UNIT ONE – NATIONAL INCOME AND ITS DIMENSIONS

UNIT -1

NATIONAL INCOME AND PRICE LEVEL

Unit Structure :

1.0 OBJECTIVES

- To understand and study the meaning of National Income
- To study different National Income concepts
- To understand the Real and Nominal income concepts
- To study the measurement of National income
- To understand the concept and measures of inflation
- To study the concept of price indices
- To understand and study the meaning of GDP deflator
- To study the concepts of Nominal and Real interest rates
- To study the Purchasing Power Parity theory

1.1 NATIONAL INCOME

National income is the money value of all economic activities of a nation conducted in each year. An economic activity refers to production of goods and services which can be valued at market prices. It includes agricultural production, industrial production and production of services. Goods and services which do not have an exchange value or market value are non-economic in nature. For

instance, services of a house wife or a house husband, services of members of family to other members or their own selves, hobbies etc. The national income of a country can be defined as the total market value of all final goods and services produced in the economy in each year.

National income measures market value of annual output. It is therefore a monetary measure of the value of goods and services. To measure the real national income or the measure the changes in physical output of goods and services, the figure for national income is adjusted for price changes. Further, for the accurate calculation of national income, all goods and services produced in a year must be counted only once. Generally, goods are produced in different stages before they reach the markets in their final form. Hence, components of goods are exchanged many times. Thus, to avoid multiple counting, national income includes only the market value of all final goods. This is how national income is defined in terms of product flow.

National income can also be defined in terms of money flow. Economic activities generate money flow in the form of payments i.e., wage, interest, rents and profits. National income can thus be obtained by adding the factor incomes land adjusting it for indirect taxes and subsidies. National income obtained in this manner is known as National Income at Factor Cost.

National income can be viewed from different angles. It represents total receipts land it also represents total expenditure. When goods and services are valued at their market prices, three identities are created, namely: the value of receipts equal to the value of payments equal to the value of goods and services produced and sold. These three identities can be put as:

National Income = National Expenditure = National Product.

To understand the concept, let us assume a two-sector model of an economy consisting of households and firms. Firms produce goods and services. To produce, firms require factor services namely: land, labor, capital and enterprise. Factors of production are paid their prices in the form of rents, wages, interests and profits for their contribution to the production of goods and services. The money value of net production must equal the total money value of factor prices i.e. rents, wages, interests and profits. These incomes become the source of expenditure. Thus, income flows from the firms to the households in exchange for productive services. The income goes back to the firms in the form of expenditure made by households on goods and services. This process is also referred to as the Circular Flow of Economic Activities. There are thus three measures of national income of a country, namely:
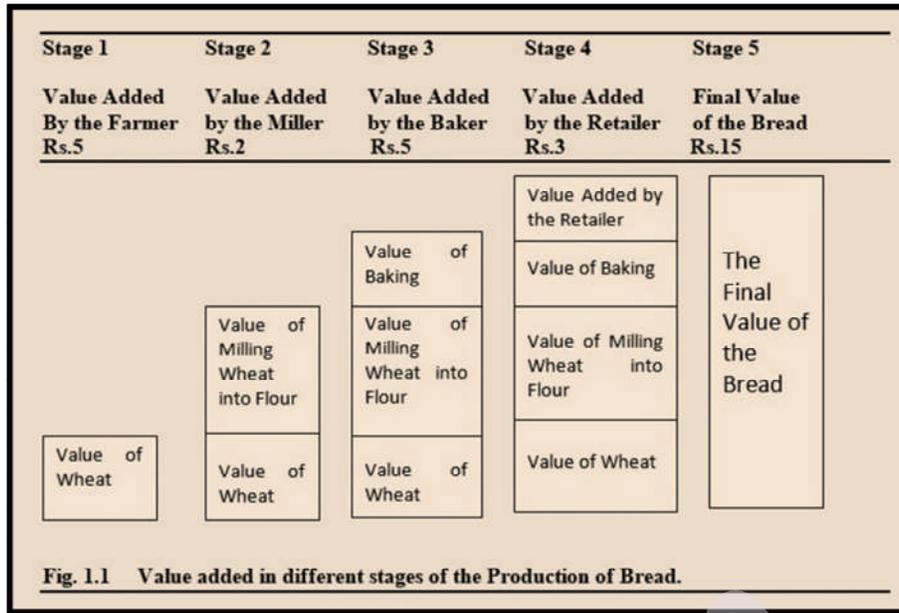
1. The total value of all final goods and services produced.
2. The total of all incomes received by the factor owners in a year, and
3. The total of consumption expenditure, net investment expenditure and government expenditure on goods and services.

These three measures denote the three fundamental functions of an economic system or a national economy, namely: production, distribution and expenditure. The fourth fundamental function is that of consumption and is subsumed in expenditure.

1.2 NATIONAL INCOME CONCEPTS

1.2.1 GROSS NATIONAL PRODUCT (GNP)

The GNP is the most widely used measure of national income. It is the basic accounting measure of the total output of goods and services. GNP is defined as the total market value of all final goods and services produced in a year. It measures the market value of a yearly output and therefore it is a monetary measure of national income. In the definition above, the term 'final' is used to avoid the possibility of double counting and to ensure that only the value of final goods and services is considered in measuring GNP. This is because the value of intermediate goods is included within the value of final goods and services. The term 'gross' refers to the fact that depreciation or capital consumption of goods has not been subtracted from the value of output. While measuring the GNP, only the final value of goods and services is considered, i.e., the value is added in each stage of the production process. For instance, there are many stages in the production of bread. The farmer produces wheat. The miller converts wheat into flour. The baker bakes the bread and finally the bread is sold by the retailer to the consumer. The value addition process in the production of bread is shown in Fig. 1.1.

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Value Added By the Farmer Rs.5	Value Added by the Miller Rs.2	Value Added by the Baker Rs.5	Value Added by the Retailer Rs.3	Final Value of the Bread Rs.15
			Value Added by the Retailer	The Final Value of the Bread
		Value of Baking	Value of Baking	
	Value of Milling Wheat into Flour	Value of Milling Wheat into Flour	Value of Milling Wheat into Flour	
Value of Wheat	Value of Wheat	Value of Wheat	Value of Wheat	

Fig. 1.1   Value added in different stages of the Production of Bread.

As shown in Fig.1.1, value is added to the product at every stage of production as cost is incurred at every stage of value addition. The final value of the bread is the total of the value added at each stage. Suppose in the second stage, if we add up Rs.7 instead of Rs.2 and in the third sage Rs.12 instead of Rs.5 and so on then it will be a case of multiple counting. This will give a wrong and inflated picture of the actual value of the product produced in each period.

The rate of growth of GNP is the most important indicator of the nation's economy. It shows the rate at which the national income of a country is increasing or decreasing. It is the broadest statistical aggregate of an economy's output and growth. The estimate of national income in terms of GNP provides the policy makers and business community a useful tool to analyze the economic performance of the country.

In an open economy, the value of GNP at market prices may be symbolically stated as follows:

$$GNP_{(MP)} = C + I + G + X_n + R_n, \text{ where:}$$

$GNP_{(MP)}$ = Gross National Product at market prices.
C = Consumption goods.
I = Investment goods.
G = Government services.
X_n = Net exports i.e. exports minus imports.
R_n = Net receipts i.e. receipts minus payments.

GNP is the basic accounting measure of national output and represents final products valued at current market prices.

1.2.2 GROSS DOMESTIC PRODUCT AT MARKET PRICES (GDP$_{MP}$)

The Gross Domestic Product refers to the value at market prices of goods and services produced inside the country in each year. It can be stated as follows:

$$\text{GDP}_{MP} = C + I + G + (X - M)$$

Where, C = Consumption goods.
       I = Capital goods or Gross investments.
       G = Government Services.
       X = Exports, and
       M = Imports.

Here, $(X - M)$ refers to net exports or X_n which can be positive or negative. If exports are greater than imports, net exports will be positive and vice versa. Net positive exports will lead to rise in GDP and net negative exports will lead to fall in GDP.

1.2.3 NET DOMESTIC PRODUCT (NDP)

While calculating the GDP, no provision is made for depreciation or capital expenditure. Net Domestic Product is arrived at by subtracting depreciation from the GDP. Depreciation is accounted for because factories, buildings etc., get depreciated over their life time during their use in the production process. These goods need replacement once their life is over. Hence, a part of the replacement cost of the capital is set aside in the form of depreciation allowance. Symbolically, Net Domestic Product can be stated as follows:

$$\text{NDP} = \text{GDP} - D$$

Where, D=Depreciation.

1.3 NOMINAL INCOME (NATIONAL INCOME AT MARKET PRICES) AND REAL INCOME (NATIONAL INCOME AT CONSTANT PRICES.

When goods and services produced in each year are multiplied with their current market prices, we get national income at current prices. However, prices do not remain constant. The value of national income at current prices changes according to the changes in prices. When we measure, national income at current prices, what we get is the nominal national income. Thus, during a period of price rise, the nominal national income would rise even when the physical quantity of output produced remains constant. To find out the real rise in national income, the physical quantity of output should be multiplied with constant prices or base year

prices. This process is called deflating the national income figures for the change in prices that have taken place during a period. Thus, through adjustment or deflation, the national income is calculated at constant prices. The national income at current prices is deflated by price index numbers to obtain national income at constant prices. To find out the real national income, the following formula is used:

National Income at =National Income at Current Prices×100
Constant Prices   Price Index Number

For instance, the estimates of India's national income (NNP) for various years at current and constant prices are given in Table 1.1. The table shows that the increase in Net National Income at current prices is much greater than the increase in Net National Income at constant prices. The nominal values of NNP are much greater than that of the real values because the prices have increased during the period 2015-16 to 2019-20.

Table 1.1   Estimating National Income at Constant Prices from
National Income at Current Prices.

Year	NI at Current Prices Rupees Trillion	Wholesale Price Index No. (Base 2011-12)	NI at Constant Prices (Base 2011-12) Rupees Trillion
1	2	3	4 = (2/3 x 100)
2015-16	121.62	122.06	99.63
2016-17	135.95 (2nd RE)	126.19	107.73
2017-18	151.28 (1st RE)	131.19	115.31
2018-19	168.37 (PE)	136.55	123.30
2019-20	181.10 (1st AE)	139.85	129.49

^{RE} **Revised Estimates,** ^{PE} **Provisional Estimates &**^{AE} **Advanced Estimates. Source: Collated from IES 2019-20.**

1.4 MEASUREMENT OF NATIONAL INCOME

In national income estimates, all goods and services produced and exchanged for money during a year are considered. National output can be estimated at three different levels, namely:

production, distribution and expenditure. Thus, there are three methods of measuring national income. These are as follows:

1. The Census of Products Method or Output Method.
2. The Census of Income Method, and
3. The Expenditure Method.

The estimates of national income indicate the performance of the economy and therefore it is an important accessory in the economist's toolkit. For economic analysis and forecasting, accurate and reliable estimates of Gross National Product assume importance.

1.4.1 The Census of Products Method, Output Method or the Inventory Method.

According to this method, the economy is classified into three sectors, namely: the industrial sector, the service sector and the external sector. Industrial sector includes all productive activities. It constitutes the flow of goods in different sub-sectors like agriculture, mining, transport and public utilities. In the service sector, the value of services which directly serve the consumers is taken into consideration. All salary payments are included. Since, pension is a transfer payment, it is excluded. In the external sector, the value of exports and imports (net exports) and receipts from abroad and payments to other countries (net receipts) are taken into consideration.

This method of estimating national income helps to find out the origin of the national income. Hence, it is called national income by industrial origin. This method can be used in a country where the census of production in each year is undertaken. Since, census data of production of all industries are not available; this method is used along with other methods to arrive at national income. For instance, the national Income Committee of India adopted Census of Production method along with Income method to estimate national income. This method shows the relative importance of the different sectors of the economy by revealing their respective contributions to the national income.

In order to avoid multiple counting, there are two alternative approaches used in the measurement of national income, namely: (1) the final goods method and, (2) the value-added method.

1. The Final Goods Method of Estimating National Income.

According to this method, the final values of goods and services are considered without taking into consideration the value of intermediate goods because the value of intermediate goods is already included in the value of final goods. For instance, the price of motor car includes the prices of its various components. To

avoid multiple counting, only the final value of the goods and services are considered to arrive at a correct estimate of national income.

**2.	The Value-Added Method of Estimating National Income.**
According to the Value-Added Method, the national income estimate is obtained by a summation of the value added at each stage of production until the final product is produced. The value-added method is shown in Table 1.2. You will notice from Table 1.5 that the value of the final product is added in the production process. To avoid multiple counting, on should consider either the value of the final output or the sum of values added.   National income estimates by Value Added Method is a tedious exercise and hence the more convenient Final Goods Method is adopted.

Table 1.2 - Value Added Method of Estimating National Income

1	2	3	4	5
1. Wheat	Farmer	1,000	0	1000
2. Flour	Flour Mill	1,400	1,000	400
3. Bread	Baker	1,800	1,400	400
4. Trading	Merchant	2,000	1,800	200
Total Sum of Value Added				2,000

Precautions to be taken while estimating National Income by Census of Product or Output Method.

The following precautions are required to be taken to arrive at a correct result of the national income estimate being made with the Census of Product Method:

1. To avoid multiple counting, only the value of final product must be added. The value of raw materials and intermediate goods must be excluded.
2. Farm output set aside for subsistence should be estimated and measured at the prevailing market prices.
3. Indirect taxes should be deducted and subsides should be added to find out the correct market value of the products.
4. Export income should be added and import expenditure must be deducted.
5. Valuation of quantities must be done with reference to base year prices.

After computing the value of GNP, the value of net exports ($X_n = X - M$) and the value of net factor incomes from abroad ($R_n = R - P$) or net receipts are added to the GNP. Indirect taxes and depreciation allowance is deducted from the GNP. Symbolically, the National Income estimate made with the Census of Product Method can be stated as follows:

$$Y = (P - D) + (S - T) + [(X - M) + (R - P)]$$

Where, Y = National Income.
P = Domestic Output of all productive sectors.
D = Depreciation Allowance.
S = Subsidies.
T = Indirect Taxes.
X = Exports.
M = Imports.
R = Receipts from abroad, and
P = Payments made abroad.

The Census of Product Method is used in USA where it is also known by 'Total Product Method' or 'Goods Flow Method'. However, in underdeveloped countries like India, there are practical difficulties encountered in using this method because of the presence of a substantially large non-monetized sector.

1.4.2 Census of Income Method or Factor Income Method

The income method approaches national income from the distribution point of view. Accordingly, the national income is measured after it has been distributed and appears as income earned by individuals or factor owners. The national income is obtained by adding up the incomes of all individuals of the country in the form of rent, wages, interests, profits, undistributed profits of joint stock companies and incomes of self-employed people. This method is therefore called National Income by Distributive Shares. Transfer payments like subsidies, gifts, etc are deducted from the total factor incomes. National income is therefore equal to factor incomes less transfer payments. This method is also known as Factor Income or Factor Cost Method. To this, net exports and net receipts are added to obtain the National Income. Symbolically, this method can be expressed as follows:

$$Y = \Sigma (r + w + i + \pi) + [(X - M) + (R - P)]$$

Where, w = Wages.
r = Rent.
i = Interest, and
π = Profits.

Precautions to be taken in the estimation of National Income by Income Method.

To obtain the correct estimates of national income by income method, the following precautions should be taken:

1. Income from the sales receipts of second hand goods must be excluded but the brokerage on such transactions must be accounted for in the national income.

2. Transfer payments such as unemployment allowance, pensions, charity, gifts, earning from gambling, windfall gains from lotteries etc are to be excluded.

3. Financial investments are to be excluded as they do not add to the real national income. All capital gains/losses related to wealth should be ignored.

4. Direct tax revenue to the government should be deducted from the total income as it is a transfer income from the people to the government. In the same manner, government subsidies should be deducted from the profits of the subsidized industries.

5. All unpaid services should be ignored. For instance, services of the housewife, service to self etc for which payments are not made should be excluded.

6. Undistributed profits of companies, income from government property and profits of public enterprises should be added.

7. Rent because self-occupied accommodation should be imputed and included in the national income.

8. Value of production for self-consumption should be accounted for in the national income.

In India, the National Income Committee used the Income Method for summing up the net income from the services sector. Due to the lack of personal accounting practices, it is difficult to know the personal income of individuals and hence the income method is not used entirely for the national income estimates. The Central Statistical Organization (CSO) uses a combination of the Census of Product Method and the Census of Income Method for estimating the national income.

1.4.3 The Expenditure Method of Estimating National Income

This method is also known as the Consumption and Investment Method of measuring national income. National income from the expenditure point of view is the sum of consumption expenditure and investment expenditure. According to this method, national income is computed in the following manner:

a) Estimate private and public consumption expenditure.
b) Add the value of investment in fixed capital and stocks.
c) Add the value of net exports i.e. $(X - M)$ and the value of net receipts $(R - P)$ or net foreign income from abroad.

Symbolically, the national income so estimated can be expressed as follows:

$$Y = \Sigma\,(C + I + G) + [(X - M) + (R - P)]$$

Where, C = Consumption Expenditure.
      I = Investment Expenditure, and
      G = Government Expenditure.

Precautions to be taken in the estimation of National Income by Expenditure Method.

      The following precautions are required to be taken in the estimation of national income by expenditure method:

1. Expenditure on second hand goods should be excluded because they are a part of the stock of goods produced in the past.

2. Expenditure on financial assets such as equity shares, bonds etc should be excluded because they do not add to the real national income.

3. Expenditure on intermediate goods should be excluded.

4. Government expenditure on pensions, scholarships, unemployment allowance etc should be ignored as these constitute transfer payments.

