Economics for Finance

CA INTERMEDIATE

CA. NIKHIL SARDA

B.Com, FCA

Email – nikhilsarda5@gmail.com

MITKARY SIR'S CAPS ACADEMY

110, Above HERO Showroom, Near Bhole Petrol Pump, VIP Road, Dharampeth, Nagpur - 440010.

Office.No. +91 7020 752 751 Emergency no. 9850322529, 9764272863, 9623445283

Email: phmcaps@gmail.com Website : capsacademy.in

https://www.facebook.com/capsacademyphm

https://www.instagram.com/capsacademyngp/

https://www.youtube.com/channel/UCE-tLwnxyde-kSGO51Bv7HA

Index

CHAPTER	ONE
Determination of National Income	**1**

This Chapter is divided into 2 Units:

1) National Income Accounting
2) The Keynesian theory of determination of National Income.

UNIT 1 : NATIONAL INCOME ACCOUNTING

This unit is basically divided into 3 parts:-

I) Different concepts of National Income.

II) Measurement of National Income in India.

III) Limitations and Challenges of National Income Computation.

Now, let us take the I part of this unit, but before this we need to know something about National Income, its meaning & usefulness and significance of National Income estimates (figures).

1.1. National Income – Meaning :

While doing the study of National Economies, we are interested in Macro-economic aggregates like–

i) Aggregate income
ii) Aggregate output
iii) Total employment
iv) General level of prices
v) Total consumption
vi) Saving & investments etc.

As there are accounting conventions for measuring performance of business, similarly there are conventions for measuring and analyzing the economic performance of a Nation. National income accounting, pioneered by the nobel prize winning economists Simon Kuznets and Richard Stone is one such measure.

Definition of National Income:-

"National income is defined as-

- *the net value of all economic goods and services*
- *produced within the domestic territory of a country*
- *in an accounting year*
- *plus the net factor income from abroad*

Also according to central statistical organization (CSO), National income is

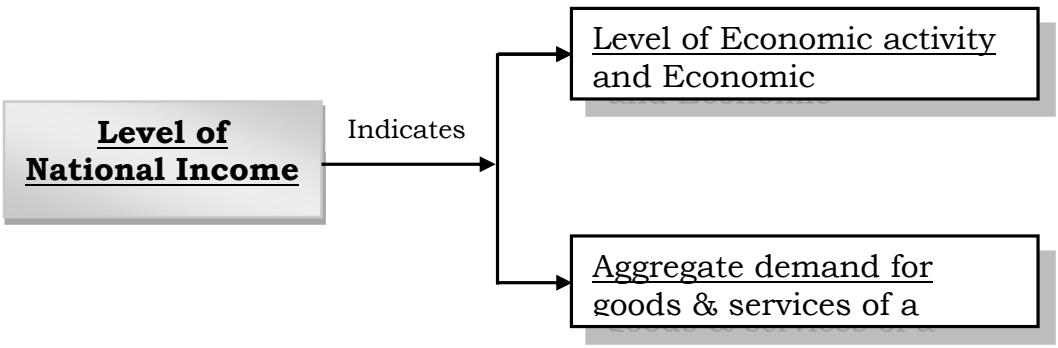
- *the sum total of factor incomes*
- *generated by the normal residents of a country*
- *in the form of wages, rent, interest and profit*
- *in an accounting year*

1.2. Usefulness & Significance of National Income Estimates (Accounts):

These are fundamental aggregate statics in macro economics and are extremely useful, especially for Emerging Economies.

Following are some specific purposes:-

1) It provides a comprehensive, conceptual and accounting framework for analyzing and evaluating the short run performance of an Economy.



2) The distribution pattern of national income determines the pattern of demand for goods and services and helps businesses to forecast the future demand for their products.
3) Economic welfare depends (to a considerable extent / degree) on magnitude (size) and distribution of national income size of per capita income and its growth over the time.
4) Estimates of national income show-
   - ❖ Composition and structure of national income in terms of different sectors of the economy.
   - ❖ Periodical variations in them, and
   - ❖ Broad sectoral shifts / changes in an economy over the time.

   Because of these estimates it is also possible to make comparisons of trend and speed of economic progress and development.

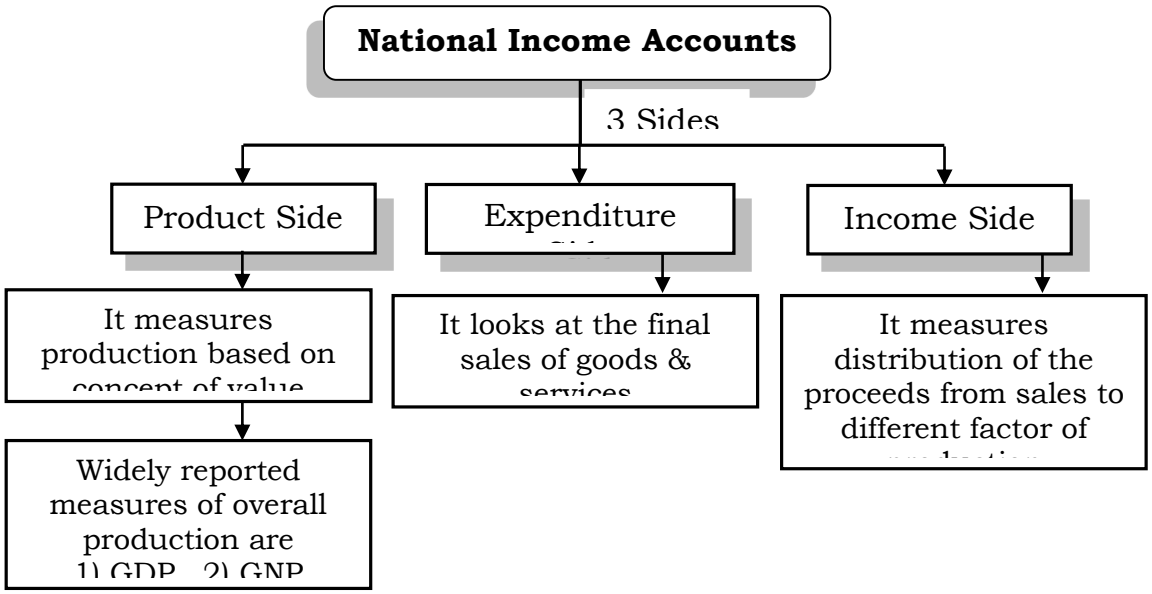
   By using this information government can fix various targets for different sectors of the economy and formulate development plans and policies suitable to increase the growth rates.

5) National income statistics provides-
   - ❖ A quantitative base for macro economic modeling and analysis
   - ❖ Choosing economic policies
   - ❖ Evaluation of governments economic policies
6) With the help of these estimates, income distribution and inequality in distribution to income earners is also revealed.
7) Ratios of investments, tax or government expenditure to GDP can also be compared because of these estimates.
8) When national income estimates are combined with financial and monetary data they provide a guide to make policies for growth and inflation.
9) It is also a necessary data to make projections about the future development trends of the economy.

Now, we will begin with the main course of Unit-1:

Part-I:- Different Concepts of National Income.

Our National Accounts largely follow those terminology given in UN system of National Accounts (SNA) developed by United Nations for analyzing and evaluating statistics that reveals performance of an economy.



This all will be discussed in details later in this unit.

Thus we can say that national income is the sum total of all the incomes accruing over a specified period to the residents of a country and consists of wages, salaries, profits, rent and interest.

1.2.1. Gross Domestic Product (GDP_{MP})

GDP_{MP} is :

- ❖ the measure of market value of all final goods and services.
- ❖ gross of depreciation (i.e. without subtracting depreciation)
- ❖ produced within domestic territory of a country
- ❖ in a specified time period (Ex. a year)

Thus GDP_{MP} is the total value added by all producing units in the "domestic" territory and includes value addition by foreign residents and foreign firms.

Computation :-

GDP_{MP} =	Value of output in domestic territory	–	Value of intermediate consumption

Thus GDP_{MP} is the sum of value added in domestic territory

GDP_{MP} =	Σ value added

However GDP_{MP} excludes the following items:

a) Value added by country citizen / firms abroad.
b) Transfer payments, ex- payments by government towards pensions, unemployed youth etc.
c) Value of transaction which cannot be expressed in monetary terms.
d) Non reported output, value of illegal transactions etc.

While learning about National Income / measuring GDP_{MP} the following points / terms should be kept in mind:-

1) **Value added:** The value of only "Final" goods and services are included in GDP computation.

   Value added = value of output – value of intermediate consumption

2) **Intermediate Consumption:**
   i) It consists of value of goods and services consumed as Inputs during production process. However, it excludes fixed assets whose consumption is recorded as consumption of fixed capital.
   ii) Intermediate goods are used for production of final goods, they are not sold as it is that is why they are not counted because it will lead to double counting. Ex. if value of car is included in GDP, then the value of tyres is not included separately in order to avoid double counting.
3) GDP of any nation represents the sum total of gross value added (GVA) (i.e. without subtracting capital consumption or depreciation) in all sectors of that economy i.e. production of agriculture forestry and fishing which are used for own consumption of producers is also included in production boundary. (Production boundary means all production activities recognized by SNA.)
4) Economic activities are to be distinguished from non economic activities.
5) National income is measured for a particular period say for a year. Therefore, the value of assets such as stock and bonds which are exchanged during current period are not to be included in national income as they do not directly involve current production of goods and services.

   However, the value of services that accompany the sale and purchase (ex. fees paid to lawyers and real estate agents) represents current production and therefore is included in national income.
6) An important point to remembers is that two types of goods used in the production process are counted in GDP:

   (a) Capital goods (fixed assets, plant equipment etc. by business firms)

(b) Non capital goods (goods and services which are demanded by individuals, households as well as business firms).

Nominal GDP vs Read GDP: GDP at Current and Constant Prices.

At Constant prices	At Current Prices
1. Measurement of value of output at the price level of a selected "Base year".	1. Measurement of value of output at the price level of the current year.
2. National income is affected only by changes in output levels.	2. National income is affected by changes in price levels and output levels.
3. This is also called Real Value of National Income. Ex. GDP at constant prices = Real GDP.	3. This is also called Nominal Value of National Income. Ex. GDP at current prices = Nominal GDP.

1.2.2. Gross National Product (GNP)

Concept:-

GNP_{MP} is the measure of the market value of all final goods and services without subtracting depreciation, produced within "domestic" territory of a country in a year plus net factor incomes from abroad.

Computation:-

$GNP_{MP} = GDP_{MP}$ + Net factor income from abroad

Or we can also say that

$GDP_{MP} = GNP_{MP}$ – Net factor income from abroad

NFIA (Net Factor Incomes from Abroad):-

It is the difference between domestic vs national i.e.

