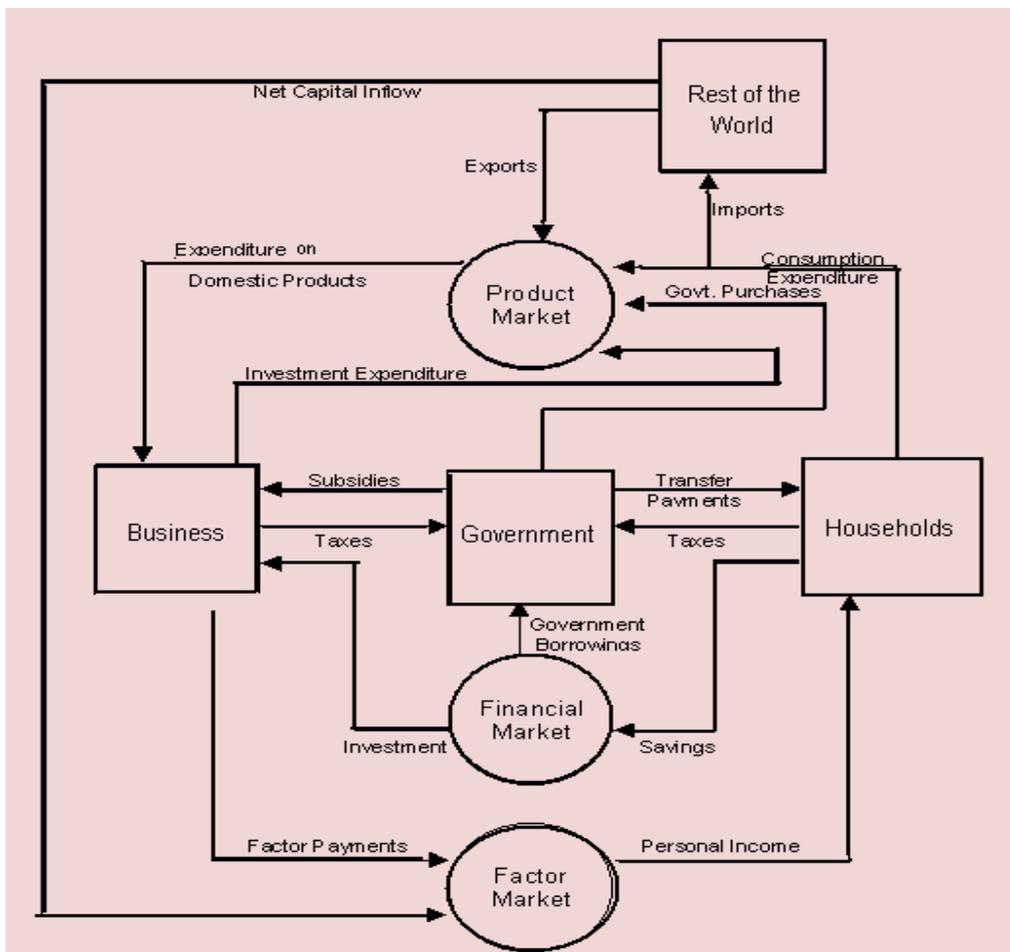
In equilibrium, we have

$$Y = C + I + G + (X-M) \qquad (2.14)$$

The domestic economy trades goods with the foreign sector through exports and imports. Exports are the injections in the national income, while imports act as leakages or outflows of national income. Exports represent foreign demand for domestic output and therefore, are part of aggregate demand. Since imports are not demands for domestic goods, we must subtract them from aggregate demand. The demand for imports has an autonomous component and is assumed to depend on income. Imports depend upon marginal propensity to import which is the increase in import demand per unit increase in GDP. The demand for exports depends on foreign income and is therefore exogenously determined and autonomous. Imports are subtracted from exports to derive net exports, which is the foreign sector's contribution to aggregate expenditures. Since import has an autonomous component ($\bar{M}$) and is assumed to depend on income(Y) and marginal propensity to import (m), the import function is expressed as $M = \bar{M} + mY$. Marginal propensity to import $m = \Delta M / \Delta Y$ is assumed to be constant.