5. Expenditure on final goods and services should be included.

1.4.4 Reconciliation of the three methods of estimating National Income.

      The output method, the income method and the expenditure method are the three different methods of estimating national income. They give us three different measures of national income, namely: Gross National Product by output method, Gross National Income by the Income Method and Gross National Expenditure by the expenditure method. Since national income is equal to national product which is equal to national expenditure, any of these three methods will obtain an identical value of national income. Since change in output is equal to change in income which is equal to change in expenditure i.e. $\Delta O = \Delta Y = \Delta E$. Symbolically, the three measures can be expressed as GNP = GNI = GNE.

Choice of Methods

      The three methods of estimating national income give the same measure of national income provided he required data or information for each method is sufficiently available. However, all the methods are not suitable for all the countries and for all purposes. This gives rise to the problem of choice of methods. A given method is chosen based on two main considerations, namely: (1) the purpose of national income analysis and (2) availability of

the required data. If the aim is to estimate the net output, the value-added method could be right choice. If the objective is to estimate the factor income distributed, then the income method would be appropriate. Similarly, if the aim is to find out the expenditure pattern of the national income, the expenditure method should be used. The availability of adequate and appropriate data is an important consideration in selecting a method of national income. The most common method, however, is the value-added method because it is easy to classify economic activities and output and the required data is also easily available. Nevertheless, no single method can accurately measure national income because want of exhaustive data. Hence, the general practice is to use two or more methods to measure national income.

Check your progress:

1. Explain the concept of National Income.
2. Distinguish between GNP and GDP.
3. Distinguish between Nominal Income and real Income.
4. State the methods of measuring National income.

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1.5 MEANING AND MEASURE OF INFLATION

A sustained rise in the general price level over time is known as inflation. Conversely, a sustained fall in the general price level would be known as deflation. Inflation is measured in terms of a price index. For instance, in India, we have the wholesale price index (WPI) and the consumer price index (CPI). The Price Index is based on a basket of goods and services. Within a given basket, the prices of some goods and services may rise or fall. However, when there is a net increase the price of the basket, it is called inflation.

Table 1.3
Inflation Rate based on Wholesale Price Index (WPI)
in India for the period 2015-16 to 2019-20.

Year	Wholesale Price Index	Inflation Rate (%) $P = [(P_1 - P_0)/P_0] \times 100$
2015-16	122.06	-
2016-17	126.19	$126.19 - 122.06/122.06 \times 100 = 3.38\%$
2017-18	131.19	$131.19 - 126.19/126.19 \times 100 = 3.96\%$
2018-19	136.55	$136.55 - 131.19/131.19 \times 100 = 4.08\%$
2019-20	139.85	$139.85 - 136.55/136.55 \times 100 = 2.41\%$

Inflation is a rate of change in the price level. The rate of change is measured with reference to the base year so that a long-term perspective is obtained with regard to price rise. For all practical purposes, inflation rate is measured on yearly basis. However, in recent years, the inflation rate is also measured on monthly and weekly basis. The rate of inflation can be measured as: **$P = [(P_1 - P_0) / P_0] \times 100$.** For example, the price index based on the Wholesale Prices in India for the year 2015-16 was 122.06 and in 2016-17, it was 126.19. The rate of inflation for the year 2016-17 was 3.38 per cent. Inflation rate measured based on wholesale price index (WPI) for the period 2015-16 to 2019-20 in India is given in Table 1.3.

1.6 PRICE INDICES

There are two aspects to the changes in prices. They are: (1) Changes in relative prices which influence the resource allocation of micro-economic units, and (2) Changes in the general price level which influences the purchasing power of money. There are several price indices which are used to explain the second aspect of changes in prices. We will try and understand the construction of two types of price indices, namely; the Consumer Price Index (CPI) and the Wholesale Price Index (WPI).

A. The Consumer Price Index

The Consumer Price Index compares the total money that is required to purchase a given basket of consumption goods and services overtime in percentage terms. The basket represents the actual consumption pattern of a typical family from a specific group for which the CPI is being constructed. As tastes and preferences vary across families and relative prices vary geographically, a separate CPI is constructed for each of a few well-defined population groups. Some such groupings are urban industrial workers, agricultural laborers, urban non-manual employees etc. To construct the index for a given year with reference to a base year, the following information is required:

1. Consumption basket in the base year,
2. Prices of the items in the basket in the base year, and
3. Relative prices for each item in the given year.

We can obtain the weights of each item in the consumption basket from (1) and (2) above. The items in the consumption basket are grouped together into a small number of groups such as, food, fuel and light, housing, clothing etc. There are further sub-groupings amongst the major groups. For instance, in food item, we can have cereals, pulses, oils, fats etc. It is not necessary to include all items in the calculation. If prices of a group of items show similar movements, only one of them needs to be included in

the index calculation. For example, in the vegetables and fruits group, we can select two items each of vegetables and fruits for monitoring price movements. Prices of other items in the category are presumed to move in the same direction as the selected items move. The weights of the non-selected items are then appropriately distributed over the selected items.

The data on consumption basket is obtained from family budget surveys which are carried out from time to time. These surveys give estimates of commodity composition of consumption expenditures of a typical family in a specified population group. Data on prices are obtained from retail outlets by a large staff of field investigators. The base year is changed every few years so that changes in taste, changes in the composition of the consumption basket etc. are considered.

The Consumer Price Indices for various population groups are calculated and published by the Bureau of Labor. In Table 2.1 below, a hypothetical example of CPI construction is given. Let us assume that a typical urban working class family has only five items in its consumption basket. The items, quantities purchased in 1998-99 per month, 1998-99 prices and 2008-09 prices are given in table 1.4.

Table 1.4: Construction of CPI

Item	Quantity 1998-99	Prices 1998-99	Prices 2008-09	Price Relative 2008-09 = $\dfrac{\text{Price2008-09} \times 100}{\text{Price 1998-99}}$
Rice	20 kg	Rs. 10/kg	Rs. 15/kg	150
Wheat	10 kg	Rs. 8/kg	Rs. 12/kg	150
Milk	60 litres	Rs. 10/ltr	Rs. 15/ltr	150
Cotton Cloth	05 mtrs	Rs. 100/mtr	Rs. 200/mtr	200
House Rent	Two BHK	Rs.1500 p.m.	Rs.3,000 p.m.	200

1. **Total expenditure in 1998-99.**

   = $p_i^0 q_i^0$ = Rs. 2,880

2. **Weights.**

   Let us consider the weight of House Rent in the total expenditure in 1998-99. It was Rs. 1,500 p.m. The share of House Rent in total expenditure was:

$$W_{\text{House Rent}} = \frac{p^0_{Hr} q^0_{Hr}}{pi^0 qi^0} \frac{1,500}{2,880} = 0.53$$

The weights of other items are as follows:

Rice = 0.07
    Wheat = 0.02
    Milk = 0.21
    Cotton Cloth = 0.17

The sum of the weights will be equal to one or unity.

3. Price Relatives

Price Relative of Rice

$$\frac{price^t}{price^0} \times 100 = \frac{15}{10} \times 100 = 150$$

The price relative of other items can be similarly obtained and is also given in the table.

4. Laspeyre's CPI

$$I_t = \Sigma w_1 \frac{pi^t}{pi^0} \times 100 = \frac{5,320}{2,880} \times 100 = 184.72$$

B. The Wholesale Price Index

The construction method of the Whole Price Index is like that of the Consumer Price Index. The difference between the two indices is given below:

1)   The items included in WPI are different from that of the CPI. The WPI includes items like industrial raw materials, semi-finished goods, minerals, fertilizers, machinery, equipment etc. in addition to items from the food, fuel, light and power groups. The WPI can be considered as an index of prices paid by producers for their inputs.

2)   Wholesale prices are used. For instance, in the case of minerals ex-mine prices are used, for manufactured products, ex-factory prices, for agricultural commodities the first wholesaler's prices are used.

3)   Weights are based on value of transaction in the various items in the base year. For manufactured products, it is the value of production, for agricultural products, the value of marketable surplus is considered.

The main groups of items are:
1)   Primary Articles.

a)   Food   –   Rice, wheat etc.
b)   Non-food   –   raw cotton, jute etc.
c)   Minerals   –   Iron ore, manganese ore etc.

A total of 80 primary articles are covered.

2)   Manufactured Articles   –   270 items.

3)   Fuel, Power, Light and Lubricants–   10 items

1.7 THE NATIONAL INCOME DEFLATOR

When we divide nominal national income by real national income, we obtain the national income deflator. The real national income can be calculated by dividing nominal national income by the national income deflator. The national income deflator for various years given is given in Table 1.5.

Table 1.5 - Calculating the National Income Deflator

Year	NI at Current Prices Rupees Trillion	NI at Constant Prices (2011-12) Rupees Trillion	The NI Deflator
1	2	3	4 = (2/3)
2015-16	121.62	99.63	1.2206
2016-17	135.95(2nd RE)	107.72	1.2619
2017-18	151.28(1st RE)	115.31	1.3119
2018-19	168.37^{PE}	123.29	1.3655
2019-20	181.10(1^{stAE})	129.49	1.3985

You may notice from Table 1.5 that when we divide the nominal national income by the real income, we can obtain national income deflator. However, to find out the real national income one needs the price index of the relevant years. Once, we have the current year price index number, we can find out the national income of the current year by dividing the nominal national income of the current year by the current year price index and multiply the quotient by hundred. Alternatively, the national income deflator can be found by dividing the current year price index by the base year

price index. Since the base year price index is always hundred, the national income deflator can be simply found by moving the decimal points by two digits to the left. For instance, the wholesale price index in the year 2015-16 divided by 100 would give the national income deflator as 1.2206. You may notice that we have simply shifted the decimal point by two digits to the left. Now when we divide the nominal national income or the national income at current prices by the national income deflator, we can obtain the real national income. For example, Rs.121.62 Trillion divided by 1.2206 will give us Rs.99.63 Trillion which is the real national income for the year 2015-16.

1.8 NOMINAL AND REAL INTEREST RATES

The nominal interest rate is the prevailing market rate of interest. Market interest rates are determined in the money market by the forces of market demand for money and the supply of money. The commercial banking system is the largest component of the money market. The interest rate offered by the commercial banks on deposits for various term periods is the market or nominal rate of interest. For instance, commercial banks in India offer interest rates in the range of 7 to 7.5 percent per annum on deposits of one year maturity period. The real interest rate is the difference between the nominal interest rate and the rate of inflation. If the rate of inflation is six percent per annum, then the real interest would be calculated as follows:

Nominal interest rate – Rate of Inflation = Real interest rate

The consumer price inflation rate in India in the year 2016 is about four percent. The commercial banks offer an interest rate of 7.5 per cent for a fixed deposit of one year maturity. Assuming, Rs.1000/- deposited for a period of one year, the real interest rate on a fixed deposit made in a commercial bank would be 7.5 – 4 = 3.5. The depositor would earn only Rs.35/- at the end of the year. However, if the inflation rate is greater than the nominal interest rate, depositors would earn negative interest income i.e. they would be losing on their deposits.

The relationship between the real interest value (r), the nominal interest rate value (R), and the inflation rate value (i) is given by **(1 + r) = (1 + R)/(1 + i).** In our example, the real interest rate would be **1.075/1.04 = 1.037**

When the inflation rate (i) is low, the real interest rate is approximately given by the nominal interest rate minus the inflation rate, i.e., **r = R – i.**

Check your progress:
1. Explain the meaning of inflation.
2. What do you understand by Consumer price index?
3. What do you understand by Wholesale price index?
4. Explain the term National income deflator.
5. Distinguish between Nominal interest rate and Real Interest rate.

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1.9 PURCHASING POWER PARITY THEORY

The purchasing power parity theory of exchange rate determination was put forward by Professor Gustav Cassel of Sweden in the year 1920. There are two versions of the PPP theory known as the absolute and the relative versions. According to the absolute version, the exchange rate between two currencies should be equal to the ratio of the price indexes in the two countries. The formula for the absolute versions of the theory is as follows:

$$R_{AB} = P_A/P_B$$

Here, R_{AB} is the exchange rate between two countries A and B and 'P' refers to the price index. The absolute version is not used because it ignores transportation costs and other factors which hinder trade, non-traded goods, capital flows and real purchasing power.

The relative version which is widely used by Economists can be illustrated as follows. Let us assume that India and the United States are on inconvertible paper standard and the domestic purchasing power of $1 in the US is equal to Rs.45 in India. The exchange rate would therefore be $1 = Rs.45. Assuming the price levels in both the countries to be constant, if the exchange rate moves to $1 = Rs.40, it would mean that less rupees are required to buy the same bundle of goods in India as compared to $1 in the US. It means that the US dollar is overvalued and the Indian Rupee is undervalued. Appreciation of the rupee will discourage exports and encourage imports in India. As a result, the demand for USD will increase and that of INR will fall till the PPP exchange rate is restored at $1 = Rs.45. Conversely, if the exchange rate moves to $1 = Rs.50, the INR is overvalued and the USD is undervalued. This will encourage exports and discourage imports till once again the PPP exchange rate is restored.

According to the PPP theory, the exchange rate between two countries is determined at a point of equality between the respective purchasing powers of the two currencies. The PPP exchange rate is a moving par which changes with the changes in the price level. To calculate the equilibrium exchange rate under the relative version of the theory, the following formula is used:

$$R = R_0 \times \frac{P_{A1}/P_{A0}}{P_{B1}/P_{B0}}$$

Where 0 = base period,
1 = period one,
A&B = Countries A and B.
P = Price Index.
R_0 = Exchange rate in the base period.

Assuming the price index of Country 'A' (India) to be 100 in the base period and 300 in period one and that of United States to be 100 and 200 in the two periods respectively and the Original exchange rate to be Rs.40, the new PPP exchange rate would be as follows:

$$R = 40 \times \frac{300/100}{200/100} = \frac{300}{100} \times \frac{100}{200} = \frac{3}{2} = 1.5 = Rs.60$$

Thus Rs.60/- or $1 = INR 60 will be the new PPP exchange rate. However, the PPP exchange rate will be modified by the cost of transporting goods including duties, insurance, banking and other charges. These costs are the limits within which the exchange rate can fluctuate given the demand supply situation. These limits are the 'upper limit' or the commodity export point and the 'lower limit' or the commodity import point.

Critical Assessment of the PPP Exchange Rate Theory. The PPP theory is criticized on the following grounds:

1. **Price Indices of Two Countries are not comparable.** The base year of indices in two countries may be different. The consumption basket may also be different. The PPP rate may not therefore give an accurate exchange rate based on the relative purchasing powers of any two currencies.

2. **Base Year is Indeterminate.** The theory assumes that the balance of payments is in equilibrium in the base year. It is difficult to find the base year in which the balance of payment was in equilibrium.

3. **Capital Mobility Influences the Price Level**. The theory assumes that there is no capital mobility. The general price level does not affect items such as insurance, shipping, banking transactions etc. However, these items influence the exchange rate.

4. **Changes in the Exchange Rate affects the General Price Level**. When the exchange rate depreciates, the domestic price level is influenced by the rise in import prices. Demand for exports increases, thereby raising the price of export goods. Conversely, when the exchange rate appreciates, exports are affected and imports become cheaper, thus bringing about a fall in the price level.

5. **Laissez Faire does not exist.** The theory is based on the policy of laissez-faire. However, laissez faire does not exist. International trade is greatly influenced by restrictive and protective trade policies. Non-market forces therefore influence the exchange rate.

6. **Elasticity of Reciprocal Demand influences Exchange Rates.** According to Keynes, the theory neglects the influence of elasticity of reciprocal demand. The exchange rate is not only determined by relative prices but also by the elasticity of reciprocal demand between trading countries.

7. **Changes in the Demand for Imports and Exports influence Exchange Rate.** The exchange rate is not determined by purchasing power parity alone. The demand for imports and exports also influence exchange rate. If the demand for imports rise, purchasing power parity remaining constant, the exchange rate will rise and vice versa.

Conclusion

In spite of the limitations, the PPP exchange rate theory is widely used in development economics to ascertain the real level of development of an economy. The theory is therefore useful and PPP exchange rate is therefore a useful macroeconomic tool. Haberler in support of the theory says that, "While the price levels of different countries diverge, their price systems are nevertheless interrelated and interdependent, although the relation need not be that of equality. Moreover, supporters of the theory are quite right in contending that the exchanges can always be established at any desired level of appropriate changes in the volume of money.

1.10 SUMMARY

1. The national income of a country can be defined as the total market value of all final goods and services produced in the economy in each year.

National income can be viewed from different angles. It represents total receipts land it also represents total expenditure. When goods and services are valued at their market prices, three identities are created, namely: the value of receipts equal to the value of payments equal to the value of goods and services produced and sold. These three identities can be put as:

National Income = National Expenditure = National Product

2. The GNP is the most widely used measure of national income. It is the basic accounting measure of the total output of goods and services. GNP is defined as the total market value of all final goods and services produced in a year. It measures the market value of a yearly output and therefore it is a monetary measure of national income.

3. When goods and services produced in each year are multiplied with their current market prices, we get national income at current prices. However, prices do not remain constant. The value of national income at current prices changes according to the changes in prices. When we measure, national income at current prices, what we get is the nominal national income.

4. National output can be estimated at three different levels, namely: production, distribution and expenditure. Thus, there are three methods of measuring national income. These are as follows:

a. The Census of Products Method or Output Method
b. The Census of Income Method, and
c. The Expenditure Method.