NFIA =	Total amounts earned by a country's citizens & firms operating abroad. (National)	–	Total amounts earned by a foreign citizen and foreign firms operating in that country. (Domestic)

If **NFIA** is :-

a) **Positive** then, National Measure > Domestic Measure

b) **Zero** then, National Measure = Domestic Measure

c) **Negative** then National Measure < Domestic Measure

Therefore difference in GDP & GNP

Item	*GDP*	*GNP*
a) Incomes of Indian citizens working abroad, and Indian owned firms operating abroad.	Excluded	Included
b) Incomes of foreign citizen / residents and foreign owned firms working operating in India.	Included	Excluded

Net Domestic Product (NDP) and Net National Product (NNP) at Market Prices:

	NDPmp	NNPmp
1) Meaning	NDPmp is the measure of the market value of all final goods and services produced within the domestic territory of a country in a year after subtracting depreciation.	NNPmp is the measure of the market value of all final goods and services produced within the domestic territory of a country after subtracting depreciation in a year plus net factor incomes from abroad (NFIA).
2) Formula (a) 'Gross' vs 'Net' route	NDPmp = GDPmp – Depreciation	NNPmp = GNPmp – Depreciation
(b) 'Domestic' vs 'National' route	NDPmp = NNPmp – NFIA	NNPmp = NDPmp + NFIA i.e. [GDPmp – Depreciation + NFIA)

1.2.3. Gross Domestic Product at factor Cost (GDP_{FC})

The production and income approach (discussed later in this unit) measure the domestic product as the cost paid to factors of production. Therefore, it is known as "domestic product at factor cost". GDP_{FC} is called so because it represents the total cost of factors i.e. labour, capital and entrepreneurship.

At this stage, we need to clearly understand the difference between the concepts: 'market price' and 'factor cost.' In addition to factor cost, the market value of the goods and services will include indirect taxes which are:

- **product taxes** like excise duties, customs, sales tax, service tax etc., levied by the government on goods and services, and
- **taxes on production,** such as, factory license fee, taxes to be paid to the local authorities, pollution tax etc. which are unrelated to the quantum of production.

You might have noticed that the government gives subsidy to many goods and services. The market price will be lower by the amount of subsidies on products and production which the government pays to the producer. Hence, the market value of final expenditure would exceed the total obtained at factor cost by the amount of product and production taxes reduced by the value of similar kinds of subsidies. Direct taxes do not have the same effect since they do not impinge directly on transactions but are levied directly on the incomes. For example if the factor cost of a unit of good X is ₹ 50/, indirect taxes amount to ₹ 15/per unit and the government gives a subsidy of ₹ 10/per unit, then market price will be ₹ 55/-

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 (GDPFC) = GDP MP – Indirect Taxes + Subsidies = Compensation of employees + Operating Surplus (rent + interest+ profit) + Mixed income of self employed + Depreciation

GNP_{FC} : (*not covered in ICAI module)*

The only change in GDP_{FC} and GNP_{FC} is the adjustment for Net factor incomes from abroad (NFIA) i.e. it will also be added after depreciation.

1.2.4. 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

1.2.5. 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.

1.2.6. Per Capita Income

a) PCI or GDP per capita is a measure of country's economic output per person i.e. it measures standard of living of a country's citizens / residents.

b) It is calculated by dividing the country's GDP (adjusted by inflation) by the total population.

1.2.7. Personal Income

1. **Meaning:** Personal Income is the Total Income which is actually received by all Individuals or Households during a given year in a Country.

   [**Note:** "Persons" for this purpose includes Individuals, Households and Not-for-ProfIt Entities that serve Households.]

2. **National vs Personal Income:** Difference between National & Personal Income arises due to the following reasons Reason–

<table>
<tr><th>Reason for difference</th><th colspan="2">Example</th></tr>
<tr><td rowspan="4">(a) All Incomes which are included in National Income are not "paid" to Individuals or Households as Income.</td><td>Components of Earnings</td><td>Paid to-</td></tr>
<tr><td>Dividends</td><td>Individual only receive Dividends</td></tr>
<tr><td>Undistributed Profits</td><td>Retained by Firms</td></tr>
<tr><td>Corporate Taxes</td><td>Government</td></tr>
<tr><td>(b) Certain Incomes "paid", but not "earned" are not included in the National Income</td><td colspan="2">Transfer Payments, i.e. Old Age Benefits, Pension, Unemployment Allowance, Interest on National Debt, Relief Payments, etc.</td></tr>
</table>

Computation of PI :

PI = NI (National Income)
+ Income received but not earned (i.e. transfer payments)
– Income earned but not received. (see 'a' part above)

1.2.8. Disposable Personal Income (DI)

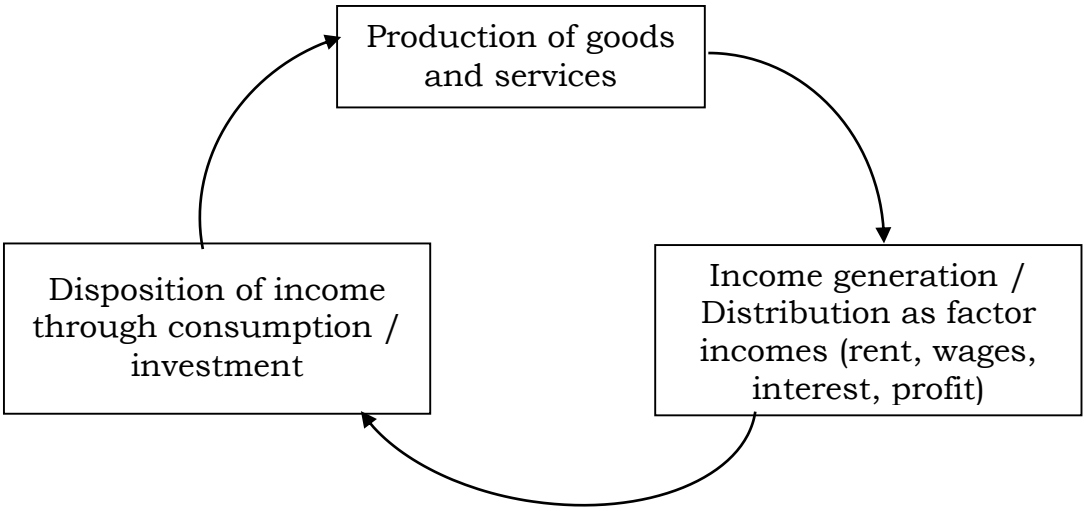
DI is a measure of amount of money in the hands of the individuals that is available for their consumption or savings.

DI = PI – Personal Income Taxes

Or

DI = Consumption + Savings

1.3. Measurement of National Income In India



Circular flow of Income

i) In production phase firm produces goods and services within help of factor services.

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

iii) In 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.

Because of these processes of production, distribution and disposition keep going on simultaneously we are able to look at national income from 3 different angles-

a) as a flow of production or value added.

b) as a flow of income.

c) as a flow of expenditure.

Each of these different ways of looking at national income suggests a different method of calculation of national income.

Overview of different methods:

Particulars	***Method 1***	***Method 2***	***Method 3***
Phase of measurement	Production / Output	Income generation	Income Disposition

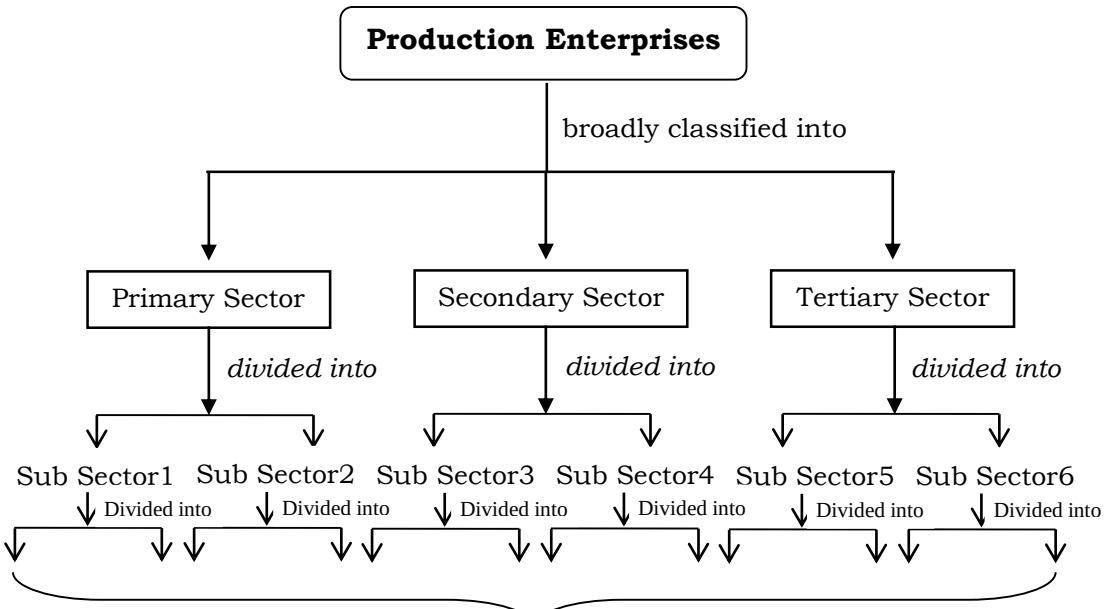
Name of Method	Production method / value added method	Income method	Expenditure method
National income is a	Flow of Production	Flow of Income	Flow of Expenditure
National Income =	Sum of value added by producers	Sum of factor incomes	Sum of all expenditure
Broad Concept	Approaches Nation Income from output side	Approaches Nation Income from distribution side	Approaches Nation Income from Expenditure side

Now, we will start discussing these 3 methods of calculation National Income in details:

1.3.1. 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. This method involves following steps:-

Step1: Identifying producing enterprises and classifying them……



Step2: Now, we have to estimate the gross value added (GVA_{MP}) by each producing enterprises.

GVA_{MP} = Value of Output – Intermediate Consumption = (Sales + Change in Stock) – Intermediate Consumption

Step3: Estimation of National Income:

i) For each individual unit, net value added is found out.
$\Sigma(GVA_{MP})$ – Depreciation = Net Valued Added (NVA_{MP})

ii) By adding all these NVA we get NVA added by sub sector.

iii) By adding NVA by sub-sector as calculated in (ii) above we get the value added or net product of that sector.

iv) For the economy as whole we add the net products contributed by each sector to get NDP.

v) Then, we subtract net indirect taxes and add net factor income from abroad (NFIA) to get National Income.

Net Value Added (NVA_{MP}) – Net Indirect Taxes = Net Domestic Product (NVA_{FC}) or (NDP_{FC}) Net Domestic Product (NVA_{FC}) or (NDP_{FC}) + NFIA = National Income (NNP_{FC})

While applying this method i.e. production method care must be taken to include the following items also-

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

b) Production for self consumption and,

c) Imputed rent of owner occupied house.

(Imputed rent is an estimate in economic theory of the rent a house owners would be willing to pay to line in his or her own house)

1.3.2. Income Method

(*Also known as factor income method ; factor payment method ; distributed share method*)

Whatever is produced by a producing unit is distributed among the factors of production for their services.

Under this 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 and 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 Employers (wages) + Operating surplus (rent + interest + profit) + Mixed Income of self employed + NFIA

While applying this method, care must be taken to include "mixed income of the self employed" in case where:-

a) Individuals provide both labour and capital services because it is difficult to differentiate between labour element and capital element of incomes. Eg.- Doctors, Chartered Accountants, Proprietors, Lawyers, Traders, etc.

b) In economies where subsistence production and small commodity production is dominant, most of the incomes of people would be of mixed type.