As noted above, the equilibrium level of national income is determined at the level at which the aggregate demand is equal to aggregate supply. As the aggregate demand in the four sector model is given in equation 2.14, the equilibrium condition is expressed as follows -

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

$$\text{Where } C = a + b(Y\text{-}T)$$

$$M = \bar{M} + mY$$

The equilibrium level of National Income can now be expressed by –

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

$$Y = a + b\,(Y\text{-}\,T) + I + G + X \text{-} \bar{M} \text{ - } mY$$

$$Y - bY + mY = a\text{-} bT + I + G + X \text{ - } \bar{M}$$

$$Y = \frac{1}{1\text{-}b\,+m}\ (a\text{-}\ b\ T + I + G + X \text{ - } \bar{M})$$

The economy being in equilibrium, suppose export of country increases by ΔX autonomously, all other factors remaining constant. By incorporating the increase in exports by ΔX, the equilibrium equation of the country can be expressed as

$$Y + \Delta Y = \frac{1}{1\text{-}b+m}\ (a\text{-}\ b\ T + I + G + X \text{ - } \bar{M} + \Delta X)\ \text{ or}$$

$$Y + \Delta Y = \frac{1}{1-b+m}(a - bT + I + G + X - \bar{M}) + \frac{1}{1-b+m}\Delta X$$

As, $$Y = \frac{1}{1 - b + m}(a - bT + I + G + X - \bar{M})$$

We get, $$Y + \Delta Y = Y + \frac{1}{1-b+m}\Delta X$$

Subtracting Y from both sides, we get $\Delta Y = \dfrac{1}{1-b+m}\Delta X$

By rearranging $\Delta Y = \dfrac{1}{1-b+m}\Delta X$, we get

$$\frac{\Delta Y}{\Delta X} = \frac{1}{1-b+m}$$

Or alternatively written as

$$\frac{\Delta Y}{\Delta X} = \frac{1}{1-(b-m)}$$

The term $\dfrac{1}{1-b+m}$ is known as foreign trade multiplier whose value is determined by marginal propensity to consume (b) and marginal propensity to import (m).

If in the model proportional income tax and government transfer payments are incorporated, then only the denominator of multiplier will change. If income tax is of form T= $\bar{T}$ + t Y where $\bar{T}$ is constant lump-sum, t is the proportion of income tax and TR > 0 and autonomous, then the four sector model can be expressed as: –

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

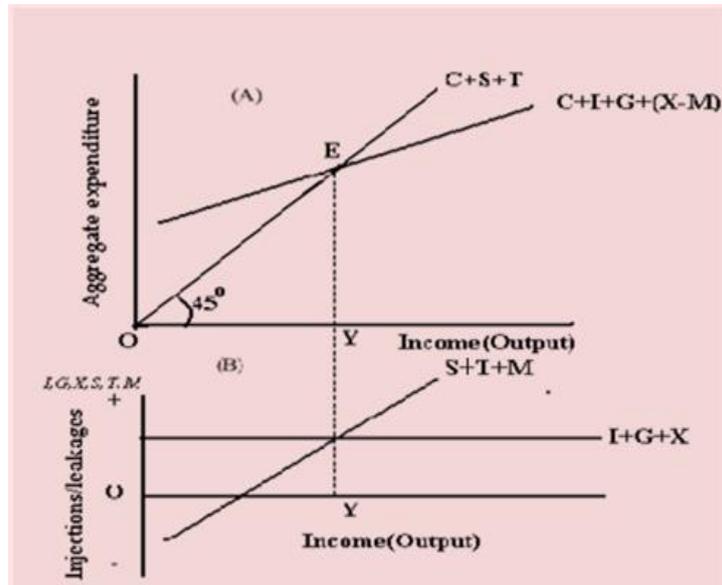$$\text{Where } C = a + b(Y - \bar{T} - tY + TR)$$

$$M = \bar{M} + mY.$$

The equilibrium level of National Income can now be expressed as:

$$Y = \frac{1}{1 - b(1-t) + m}(a - b\bar{T} + bTR + I + G + X - \bar{M})$$

With the help of figure 1.2.11, we shall explain income determination in the four sector model.

Figure 1.2.11

Determination of Equilibrium Income: Four Sector Model


Equilibrium is identified as the intersection between the C + I + G + (X - M) line and the 45-degree line. The equilibrium income is Y. From panel B, we find that the leakages(S+T+M) are equal to injections (I+G+X) only at equilibrium level of income.