5. A sustained rise in the general price level over time is known as inflation. Inflation is measured in terms of a price index. For instance, in India, we have the wholesale price index (WPI) and the consumer price index (CPI). The Price Index is based on a basket of goods and services. Within a given basket, the prices of some goods and services may rise or fall. However, when there is a net increase the price of the basket, it is called inflation.

6. When we divide nominal national income by real national income, we obtain the national income deflator. The real national income can be calculated by dividing nominal national income by the national income deflator.

7. The nominal interest rate is the prevailing market rate of interest. Market interest rates are determined in the money market by the forces of market demand for money and the supply of money. The real interest rate is the difference between the nominal interest rate and the rate of inflation. If the rate of inflation is six percent per annum, then the real interest would be calculated as follows:

Nominal interest rate – Rate of Inflation = Real interest rate

8. The purchasing power parity theory of exchange rate determination was put forward by Professor Gustav Cassel of Sweden in the year 1920. There are two versions of the PPP theory known as the absolute and the relative versions. According to the absolute version, the exchange rate between two currencies should be equal to the ratio of the price indexes in the two countries.

1.11 QUESTIONS

1. Explain the following concepts:
   a) GNP.
   b) The National Income Deflator.
   c) GDP and NDP.

2. Explain the difference between real and nominal income.

3. Write short notes on the following methods of measuring national income:
   a) Census of Income Method.
   b) Expenditure Method.
   c) Census of Product Method.

4. Explain the 'Census of Product Method' of measuring national income and state the precautions to be taken in estimating national income by this method.
5. What is inflation and how inflation is measured?
6. Explain the construction of Laspeyre's Price Index giving an example.
7. Explain the construction of wholesale price index.
8. Explain the concept of GDP deflator.
9. Explain the difference between nominal and real interest rates.
10. Explain the concept of purchasing power parity income.

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UNIT ONE - NATIONAL INCOME AND ITS DIMENSIONS

UNIT -1A

HUMAN DEVELOPMENT INDEX

Unit Structure :

1A.0 OBJECTIVES

- To understand and study the concept of Human Development
- To study various components of Human Development Index
- To study the measurement of Human Development Index

1A.1 CONCEPT OF HUMAN DEVELOPMENT INDEX

The UNDP Human Development Report 1997 describes human development as "the process of widening people's choices and the level of well-being they achieve are at the core of the notion of human development. Such theories are neither finite nor static. But regardless of the level of development, the three essential choices for people are to lead a long and healthy life, to acquire knowledge and to have access to the resources needed for a decent standard of living. Human development does not end there, however. Other choices highly valued by many people, range from political, economic and social freedom to opportunities for being creative and productive and enjoying self-respect and guaranteed human rights". The HDR 1997 further stated that, "Income clearly is only one option that people would like to have though an important one. But it is not the sum-total of their lives. Income is only a means with human development the end".

What we understand from the description of human development found in HDR 1997 is that human development is a continuous process. The process becomes developmental only if it increases choices and improves human well-being. Amongst other choices, the three most important choices are that of long and

healthy life which is determined by life expectancy at birth, to acquire knowledge which is determined by education and a decent standard of living which is determined by GDP per capita. These three choices are also the components of human development index. While these three choices are basic to human development, the choices go beyond these three to include the ever expanding social, political and economic freedoms that make human life worth living. Thus, guaranteed human rights become an important aspect of human development.

According to Paul Streeton, human development is necessary due to the following reasons:

1. Economic growth is only a means to the end of achieving human development.

2. Investments in education, health and training will increase longevity and productivity of the labor force and thereby improve human development.

3. Female education and development widens choices for women's development. Reduced infant mortality rate reduces fertility rate and reduces the size of the family. It further improves female health and helps to reduce the rate of growth of population.

4. Encroachment upon the natural environment is the result of growing size of impoverished populations. Problems of desertification, deforestation, and soil erosion, erosion of natural beauty, unpleasant habitats and surroundings will reduce with human development.

5. Poverty reduction will encourage people to satisfy higher order needs like esteem needs and the need for self-actualization. Thus, human development can contribute to a better civil society, a credible democracy and social stability and political stability.

1A.2 THE HUMAN DEVELOPMENT INDEX (New method for 2011 data onwards)

1. Life Expectancy Index (LEI)

$$= \frac{LE - 20}{85 - 20}$$

2. Education Index (EI)

$$= \frac{\sqrt{MYSI + EYSI}}{2}$$

2.1

2.2

2.3 Mean Years of Schooling Index (MYSI)

$$\frac{MYS}{15}$$

2.4 Expected Years of Schooling Index (EYSI)

$$= \frac{EYS}{18}$$

3. Income Index (II)

$$= \frac{\ln(GNIpc) - \ln(100)}{\ln(75,000) - \ln(100)}$$

Finally, the HDI is the geometric mean of the previous three normalized indices:

$$HDI = (LEI \cdot EI \cdot II)^{\frac{1}{3}}$$

LE : Life expectancy at birth

MYS: Mean years of schooling (Years that a 25-year-old person or older has spent in Schools)

EYS: Expected years of schooling (Years that a 5-year-old child will spend with his education in his whole life)

GNIpc: Gross national income at purchasing power parity per capita.

1A.2.1 Calculating the Human Development Index
The Human Development Index (HDI) is a summary measure of human development. It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. The HDI is the geometric mean of normalized indices measuring achievements in each dimension.
There are two steps to calculating the HDI.

Step 1. Creating the dimension indices
Minimum and maximum values (goalposts) are set to transform the indicators expressed in different units into indices between 0 and 1. These goalposts act as the 'natural zeroes' and 'aspirational goals', respectively, from which component indicators are standardized. They are set at the following values:

Dimension	Indicator	Minimum	Maximum
Health	Life Expectancy	20	85
Education	Expected Years of Schooling	0	18
	Mean Years of Schooling	0	15
Standard of Living	GNI$_{PC}$ (PPP 2011 $)	100	75000

The justification for placing the natural zero for life expectancy at 20 years is based on historical evidence that no country in the 20th century had a life expectancy of less than 20 years (Oeppenand Vaupel 2002; Maddison 2010; Riley 2005). Societies can subsist without formal education, justifying the education minimum of 0 years. The maximum for mean years of schooling, 15, is the projected maximum of this indicator for 2025. The maximum for expected years of schooling, 18, is equivalent to achieving a master's degree in most countries.

The low minimum value for gross national income (GNI) per capita, $100, is justified by the considerable amount of unmeasured subsistence and nonmarket production in economies close to the minimum, which is not captured in the official data. The maximum is set at $75,000 per capita. Kahneman and Deaton (2010) have shown that there is a virtually no gain in human development and well-being from annual income beyond $75,000. Assuming annual growth rate of 5 percent, only three countries are projected to exceed the $75,000 ceiling in the next five years.

Having defined the minimum and maximum values, the dimension indices are calculated as:

$$DimensionIndex = \frac{actual\,value - minimum\,value}{maximum\,value - minimum\,value}$$

(1)

For the education dimension, equation 1 is first applied to each of the two indicators, and then the arithmetic mean of the two resulting indices is taken. Because each dimension index is a proxy for capabilities in the corresponding dimension, the transformation function from income to capabilities is likely to be concave (Anand and Sen 2000)—that is, each additional dollar of income has a smaller effect on expanding capabilities. Thus, for income, the natural logarithm of the actual, minimum and maximum values is used.

Step 2. Aggregating the dimensional indices to produce the Human Development Index

The HDI is the geometric mean of the three dimension indices:

$$HDI = (I_{HEALTH} \cdot I_{EDUCATION} \cdot I_{INCOME})^{1/3}$$
(2)

Example: Costa Rica	
Life expectancy at birth (years)	**79.93**
Mean years of schooling (years)	**8.37**
Expected years of schooling (years)	**13.5**
GNI per capita (PPP $)	**13,011.7**
Note: Values are rounded.	

Health index $\quad = \dfrac{79.9_3 - 2_0}{8_5 - 2_0} = 0.92_2$

Mean years of schooling index $\quad = \dfrac{8.3_7 - 0}{1_5 - 0} = 0.58_8$

Expected years of schooling index $\quad = \dfrac{13.5 - 0}{1_8 - 0} = 0.75_0$

Education index $\quad = \dfrac{0.558 + 0.75_0}{2} = 0.65_4$

Income index $\quad = \dfrac{\ln(\square)[(13,011.7) - \ln(100)}{\ln(75,000) - \ln(100)}$

$\quad = \dfrac{9.4_7 - 4.6_0}{11.2_2 - 4.6_0} = 0.73_5$

Human Development Index $\quad = HDI = \dfrac{(0.922 + 0.654 + 0.73_5)}{3} = 0.76_3$

The HDR 2015 has grouped countries in four categories:
1. **Very high human development -   0.800 - 1.00**
2. **High human development.   -   0.700 -0.799**
3. **Medium human development.   -   0.550 -0.699**
4. **Low human development.   -   < 0.550**

The HDI trends for some selected countries are given in Table 2.1 below.

Table 2.1 – Human Development Index Trends.				
VERY HIGH HUMAN DEVELOPMENT	**1990**	**2000**	**2010**	**2014**
1 **Norway**	0.849	0.917	0.940	**0.944**
2 **Australia**	0.865	0.898	0.927	0.933
3 **Switzerland**	0.831	0.888	0.924	0.930

4	Denmark	0.799	0.862	0.908	0.923
5	Netherlands	0.829	0.877	0.909	0.922
6	Germany	0.801	0.855	0.906	0.916
6	Ireland	0.770	0.861	0.908	0.916
8	United States	0.859	0.883	0.909	0.915
9	Canada	0.849	0.867	0.903	0.913
9	New Zealand	0.820	0.874	0.905	0.913
11	Singapore	0.718	0.819	0.897	0.912
12	Hong Kong China (SAR)	0.781	0.825	0.898	**0.910**
HIGH HUMAN DEVELOPMENT					
50	Belarus	-	0.683	0.786	**0.798**
50	Russian Federation	0.729	0.717	0.783	0.798
63	Mauritius	0.619	0.674	0.756	0.777
67	Cuba	0.675	0.685	0.778	0.769
69	Iran	0.567	0.665	0.743	0.766
73	Sri Lanka	0.620	0.679	0.738	**0.757**
MEDIUM HUMAN DEVELOPMENT					
106	Botswana	0.584	0.561	0.681	**0.698**
110	Indonesia	0.531	0.606	0.665	0.684
116	South Africa	0.621	0.632	0.643	0.666
121	Iraq	0.572	0.606	0.645	0.654
130	India	0.428	0.496	0.586	**0.609**
132	Bhutan	-	-	0.573	0.605
142	Bangladesh	0.386	0.468	0.546	**0.570**
LOW HUMAN DEVELOPMENT					
145	Kenya	0.473	0.447	0.529	**0.548**
147	Pakistan	0.399	0.444	0.522	0.538
188	Niger	0.214	0.257	0.326	**0.348**

The HDI for some selected countries along with their components is given in Table 2.2 below:

Table 2.2: HDI (2014) for Selected Countries.

HDI Rank	Country	HDI Value	LEB (Years)	MYS (Years)	EYS (Years)	GNIpc (Constant 2011 PPP$)
Very High Human Development						
1	Norway	0.944	81.6	12.6	17.5	64,992
6	Germany	0.916	80.9	13.1	16.5	43,919
8	United States	0.915	79.1	12.9	16.5	52,947
14	United Kingdom	0.907	80.7	13.1	16.2	39,267
20	Japan	0.891	83.5	11.5	15.3	36,927
22	France	0.888	82.2	11.1	16.0	38,056
39	Saudi Arabia	0.837	74.3	8.7	16.3	52,821
High Human Development						
50	Russian Federation	0.798	70.1	12.0	14.7	22,352
63	Mauritius	0.777	74.4	8.5	15.6	17,470
69	Iran	0.766	75.4	8.2	15.1	15,440
73	Sri Lanka	0.757	74.9	10.8	13.7	9,779
90	China	0.727	75.8	7.5	13.1	12,547
Medium Human Development						
106	Botswana	0.698	64.5	8.9	12.5	16,646
130	India	0.609	68.0	5.4	11.7	5,497
142	Bangladesh	0.570	71.6	5.1	10.0	3,191
Low Human Development						
145	Kenya	0.548	61.6	6.3	11.0	2,762
147	Pakistan	0.538	66.2	4.7	7.8	4,866
188	Niger	0.348	61.4	1.5	5.4	908

Source: Compiled from UNDP HDR 2015.

Check your progress:
1. What do you understand by the term Human development Index?
2. State the Life Expectancy Index as a method to measure HDI.
3. State the Education Index method to measure HDI.
4. State the Income Index method of measurement of HDI.

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1A.2.2 CRITICISMS OF THE HDI

The Human Development Index has been criticized for failing to include any ecological considerations, focusing exclusively on national performance and ranking (although many national Human Development Reports, looking at sub-national performance, have been published by UNDP and others—so this last claim is untrue), not paying much attention to development from a global perspective and based on grounds of measurement error of the underlying statistics and formula changes by the UNDP which can lead to severe misclassifications of countries in the categories of being a 'low', 'medium', 'high' or 'very high' human development country.

Economists Hendrik Wolff, Howard Chong and Maximilian Auffhammer discuss the HDI from the perspective of data error in the underlying health, education and income statistics used to construct the HDI. They identify three sources of data error which are due to (i) data updating, (ii) formula revisions and (iii) thresholds to classify a country's development status and find that 11%, 21% and 34% of all countries can be interpreted as currently misclassified in the development bins due to the three sources of data error, respectively. The authors suggest that the United Nations should discontinue the practice of classifying countries into development bins because the cut-off values seem arbitrary, can provide incentives for strategic behavior in reporting official statistics, and have the potential to misguide politicians, investors, charity donators and the public at large which use the HDI.

In 2010 the UNDP reacted to the criticism and updated the thresholds to classify nations as low, medium and high human development countries. In a comment to The Economist in early January 2011, the Human Development Report Office responded to a January 6, 2011 article in *The Economist* which discusses the Wolff *et al.* paper. The Human Development Report Office states that they undertook a systematic revision of the methods used for the calculation of the HDI and that the new methodology directly addresses the critique by Wolff *et al.* in that it generates a system

for continuous updating of the human development categories whenever formula or data revisions take place. Some common criticisms of the HDI are as follows:

1. It is a redundant measure that adds little to the value of the individual measures composing it.
2. It is a means to provide legitimacy to arbitrary weightings of a few aspects of social development.
3. It is a number producing a relative ranking which is useless for inter-temporal comparisons, and difficult to compare a country's progress or regression since the HDI for a country in each year depends on the levels of, say, life expectancy or GDP per capita of other countries in that year. However, each year, UN member states are listed and ranked according to the computed HDI. If high, the rank in the list can be easily used as a means of national aggrandizement; alternatively, if low, it can be used to highlight national insufficiencies.

Ratan Lal Basu criticizes the HDI concept from a completely different angle. According to him the Amartya Sen-Mahbub ulHaq concept of HDI considers that provision of material amenities alone would bring about Human Development, but Basu opines that Human Development in the true sense should embrace both material and moral development. According to him human development based on HDI alone, is similar to dairy farm economics to improve dairy farm output. To quote: 'so human development effort should not end up in amelioration of material deprivations alone: it must undertake to bring about spiritual and moral development to assist the biped to become truly human.' For example, a high suicide rate would bring the index down.

A few authors have proposed alternative indices to address some of the index's shortcomings. However, of those proposed alternatives to the HDI, few have produced alternatives covering so many countries, and that no development index (other than, perhaps, Gross Domestic Product per capita) has been used so extensively—or effectively, in discussions and developmental planning as the HDI.

1A.3 SUMMARY

1. The UNDP Human Development Report 1997 describes human development as "the process of widening people's choices and the level of well-being they achieve are at the core of the notion of human development.

2. Human Development Index is based on the following three new methods:

a. Life Expectancy Index
b. Education Index
c. Income Index

3. The Human Development Index has been criticized for failing to include any ecological considerations, focusing exclusively on national performance and ranking, not paying much attention to development from a global perspective and based on grounds of measurement error of the underlying statistics and formula changes by the UNDP which can lead to severe misclassifications of countries in the categories of being a 'low', 'medium', 'high' or 'very high' human development country.

1A.4 QUESTIONS

1. Explain the concept of Human Development?
2. Explain the construction of the HDI with a suitable example.
3. Explain the criticisms of HDI.

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UNIT TWO - DETERMINATION OF NATIONAL INCOME

UNIT -2

THEORY OF AGGREGATE DEMAND

Unit Structure :

2.0 OBJECTIVES

- To understand the principle of effective demand
- To study the Aggregate Demand and Aggregate Supply concepts
- To study the determination of level of employment
- To study the concept of Under employment equilibrium
- To study the concept of inflationary gap

2.1 THE PRINCIPLE OF EFFECTIVE DEMAND

According to John Maynard Keynes, the level of employment and output in an economy is determined by the level of income and the level of income is determined by the level of effective demand. Effective demand refers to the total expenditure made by the people in a country on goods and services produced in each period. The expenditure stream determines the income stream i.e. Aggregate Expenditure = Aggregate Income.   The level of expenditure or Aggregate Demand and the level of income are directly related to each other.   Higher the level of expenditure, higher will be the level of national income and vice-versa.

Aggregate expenditure in an economy is the sum of aggregate consumption and investment expenditure.   Effective demand, therefore, represents the aggregate demand for aggregate output produced at any equilibrium level of income. Aggregate demand shows the monetary value of national output or

real national income. The national output consists of consumption and investment goods. Effective demand is, therefore, determined by aggregate consumption and investment demand. In modern welfare-oriented economies, government demand is also a major component of aggregate demand and hence it becomes the third component of effective demand. The component of effective demand can therefore be stated as follows:

Effective Demand   =C + I + G
Where;
C   =   Consumption expenditure of the households.
I   =   Investment expenditure by private firms.
G =   Government   expenditure   on   consumption   and investment goods.