1.3.3. Expenditure Method

Procedure: Income can be spent either on Consumer Goods or Investment Goods. So, the procedure is as under:–

Step	Description
1	Identify the various heads of Consumption Expenditure and Investment, under the following categories- (a) Final Consumption Expenditure by - (i) Households, (ii) Government, (b) Gross Domestic Capital Formation, (c) Net Exports, i.e. Exports (-) Imports.
2	Compute GDP_{MP} = Σ (Final Consumption Expenditure + Gross Domestic Capital Formation + Net Exports).
2	Compute **National Income** (i.e. NNPFc) by the following computation procedures – (a) NDP_{MP} = GDP_{MP} (as per Step 2) (-) Depreciation, (b) NDP_{FC} = NDP_{MP} (as per Step 3a) (-) Net Indirect Taxes, (c) NNP_{FC} (i.e. National Income) = NDP_{FC} (as per Step 3b) (+) Net Factor Income from Abroad.

Note: Meaning of terms:

Particulars	Meaning
Private Final Consumption Expenditure	It is the total of what Private Individuals / Consumer Households / Not-for-Profit Entities that serve Households, spend on Consumption Goods & Services, and includes– • Value of all Final Sales of Goods and Services at Market Prices, • Value of Primary Products produced for own consumption, • Payments for domestic services which one Household renders to another, • Net Expenditure on Foreign Financial Assets, i.e. Net Foreign Investment.
Government Final Consumption Expenditure	• It is the Total Spending of the Government on activities like defence, education, healthcare, etc. It is also referred to as "Government Purchases". • Transfer Payments like Pensions, Scholarships, Unemployment Doles, are **excluded.**
Gross Domestic Investment (or) Gross Domestic Capital Formation	It is the Total Expenditure towards Investment Goods, and includes - • Assets, Machinery, Equipment, etc. purchased by Business Firms / Producing Units, • Own Account Production of Assets, Machinery, Equipment, etc. by Producing Units, • Expenditure on Changes in Inventories, • Land and Residential Buildings purchased / constructed by Consumer Households, • Expenditure on the acquisition of valuables by Households, e.g. Jewellery, etc.

Net Exports [i.e. Exports Less Imports]	• It is the Total of what Foreign Countries spend on the Goods and Services of the National Economy over and above what this Economy spends on the Output of the Foreign Countries. • Net Exports may be positive or negative, depending on consumption pattern.

1.3.4. Choice of Appropriate Method

Ideally, all the three methods of national income computation should arrive at the same figure. When 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 agricultural sector, net value added is estimated by the production method, in 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.

1.4. The System of Regional Accounts In India

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 are 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.

1.5. Limitations and Challenges Of National Income Computation

Computation of National Income is very complicated task in underdeveloped and developing countries.

GDP measures ignores the following:-

a) It ignores 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 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) Non-market 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 dis-utility 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) 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.

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

i) lack of an agreed definition of national income,

ii) accurate distinction between final goods and intermediate goods,

iii) issue of transfer payments,

iv) services of durable goods,

v) difficulty of incorporating distribution of income

vi) valuation of a new good at constant prices, and

vii) 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

Practical things which we learnt in this chapter is calculation of:-
1) GDP_{MP} (Gross Domestic Product at Market Price)
2) GNP_{MP} (Gross National Product at Market Price)
3) NDP_{MP} (Net Domestic Product at Market Price)
4) NNP_{MP} (Net National Product at Market Price)
5) GDP_{FC} (Gross Domestic Product at Factor Cost)
6) GNP_{FC} (Gross National Product at Factor Cost)
7) NDP_{FC} (Net Domestic Product at Factor Cost)
8) NNP_{FC} (Net National Product at Factor Cost)

Illustration

1. *Estimation of National Income by Value Added :*
Consider the following transactions in an economy–
- Industry A sells Wood to Industry B for ₹ 60.
- Industry B which is a Manufacturer of Chairs sells Chairs to Industry C for ₹ 90.
- Industry C. which is a Dealer in Furniture sells Chairs to Consumers for ₹ 100.

Would you agree that the National Income in this case is the total of all Sales Values, i.e. ₹60 + ₹90 + ₹100 = ₹ 250? Explain.

Solution:

1. Value of Intermediate Consumption should not be included in National Income, since it will lead to double counting.
2. Hence, the Value Added at every Stage should be considered, and not merely the Gross Sales Value.

Stage	Industry	Selling Price	Cost Price	Value Added
First	A	60	0	60
Second	B	90	60	30
Third	C	100	90	10
Total		**250**	**150**	**100**

In reality, the economy is getting Chairs worth ₹ 100 (the final value of product)

2. *Estimation of National Income by Value Addition:*
Suppose only the following transactions take place in an economy:
- Industry A imports goods worth ₹ 100. It sells goods worth ₹ 400 to Industry B, goods worth ₹ 200 to Industry C, and goods worth ₹ 1,000 for Private Consumption.

- Industry B sells goods worth ₹ 500 to Industry C and goods worth ₹ 800 for Private Consumption.
- Industry C sells goods worth ₹ 600 to Private Consumption and Exports goods valued at ₹ 500.
- Depreciation Cost during the year is ₹ 100,
- Government realizes Indirect Taxes of the value of ₹ 100. Subsidies paid by Government is ₹ 50.

Calculate the following with the help of Net Value Added Method: (a) GNP(MP) (b) GNP(FC) (c) NNP(MP) and (d) NNP(FC).

Solution:

Particulars	**Industry A**	**Industry B**	**Industry C**
Sale Price of Output	400+200+1,000 =1,600	500+800 =1,300	600+500 =1,100
Less: Cost of Intermediate Consumption	100	400	200+500 = 700
Value Added by Industry	1,500	900	400

GDP at Market Prices = **GNP at Market Prices** (no Net Factor Income from abroad)	**2,800**
Less: Indirect Taxes	(100)
Add: subsidies	50
Gross National Product at Factor Cost	**2,750**
Less: Depreciation	(100)
Net National Product at Factor Cost	**2,650**
Less: Subsidies	(50)
Add: Indirect Taxes	100
Net National Product at Market Prices	**2,700**

3. *Relationship between National Income Measures:*

GDP at Market Prices 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. Calculate the aggregate value of Depreciation.

Solution:

1. GNP at Market Prices = GDP at Market Prices + Net Factor Income from Abroad = 1,100 + 100 = 1,200.
2. NNP at Market Prices = NNP at Factor Cost + Net Indirect Taxes = 850 + 150 = 1,000
3. Hence, Depreciation = GNP at Market Prices (-) NNP at Market Prices = 1,200 - 1,000 = ₹ 200 Crores.

4. *Relationship between National Income Measures:*

Net National Product at Factor Cost of a particular country in a year is ₹ 1,900 Crores. There are no interest payments made by the Households to the Firms / Government, or by the Firms/Government to the Households. The Personal Disposable Income of the Households is ₹ 1,200 Crores. The Personal Income Taxes paid by them is ₹ 600 Crores and the value of Retained Earnings of the Firms and Government is valued at ₹ 200 Crores. What is the value of Transfer Payments made by the Government and Firms to the Households?

Solution:

The relationship between NNP at Factor Cost, Personal Income and Personal Disposable Income is given in the following Table. Transfer Payments are computed as the **Balancing Figure** by reverse calculation.

	₹ Crores
National Income at Factor Cost	Given 1,900
Add: Incomes Received but not "earned", i.e., Transfer Payments	**(bal. fig) 100**
Less: Incomes Earned, but not received, e.g., Contributions to Social Insurance, Corporate Income Taxes, Retained Corporate Earnings, etc.	Given (200)
Personal Income	**1,800**
Less: Personal Income Taxes	Given (600)
Personal Disposable Income	Given 1,200

5. *Relationship between National Income Measures:*

From the following data, calculate Personal Income and Personal Disposable Income.

₹ Crores

(a) Net Domestic Product at Factor Cost	8,000	(e) Interest Received by Households	1,500
(b) Net Factor Income from Abroad	200	(f) Interest Paid by Households	1,500
(c) Undisbursed Profit	1,000	(g) Transfer Income	300
(d) Corporate Tax	500	(h) Personal Tax	500

Solution:

Relationship between NDP at FC, NNP at FC, Personal Income and Personal Disposable Income is given in the following Table. Since Interest Received and Paid by Households is the same, its Net Effect is ignored.

₹ Crores

Net Domestic Product at Factor Cost	3,000
Add: Net Factor Income from abroad	200
National Income = Net National Product at Factor Cost	8,200
Add: Incomes Received but not "earned", i.e. Transfer payments	300
Less: Incomes Earned, but not received, e.g. Contributions to Social Insurance, Corporate Income Taxes, Retained Corporate Earnings, etc.	1,000+500 = (1,500)
Personal Income	**7,000**
Less: Personal Income Taxes	(500)
Personal Disposable Income	**6,500**

6. *Relationship between National Income Measures:*

In a single day, Ram collects ₹ 500 as Revenue. Over this day, his Equipment depreciates in value by ₹ 50. Of the remaining ₹450, Raju pays GST worth ₹ 30, takes home ₹ 200 and retains ₹ 220 for improvement and buying of new equipment. He further pays ₹ 20 as Income Tax from his Income. From this data, compute Ram's contribution to the following measures of income - (a) Gross Domestic Product (b) NNP at MP(c) NNP at FC (d) Personal Income (e) Personal Disposable Income.

Solution:

GDP at Market Prices = GNP at Market Prices (since there is not Net Factor Income from abroad)	**500**
Less: Depreciation	50
Net National Product at Market Prices	**450**
Less: Net Indirect Taxes = Indirect Taxes less subsidies	30 – 0 = 30
Net National Product at Factor Cost	**420**
Add: Incomes Received but not "earned", i.e. Transfer Payments	Nil

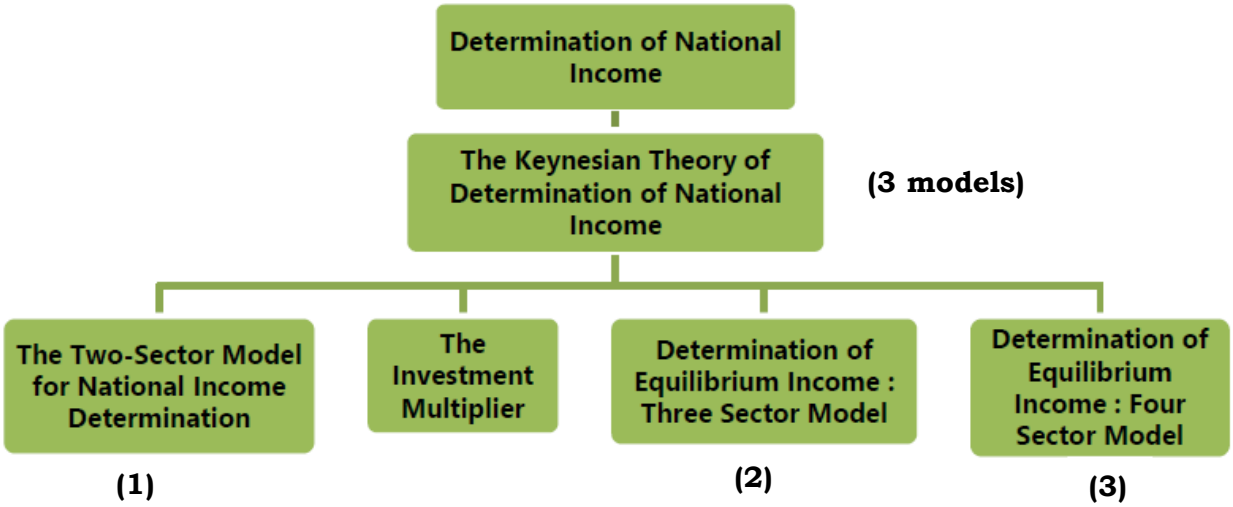
Less: Incomes Earned, but not received, e.g. Contributions to Social Insurance, etc.	Nil
Personal Income	**420**
Less: Personal Income Taxes	20
Personal Disposable Income	**400**

Note: Personal Disposable Income comprises Net Consumption (200 – 20) = 180 + Savings (for Investment) 220 = 400.