We have seen above that only net exports(X-M) are incorporated into the four sector model of income determination. We know that injections increase the level of income and leakages decrease it. Therefore, if net exports are positive (X > M), there is net injection and national income increases. Conversely, if X<M, there is net withdrawal and national income decreases.

Figure 1.2.12

Effects on Income When Imports are Greater than Exports
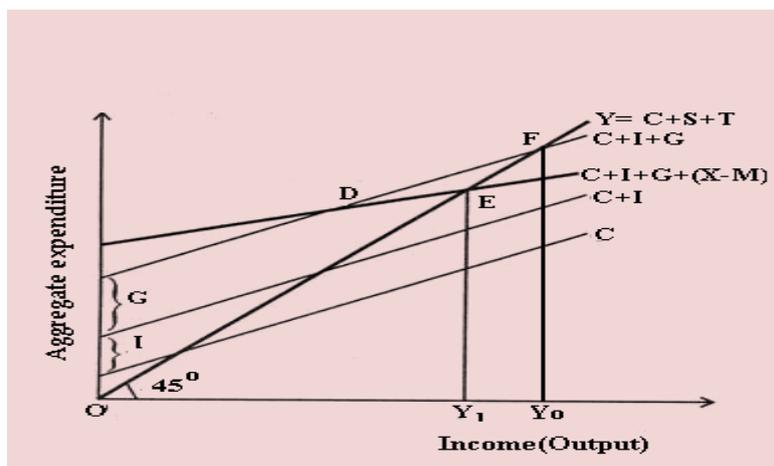
We have seen in section 2.5 above that equilibrium income is expressed as a product of two terms: $\Delta Y = k \, \Delta I$; i.e. the level of autonomous investment expenditure and the investment multiplier. The autonomous expenditure multiplier in a four sector model includes the effects of foreign transactions and is stated as $\frac{1}{(1-b+m)}$ where 'm' is the propensity to import which is greater than zero. You may recall that the multiplier in a closed economy is $\frac{1}{(1-b)}$

The greater the value of 'm', the lower will be the autonomous expenditure multiplier. The more open an economy is to foreign trade, (the higher mis) the smaller will be the response of income to aggregate demand shocks, such as changes in government spending or autonomous changes in investment demand. The higher the value of 'm',the larger the proportion of this induced effect on demand for foreign, not domestic, consumer goods. The increase in imports per unit of income constitutes an additional leakage from the circular flow of (domestic) income at each round of the multiplier process and reduces the value of the autonomous expenditure multiplier.

An increase in demand for exports of a country is an increase in aggregate demand for domestically produced output and will increase equilibrium income just as an increase in government spending or an autonomous increase in investment. In summary, an increase in the demand for a country's exports has an expansionary effect on equilibrium income, whereas an autonomous increase in imports has a contractionary effect on equilibrium income. However, this should not be interpreted to mean that exports are good and imports are harmful in their economic effects. Countries import goods that can be more efficiently produced abroad, and trade increases the overall efficiency of the worldwide allocation of resources. This forms the rationale for attempts to stimulate the domestic economy by promoting exports and restricting imports.

Numerical Illustration

ILLUSTRATION 17

The consumption function is C = 40 + 0.8Y$_d$,T= 0.1Y, I = 60 Crores G = 40 Crores, X = 58 and M = 0.05 Y. Find out equilibrium level of income, Net Export, net export if export were to increase by 6.25.

SOLUTION

C= 40+ 0.8Y$_d$

C= 40 + 0.8 (Y- 0.1Y)

Y= C + I+ G + (X − M)Y= 40+0.8(Y-0.1Y)+60+40+(58-0.05Y)

Y= 40+0.8(0.9Y)+60+40+58-0.05Y

Y-0.72Y+0.05Y =198

Y(1-0.72+0.05) =198

Y(0.33) =198

Y= 198/0.33 = 600 Crores

Net Export= X-M = 58 – 0.05Y

58 – 0.05 (600) =58- 30= 28

If exports increase by 6.25, then exports = 64.25

Then, Y = 40+ 0.8 (Y- 0.1Y) + 60 + 40 + (64.25- 0.05Y)

Y(1-0.72+0.05) = 204.5

Y(0.33) = 204.5

Y=204.5/0.33 = 619.697

Then import = .05 × 619.697= 30.98

Net Export= 64.25- 30.98= 33.27 Crores

Thus, there is surplus in balance of trade as Net Exports are positive.