2.2 FACTORS DETERMINING EFFECTIVE DEMAND

According to Keynes, effective demand is determined by the interaction of aggregate demand and supply functions.

A. Aggregate Demand Function (ADF)

The ADF is a schedule of maximum sales revenue expected to be received by the class of entrepreneurs from the sale of output produced at various levels of employment. It is also known as the demand price. There is a direct relationship between the aggregate demand price and the level of income or employment. Higher the level of real income or employment, higher will be the aggregate demand price and vice-versa. The aggregate demand function is shown in the form of a schedule in Table 2.1 below with the help of a hypothetical data.

Table 2.1 The Aggregate Demand Schedule	
Level of Real Income (Y) (in Million Workers)	Aggregate Demand Price (in billion rupees)
1	350
2	500
3	650
4	800
5	950

The aggregate demand schedule relates real income measured in terms of employment with the flow of expenditure in the economy. The data in Table 2.1 can be graphically plotted to

obtain the aggregate demand curve as shown in Fig. 2.1 below. Fig. 2.1 below shows the aggregate demand curve. It is a positive sloping curve showing direct relationship between the level of employment or real income and the aggregate demand price. Symbolically,

$$ADP = f(N)$$

Where; ADP = Aggregate Demand Price

N = Level of employment, and
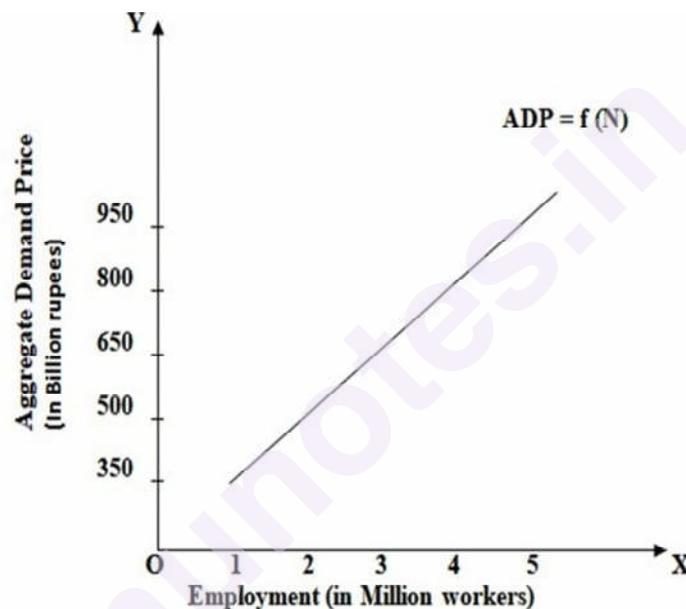
f = Functional relationship

Fig. 2.1: The Aggregate Demand Curve.

B. Aggregate Supply Function (ASF)

The aggregate supply function schedule shows the minimum expected sales revenue of the class of entrepreneurs from output produced at various levels of employment. The aggregate supply price is the minimum supply price or reserve price which the entrepreneurs must receive from the output produced. It is the cost of production that the entrepreneurs must obtain from the sale of output to continue to remain in business. According to Keynes, the supply price of national output can be measured in terms of labor cost. Accordingly, a hypothetical aggregate supply function schedule is tabulated in Table 2.2 below.

Table: 2.2 The Aggregate Supply Schedule	
Level of Employment(N) (in Million workers)	Aggregate Supply Price (ASP) (in Billion rupees)
1	200
2	400
3	600
4	800
5	1000

The data tabulated in Table 2.2 above assumes that money wages paid to a worker is Rs.200, 000 per annum. The schedule therefore shows the minimum expected revenue from the sale of output produced at different levels of employment. Thus, to employ one million workers, the entrepreneurs must receive Rs.200 Billion i.e., Rs.200, 000 X 1000,000 workers. The aggregate supply price is directly related to the level of employment. Higher the level of employment, higher will be the aggregate supply price and vice-versa.

The data given in Table 2.2 is graphically plotted in Fig. 2.2 to obtain the aggregate supply curve.
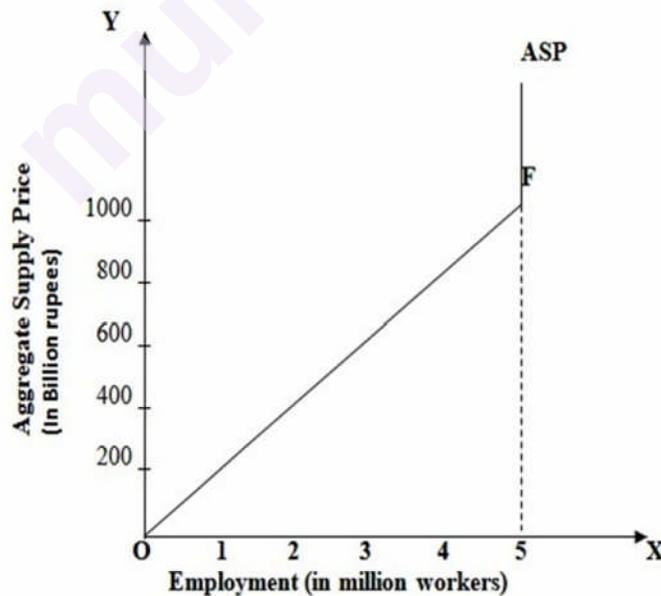
Fig.2.2: The Aggregate Supply Curve.

In Fig. 2.2 above, the X-axis shows the level of employment and Y-axis shows the aggregate supply price. The aggregate supply price curve (ASP) is positively sloping towards the right

indicating a direct relationship between the level of employment and the supply price. The ASP curve becomes perfectly inelastic or vertical at the full employment level. In our example, the full employment level is achieved when five million workers are employed. The ASP curve becomes vertical at point 'F' as shown in Fig.2.2

2.3 EQUILIBRIUM LEVEL OF EMPLOYMENT

The equilibrium level of employment and real national income is determined at the point of equality between the aggregate demand price and the supply price. Employment and real output continues to rise if demand price is greater than the supply price and stops at the point of equality. You will notice from Table 2.3 below that when four million workers are employed the AD price and the AS price are equal i.e., Rs.800 Billion. This point of equality is the point of Effective demand. If employment is increased beyond the point of effective demand, the aggregate demand price will fall below the supply price and the class of entrepreneurs will make losses.

Table 2.3 Equilibrium Level of Employment and National Income The Point of Effective Demand				
Employment (million workers)	AD Price (Billion Rest)	AS Price (Billion Rest)	Comparison	Change in Employment/Real National Income
1	350	200	ADP > ASP	Increase
2	500	400	ADP > ASP	Increase
3	650	600	ADP > ASP	Increase
4	800	800	ADP = ASP	Equilibrium
5	950	1000	ADP < ASP	Decrease

The equilibrium level of employment and real national income or the point of effective demand can be diagrammatically shown as in Fig.2.3 below.
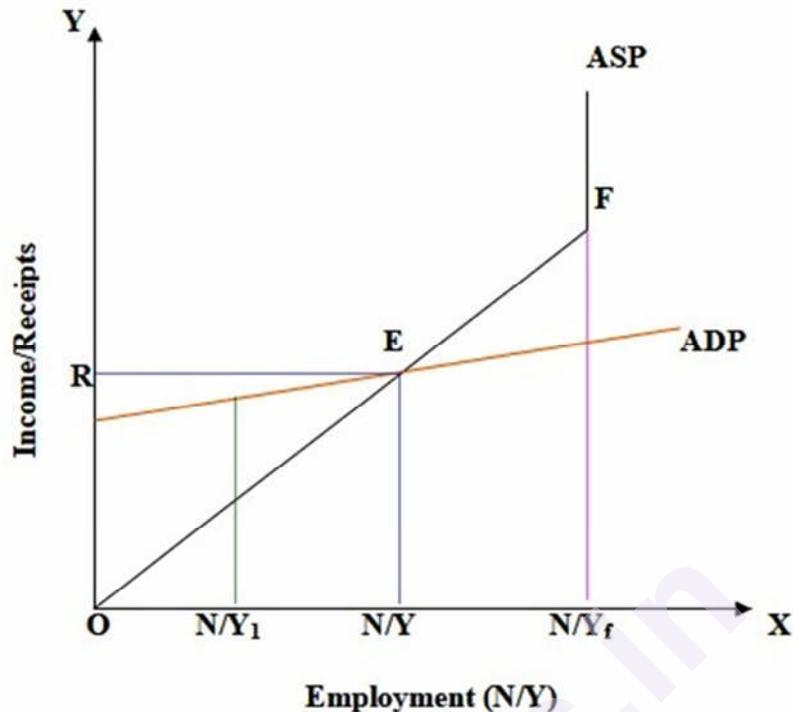
Fig. 2.3: Equilibrium Level of Employment and Real National Income.

In Fig. 2.3 above, the two curves ADP and ASP intersect each other at point 'E'. Point 'E' is the point of effective demand. Corresponding to point 'E', point 'R' on the Y-axis indicates equilibrium receipts and point 'N' on the X-axis indicates equilibrium level of employment and real national income. However, point 'E' is only an under employment or less than full employment equilibrium as full employment level is indicated by point 'F' on the aggregate supply curve.

Per Keynes, the economy achieves equilibrium at less than full employment level because the gap between income and consumption is not fully filled up by investment. Both investment and savings are made by two different classes. While savings are made by the household sector, investments are made by the class of entrepreneurs. Hence, investment cannot be equal to saving. If aggregate investment is less than aggregate savings, economy will operate at less than full employment level.

Increase in the Level of Effective Demand and Employment

Per Keynes, the aggregate supply function is constant in the short run because the productive capacity of the economy cannot be increased in the short period. However, the level of effective demand and employment can be increased by increasing the aggregate demand function. This is shown in Fig.2.4 below.
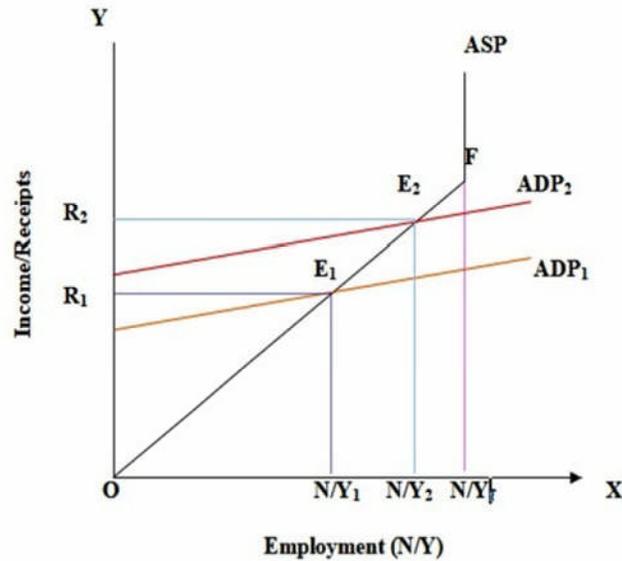
Fig. 2.4: Increase in the level of Employment& Real National Income.

In Fig. 2.4 above, the aggregate demand price curve ADP_1 intersects the aggregate supply price curve ASP at point E_1 and ON_1 level of employment is determined. When the aggregate demand is increased the ADP, curve shifts upwards and intersects the ASP curve at point E_2 and a higher level of employment i.e. E_2 is determined.

It may be concluded that the level of employment in an economy can be increased if aggregate demand is increased. Aggregate demand can be increased if either investment demand or consumption demand increases.

2.3.1 Limitations of the Keynesian Theory of Employment

The Keynesian theory of employment and real national income is criticized on the following grounds:

1. **Relevant to Free Market Economy.** The Keynesian theory is applicable only in free market capitalist economies which operate based on market mechanism. It is not relevant to other economic systems such as socialism where all economic decisions are taken by the government. It is also not relevant to a mixed economy where the role of the government is substantially large.

2. **Keynesian Theory is Relevant to Depression.** Keynes wrote his General Theory in 1936. Both Europe and America were caught in the great economic depression during the first half of the 20th century. Keynes prescribed increased Government expenditure to increase the level of effective demand under conditions of recession. However, the theory cannot be applied under the conditions of jobless growth when economy grows along with fall in employment and stagflation when prices rise but employment and output falls.

3. **Keynesian Theory is not relevant to open Economies.** Keynes did not consider the impact of international trade and investment on national economies. Keynes assumed a closed economy while writing his theory.

4. **Keynesian Theory is not Relevant to UDCs.** Keynes had dealt with the problem of the down-turn in business cycles and the resultant rise in unemployment. However, under developed countries face the problem of regular and disguised unemployment.

5. **Keynesian Theory Ignores the Long Run Problems.** Keynes sought solution to the short run macro-economic problems and went on to say that in the long run we are all dead. He thus ignored the long run problems of changes in the economic conditions.

2.4 THE CONCEPT OF UNDER EMPLOYMENT EQUILIBRIUM

The equilibrium level of employment is determined by the point of equality between the aggregate demand price and the supply price. Employment continues to rise if demand price is greater than the supply price and stops at the point of equality. You will notice from Table 2.4 below that when four million workers are employed, the AD price and the AS price are equal i.e., Rs.800 billion. This point of equality is the point of Effective demand. If employment is increased beyond the point of effective demand, the aggregate demand price will fall below the supply price and the class of entrepreneurs will make losses.

Table 2.4 Equilibrium Level of Employment/Real National Income The Point of Effective Demand				
Employment (million workers)	AD Price (Billion Rest)	AS Price (Billion Rest)	Comparison	Change in Employment/Real National Income
1	350	200	ADP > ASP	Increase
2	500	400	ADP > ASP	Increase
3	650	600	ADP > ASP	Increase
4	800	800	ADP = ASP	Equilibrium
5	950	1000	ADP < ASP	Decrease

The equilibrium level of employment or the point of effective demand can be diagrammatically shown as in Fig.2.5 below.
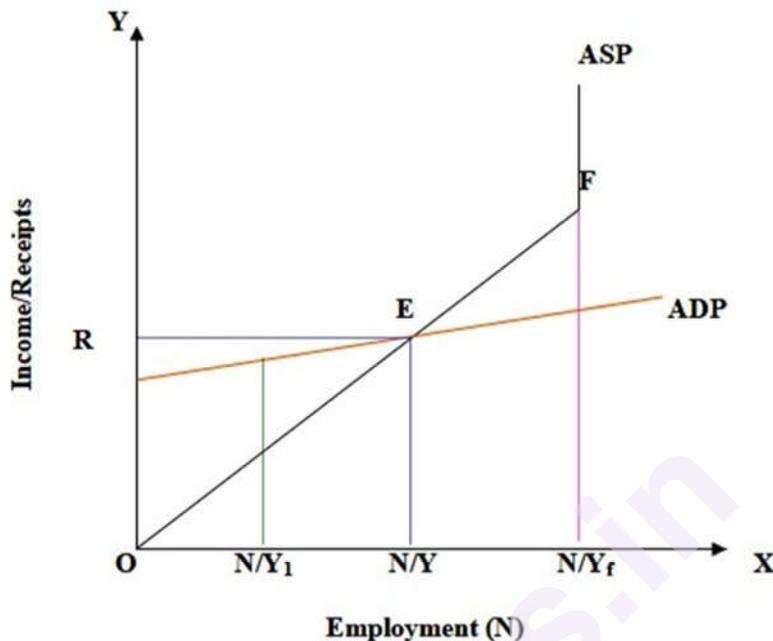

Fig. 2.5: Equilibrium Level of Employment.

In Fig. 2.5 above, the two curves ADP and ASP intersect each other at point 'E'. Point 'E' is the point of effective demand. Corresponding to point 'E', point 'R' on the Y-axis indicates equilibrium receipts and point 'N' on the X-axis indicates equilibrium level of employment. However, point 'E' is only an under employment or less than full employment equilibrium as full employment level is indicated by point 'F' on the aggregate supply curve. Per Keynes, the economy achieves equilibrium at less than full employment level because the gap between income and consumption is not fully filled up by investment. The reasons for the gap in savings and investment are as follows:

1. The people who save and the people who invest are not same. The households save and the entrepreneurs invest.

2. The factors which determine saving are different from the factors which determine investment. For instance, people save to provide for education, marriage and contingencies such as disease, unemployment and death. People may also save to acquire durable goods such as houses, gold and to provide for old age. The level of investment depends upon marginal efficiency of capital and the rate of interest in the short run and in the long run, it depends upon population and technological progress.

In view of the reasons mentioned above, we may conclude that investment cannot be equal to savings at full employment level. If

the profit expectations of the entrepreneurs fall, the level of investment will fall and hence the equilibrium level of national income and employment will also fall.

Check your progress
1. State the Principle of Effective demand.
2. Distinguish between ADF and ASF.
3. Explain the concept of under employment equilibrium.