7. Estimate national Income by (a) Expenditure Method (b) Income Method from following data

	Rs. in Crores
Private Final Consumption Expenditure	210
Govt. Final Consumption Expenditure	50
Net domestic capital Formation	40
Net Exports	(-) 5
Wages and Salaries	170
Employers Contribution	10
Profit	45
Interest	20
Indirect Taxes	30
Subsidies	05
Rent	10
Factor Income from abroad	03
Consumption of Fixed capital	25
Royalty	15

UNIT 2 : THE KEYNESIAN THEORY OF DETERMINATION OF NATIONAL INCOME



2.1. Introduction

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. A comprehensive theory to explain these phenomena was first put forward by the British economist John Maynard Keynes in his masterpiece 'The General Theory of Employment Interest and Money' published in 1936. 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

1) Consider a 2 sector economy (not present in reality), it provides a simple and convenient basis for understanding the Keynesian theory of Income determination.

2) Two sectors are households and business firms with only consumption and investment outlays.

Households:

– Owns all factors of production

– Sell their factors to earn factor incomes

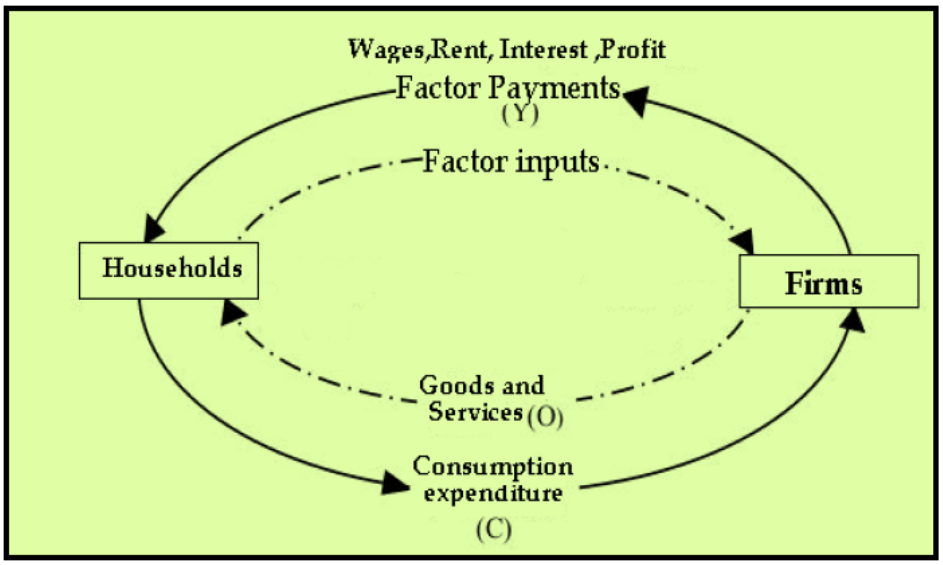
– Spent this income to consume all final goods and services produced by business firms

Business firms:

– Hire factors of production from household
– Produce and sells goods and services to households
– And they do not save

3) All prices, supply of capital and technology remains constant.
4) Government sector does not exist, therefore no taxes, govt. expenses or transfer payments (pensions etc.)
5) In this model economy is closed and hence foreign trade doesn't exist, that means no export and import.

Figure : 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. These two circular flows-real flows and money flows-are in opposite directions and the value of real flows equal the money flows because the factor payments are equal to household incomes. 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 value of output.

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

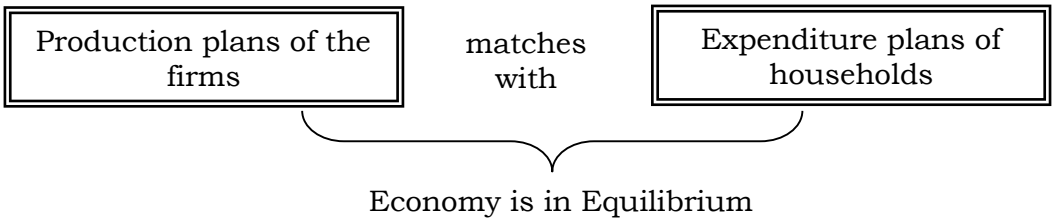
2.2.1. Some Conceptual Framework

A) Equilibrium

Definition: A state in which there is no tendency to change ; or a position of rest.

Meaning: 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.

When,



B) The aggregate demand f

In a simple two sector economy aggregate demand (AD) or aggregate expenditure consists of only 2 components.

1) Demand for consumer goods (C) &
2) Demand for investment goods (I)

Out of these two components demand for investment goods(I) is constant (say $\bar{I}$) and hence aggregate demand is largely determined by the demand for consumption goods so

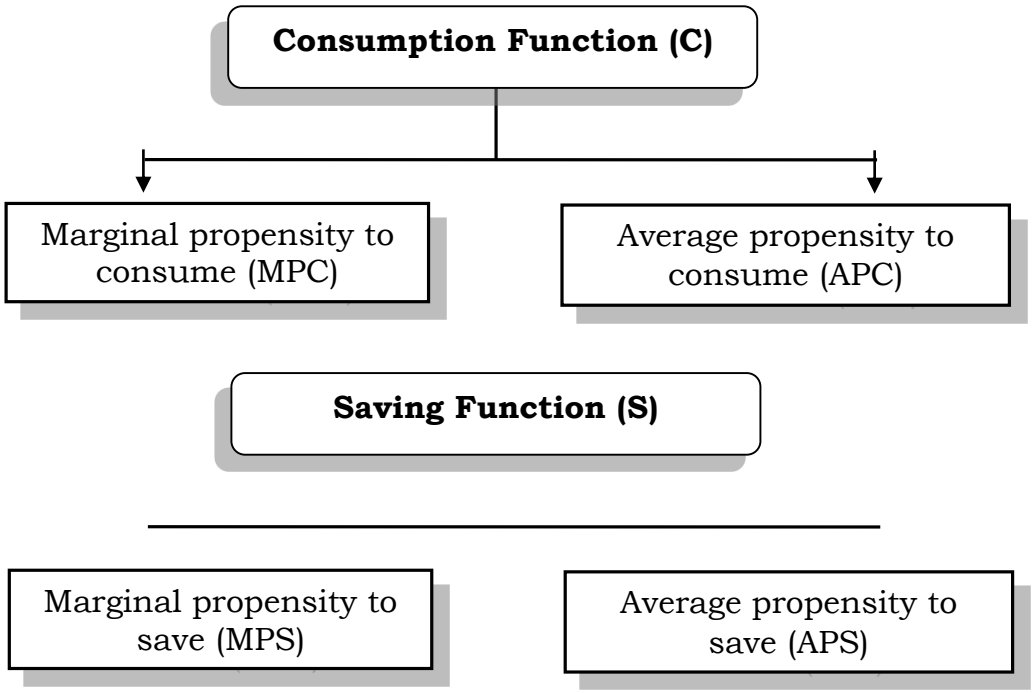
$$AD = C + \bar{I}$$

Where,

$\bar{I}$ = constant investment

Therefore, in short run, AD depends largely on 'C' i.e., aggregate consumer goods/ aggregate consumption expenditure.

C) Consumption & saving function



Consumption function:-

Concept: The Consumption Function expresses the positive relationship between Consumption Expenditure (C) and Total Disposable Income (Y).

Relationship: The specific form of consumption – Income relationship (C = f(y)) termed as consumption function proposed by Keynes is as follows-

$$C = a + by \quad \text{where}$$

C = Aggregate consumption expenditure

y = Total disposable income

a = It is a constant which denotes positive value of consumption at zero level of disposable income.

b = slope of consumption function i.e. $\frac{\Delta C}{\Delta y}$

'b' is also called MPC i.e. marginal Propensity to Consume

Marginal Propensity to Consume:-

The concept of MPC describes the relationship between change in consumption (Δc) and change in income (Δy). MPC is the increase in consumption for every unit of increase in disposable income.

$$\text{MPC} = \frac{\Delta c}{\Delta y} = b$$

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

Hence, 'b' lies between 0 & 1.

Average Propensity to Consume (APC):-

The ratio of total consumption to total income is known as the APC.

$$\text{APC} = \frac{Total\ Consumption}{Total\ Income} = \frac{C}{y}$$

APC shows decreasing trend as Income increases.

Saving function:-

Income not spent on consumption is saved. Thus, saving function denotes the balance after the impact of consumption.

Saving is that part of income which is not spent so, saving function is given by relationship

$S = y - C$ where,

S = aggregate saving

y = total disposable income

C = aggregate consumption expenditure

Marginal Propensity to Save (MPS):-

MPS is the increase in saving for every unit of increase in disposable income.

Ex.- It one unit increase in disposable income leads to an increase of 'b' units of consumption then the remainder i.e. (1 – b) is the increase in saving. This increment saving per unit increase in disposable income (1 – b) is called MPS.

$$\therefore \text{MPS} = \frac{\Delta S}{\Delta y} = 1 - b$$

But we know that $b = \frac{\Delta C}{\Delta y} = \text{MPC}$

∴ We can say that,

$$\text{MPS} = \frac{\Delta S}{\Delta y} = 1 - b = 1 - \text{MPC}$$

As income (y) increases saving (S) also increase. Also since, MPS + MPC = 1
MPS = 1 – B is positive i.e. saving increase as income increases.

Average Propensity to Save (APS):-

The ratio of total saving to total income is called (APS) or it is that part of income which is saved.

$$APS = \frac{S}{y} = \frac{Total\ Saving}{Total\ Income}$$

APS shows increasing trend as income increases.

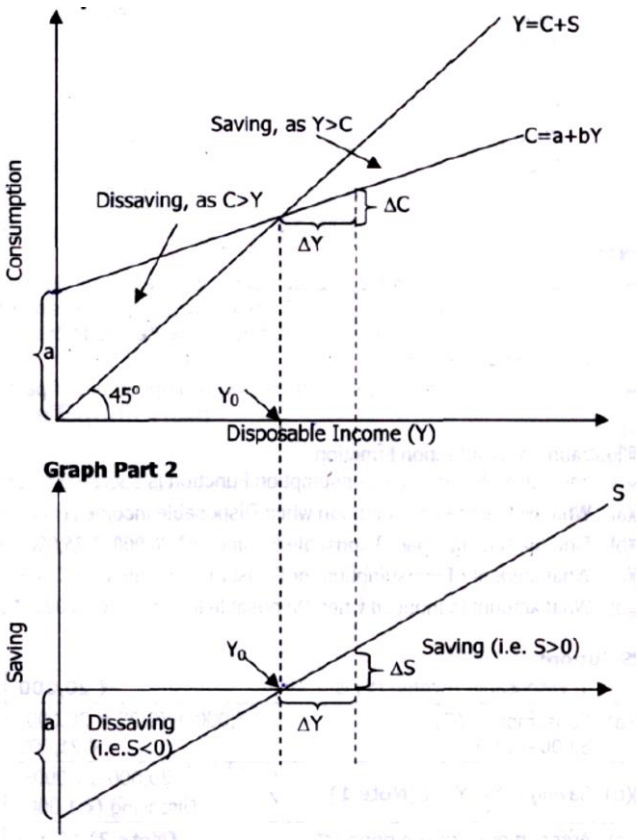
D) 45⁰ Line:

(a) In determining National Income Equilibrium Level, a 45° Line is drawn to split the 1st Quadrant (Positive Quadrant) on the Graph.