ILLUSTRATION 18

An economy is characterised by the following equation-

Consumption	$C = 60+0.9Y_d$
Investment	$I = 10$
Government expenditure	$G = 10$
Tax	$T = 0$
Exports	$X = 20$
Imports	$M = 10 +0.05 Y$

What is the equilibrium income?

Calculate trade balance and foreign trade multiplier.

SOLUTION

Y = C + I+ G + (X – M)

   = 60+0.9(Y – 0) + 10 +10 + (20- 10 -0.05Y)

   = 60+ 0.9 Y +30 -0.05 Y

Y= 600

Trade Balance = X – M = 20-10-0.05(600)=- 20

Thus, trade balance in deficit.

Foreign trade multiplier= $\dfrac{1}{1\text{-b+m}}$ = $\dfrac{1}{1\text{-}0.9\text{+}0.05}$ = 6.66

2.8   CONCLUSION

According to the Keynesian theory of income and employment, national income depends upon the aggregate effective demand. If the aggregate effective demand falls short of that output at which all those who are both able and willing to work are employed, it will result in unemployment in the economy. Consequently, there will be a gap between the economy's actual and optimum potential output. On the contrary, if the aggregate effective demand exceeds the economy's full employment output (production capacity), it will result in inflation. Nominal output will increase, but it simply reflects higher prices, rather than additional real output. It is not necessary that the equilibrium aggregate output will also be the full employment aggregate output. It is undesirable and a cause of great concern for the society and government if a large number of people remain unemployed. In the absence of government policies to stabilise the economy, incomes will be unstable because of the instability of investment. By making appropriate changes in government spending (G) and taxes, the government can counteract the effects of shifts in investment. Appropriate changes in fiscal policy by adjusting government expenditure and taxes could keep the autonomous expenditure constant even in the face of undesirable changes in the investment.

SUMMARY

♦   John Maynard Keynes in his masterpiece 'The General Theory of Employment Interest and Money' published in 1936 put forth a comprehensive theory to explain the determination of equilibrium aggregate income and output in an economy.

♦   The equilibrium analysis is best understood with a hypothetical simpletwo-sector economy which has only households and firms with all prices (including factor prices), supply of capital and technology constant; the total income produced *Y*, accrues to the households and equals their disposable personal income.

♦   The equilibrium output occurs when the desired amount of output demanded by all the agents in the economy exactly equals the amount produced in a given time period.

♦   In the two-sector economy aggregate demand (AD) or aggregate expenditure consists of only two components: aggregate demand for consumer goods and aggregate

demand for investment goods, *I* being determined exogenously and constant in the short run.

♦ Consumption function expresses the functional relationship between aggregate consumption expenditure and aggregate disposable income, expressed as C = f (Y).The specific form consumption function, proposed by Keynes C = a + bY

♦ The value of the increment to consumer expenditure per unit of increment to income *(b)* is termed the Marginal Propensity to Consume (MPC).

♦ The Keynesian assumption is that consumption increases with an increase in disposable income (*b* >0), but that the increase in consumption will be less than the increase in disposable income (*b* <1).

♦ The propensity to consume refers to the proportion of the total and the marginal incomes which people spend on consumer goods and services.

♦ The proportion or fraction of the total income consumed is called 'average propensity to consume' *(APC)=* Total Consumption /Total Income

♦ Since *Y = C + S,* consumption and saving functions are counterparts of each other. The condition for national income equilibrium can thus be expressed as C + I = C + S

♦ Changes in income are primarily from changes in the autonomous components of aggregate demand, especially from changes in the unstable investment component.

♦ The investment multiplier k is defined as the ratio of change in national income (ΔY) due to change in investment (ΔI)

♦ The marginal propensity to consume (MPC) is the determinant of the value of the multiplier. The higher the marginal propensity to consume (MPC) the greater is the value of the multiplier.

♦ The more powerful the leakages are, the smaller will be the value of multiplier.

♦ Aggregate demand in the three sector model of closed economy (neglecting foreign trade) consists of three components namely, household consumption(C), desired business investment demand(I) and the government sector's demand for goods and services(G).