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2.5 CONCEPT OF INFLATIONARY GAP

Inflation or price rise is the result of a persistent excess aggregate demand over aggregate supply in the economy. The rise in aggregate demand beyond the capability of the economy during a given time to offer a matching aggregate supply would result in price rise. The capability of the economy is the productive capacity with the availability of the given productive resources. If the rise in aggregate demand is because a large budget deficit financed by borrowing from the Central Bank, there will be an increase in money supply and prices would rise. Thus, along with rise in aggregate demand, a rise in money supply would also cause the generation of inflationary forces. Because excess aggregate demand, inflationary gap will be created which if not vacated or neutralized, prices will begin to rise. The fiscal policy instruments to control inflation are: (a) reduction in government expenditure and (b) increase in taxes. Reduction in government expenditure by way of reduction in the budget deficit and or by increasing the taxes, the level of aggregate demand can be brought down. The process of decrease in government expenditure and its impact on the level of aggregate demand is shown in Fig.1.6. The figure shows that the aggregate demand curve $C + I + G_1$ intersect the 45° line or the line of unity ($C = Y$) at point 'E_1' and determines equilibrium national income and output at point Y_1 which is the potential productive capacity of the economy during the given time. Beyond this point if the aggregate demand rises because increase in government expenditure, financed by a budget deficit, the aggregate demand curve will intersect the line of unity at point E_2. The new aggregate demand curve $C + I + G_2$ will determine Y_2 level of income which is greater than the productive capacity of the economy determined at point Y_1..Thus, excess aggregate demand over aggregate supply by the amount E_1A shown in the figure generates an inflationary pressure causing the prices to rise. Such a price rise or inflation is also known as Demand-pull Inflation.

The inflationary gap can be vacated or neutralized by a decrease in the level of aggregate demand. The level of aggregate demand can be reduced by a contractionary fiscal policy using the fiscal policy instruments of reduced government expenditure and increase in taxes. With equilibrium at point E_2 and money income being OY^2, if the government reduces expenditure by E_2 which is equal to the inflationary gap E_1A, the aggregate demand curve $C + I + G_2$ will shift downward and once again the original equilibrium level of aggregate demand $C + I + G_1$ and Y_1 level of national income corresponding to the productive capacity of the economy will be established. You will notice that the fall in the nominal national income Y_2Y_1 is much greater than the fall in government expenditure E_2B. This is because the operation of reverse income or the investment multiplier.
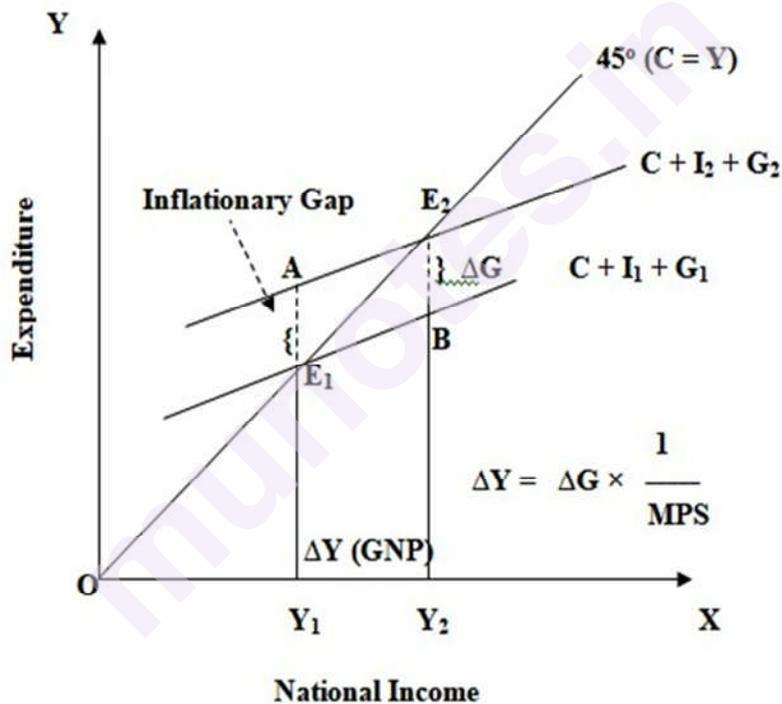
Fig. 2.6 –Inflationary Gap

Alternatively, the government can also bring about an increase in the direct taxes and reduce the disposable income of the community to bring down the level of aggregate demand and prices to their desired level. If the government has a balanced budget and the economy experiences inflationary tendencies, it would mean that there are supply bottlenecks creating a shortfall in supply relative to demand. In such a situation, an anti-inflationary or tight fiscal policy by way of reduction in government expenditure will create a budget surplus. The government can vacate the budget surplus either by reducing or by impounding public debt. However, if the bduget surplus is vacated by reducing public debt, the money supply will increase and thus dampen the anti-

inflationary impact of a tight fiscal policy. The best way to realize the full impact of a tight fiscal policy in the event of la budget surplus is to keep the surplus idle so that money supply does not increase and dampen the deflationary impact of an anti-inflationary fiscal policy.

2.6 SUMMARY

1. According to John Maynard Keynes, the level of employment and output in an economy is determined by the level of income and the level of income is determined by the level of effective demand. Effective demand refers to the total expenditure made by the people in a country on goods and services produced in each period. The expenditure stream determines the income stream i.e. Aggregate Expenditure = Aggregate Income.

2. The ADF is a schedule of maximum sales revenue expected to be received by the class of entrepreneurs from the sale of output produced at various levels of employment. It is also known as the demand price. There is a direct relationship between the aggregate demand price and the level of income or employment.

3. The aggregate supply function schedule shows the minimum expected sales revenue of the class of entrepreneurs from output produced at various levels of employment. The aggregate supply price is the minimum supply price or reserve price which the entrepreneurs must receive from the output produced. It is the cost of production that the entrepreneurs must obtain from the sale of output to continue to remain in business.

4. The equilibrium level of employment and real national income is determined at the point of equality between the aggregate demand price and the supply price. Employment and real output continues to rise if demand price is greater than the supply price and stops at the point of equality. This point of equality is the point of Effective demand. If employment is increased beyond the point of effective demand, the aggregate demand price will fall below the supply price and the class of entrepreneurs will make losses.

5. According to Keynes, the economy achieves equilibrium at less than full employment level because the gap between income and consumption is not fully filled up by investment.

6. Due to excess aggregate demand, inflationary gap will be created which if not vacated or neutralized, prices will begin to rise. The inflationary gap can be vacated or neutralized by a decrease in the level of aggregate demand. The level of aggregate demand can be reduced by a contractionary fiscal

policy using the fiscal policy instruments of reduced government expenditure and increase in taxes.

2.7 QUESTIONS

1. Explain the concept of effective demand.
2. Explain how real national income is determined under the Keynesian theory.
3. Explain the aggregate demand function.
4. Explain the aggregate supply function.
5. Explain how the actual level of real national income is less than full employment level of income.
6. Explain the concept of inflationary gap.
7. Explain how the level of real national income can be increased according to the Keynesian theory of income.

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UNIT TWO - DETERMINATION OF NATIONAL INCOME

UNIT -2A

PHILLIPS CURVE ANALYSIS

Unit Structure :

2A.0 OBJECTIVES

- To understand the concept of Phillip's Curve

- To study Keynesian explanation of the Phillip's curve

- To understand the collapse of the Phillip's curve hypothesis

- To study the Natural Unemployment Rate Hypothesis and the theory of Adaptive Expectations

- To understand the Long Run Phillips Curve and the theory of Adaptive Expectations

- To study the Rational Expectations and the Long Run Phillips Curve

- To understand the Relationship between the Short Run and the Long Run Philips Curve

2A.1 INTRODUCTION TO PHILLIP'S CURVE

Economic growth without inflation and unemployment is the objective behind macro-economic policies of modern times. However, in the short term, there seems to be a trade-off between inflation and unemployment and hence macro-economic policy

makers need to balance between inflation, economic growth and unemployment. A low inflation rate is seen to accompany lower economic growth rate and higher unemployment whereas a high inflation rate is seen to accompany higher economic growth rate and lower unemployment. Here, in this chapter, we look at the Phillips curve which was the first explanation of its kind to show the negative relationship between unemployment and inflation rate. We also look at the long run picture and see whether the negative relationship sustains in the long run.

In 1958, AW Phillips, a professor at the London School of Economics published a study of wage behavior in the United Kingdom for the years 1861 and 1957. Phillips found an inverse relationship between the rate of unemployment and the rate of inflation or the rate of increase in money wages. The higher the rate of unemployment, the lower the rate of wage inflation i.e. there is a trade-off between wage inflation and unemployment. The Phillips curve shows that the rate of wage inflation decreases with the increase in unemployment rate. Such a Phillips curve is depicted in Fig. 2A.1.

You may notice that when the rate of inflation is ten per cent, the unemployment rate is three per cent and when the rate of inflation is five per cent, the rate of unemployment increases to eight per cent. Empirical or objective data collected from other developed countries also proved the existence of Phillips Curve. Economists believed that there existed a stable Philips Curve depicting a trade-off between unemployment and inflation. This trade-off presented a dilemma to policy makers. The dilemma was a choice between two evils, namely: unemployment and inflation. In a dilemma, you chose a lesser evil and inflation is a lesser evil for policy makers. A little more inflation can always be traded off for a little more employment. However, further empirical data obtained in the 70s and early 80s proved the non-existence of Phillips Curve. During this period, both Britain and the USA experienced simultaneous existence of high inflation and high unemployment. While prices rose rapidly, the economy contracted along with more and more unemployment.
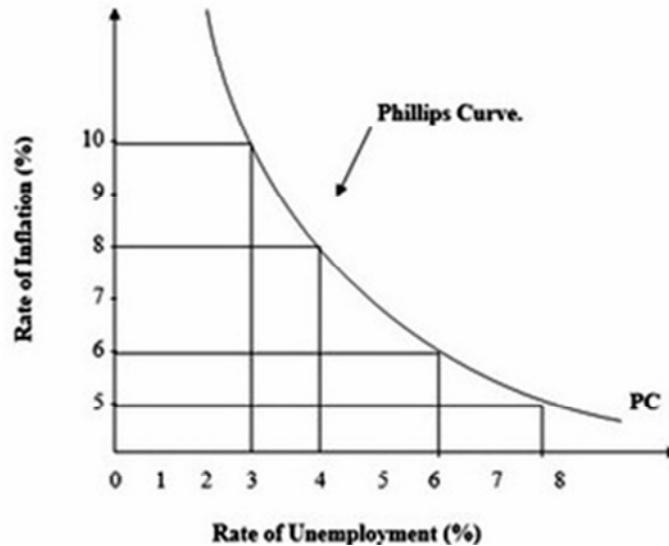
Figure 2A.1 – Phillilps Curve

2A.2 KEYNESIAN EXPLANATION OF PHILLIPS CURVE

The explanation of Phillips curve by the Keynesian economists is shown in Fig. 2A.2. Keynesian economists assume the upward sloping aggregate supply curve. The AS curve slopes upwardly due to two reasons. Firstly, as output is increased in the economy, the law of diminishing marginal returns begins to operate and the marginal physical product of labor (MPP_L) begins to decline. Since the money wages are fixed, a fall in the MPP_L leads to a rise in the marginal cost of production because $MC = W/MPP_L$. Secondly, the marginal cost goes up due a rise in the wage rate as employment and output are increased. Following rise in aggregate demand, demand for labor increases and hence the wage rate also increases. As more and more labor is employed, the wage rate continues to rise and the marginal cost of firms increases. You may notice that in Panel (a) of Fig.2A.2 that with the initial aggregate demand curve AD_0 and the given aggregate supply curve AS_0, the price level P_0 and output level Y_0 are determined. When the aggregate demand increases, the AD_0 curve shifts to the right and the new aggregate demand curve AD_1 intersects the aggregate supply curve at point 'b'. Accordingly, a higher price level P_1 is determined along with a rise in GNP to Y_1 level. With the increase in the real GNP, the rate of unemployment falls to U_2. Thus, the rise in the price level or the inflation rate from P_0 to P_1, the unemployment rate falls thereby depicting an inverse relationship between the price level and the unemployment rate. Now when the aggregate demand further increases, the AD curve shifts to the right to become AD_2. The new aggregate demand curve AD_2 intersects the aggregate supply curve at point 'c'.

Accordingly, the price level P_2 and output level Y_2 is determined. The level of unemployment now falls to U_3. In Panel (b) of Figure 2A.2, points a, b and c are plotted and these points corresponds to the three-equilibrium points a, b and c in Panel (a) of the figure. Thus, a higher rate of increase in aggregate demand and a higher rate of rise in price level are related with the lower rate of unemployment and vice versa. The Keynesian economists were thus able to explain the downward sloping Philips curve showing inverse relation between rates of inflation and unemployment.
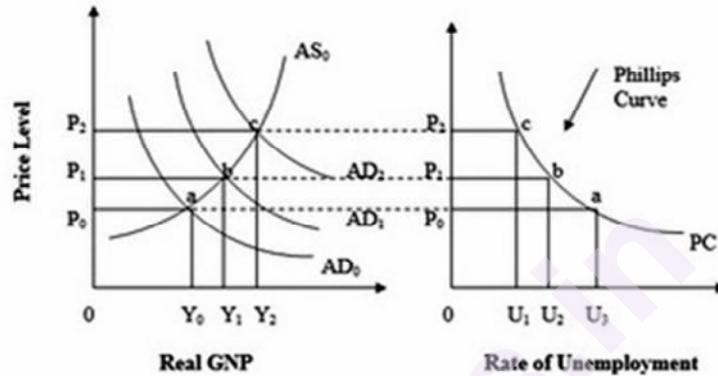
Figure 2A.2 - Keynesian explanation of Phillips Curve

2A.3 COLLAPSE OF THE PHILLIPS CURVE HYPOTHESIS (1971-91)

The Phillips Curve hypothesis was accepted as a cure to increase the level of employment and income in the sixties. It became a macroeconomic tool to explain the trade-off between inflation rate and unemployment rate. It suggested that policy makers could choose different combinations of unemployment inflation rates. Policy makers may choose low unemployment and high inflation if it is politically and economically expedient. However, the stable relationship between higher inflation and lower unemployment as seen in the sixties could not be replicated in the seventies and thereafter, particularly in the United States and Great Britain. It was seen that both inflation rate and unemployment rate had increased on numerous occasions and the tradeoff had thus disappeared. Further, there cannot be a long run trade-off between inflation and unemployment because in the long run the aggregate supply curve becomes vertical and any further expansion after the point of full employment is reached will only add to the price level without adding anything to income, employment and output. Thus, there is no permanent unemployment-inflation trade-off. Data obtained in the seventies and thereafter indicated a shift in the Phillips curve i.e. in various years, at a given rate of inflation, the Phillips curve either shifted to the left or to the right, indicating thereby that at times, given the inflation rate, unemployment rate

has increased or decreased. The stable relationship between inflation rate and unemployment rate thus was proved to be non-existent.

Causes of Shift in Phillips Curve

The shifts in the Phillips curve according to Keynesians is due to adverse supply shocks experienced in the seventies in the form of unprecedented oil price hikes. Adverse supply shocks gave rise to the phenomenon of Stagflation and the breakdown of the Phillips curve hypothesis. The impact of adverse supply shocks on national product and the price level is depicted in Fig. 2.3. The original aggregate demand and supply curves AD_0 and AS_0 are in equilibrium at point E_0. Accordingly, the price level P_0 and national output Y_0 is determined. The oil price hike initiated by the Oil and Petroleum Exporting Countries (OPEC) an oil cartel of oil producing Middle East countries contributed to the rise in cost of production of many goods and services in which oil is used as an input. Increase in the cost of production caused the aggregate supply curve to shift to the left in the upward direction, thereby causing the price level to rise along with a decrease in national output. Notice that the new aggregate supply curve AS_1 now intersects the aggregate demand curve AD_0 at point E_1 and accordingly the new price level P_1 is determined. However, at a higher price level P_1, the national output has fallen to Y_1 leading to rise in unemployment. Such a situation is explained in terms of stagflation where in both unemployment and price level increases. This new phenomenon experienced, particularly by the United States in the seventies and thereafter has caused the shift in the Phillips curve. Stagflation, thus, consigned the Phillips curve hypothesis to the pages of economic history.
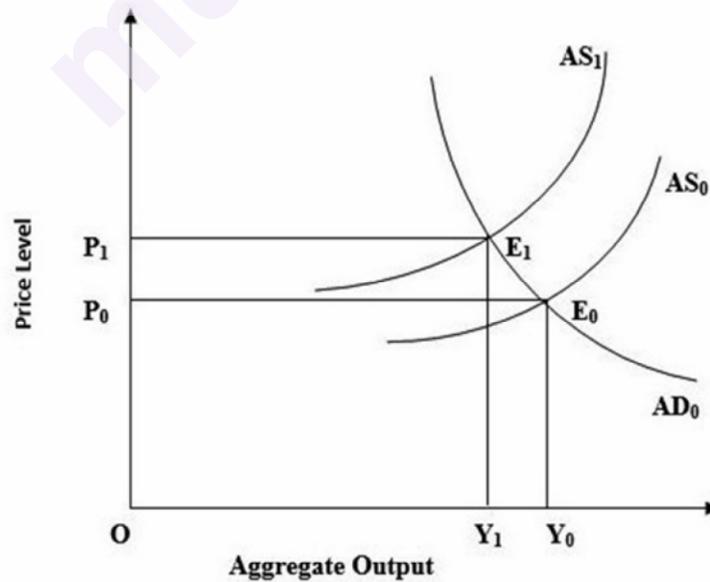

**Figure 2A.3 – Adverse Supply Shock, Stagflation
and Rejection of the Phillips Curve Hypothesis.**

Check your progress
1. What is the basic idea of Phillips curve?
2. How Keynes represented Phillips curve?
3. Write a note on the collapse of Phillips curve.
4. Give the causes of shift in Phillips curve.

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2A.4 NATURAL UNEMPLOYMENT RATE HYPOTHESIS AND THE THEORY OF ADAPTIVE EXPECTATIONS

Milton Friedman put forward the concept of 'natural rate of unemployment' to prove that the Phillips curve phenomenon does not operate in the long run and that the long run Phillips curve is vertically sloping, thereby having no relationship between inflation rate and unemployment rate. However, he accepted the fact that there is a short run negative relationship between inflation rate and unemployment rate. Milton Friedman says that the economy is stable in the long run at the natural rate of unemployment and any intervention in the form of expansionary fiscal and monetary policies would only result in higher prices without higher output.