(b) This 45° Line is called **Aggregate Supply Line** and it is also called **'Income Line'**, which denotes the function Income (Y) = Consumption (C) + Saving (S), i.e. Y=C+ S.

(c) All points on the 45° Line indicate that Aggregate Expenditure equals Aggregate Output. So, this 45° Line maps out all possible Equilibrium Income Levels.

(d) If the economy is operating at less than full-employment capacity, Producers will produce any output along the 45° Line that they believe Consumers will buy.



Note: In the Graph, Consumption and Saving Concepts are depicted. Following points are relevant

- X Axis represents Disposable Income in both Parts 1 and 2.
- Y Axis represents Consumption in Part 1, and represents Saving in Part 2.
- Consumption at Zero Income Level = a = same Gap under Part 1 and Part 2 of the Graph.
- At Level YQ of Income, Consumption = Income as per Part 1. This is the Point of Zero Savings, i.e. Savings Line cuts the X-Axis in Part 2.
- b = MPC = Slope of Consumption Function = $\frac{\Delta C}{\Delta Y}$ as indicated in the Graph.
- MPS = $\frac{\Delta S}{\Delta Y}$ as indicated in the Graph.

A sample of Income, Consumption and Saving Schedule is given below for illustrating the above concepts.

Income (Y)	**Consumption (C)**	**Saving (S) = Y – C**	**APC = $\frac{C}{Y}$**	**MPC = $\frac{\Delta C}{\Delta Y}$**	**APS = $\frac{S}{Y}$**	**MPS = $\frac{\Delta C}{\Delta Y}$ (1 – MPC)**
0	**(Note)** 500	-500	Infinity	NA	–	NA
1000	1250	-250	1.25	0.75	(0.25)	0.25
2000	2000	0	1.00	0.75	-	0.25
3000	2750	250	0.92	0.75	0.08	0.25
4000	3500	500	0.88	0.75	0.13	0.25
5000	4250	750	0.85	0.75	0.15	0.25
6000	5000	1000	0.83	0.75	0.17	0.25
7000	5750	1250	0.82	0.75	0.18	0.25
8000	6500	1500	0.81	0.75	0.19	0.25
9000	7250	1750	0.81	0.75	0.19	0.25
10000	8000	2000	0.80	0.75	0.20	0.25

Note:

- At Zero level of Income, Consumption will be out of Past Savings (i.e. Dissaving). This is denoted by "a" in the Consumption Function in Point 3 above, where a = Positive Value of Consumption at Zero Level of Income. This is referred to as Autonomous Consumption. [**Note:** Additional Consumption at higher levels of Income is referred to as Induced Consumption.]
- At Zero level of Income, since there is consumption out of past savings, APC at that level will be Infinity "∞".

Illustration:

1. *Consumption Function:*

Assume that an Economy's Consumption Function is specified by the equation C = 6,000 + 0.75Y. Answer the following-

(a) What will be the Consumption when Disposable Income (Y) is ₹ 20,000, ₹ 25,000 and ₹ 30,000?

(b) Find the Saving when Disposable Income is ₹ 20,000, ₹ 25,000 and ₹ 30,000.

(c) What amount of consumption for Consumption Function C is autonomous?

(d) What amount is induced when Disposable Income is ₹ 20,000, ₹ 25,000 and ₹ 30,000?

Solution:

If Disposable Income (Y) is	**₹ 20,000**	**₹ 25,000**	**₹ 30,000**
(a) Consumption (C) = 6,000 + 0.75Y	6,000 + (075 x 20,000) = ₹ 21,000	6,000 + (0.75 x 25,000) = ₹ 24,750	6,000 + (0.75 x 30,000) = ₹ 28,500
(b) Saving (S) = Y – C **[Note 1]**	20,000 – 21,000 = Dissaving (₹ 1,000)	25,000 – 24,750 = ₹ 250	30,000 – 28,500 = ₹ 1,500
(c) Autonomous Consumption (a)	**[Note 2]** ₹ 6,000	₹6,000	₹6,000
(d) Induced Consumption = C – a	**₹ 15,000**	₹ 18,750	₹ 22,500

Note:

1. Saving is the difference between Disposable Income and Consumption. It is the difference between the Consumption line and the 45 Degree line at each level of Disposable Income.
2. For the Consumption Function C = a + bY, where "a" = a constant which represents the positive value of Consumption at Zero Level of Disposable Income. Hence, in this case, a = **₹6,000**. This is also the point at which the Consumption Line intersects the vertical axis (Y-Axis). This is called Autonomous Consumption, i.e. unconnected with Income.
3. Induced Consumption is determined by the level of Income, i.e. it is Income-induced Consumption and is computed as Total Consumption (-) Autonomous Consumption.

2. *Consumption Function:*

Consider the following information and frame the Consumption Function. Also compute Income (Y), when the amount of Consumption is ₹ 36,000.

• Autonomous Consumption even at Zero Level of Disposable Income = ₹ 9,000

• Marginal Propensity to Save = 0.40

Solution:

1. Consumption Function (C) = a + bY. In this case, a = 9,000 (given), b = MPC = 1 - MPS = 1 - 0.4 = 0.6 Hence, Consumption Function^ (C) = 9,000 + 0.6Y
2. If the Consumption is 36,000, then (C) 36,000 = 9,000 + 0.6 Y. Solving, we have, **Income (Y) = 7 45,000**

3. *Consumption Function:*

Consider the following information.

• Autonomous Consumption even at Zero Level of Disposable Income = ₹ 9,000

• For every Rupee increase in Income, the additional Consumption is 40 paise.

You are required to-

1. Frame the Consumption Function.
2. Compute Income (Y), when the amount of Consumption is ₹ 36,000.
3. Compute the Induced Consumption when Income is ₹ 75,000.

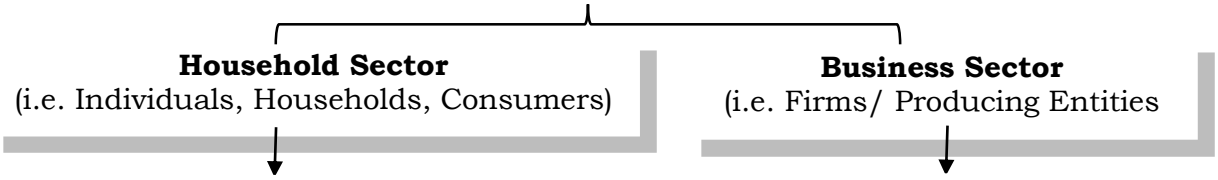
Solution:

1. Consumption Function (C) = a + bY. In this case, a = 9,000 (given), b = MPC = 0.4 (given) Hence, Consumption Function (C) = 9,000 + 0.4Y
2. If the Consumption is 36,000, then (C) 36,000 = 9,000 + 0.4 Y. Solving, we have, **Income (Y) = ₹ 67,500**
3. If Income (Y) is 75,000, Consumption = 9,000 + 0.4Y = 9,000 + (0.4 x 75,000) = **₹ 39,000.** Out of the Total Consumption, since Autonomous Consumption is 7 9,000, balance Induced Consumption is **₹ 30,000.**

2.2.2. Two Sector Model – National Income Determination

1. **Assumptions:**

(a) There are only two sectors in the economy, with the following roles, viz.-



- owns all Factors of Production,
- provides Factor inputs to the Business Sector,
- receive Factor Incomes from Business Sector,
- demands and consumes the Goods and Services produced by the Business Sector.

- utilizes Factor Inputs from Household Sector,
- makes Factor Payments to Household Sector,
- produces Goods and Services for meeting the Consumption Demand of Household Sector.

(b) There is **no Government** Sector, hence, - (i) no Corporate or Personal Taxes, (ii) no Transfer Payments.
(c) There is **no Foreign Sector.** Hence, there are - (i) no exports or imports, (ii) no internal inflows/outflows.
(d) All **Investment is autonomous,** i.e. not determined either by the level of Income or Rate of Interest. Hence, Investment Line (I) is **parallel to X-Axis,** i.e. same investment irrespective of Income Levels.
(e) Capital Equipment, Population, Technical Knowledge, Labour Efficiency, Price Levels, etc. remain **constant.**
(f) There are no injections into or leakages out of, the system.

Note:

• Injections refer to inflows / receipts from outside (i.e. Government or Foreign Sectors) into the Household and Business Sectors, (e.g. Govt Purchases from Firms, Transfer Payments to Households, Exports, etc.)

• **Leakages** refer to outflows /payments by Household and Business Sectors to outside the system (i.e. Government or Foreign Sectors) (e.g. Tax Payments, Imports, etc.).

TWO SECTOR MODEL

Supply of Factor Inputs

Household Sector ⟷ **Business Sector**

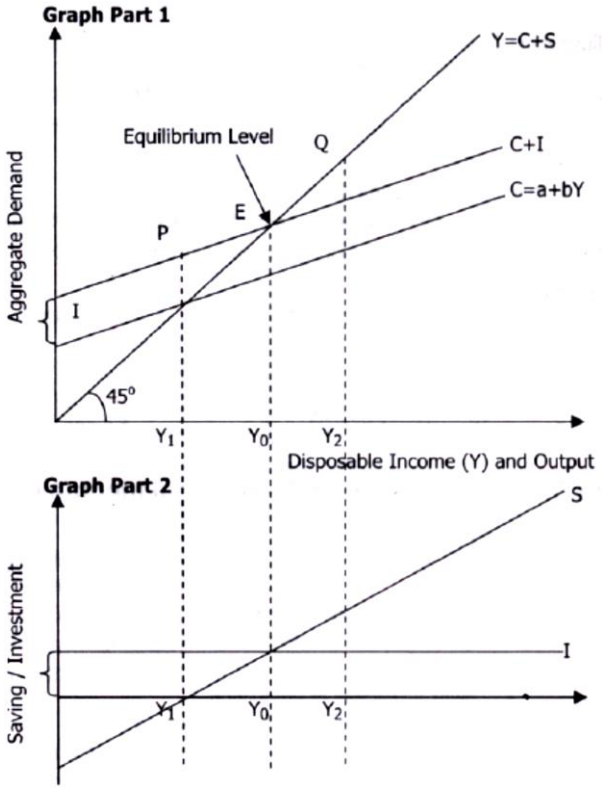
Supply of Goods & Services

Note: Refer Assumptions above, for the inter-relationship between these 2 Sectors. The economy is considered "**closed**" as regards Govt / Foreign Sectors.