♦ The government sector imposes taxes on households and business sector,effects transfer payments to household sector and subsidy payments to the business sector, purchases goods and services and borrow   from financial markets.

♦ In equilibrium, it is also true that the (S + T) schedule intersects the (I + G) horizontal schedule.

♦   Taxes act as leakage from the economic system. Thus, tax multiplier when, $T = \bar{T} - tY$, is

$$\frac{1}{1-b(1-t)} < \frac{1}{(1-b)}$$

♦   The four sector model includes all four macroeconomic sectors, the household sector, the business sector, the government sector, and the foreign sector and in equilibrium, we have Y = C + I + G + (X-M)

♦   The domestic economy trades goods with the foreign sector through exports and imports.

♦   Imports are subtracted from exports to derive net exports, which is the foreign sector's contribution to aggregate expenditures. If net exports are positive (X > M), there is net injection and national income increases.   Conversely, if X<M, there is net withdrawal and national income decreases.

♦   The autonomous expenditure multiplier in a four sector model includes the effects of foreign transactions and is stated as $\frac{1}{(1-b+m)}$ against $\frac{1}{(1-b)}$ in a closed economy.

♦   The greater the value of m, the lower will be the autonomous expenditure multiplier.

♦   An increase in the demand for exports of a country is an increase in aggregate demand for domestically produced output and will increase equilibrium income just as would an increase in government spending or an autonomous increase in investment.

TEST YOUR KNOWLEDGE

Multiple Choice Questions

1.   *In the Keynesian model, equilibrium aggregate output is determined by*

   (a)   aggregate demand

   (b)   consumption function

   (c)   the national demand for labor

   (d)   the price level

2.   *Keynes believed that an economy may attain equilibrium level of output*

   (a)   only at the full-employment level of output

   (b)   below the full-employment level of output

   (c)   only if prices were inflexible

   (d)   a) and c) above

3. According to Keynes, consumption expenditure is determined by

    (a) the level of interest rates

    (b) extent of government taxes and subsidies

    (c) disposable income

    (d) autonomous investment expenditure

4. The marginal propensity to consume (MPC) can be defined as

    (a) a change in spending due to a change in income

    (b) a change in income that is saved after consumption

    (c) part of income that is spent on consumption.

    (d) part of income that is not saved.

5. If the consumption function is expressed as $C = a + bY$ then b represents

    (a) autonomous consumer expenditure when income is zero

    (b) the marginal propensity to consume.

    (c) the expenditure multiplier when consumption is increased

    (d) part of disposable income

6. If the consumption function is expressed as $C = a + bY$ then a represents

    (a) autonomous consumer expenditure.

    (b) the marginal propensity to consume.

    (c) the consumption income relationship

    (d) Non- linear consumption function

7. If the consumption function is $C = 20 + 0.5Yd$, then an increase in disposable income by ₹ 100 will result in an increase in consumer expenditure by ₹----------

    (a) 25

    (b) 70

    (c) 50

    (d) 100

8. If the autonomous consumption equals ₹2,000 and the marginal propensity to consume equals 0.8. If disposable income equals ₹ 10,000, then total consumption will be ₹____

    (a) 8,000

(b) 6,000

(c) 10,000

(d) None of the above

9. In the Keynesian cross diagram, the point at which the aggregate demand function crosses the 45-degree line indicates the

(a) level of full employment income.

(b) less than full employment level of income.

(c) equilibrium level of income which may or may not be full employment level of income

(d) autonomous level of income which may not be full employment   level of income

10. In a closed economy, aggregate demand is the sum of

(a) consumer expenditure, demand for exports and government spending.

(b) consumer expenditure, planned investment spending and government spending.

(c) consumer expenditure, actual investment spending, government spending and net exports.

(d) consumer expenditure, planned investment spending, government spending, and net exports.

11. Under equation C= a+by, b=0.8, what is the value of 2 sector expenditure multiplier?

(a) 4

(b) 2

(c) 5

(d) 1

ANSWERS

1.	**(a)**	2.	**(b)**	3.	**(c)**	4.	**(a)**	5.	**(b)**	6.	**(a)**
7.	**(c)**	8.	**(c)**	9.	**(c)**	10.	**(b)**	11.	**(c)**		