When current GDP is at its potential level, unemployment is not zero or there is no full employment. The unemployment rate that exists because frictional and structural reasons when the economy is operating at full employment level is called the natural rate of unemployment or more appropriately NAIRU (Non-accelerating Inflation Rate of Unemployment). The natural rate of unemployment is the rate at which in the labor market, the current number of unemployed is equal to the number of jobs available. Natural unemployment exists due to frictional and structural reasons. For example, fresh additions to the labor force may spend time to search suitable jobs. Individuals pursuing higher education may be in the labor force but may not participate in the workforce due to educational commitments. While the sunset industries may be on the decline and thereby reducing the workforce from its rolls, the sunrise industries would be expanding and adding to its workforce. However, unemployed labor force needs to be trained for suitable jobs before they are recruited. Unemployment arising out of frictional and structural causes is termed as natural unemployment and the number of such unemployed persons constitutes the natural rate of unemployment. In other words, Milton Friedman argues that if information were not to fail, there will be no divergence between full employment and actual employment.

The natural rate of unemployment is estimated in the range of four to six per cent in the developed countries.

The term 'NAIRU' is a more appropriate term to describe the natural rate of unemployment because the term 'natural rate of unemployment' connotes that unemployment cannot fall below the natural rate. The Phillips curve hypothesis shows that unemployment rate can fall below the NAIRU in the short term. Thus, when actual GDP is greater than potential GDP ($Y > Y^*$), unemployment will be less than NAIRU ($U < U^*$) and vice versa. When the unemployment rate is below the NAIRU, demand forces put pressure on wages to rise faster than productivity. When the unemployment rate is above the NAIRU, demand forces put pressure on wages to rise more slowly than productivity or even to fall. When unemployment is at the NAIRU, demand forces exert no pressure on wages relative to productivity.

To prove the non-existence of Phillips curve in the long run, Milton Friedman put forward the theory of adaptive expectations. People form their expectations based on previous and present rate of inflation and adapt their expectations only when the actual inflation rate is different from their expected rate. The trade-off between inflation and unemployment is therefore only in the short run. Milton Friedman's theory of adaptive expectations and the derivation of the vertically sloping long run Phillips curve is depicted in Fig.2A.4.

It is assumed that the economy is operating at point A_0 on the short run Phillips curve (SPC_1) and the natural rate of unemployment is six per cent. The actual inflation rate is four per cent. The nominal wages are set based on four per cent inflation rate and it is expected that the inflation rate will continue to be the same in future. When the government adopts expansionary monetary and fiscal policies, the inflation rate goes up to six per cent. Since the nominal wages are set based on four per cent inflation rate, the firms make additional profits equal to two per cent and hence they make fresh investments, thereby increasing the level of employment and output. Because of fresh investments, the unemployment rate falls below the natural rate of unemployment and the economy moves to point A_1 where the corresponding inflation rate is six per cent and the unemployment rate is three per cent. Thus, Milton Friedman and other monetarists argue that there exists a short run trade-off between inflation rate and unemployment rate.
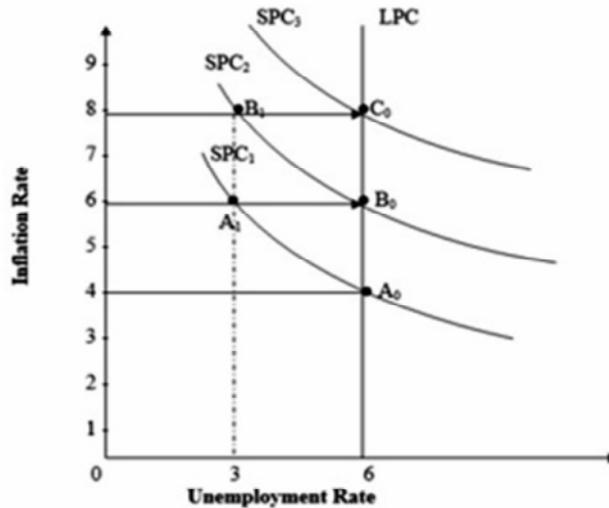
Figure 2A.4 – Shift in the SR Phillips curve & the LR Phillips Curve.

2A.5 LONG RUN PHILLIPS CURVE AND THE THEORY OF ADAPTIVE EXPECTATIONS

The economy after having reached point A_1 does not stay put at that point because after a time lag, the workers are informed that the current inflation rate is six per cent and that their real wages have fallen by two per cent. Organized workers will therefore demand compensation for the inflation which is over and above the expected rate to restore their real incomes. When wage compensation takes place, the profits levels are also restored to the original levels and the economy returns to its original equilibrium position at point B_0. However, point B_0 is on the new short run Phillips curve SPC_2. Corresponding to point B_0, the actual inflation rate is six per cent and the unemployment rate is back at its natural level i.e. six per cent. Now the expected inflation rate would be six per cent and workers will continue to expect the same rate of inflation in future. The shift in the Phillips curve will continue if expansionary monetary and fiscal policies are adopted by the Government and the economy will move along the points B_1, C_0 etc. When points such as A_0, B_0, C_0 are joined, the long run Phillips curve is obtained. Note that the LPC is vertically sloping and the vertical slope indicates that it is neutral between inflation rate and the unemployment rate. Milton Friedman thus proves that there is no long run trade-off between inflation rate and unemployment rate. The theory of adaptive expectations indicate that workers adapt to the new rates of inflation and their expected inflation rate gets adapted in due course i.e. after a time lag and the economy returns to its original status with a higher rate of inflation.

2A.6 RATIONAL EXPECTATIONS AND THE LONG RUN PHILLIPS CURVE

According to Milton Friedman's theory of adaptive expectations, nominal wages lag changes in the price level or the inflation rate. The adjustment lag in nominal wages to the price level causes business profits to go up. When profits go up, business units expand their scale output and thus the level of unemployment in the economy falls below the natural rate.

The advocates of rational expectation theory believe that there is no adjustment lag involved between nominal wages and changing price level. They argue that there is a quick adjustment between nominal wages and expected changes in the price level and hence there is no trade-off between inflation and unemployment. The rate of inflation resulting from increase in aggregate demand is well anticipated by workers and firms and gets factored in wage agreements. Such adjustments made in quick succession sometimes and sometimes in advance lead to further price increases. Thus, there is a rise in the price level without any rise in the real output or fall in unemployment below the natural rate. According to the Rational Expectations theorists, given the availability of resources and technology, the aggregate supply curve is vertically sloping at the potential GDP level or at the natural unemployment rate level. The long run Phillips curve therefore corresponds to the long run aggregate supply curve at the natural rate of unemployment. The long run Phillips curve is therefore a vertical straight line or vertically sloping at the natural rate of unemployment. The derivation of the long run aggregate supply curve is shown in Fig. 2A.5 and the long run Phillips curve is depicted in Fig. 2A.6.

According to the Rational Expectations theorists, the workers and firms are rational beings and have a good understanding of the operation of the economy. Both workers and firms can therefore fairly and correctly anticipate the consequences of the economic policies of the Government. Secondly, all product and factor markets are very competitive and hence factor and product prices are highly flexible to bring about quick and rapid adjustments. Figure 2A.5 shows the argument made by Rational Expectations theorists about the relation between inflation and unemployment. The original equilibrium is at point 'a' where the initial short run aggregate demand curve AD_0 and the short run aggregate supply curve AS_0 intersect each other and the equilibrium, full employment, national output OY_0 and price level P_0 is determined, given the natural rate of unemployment.

Now when the government adopts expansionary monetary and fiscal policies, the economic units or the factor owners will

correctly anticipate the inflationary impact of these policies and make upward adjustment in factor and product prices thereby holding real national output and real wages at their original level. The shift in the short run aggregate demand and supply curves will therefore be vertically upward as shown in the figure. The economy now operates at the new equilibrium point 'b' which is corresponding to the original equilibrium point 'a'. However, the equilibrium is achieved at a higher price level P_1. At every occasion when the Government adopts expansionary policies when the economy is operating at the full employment level of income and output, the aggregate demand and supply curves behave in the same manner and the equilibrium point changes from point 'b' to point 'c' and so on and so forth. By joining these points, the Long Run Aggregate Supply curve is obtained. Note that the long run AS curve is vertically sloping indicating thereby that once the full employment equilibrium income and output is determined at the natural rate of unemployment, any expansionary policy will only result in price rise, real national output remaining constant.

As the long-run aggregate supply curve is vertically sloping at the natural unemployment rate, the long run Phillips curve is also vertically sloping.
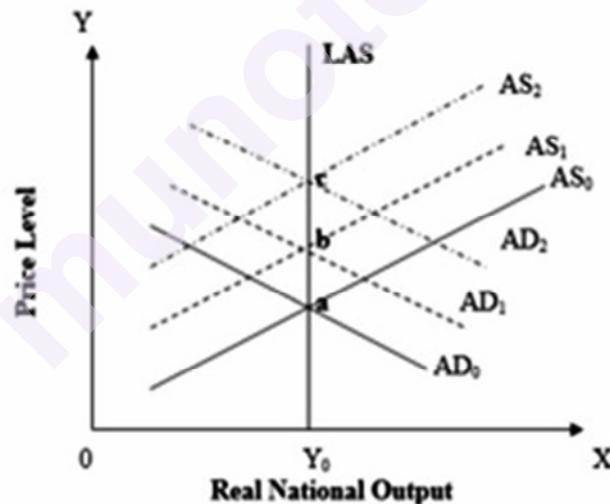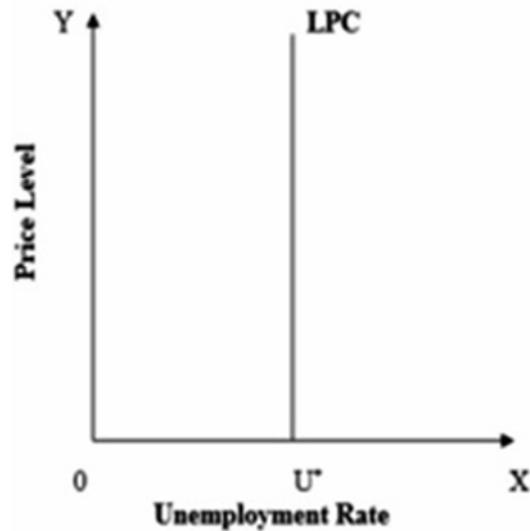

Fig.2A.5 – Derivation of the Long Run AS Curve.

Fig.2A.6 – Long Run Phillips Curve.

Check your progress
1. Explain the concept of natural rate of unemployment.
2. Explain the relationship between Phillips curve and the Theory of Adaptive expectations.
3. Explain the relationship between Phillips curve and the Theory of Rational expectations.

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2A.7 RELATIONSHIP BETWEEN SHORT AND LONG RUN PHILLIPS CURVE

The position of the short run Phillips curve passing through a long run Phillips curve is determined by the anticipated or expected inflation rate. The short run Phillips curve can be compared to the short run aggregate supply curve because both the curves are drawn with a given expected price level. The short run Phillips curve drawn with an expected inflation rate shifts its position as the inflation rate changes (See figure 2.7). If the expected inflation rate is six per cent, the short run Phillips curve (SPC_1) also passes through the corresponding point 'A$_0$' on the long run Phillips curve with natural unemployment rate of six per cent. The movement along a short run Phillips curve is determined by changes in aggregate demand. When there is an unexpected increase in aggregate demand, the actual inflation rate is found to be more than the expected inflation rate and the real national output increases causing the unemployment rate to fall below the natural rate. The new short run equilibrium is determined at point 'A$_1$'

which is to the left of the original equilibrium point. Conversely, if there is an unexpected decrease in aggregate demand, the actual inflation rate will fall below the expected rate and the unemployment rate will increase and real national output will fall. In this case, the movement will be downwards and to the right. The shift in the short run Phillips curve is caused due to the divergence between actual and expected inflation rates and this divergence is caused by unexpected changes in monetary and fiscal policies of the government. If the actual inflation rate is greater than the expected inflation rate, the short run Phillips curve will shift upward and vice-versa. The distance by which the short run Phillips curve shifts to a new position is equal to the change in the expected rate of inflation.
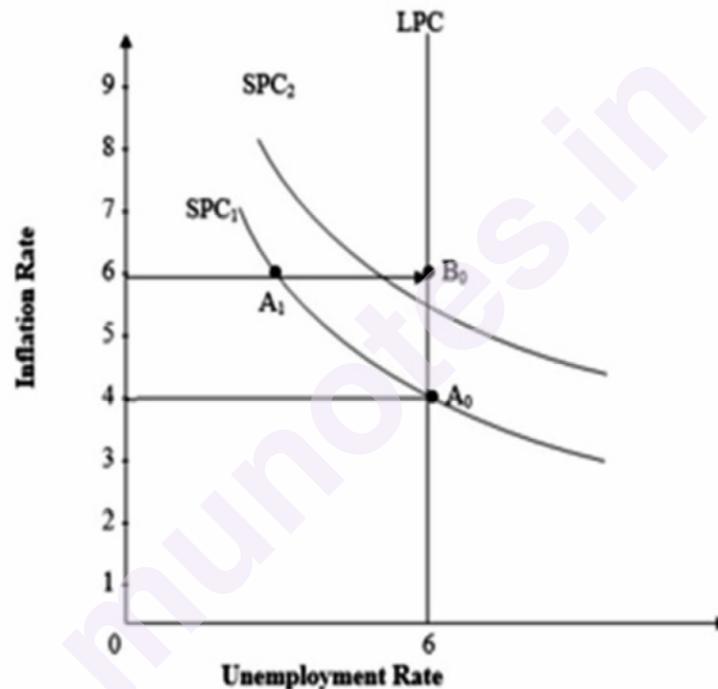
Fig.2A.7 – Short Run and Long Run Phillips Curve

2A.8 SUMMARY

1. A.W. Phillips, a professor at the London School of Economics published a study of wage behavior in the United Kingdom for the years 1861 and 1957. Phillips found an inverse relationship between the rate of unemployment and the rate of inflation or the rate of increase in money wages. The higher the rate of unemployment, the lower the rate of wage inflation i.e. there is a trade-off between wage inflation and unemployment. The Phillips curve shows that the rate of wage inflation decreases with the increase in unemployment rate.

2. The Keynesian economists were thus able to explain the downward sloping Philips curve showing inverse relation between rates of inflation and unemployment.

3. Data obtained in the seventies and thereafter indicated a shift in the Phillips curve i.e. in various years, at a given rate of inflation, the Phillips curve either shifted to the left or to the right, indicating thereby that at times, given the inflation rate, unemployment rate has increased or decreased. The stable relationship between inflation rate and unemployment rate thus was proved to be non-existent.

4. The shifts in the Phillips curve according to Keynesians is due to adverse supply shocks experienced in the seventies in the form of unprecedented oil price hikes. Adverse supply shocks gave rise to the phenomenon of Stagflation and the breakdown of the Phillips curve hypothesis.

5. Milton Friedman put forward the concept of 'natural rate of unemployment' to prove that the Phillips curve phenomenon does not operate in the long run and that the long run Phillips curve is vertically sloping, thereby having no relationship between inflation rate and unemployment rate. However, he accepted the fact that there is a short run negative relationship between inflation rate and unemployment rate. Milton Friedman says that the economy is stable in the long run at the natural rate of unemployment and any intervention in the form of expansionary fiscal and monetary policies would only result in higher prices without higher output.

6. The term 'NAIRU' is a more appropriate term to describe the natural rate of unemployment because the term 'natural rate of unemployment' connotes that unemployment cannot fall below the natural rate. The Phillips curve hypothesis shows that unemployment rate can fall below the NAIRU in the short term.

7. Milton Friedman proved that there is no long run trade-off between inflation rate and unemployment rate. The theory of adaptive expectations indicate that workers adapt to the new rates of inflation and their expected inflation rate gets adapted in due course i.e. after a time lag and the economy returns to its original status with a higher rate of inflation.

8. The advocates of rational expectation theory believe that there is no adjustment lag involved between nominal wages and changing price level. They argue that there is a quick adjustment between nominal wages and expected changes in the price level and hence there is no trade-off between inflation and unemployment.

9. The position of the short run Phillips curve passing through a long run Phillips curve is determined by the anticipated or expected inflation rate.

2A.10 QUESTIONS

1. Explain the trade-off between inflation and unemployment with the help of Phillips curve analysis.

2. Explain the derivation of the Phillips curve with the Keynesian AD-AS model.

3. Write a note on the collapse of the Phillips Curve Hypothesis.

4. Explain the natural rate of unemployment hypothesis and the theory of adaptive expectations.

5. Explain the long run Phillips curve and the theory of adaptive expectations.

6. Explain the theory of Rational Expectations and the long run Phillips curve.

7. Explain the relationship between the short and the long run Phillips curve.

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Unit -3

"THE IS-LM MODEL"

Unit Structure:

3.0 OBJECTIVES

- To enable the learners to grasp fully the theoretical rationale behind policies at the country as well as corporate level.

- To receive a firm grounding on the basic macroeconomic concepts that strengthen analysis of crucial economic policies.

3.1 INTRODUCTION

The IS-LM model, which stands for "investment-savings" (IS) and "liquidity preference-money supply" (LM) is a Keynesian macroeconomic model that shows how the market for economic goods (IS) interacts with the loanable funds market (LM) or money market. It is represented as a graph in which the IS and LM curves intersect to show the short-run equilibrium between interest rates and output.