2. Equilibrium Level:

(a) In a Two-Sector Economy with the above assumptions, Total Factor Payments = Income of Household Sector = Total Consumption + Investment Expenditure of Households = Total Receipts by Business Sector = Value of Output.
(b) Aggregate Demand depends on the Household Sector's plans to consume and save.
(c) Aggregate Supply depends on the Producers (i.e. Business Sector's) plans to produce goods and services.
(d) Equilibrium Level of National Income is the point at which –
- Aggregate Supply (i.e. Consumption + Savings) = Aggregate Demand (i.e. Consumption + Investment)
- Thus, C + S = C + I
- Hence, Saving (S) = Investment (I).

Explanation of Equilibrium Level:



- X Axis represents Disposable Income and Output, in both Parts 1 and 2.
- Y Axis represents Aggregate Demand in Part 1, and represents Saving / Investment in Part 2.
- Income Level YQ, represents Equilibrium Level of National Income, since at Point E, C+S = C+I.
- Corresponding to that Point in Part 1, at that Income Level YQ, S = I, in Part 2.

Impact of Point P, i.e. where C+I > C+S:

- At Income Level YI, i.e. Point P, C+I > C+S.
- Thus, if I > S (as per Part 2) at this Income Level YI, the Aggregate Expenditures (i.e. Demand) exceed Aggregate Output.
- Hence, Business Sector ,will try to meet the excess demand by expanding production, leading to increase in National Income.
- This will cause a upward movement along the line, to achieve Equilibrium at Point E.

Impact of Point Q, i.e. where C+I < C+S:

- At Income Level Y2, i.e. Point Q, C+I < C+S.
- Thus, if I < S (as per Part 2) at this Income Level Y2, the Aggregate Expenditures (i.e. Demand) is less than Aggregate Output.
- Hence, Business Sector will be unable to sell their output, and hence will reduce their output, leading to decrease in National Income.
- This will cause a downward movement along the line, to achieve Equilibrium at Point E.

3. Impact on Employment:

a) Generally, Increase in National Income would mean Increase in Employment. The larger the National Income, the larger the Employment Level and vice-versa.

b) However, the Equilibrium as per Keynesian Theory need not take place at the full-employment level.

c) In the above Graph, at Income Level YI, Increase in Production will happen only by hiring factors of production. However, at Income Level Y2, reduction in output will happen by keeping some resources idle, thereby leading to the observation that Equilibrium Level YQ, need not be the level of full-employment.

d) Output will remain at less than the full-employment Rate, as long as there is insufficient spending in the economy.

Illustration:

4. Equilibrium Level of National Income in Two Sector Economy

If Consumption Function is C = 500 + 0.75Y, and I = 3,000, compute Equilibrium Level of National Income. Also compute Consumption Expenditure and Savings at that level.

Solution:

- In a Two-Sector Economy, at Equilibrium Level, Y= C + I. So, Y = 500 +0.75Y + 3,000.
- On solving, Y - 0.75Y = 3,500. So, Y = $\frac{3,500}{0.25}$ = 14,000.
- At this Equilibrium Level, Since Investment (I) = 3,000 (given), Consumption (C) = Y -1 = 11,000.
- Also, at Equilibrium Level, Saving (S) = Investment (I) = 3,000.

5. Equilibrium Level of National Income in Two Sector Economy

Assume a two Sector Economy. lf Consumption Function is C = 1,000 + 0.6Y, and S = 6,000, compute Equilibrium Level of National Income. Also compute Consumption Expenditure and Investment at that level.

Solution:

- In a Two-Sector Economy, at Equilibrium Level, Y= C + I. Also, Saving (S) = Investment (I) = 6,000. So, Y = 1,000 +0.6Y + 6,000.
- On solving, Y - 0.6Y = 7,000. So, Y = $\frac{7,000}{0.40}$ = 17,500.
- At this Equilibrium Level, Since Investment (I) = 6,000 (same as Savings), Consumption (C) = Y - 1 = 11,500.
- Also, at Equilibrium Level, Saving (S) = Investment (I) = 6,000.

6. Two Sector Economy

Assume a two Sector economy, and the Business Sector produces 10,000 Units of Output at an Average Price of 7 15. Compute the following–

(a) What is the Money Value of Output?

(b) What is the Money Income of Households?

(c) If Households spend 80% of their Income, what is the total Consumer Expenditure?

(d) What is the total Money Revenues received by the Business Sector?

(e) What should happen to the level of output in this case?

Solution:

(a) Money Value of Output = 10,000 units x 15 p.u. = ₹1,50,000.

(b) In a two sector economy, Factor Payments by Business Sector = Money Value of Output = Factor Incomes of Households = ₹1,50,000.

(c) Total Consumer Expenditure, i.e. Spending by Households = 80% of Incomes = 80% of ₹1,50,000 = ₹1,20,000.

(d) Total Money Revenues received by the Business Sector = Spending by Households = ₹1,20,000.

(e) Business Sector makes Factor Payments of ₹1,50,000 to produce the output, but Households purchase only output worth ₹1,20,000, of what is produced. So, the Business Sector has unsold inventories valued at ₹30,000. They should be expected to decrease output.

2.2.3. Two Sector Model - Effect of Additional Investment i.e. Investment Multiplier

1. Effect of Increase in Investment:

(a) In the Equilibrium Level, generally Investment Demand is considered constant, and the Aggregate Demand is largely determined by Consumption Expenditure.

(b) Factors leading to increase in Investment Demand include Marginal Efficiency of Capital and Rate of Interest.

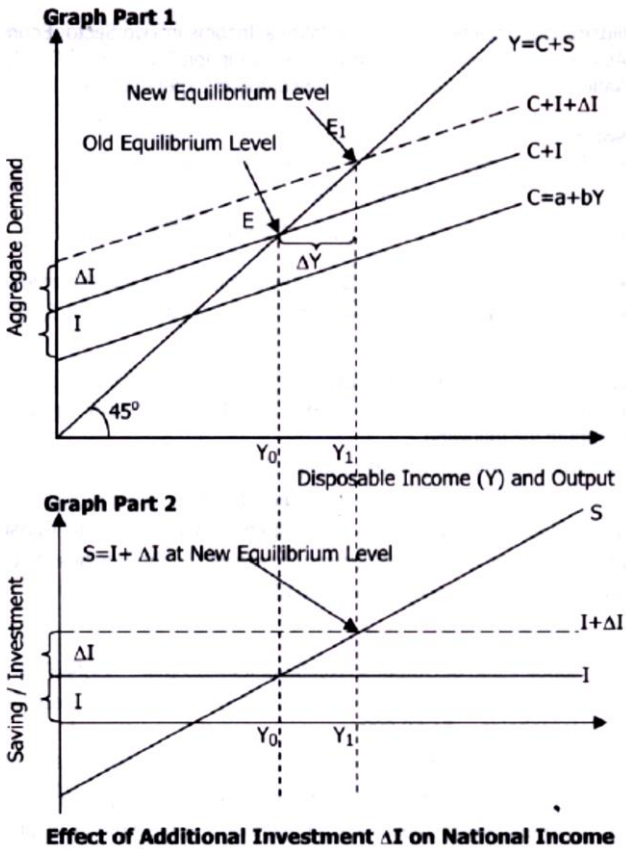
(c) Thus, if there is an additional autonomous Investment by ΔI, National Income will now increase and reach a higher Equilibrium Point at E_1 instead of at E earlier.

2. Higher Rate of Increase in National Income:

(a) The Increase in National Income ΔY from Point E to E_1, i.e. Income Level Y_0 to Y_1, will be much higher than ΔI.

(b) Such disproportionately higher increase in National Income is similar to the "Ripple Effect" if a stone is thrown in a pond of water. This is explained as under–

- Increase in Investment (and thereby Aggregate Demand) leads to an increase in National Income, which will be distributed as Factor Incomes.
- Since Factor Incomes increase, there will be an increase in Disposable Income also, leading to further Investment, after meeting additional Consumption Expenditure due to additional Disposable Income.
- Such Additional Investment leads to an additional round of Increase in Factor Incomes, Increase in Disposable Income, and the process repeats itself.



Effect of Additional Investment ΔI on National Income

3. Investment Multiplier:

(a) The ratio of $\frac{\Delta Y}{\Delta I}$ is called as the **Investment Multiplier**.

(b) Since "Ripple Effect" is caused by further investment (after meeting Consumption Expenditure) out of increased Disposable Income, it is inversely related to the Marginal Propensity to Save (MPS).

(c) Hence, Investment Multiplier is given by the formula = $\frac{\Delta Y}{\Delta I} = \frac{1}{1-MPC} = \frac{1}{MPS}$

4. Effect of above analysis:

(a) Based on the Investment Multiplier concept above, Additional Investment leads to higher levels of National Income.

(b) Additional Investment depends on Marginal Efficiency of Capital and Rate of Interest. [Refer Dependency Chart.]

(c) So, when a Country wants to increase its National Income or Employment then it should create conditions in which Profit Expectations of Investors and Businessmen (i.e. Marginal Efficiency of Capital) go high.

For example: If a change in investment of ₹ 2,000 causes change in national income by ₹ 6,000 then multiplier is $\frac{6,000}{2,000}$ = 3 i.e. for every 1₹ increase in investment expenditure, there will be ₹ 3 increase in equilibrium national income.

Illustration:

7. Effect of Investment Multiplier in Two Sector Economy

If the present Equilibrium Level of National Income is 14,000, compute the Revised Equilibrium Level of National Income if MPS = 0.75, and autonomous Investment increases by 1,000.

Solution:

- Investment Multiplier = $\frac{\Delta Y}{\Delta I} = \frac{1}{MPS} = \frac{1}{0.75}$ = 1.33 times. Since, ΔI = 1,000, ΔY = 1.33 times x 1,000 = **1,333.**
- Hence, Revised Equilibrium Level of Income = Y + ΔY = 14,000 + 1,333 = **15,333.**

8. Effect of Investment Multiplier in Two Sector Economy

In an Economy, it is observed that any increase in investment causes a three-fold increase in National Income. From this data, compute the following - (1) Marginal Propensity to Save (MPS), (2) Marginal Propensity to Consume (MPC).

Solution:

- Investment Multiplier = $\frac{\Delta Y}{\Delta I} = \frac{1}{MPS}$ = 3 times. So, MPS = $\frac{1}{3}$ = 0.33
- MPC (Marginal Propensity to Consume) = 1 – MPS = 1 – 0.33 = 0.67

9. Effect of Investment Multiplier in Two Sector Economy

Assume a two Sector Economy with Consumption Function C = 1,000 + 0.6Y, and S = 6,000. You are required to compute the following–

1. Equilibrium Level of National Income.
2. Consumption Expenditure at the above Equilibrium Level of National Income.
3. Additional Investment, if Autonomous Investment increases by 10% of the existing Investment.
4. Revised Amount of National Income after the above Autonomous Investment.

Solution:

1. In a Two-Sector Economy, at Equilibrium Level, Y= C + I. Also, Saving (S) = Investment (I) = 6,000. So, Y = 1,000 +0.6Y + 6,000.

   On solving, Y - 0.6Y = 7,000. So, Y = $\frac{7,000}{0.40}$ = **17,500.**
2. At this Equilibrium Level, Since Investment (I) = 6,000 (same as Savings), Consumption (C) = Y - 1 = **11,500**.
3. Also, at Equilibrium Level, Saving (S) = Investment (I) = 6,000. Hence, AI = 10% of 6,000 = **600**.
4. Investment Multiplier = $\frac{1}{1-MPS} = \frac{1}{1-0.60}$ = 2.5 times. Since, ΔI = 600, ΔY = 2.5 times x 600 = **1,500**.

So, Revised Equilibrium Level of National Income = 17,500 + 1,500 = **19,000**.

Note: This process of increase in income due to increase in investment does not go endlessly. The process of income propagation slows down and ultimately comes to halt. This is called leakages. If the increased income goes out of the cycle of consumption expenditure, there is a leakage from income stream which reduces the effect of multiplier. These 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 bond holders
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 under developed countries; 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.

2.2.4. Three Sector Model - National Income Equilibrium (Determination of Equilibrium Income)

1. **Background:** The impact of introducing Government Sector leads to the following inter-relationships and flows - (**Note:** Read the Table Column downward, i.e. as "**From**".... "**To**". .....)

	From Household Sector	**From** Government Sector	**From** Business Sector
To Household Sector	NA	(a) Factor Payments (b) Transfer Payments (c) Government Borrowings from Financial Markets [**Note1**]	(a) Factor Payments (b) Investments availed from Financial Markets (c) Provision of Goods/Services for Consumption
To Government Sector	(a) Provision of Factor Services [**Note 2**]	NA	(a) Payment of Corporate

	(b) Payment of Personal Income Taxes (c) Savings in Financial Markets, to enable Govt. Borrowings		Taxes, Indirect Taxes (b) Provision of Goods for Govt. Purchases
To Business Sector	(a) Provision of Factor Services (b) Savings in Financial Markets, for Business Sector to avail Investments in the form of Equity / Debt, (c) Consumption Expenditure	(a) Payment of Subsidies (b) Government Purchases, i.e. Consumption Expenditure	NA

Note 1: Government borrows from Financial Markets when Tax Collections (Inflows) are less than Outflows towards Government Purchases, Transfer Payments and Subsidies, i.e. to finance the deficit / shortfall.

Note 2: Services by Government Employees is an example of Factor Services rendered to Government.

2. Assumptions:

(a) There are 3 Sectors viz. - (i) Households, (ii) Government, and (iii) Business, with the inter-relationships mentioned above.

(b) There is **no Foreign Sector**. Hence, there are - (i) no exports or imports, (ii) no internal inflows/outflows.

(c) There are **no injections** into **or leakages** out of, the system-vis-a-vis Foreign Sector.

(d) Capital Equipment, Population, Technical Knowledge, Labour Efficiency, Price Levels, etc. remain **constant**.

(e) All **Investment is autonomous**, i.e. not determined either by the level of Income or Rate of Interest. Hence, Investment Line (I) is **parallel to X-Axis**, i.e. same investment irrespective of Income Levels.

(f) Government Purchases and Level of Taxes are decided by policy-makers **independent** of Demand and Supply. So, I+G line is also parallel to X-Axis, i.e. at same amounts.

3. Equilibrium Level:

(a) In a 3 Sector Economy as above, Aggregate Supply (to use Disposable Income) = Consumption + Savings = C+S. Since Disposable Income (DI) is net of Taxes, we have DI = Y-T = C + S. Hence, Y = C + S + T.

(b) Aggregate Demand (i.e. Consumption + Investment + Govt Purchases/Payments) = C + I + G.

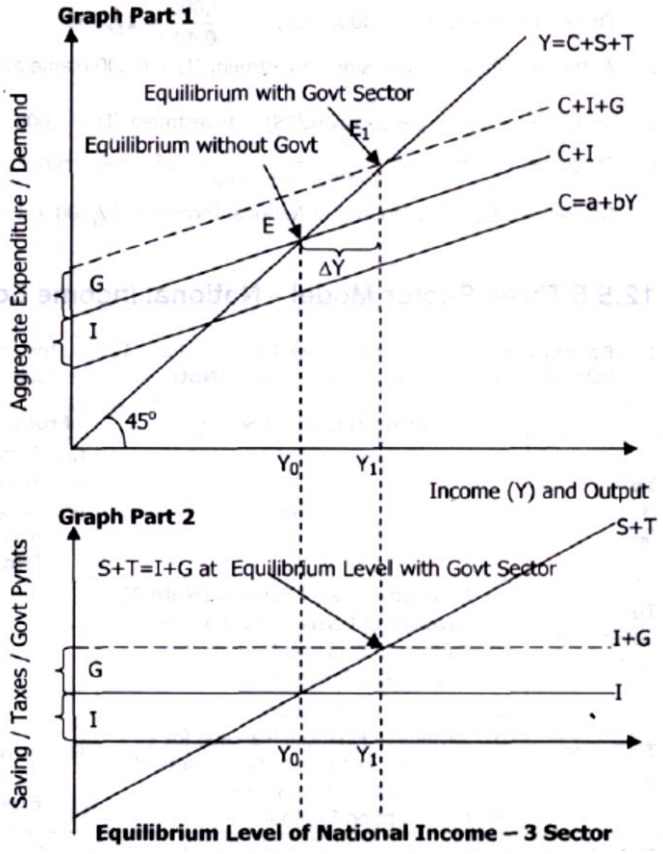
(c) Equilibrium Level of National Income is the point at which-

- Aggregate Supply (i.e. C+S+T) = Aggregate Demand (i.e. C+I+G)
- Savings + Taxes (S+T) = Investment + Govt Purchases / Payments (I+G).

4. Explanation of Equilibrium Level: In the above Graph, Point E_1 (at Income Level YI) is the Equilibrium Level of National Income with Government Sector. Any point above or below this Point E_1 will not be in Equilibrium, as under-

In the Graph, Equilibrium Level of Income without Govt. Sector is at E, whereas Equilibrium Level of Income with Govt. Sector Spending is at E_1. At the Equilibrium Level E_1-

- Aggregate Supply (C+S+T) = Aggregate Demand (C+I+G) [Refer Part 1 of Graph]
- Savings + Taxes (S + T) = Invt. + Govt. Payments (I + G) [Refer Part 2 of Graph]



Point below E_1

(a) Aggregate Demand (C+I+G) exceeds Aggregate Supply / Income (C+S+T).

(b) Since Demand exceeds Production, desired investments will exceed actual investment, and there will be a reduction in Inventory, causing production to rise.

(c) Increased Production leads to increase in Incomes upto Point E_1 leading to Increase in National Income.

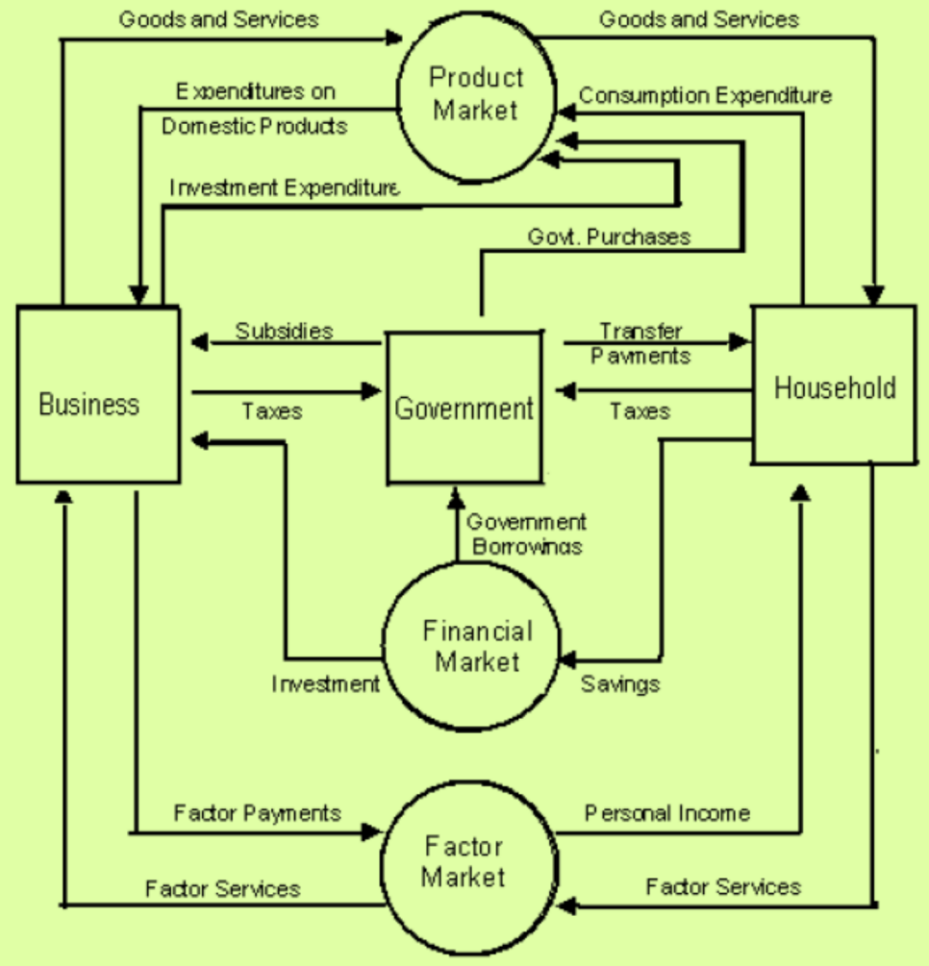
Point above E_1

(a) Aggregate Demand (C+I+G) is less than Aggregate Supply / Income (C+S).

(b) Since Production is more than Demand, people will not be willing to buy/consume, causing increase in Inventory, and output reduction by Business Sector.

(c) Reduction in Output and Employment, causes slide back of National Income back to Point E_1.

Figure : Circular Flow in a Three Sector Economy



Source ICAI Module

2.2.5. Four Sector Model - National Income Equilibrium

1. Background: In the Three Sector Model in Para 12.5.3, the impact of bringing in the Foreign Sector (i.e. Rest of the World) leads to the following additional flows–

(a) Imports (denoted by M) and Exports (denoted by X) of Goods or Services by - (i) Households, (ii) Government, and (iii) Business Firms,

(b) Capital Formation and Capital Inflows from the Rest of the World, into the Economy.

2. Impact of Exports / Imports:

Point	**Export (X)**	**Imports (M)**
Impact on Aggregate Demand	Exports represent Foreign Demand for this Economy's Output, and is hence **included** in Aggregate Demand.	Imports represent demand for Foreign Goods and not domestic goods, and is hence **excluded** from Aggregate Demand.
Injection / Leakage	Exports constitute Injection / Addition / Inflows into the National Income.	Imports constitute Leakage / Reduction / Outflows from the National Income.

Nature of Demand	This Demand is based on Incomes in Foreign Countries, and is not based on levels of this Country's National Income / Output.	This Demand is assumed to be based on the levels of Domestic Income, i.e. based on the marginal propensity to import.