The IS-LM (Investment Savings-Liquidity preference Money supply) model focuses on the equilibrium of the market for goods and services, and the money market. It basically shows the relationship between real output and interest rates.

John R. Hicks, based on J. M. Keynes' "General Theory", in which he analyses four markets, developed it: goods, labour, credit and money. This model, firstly named IS-LL, appeared in his article "Mr. Keynes and the Classics: a Suggested Interpretation", published in 1937 in the journal Econometrica.

In order to understand how this model works, we'll first see how the IS curve, which represents the equilibrium in the goods market, is defined. Then, the LM curve, which represents the equilibrium in the money market. Finally, we'll analyze how the equilibrium is reached.

- The IS-LM model describes how aggregate markets for real goods and financial markets interact to balance the rate of interest and total output in the macroeconomy.
- IS-LM stands for "investment savings-liquidity preference-money supply."
- The model was devised as a formal graphic representation of a principle of Keynesian economic theory.
- On the IS-LM graph, "IS" represents one curve while "LM" represents another curve.
- IS-LM can be used to describe how changes in market preferences alter the equilibrium levels of gross domestic product (GDP) and market interest rates.
- The IS-LM model lacks the precision and realism to be a useful prescription tool for economic policy.

The three critical exogenous, i.e. external, variables in the IS-LM model are liquidity, investment, and consumption. According to the theory, liquidity is determined by the size and velocity of the money supply. The levels of investment and consumption are determined by the marginal decisions of individual actors.

The IS-LM graph examines the relationship between output, or gross domestic product (GDP), and interest rates. The entire economy is boiled down to just two markets, output and money; and their respective supply and demand characteristics push the economy towards an equilibrium point.

The IS-LM graph consists of two curves, IS and LM. Gross domestic product (GDP), or (Y), is placed on the horizontal axis, increasing to the right. The interest rate, or (i or R), makes up the vertical axis.

The IS curve depicts the set of all levels of interest rates and output (GDP) at which total investment (I) equals total saving (S). At lower interest rates, investment is higher, which translates into more total output (GDP), so the IS curve slopes downward and to the right.

The LM curve depicts the set of all levels of income (GDP) and interest rates at which money supply equals money (liquidity) demand. The LM curve slopes upward because higher levels of

income (GDP) induce increased demand to hold money balances for transactions, which requires a higher interest rate to keep money supply and liquidity demand in equilibrium.

The intersection of the IS and LM curves shows the equilibrium point of interest rates and output when money markets and the real economy are in balance. Multiple scenarios or points in time may be represented by adding additional IS and LM curves.

3.2 THE IS-LM MODEL

The IS-LM model provides another way of looking at the determination of the level of short-run real gross domestic product (real GDP) in the economy. Like the aggregate expenditure model, it takes the price level as fixed. But whereas that model takes the interest rate as exogenous—specifically, a change in the interest rate results in a change in autonomous spending—the IS-LM model treats the interest rate as an endogenous variable.

The basis of the IS-LM model is an analysis of the money market and an analysis of the goods market, which together determine the equilibrium levels of interest rates and output in the economy, given prices. The model finds combinations of interest rates and output (GDP) such that the money market is in equilibrium. This creates the LM curve. The model also finds combinations of interest rates and output such that the goods market is in equilibrium. This creates the IS curve. The equilibrium is the interest rate and output combination that is on both the IS and the LM curves.

IS Curve

The IS curve relates the level of real GDP and the real interest rate. It incorporates both the dependence of spending on the real interest rate and the fact that, in the short run, real GDP equals spending. The IS curve is shown in Figure 3.1 "A Change in Income". We label the horizontal axis "real GDP" since, in the short run, real GDP is determined by aggregate spending. The IS curve is downward sloping: as the real interest rate increases, the level of spending decreases.

The IS curve (I for investment and S for savings) summarizes all the combinations of income and interest rates that ensure equilibrium on the B&S → market inverse relationship between Y and the interest rate.

In Figure: 3.1   Initial equilibrium: 1 and 1' → fall in r → interest-sensitive components of total expenditure (C and I) increase → shift of E upwards → new equilibrium: 2 and 2'.

Linking the points 1' and 2' in the bottom graph gives the IS curve = set of equilibria on the B&S market associated with different income and interest rate levels.The slope of the IS curve reflects the responsiveness of C and I to changes in r.Any increase (decrease) in an exogenous component of the expenditure, as well as G and X, causes the IS curve to shift to the right (left).
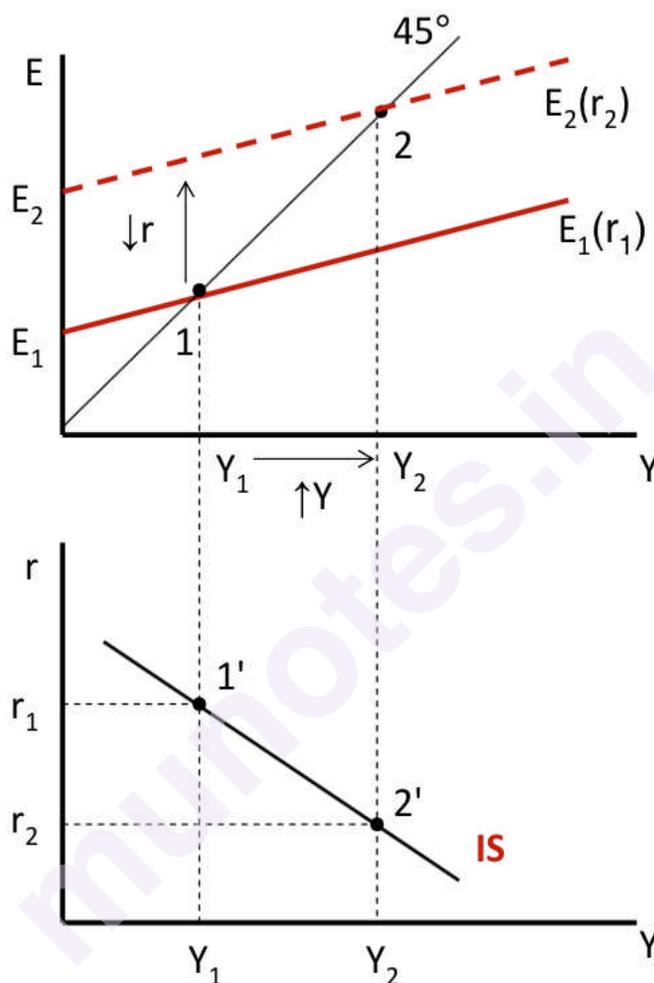

Figure: 3.1

In fact, the dependence of spending on real interest rates comes partly from investment. As the real interest rate increases, spending by firms on new capital and spending by households on new housing decreases. Consumption also depends on the real interest rate: spending by households on durable goods decreases as the real interest rate increases.

The connection between spending and real GDP comes from the aggregate expenditure model. Given a particular level of the interest rate, the aggregate expenditure model determines the level of real GDP. Now suppose the interest rate increases. This reduces those components of spending that depend on the interest

rate. In the aggregate expenditure framework, this is a reduction in autonomous spending. The equilibrium level of output decreases. Thus the IS curve slopes downwards: higher interest rates are associated with lower real GDP.

LM Curve

The LM curve represents the combinations of the interest rate and income such that money supply and money demand are equal. The demand for money comes from households, firms, and governments that use money as a means of exchange and a store of value. The law of demand holds: as the interest rate increases, the quantity of money demanded decreases because the interest rate represents an opportunity cost of holding money. When interest rates are higher, in other words, money is less effective as a store of value. Money demand increases when output rises because money also serves as a medium of exchange. When output is larger, people have more income and so want to hold more money for their transactions.

The LM curve (L for liquidity and M for currency) summarizes all the combinations of income and interest rates that ensure equilibrium on the currency market → direct relation between Y and the interest rate.
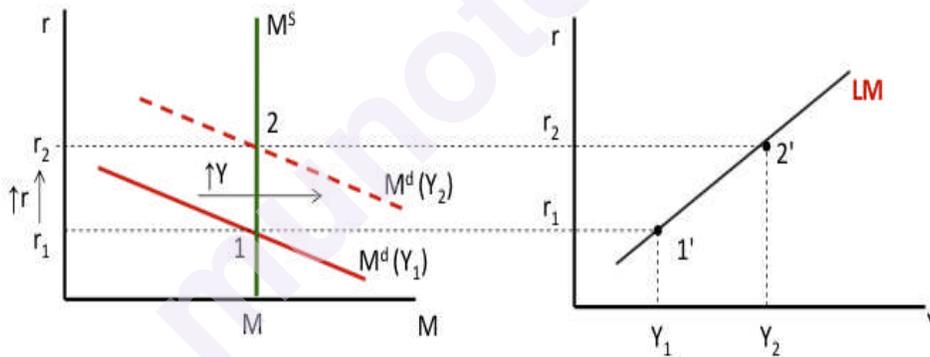

Figure: 3.2

In Figure: 3.2 Starting equilibrium: 1 and 1'→ increase of Y → moving Md upwards → being Ms fixed, new equilibrium: 2 and 2'.By connecting points 1' and 2' in the graph on the right, we obtain the LM curve = all combinations of income and equilibrium interest rates on the money market.

The slope of the LM curve reflects the sensitivity of Md to changes in Y.

Any increase (decrease) in the money supply causes the LM curve to move down (up).

Check your progress
1. Explain the meaning and derivation of IS curve.
2. Explain the meaning and derivation of LM curve.

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3.3 MONEY MARKET EQUILIBRIUM

The supply of money is chosen by the monetary authority and is independent of the interest rate. Thus, it is drawn as a vertical line. The equilibrium in the money market is shown in Figure 3.3 "Money Market Equilibrium". When the money supply is chosen by the monetary authority, the interest rate is the price that brings the market into equilibrium. Sometimes, in some countries, central bank target the money supply. Alternatively, central banks may choose to target the interest rate. Figure 3.3 "Money Market Equilibrium" applies in either case: if the monetary authority targets the interest rate, then the money market tells us what the level of the money supply must be.

To trace out the LM curve, we look at what happens to the interest rate when the level of output in the economy changes and the supply of money is held fixed.
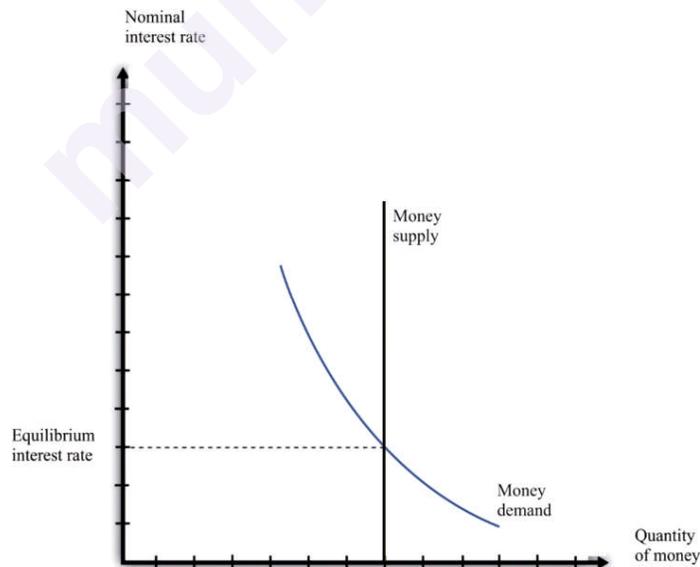

Figure: 3.3

In **Figure 3.4 "A** Change in Income" shows the money market equilibrium at two different levels of real GDP. At the higher level of income, money demand is shifted to the right; the interest rate increases to ensure that money demand equals money supply.

Thus, the LM curve is upward sloping: higher real GDP is associated with higher interest rates. At each point along the LM curve, money supply equals money demand.

We have not yet been specific about whether we are talking about nominal interest rates or real interest rates. In fact, it is the nominal interest rate that represents the opportunity cost of holding money. When we draw the LM curve, however, we put the real interest rate on the axis, as shown in Figure 3.4 "The LM Curve". The simplest way to think about this is to suppose that we are considering an economy where the inflation rate is zero. In this case, by the Fisher equation, the nominal and real interest rates are the same. In a more complete analysis, we can incorporate inflation by noting that changes in the inflation rate will shift the LM curve. Changes in the money supply also shift the LM curve.
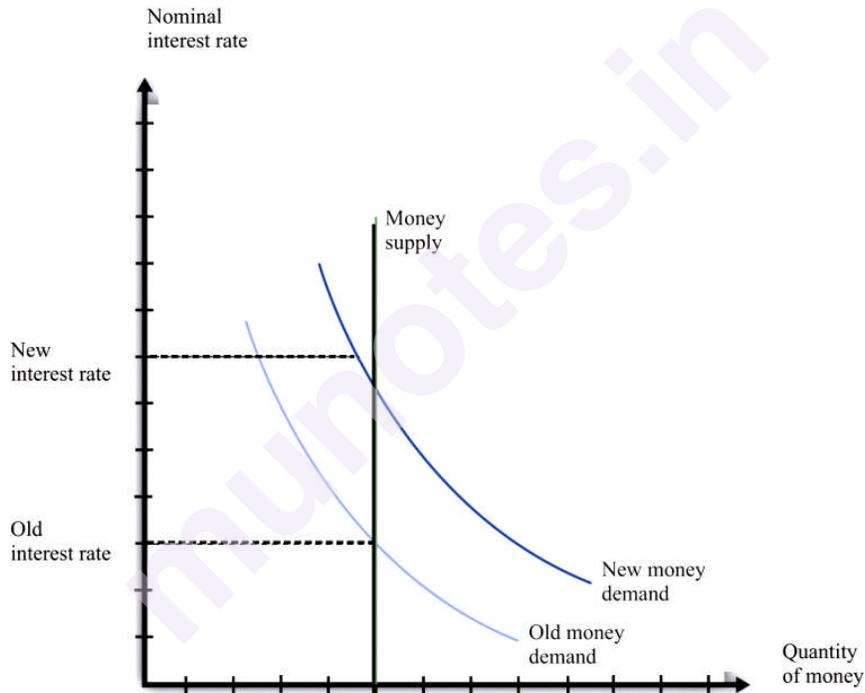

Figure 3.4 A Change in Income

Equilibrium

Combining the discussion of the LM and the IS curves will generate equilibrium levels of interest rates and output. Note that both relationships are combinations of interest rates and output. Solving these two equations jointly determines the equilibrium. This is shown graphically in **Figure 3.5**, The crossing of these two curves is the combination of the interest rate and real GDP, denoted (r*,Y*), such that both the money market and the goods market are in equilibrium.
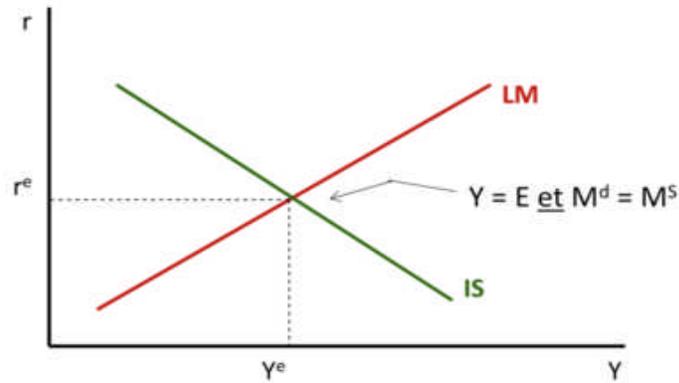
Figure 3.5 : Equilibrium in the IS-LM Model.

Comparative Statics

Comparative statics results for this model illustrate how changes in exogenous factors influence the equilibrium levels of interest rates and output. For this model, there are two key exogenous factors: the level of autonomous spending (excluding any spending affected by interest rates) and the real money supply. We can study how changes in these factors influence the equilibrium levels of output and interest rates both graphically and algebraically.