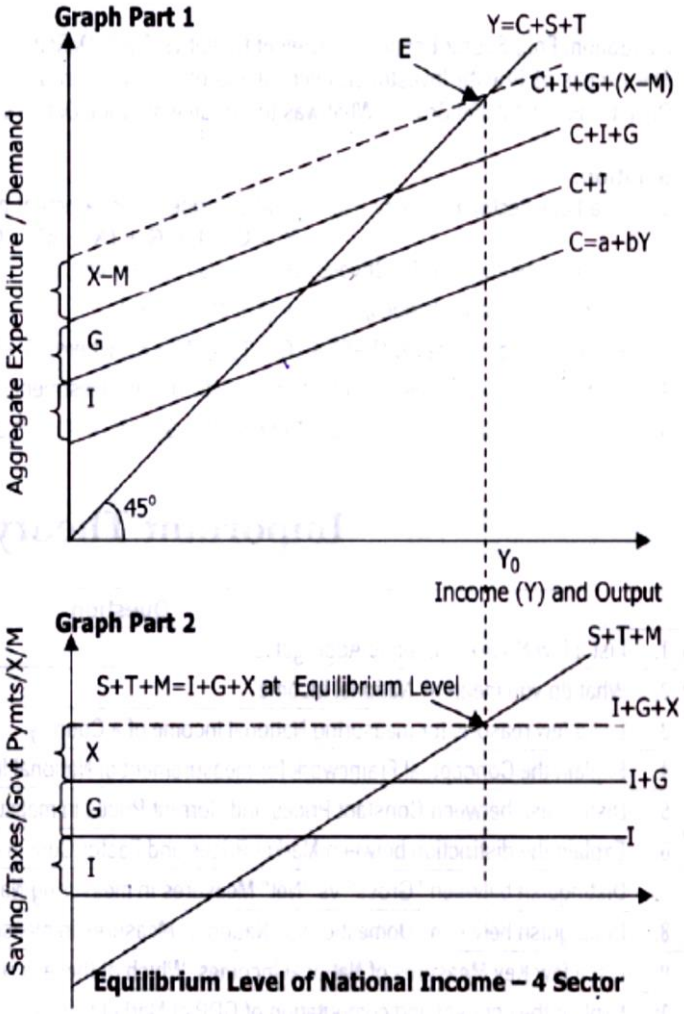
3. Equilibrium Level:

(a) In a 3-Sector Economy (without Foreign Sector), Aggregate Supply = Y = C + S + T. For a 4-Sector Economy, with Foreign Sector, there is no change in Aggregate Supply as such. Hence, Y = C+S+T continues here also.

(b) Aggregate Demand (i.e. Consumption + Investment + Govt Payments + Net Exports) = C + I + G + (X-M).

(c) Equilibrium Level of National Income is the point at which–

- Aggregate Supply (i.e. C + S + T) = Aggregate Demand [i.e. C + I + G + (X-M)].
- Savings + Taxes + Imports (S + T + M) = Investment + Govt. Payments + Exports (I + G + X)



In the Graph, Equilibrium Level is E where–

- Aggregate Supply (C+S+T) = Aggregate Demand [C+I+G+(X-M)] [See Part 1 of Graph]
- Savings + Taxes + Imports (S + T + M) = Investment + Govt. Payments + Exports (I + G + X) [See Part 2 of Graph]

Point below E:

(a) Aggregate Demand [C+I+G+(X-M)] exceeds Aggregate Supply / Income (C+S+T).

(b) Since Demand exceeds Production, desired investments will exceed actual investment, and there will be a reduction in Inventory, causing production to rise.

(c) Increased Production leads to increase in Incomes upto Point E leading to Increase in National Income.

Point above E:

(a) Demand [C+I+G+(X-M)] < Supply (C+S+T).

(b) As Production > Demand, people will not be willing to buy, causing increase in Inventory, and output reduction by Business Sector.

(c) Reduction in Output and Employment, causes slide back of National Income back to Point E.

Note: The above explanation is based on the assumption that **Net Exports (X - M) is positive**. Hence, C+I+G+(X-M) line lies above C+I+G line.

4. Impact of Imports > Negative:

(a) If Net Exports is negative, i.e. M > X, then C+I+G+(X-M) line will fall below C+I+G line, causing a reduction in National Income, and a new Equilibrium at a lower level of Income than YQ. Hence, generally higher Net Imports reduce the National Income, while higher Net Exports increase the National Income.

(b) However, the above should not lead to a conclusion that Imports are harmful in an economic sense. This is because, if imports are cheaper, it is better to import those goods, and utilize the corresponding domestic resources on producing other goods and services, so as to have overall increase in National Output and Incomes.

5. Expenditure Multiplier:

(a) In a 4 Sector Economy, the Autonomous Expenditure Multiplier is given by the computation $\frac{1}{1-b+v}$ where b = Marginal Propensity to Consume (MPC) and v = Propensity to Import.

(b) Higher the value of "v", lower will be the Expenditure Multiplier, and vice-versa. Higher "v" leads to higher induced effect on demand for foreign consumer goods (not domestic consumer goods.)

Illustration:

10. Four Sector Economy

For the Linear Consumption Function is C = 700 + 0.8Y, I is 1,200 and Net Exports X-M = 100. Find Equilibrium Output, ignoring Government Spending (G) and Taxes (T).

Solution:

1. In a Four Sector Economy (Households, Business, Government and Foreign Sectors), we have the equation,

   Y = C + I + G + (X-M) = C + S + T, where

   C = Consumption, I = Investment, G = Govt Spending, X = Exports, M = Imports, S = Savings and T = Taxes.
2. Here, on the Aggregate Demand side Y = C + I + G + (X - M). 3. Substituting the values, we have Y = 700 + 0.8Y + 1,200 + Nil + 100. On solving **Y = 10,000**.

11. Four Sector Economy - Budget Deficit vs Trade Deficit

The excess of Private Investment over Saving of a country in a particular year was ₹ 3,000 Crores. The amount of Budget Deficit was (-) ₹ 2,000 Crores. What was the volume of Trade Deficit of that country?

Solution:

1. In a Four Sector Economy (Households, Business, Government and Foreign Sectors), we have the equation,

   Y = C + I + G + (X-M) = C + S + T, where

   C = Consumption, I = Investment, G = Govt. Spending, X = Exports, M = Imports, S = Savings and T = Taxes.
2. Cancelling C on both sides, I + G + (X-M) = S + T
3. Re-arranging, we have, (I -S) + (G - T) = (M - X), where (G - T) = Budget Deficit, and (M - X) = Trade Deficit.

4. In the above case, it is given that excess of Private Investment over Saving, i.e. (I - S) is 3,000, and (G - T) = 2,000.
5. Thus, from Point 3 above, Trade Deficit = (I -S) + (G - T) = 3,000 + 2,000 = **₹ 5,000 Crores.**

12. An increase of investment by Rs. 600 Crores resulted in an increase in national income by 2400 Crores. Find MPC and MPS?

13. The equilibrium level of real GDP is Rs. 1,000 billion, the full employment level of real GDP is Rs. 1,250 billion, and the marginal propensity to consume (MPC) is 0.60. How much government spending (ΔG) would be needed to raise income to full-employment level?

14. You are given the following data on an economy (Rs. in Cores):

Investment expenditure (I):	250
Government expenditure on goods and services (G):	800
Exports (X):	600

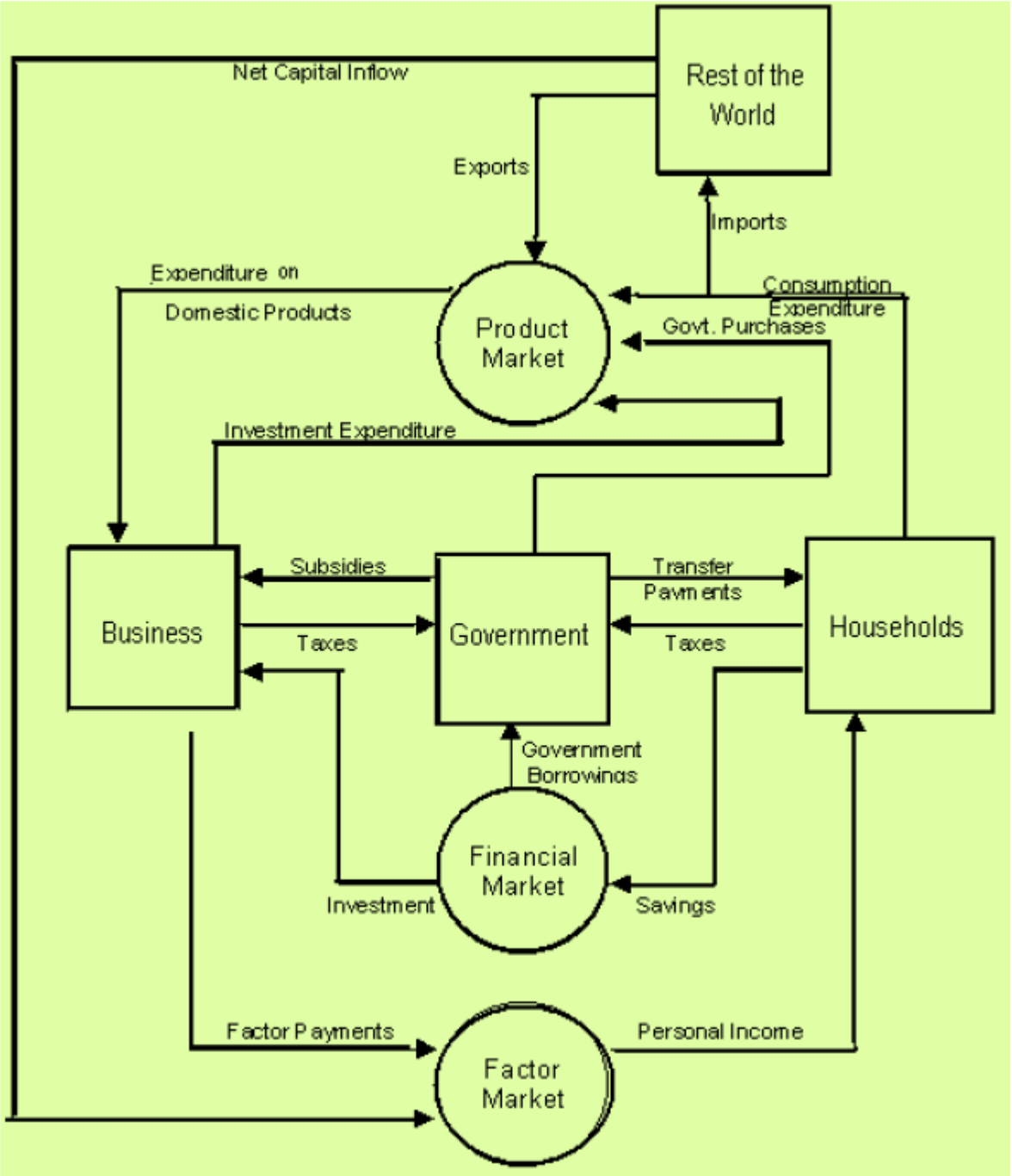
All tax revenues are derived from a uniform rate of income tax of 30% of income.

Consumption expenditure is given by: C = 0.75 Y_d; Where: Y_d is disposable national income (i.e., income less taxes) and C is consumption expenditure

Import expenditure is given by: M = 0.15 Y Where; Y is national income and M is import expenditure

(i) Calculate the equilibrium value of National Income.
(ii) Calculate the Current Account Balance at the equilibrium value of National Income.
(iii) Calculate the Fiscal Surplus (+) or Deficit (-) at the equilibrium value of National Income.

Figure : Circular Flow in a Four Sector Economy



Source ICAI Module

❑❑❑