Variations in the level of autonomous spending will lead to a shift in the IS curve, as shown in **Figure 3.6** "A Shift in the IS Curve". If autonomous spending increases, then the IS curve shifts out. The output level of the economy will increase. Interest rates rise as we move along the LM curve, ensuring money market equilibrium. One source of variations in autonomous spending is fiscal policy. Autonomous spending includes government spending (G). Thus an increase in G leads to an increase in output and interest rates as shown in Figure 3.6 "A Shift in the IS Curve".
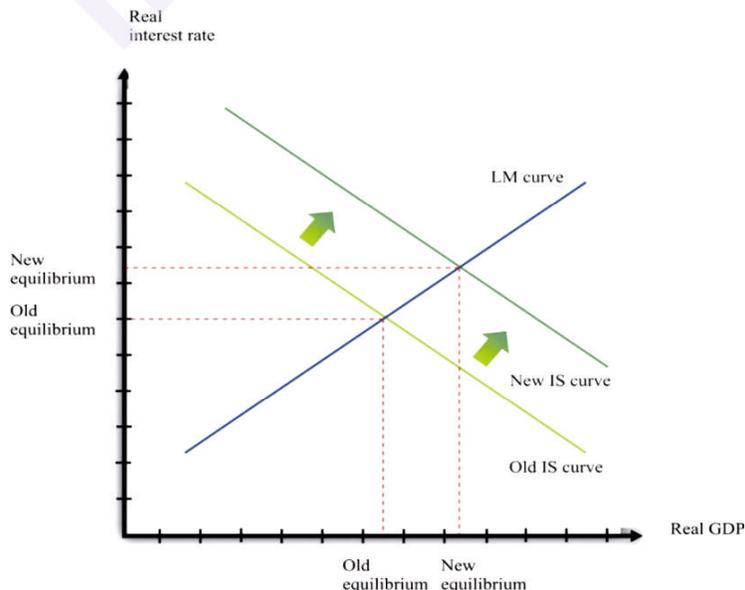

Figure 3.6 A Shift in the IS Curve

Variations in the real money supply shift the LM curve, as shown in Figure 3.7 "A Shift in the LM Curve". If the money supply decreases, then the LM curve shifts in. This leads to a higher real interest rate and lower output as the LM curve shifts along the fixed IS curve.
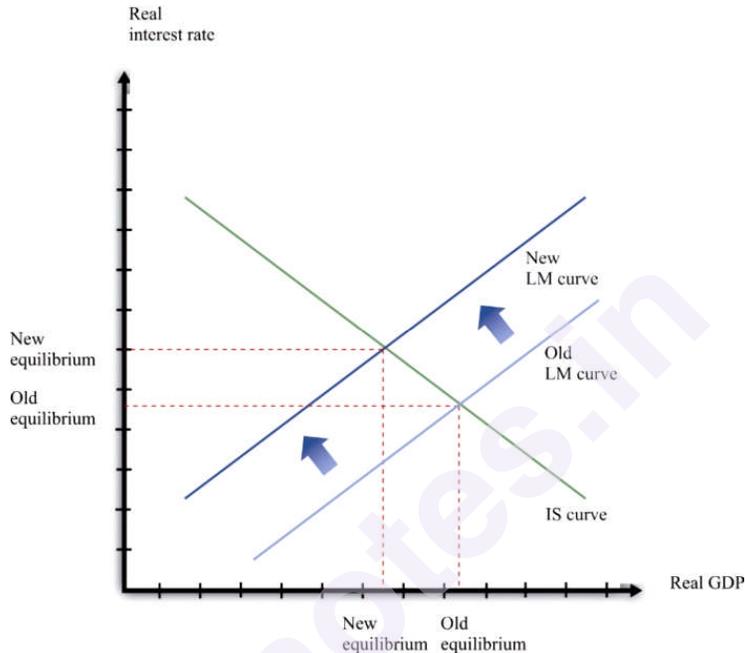

Figure 3.7 A Shift in the LM Curve

Fiscal and Monetary Policies and IS-LM Curve Model

Effect of Fiscal Policy:

Let us first explain how IS-LM model shows the effect of expansionary fiscal policy of increase in Government expenditure on level of national income. This is illustrated in Fig. 3.8. Increase in Government expenditure which is of autonomous nature raises aggregate demand for goods and services and thereby causes an outward shift in IS curve, as is shown in Fig. 3.8 where increase in Government expenditure leads to the shift in IS curve from IS_1 to IS_2.

Note that the horizontal distance between the two IS curves is equal to the increase in government expenditure times the government expenditure multiplier, that is, ΔG x 1/1-MPC which shows the increase in national income equal to the horizontal distance EK that occurs in Keynes' multiplier model. However, in IS-LM model actual increase in national income is not equal to EK caused by the working of Keynesian multiplier.
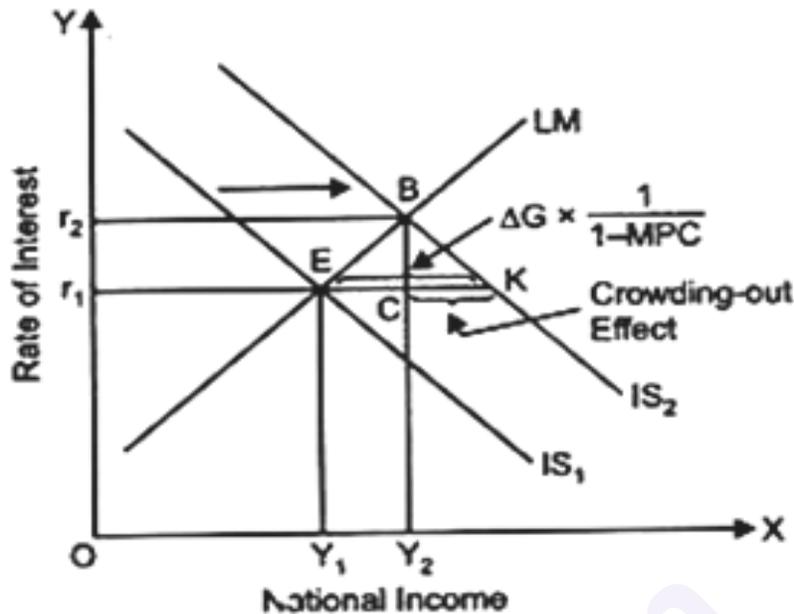
Fig 3.8 Expansionary Fiscal Policy

This is because with the rightward shift in IS curve rate of interest also rises which causes reduction in private investment. It will be seen from Fig. 3.8 that, with the LM curve remaining unchanged, the new IS_2 curve intersects LM curve at point B. Thus, in IS-LM model with the increase in Government expenditure (ΔG), the equilibrium moves from point E to B and with this the rate of interest rises from r_1 to r_2 and income level from Y_1 to Y_2.

Income equal to CK has been wiped out because of rise in interest causing a decline in private investment. Thus, CK represents crowding-out effect of increase in government expenditure Thus, IS-LM model shows that expansionary fiscal policy of increase in Government expenditure raises both the level of income and rate of interest.

It is worth noting that in the IS-LM model increase in national income by $Y_1 Y_2$ in Fig. 3.8 is less than EK which would occur in Keynes' model. This is because Keynes in his simple multiplier model assumes that investment is fixed and autonomous, whereas IS-LM model takes into account the fall in private investment due to the rise in interest rate that takes place with the increase in Government expenditure. That is, increase in Government expenditure crowds out some private investment.

Likewise, it can be illustrated that the reduction in Government expenditure will cause a leftward shift in the IS curve, and given the LM curve unchanged, will lead to the fall in both rate of interest and level of income. It should be noted that Government often cuts expenditure to control inflation in the economy.

Expansionary Fiscal Policy: Reduction in Taxes:

An alternative measure of expansionary fiscal policy that may be adopted is the reduction in taxes which through increase in disposable income of the people raises consumption demand of the people. As a result, cut in taxes causes a shift in the IS curve to the right as is shown in Fig. 3.9 from IS_1 to IS_2.

It may however be noted that in the Keynesian multiplier model, the horizontal shift in the IS curve is determined by the value of tax multiplier times the reduction in taxes (ΔT), that is, ΔT x MPC/1-MPC and causes level of income to increase by EH.

However, in the IS-LM model, with the shift of the IS curve from IS_1 to IS_2 following the reduction in taxes, the economy moves from equilibrium point E to D and, as is evident from Fig. 3.8, rate of interest rises from r_1 to r_2 and level of income increases from Y_1 to Y_2. Income equal to LH has been wiped out because of crowding-out effect on private investment because of rise in interest rate.
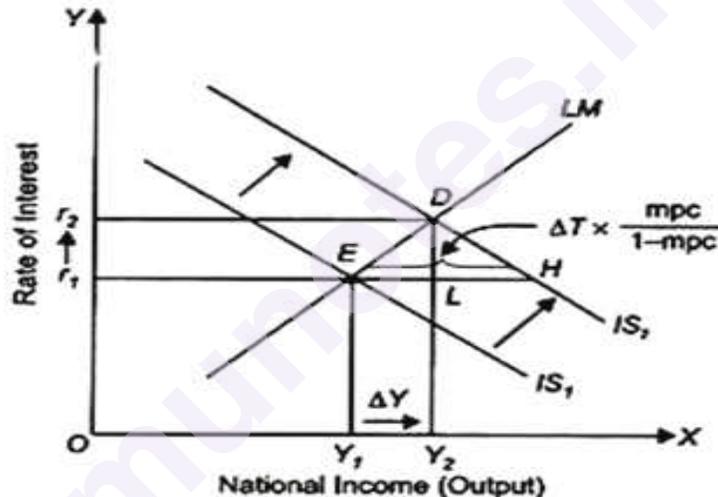

Fig 3.9 Expansionary Fiscal Policy : Effect of Cut in Taxes

On the other hand, if the Government intervenes in the economy to reduce inflationary pressures, it will raise the rates of personal taxes to reduce disposable income of the people. Rise in personal taxes will lead to the decrease in aggregate demand. Decrease in aggregate demand will help in controlling inflation. This case can also be shown by IS-LM curve model.

Role of Monetary Policy to Ensure Economic Stability: Explained through IS-IM Curve Model:

Through making appropriate changes in monetary policy the Government can influence the level of economic activity. Monetary policy may also be expansionary or contractionary depending on the prevailing economic situation. IS-LM model can be used to show the effect of expansionary and tight monetary policies. A

change in money supply causes a shift in the LM curve; expansion in money supply shifts it to the right and decrease in money supply shifts it to the left.

Suppose the economy is in grip of recession, the Government (through its Central Bank) adopts the expansionary monetary policy to lift the economy out of recession. Thus, it takes measures to increase the money supply in the economy. The increase in money supply, state of liquidity preference or demand for money remaining unchanged, will lead to the fall in rate of interest.

At a lower interest there will be more investment by businessmen. More investment will cause aggregate demand and income to rise. This implies that with expansion in money supply LM curve will shift to the right as is shown in Fig. 3.10. As a result, the economy will move from equilibrium point E to D, with this the rate of interest will fall from r1 to r2, and national income will increase from Y_1 to Y_2. Thus, IS-LM model shows that expansion in money supply lowers interest rate and raises income.

We have also indicated what is called monetary transmission mechanism, that is, how IS-LM curve model shows the expansion in money supply leads to the increase in aggregate demand for goods and services. We have thus seen that increase in money supply lowers the rate of interest, which then stimulates more investment demand. Increase in investment demand through multiplier process leads to a greater increase in aggregate demand and national income.
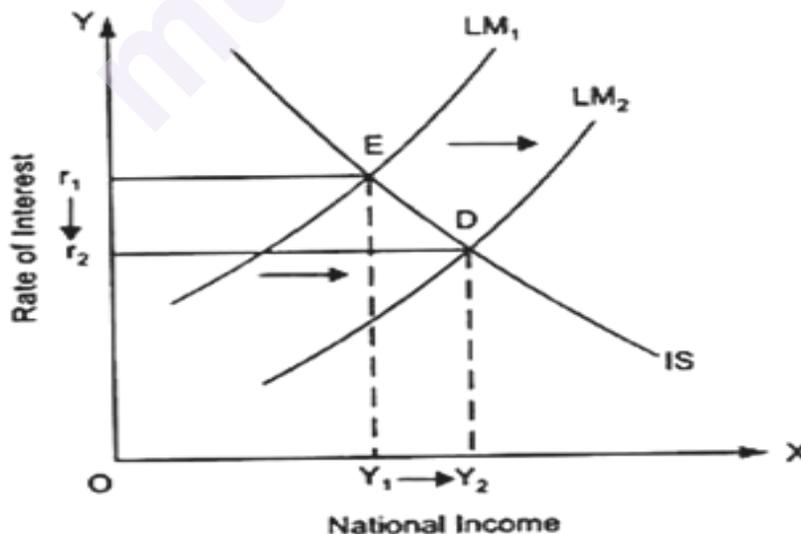

Fig 3.10 Effect of Expansion in Money Supply on Interest Rate and Income

If the economy suffers from inflation, the Government will like to check it. Then its Central Bank should adopt tight or contractionary monetary policy. To control inflation the Central Bank of a country can reduce money supply through open market operations by selling bonds or government securities in the open market and in return gets currency funds from those who buy the bonds. In this way liquidity in the banking system can be reduced.

To reduce money supply for fighting inflation the Central Bank can also raise cash reserve ratio of the banks. The higher cash reserve ratio implies that the banks have to keep more cash reserve with the Central Bank. As a result, the cash reserves with the banks fall which force them to contract credit. With this money supply in the economy declines.
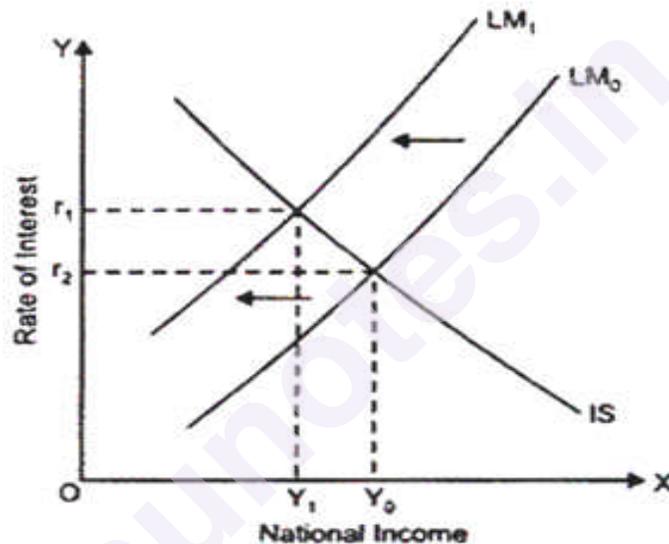
3.11 Contractionary monetary policy to Fight Inflation

Thus, IS-LM model can be used to show that reduction in money supply will cause a leftward shift in LM curve and will lead to the rise in interest rate and fall in the level of income. The rise in interest rate, which will cause reduction in investment demand and consumption demand and help in controlling inflation. This is shown in Fig.3.11.

3.4 SUMMARY

1. The IS-LM model, which stands for "investment-savings" (IS) and "liquidity preference-money supply" (LM) is a Keynesian macroeconomic model that shows how the market for economic goods (IS) interacts with the loanable funds market (LM) or money market. It basically shows the relationship between real output and interest rates.

2. The IS curve (I for investment and S for savings) summarizes all the combinations of income and interest rates that ensure equilibrium on the B&S → market inverse relationship between Y and the interest rate.

3. The LM curve (L for liquidity and M for currency) summarizes all the combinations of income and interest rates that ensure equilibrium on the currency market → direct relation between Y and the interest rate.

4. The crossing of the two curves i.e. IS and LM is the combination of the interest rate and real GDP, denoted (r*,Y*), such that both the money market and the goods market are in equilibrium.

5. Expansionary and Contractionary Fiscal and monetary policies leads to a shift in the IS and LM curve.

3.5 QUESTIONS

1. Discuss the derivation of IS curve.
2. Explain the derivation of LM curve.
3. Explain how equilibrium is achieved in the goods and the money market.
4. Explain the effect of changes in the fiscal policy on IS curve.
5. Explain the effect of changes in the Monetary policy on Money market equilibrium.

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Unit - Three

Unit-3A

"THE IS-LM MODEL"

Unit Structure :

3A.0 OBJECTIVES

- To enable the learners to grasp fully the theoretical rationale behind policies at the country as well as corporate level.
- To receive a firm grounding on the basic macroeconomic concepts that strengthens analysis of crucial economic policies.

3A.1 INTRODUCTION

Growth, stability, and distribution are the three principal concerns of economics. Since economics deals with the material well-being alone, growth is defined in terms of the growth in real national income, stability (rather instability) in terms of the fluctuations in real national income or in the rate of unemployment (the two are linked through the Okun's law) and in the (general) price level (inflation/ deflation), and distribution in terms of the income distribution across households. Economists

unanimously recommend every country to aim at a high growth rate, high stability, and a fair, though not equal, distribution. However, most economists believe that growth and price stability are incompatible goals in the short- run (Phillip's curve) and thus an ideal mix of the two is a debatable issue.

The famous Kuznet's curve suggests that growth and desired income distribution do not always move in tandem. This lesson addresses the issue of economic fluctuations and their monitoring through the application of stabilization policies. We analyses time series data on economic fluctuations and the indicators of stabilizing policies in selected countries to examine the depth and spread of these fluctuations and the actual uses of the corresponding policies. We also highlight inherent limitations of these policies to appreciate their less than perfect role in taming business cycles.

ECONOMIC FLUCTUATIONS

Economic fluctuations are simply fluctuations in the level of the national income of a country representing growth or contraction. A market economy is not static. It's dynamic. A rise in national income means an economy is growing, while a decline in national income means that an economy is contracting. The current economic model describing economic fluctuations in a market economy is the business cycle.

The business cycle is a pattern of economic fluctuations describing the periods of economic growth, contraction, and the transitions in between. If you plot these periods on a graph, you'll see peaks and troughs, ups and downs.

Economic fluctuations are a fact of life (Schumpeter, 1939) All countries have suffered from these though the booms and busts have not always synchronized across countries and neither the length nor the amplitude have been uniform. Table 1 provides data for selected years on the three most significant macro- economic variables (viz., growth rate, unemployment rate, and inflation rate) for select countries, including India, China, Malaysia, the G-7 countries, and the world.

The average growth rate in these countries during the last 34 years (1964-1997) has fluctuated between 2.3 per cent in UK and 9.2 per cent in China, with standard deviations of 2.2 per cent and 6.7 per cent, respectively. For the world as a whole, while the average growth rate during the said period stood at 3.7 per cent, the standard deviation turned out to be 1.4 per cent, giving a coefficient of variation of 38 per cent. These indicate a fairly high degree of volatility both over space and time. The data on growth rates, unemployment rates, and inflation rates

further highlight the presence and depth of business cycles. The data also indicate that, among the countries, the maximum fluctuations in the growth rate were in China, in the unemployment rate in the UK, and in the inflation rate in India.

In India, the drought of 1979-80 (when the agriculture output fell by 12%) led to the worst negative growth rate of 6 per cent and the mild reforms-induced prosperity of the second half of the 1980s (when industrial output went up by 9.6 %, and finance, insurance, real estate, and business services' output was up by 11.4%) took the growth to its peak rate of around 10 per cent in 1988-89.

Some striking examples of extreme fluctuations in the globe are cited below:

- The Great Depression of 1929-33 was fairly widespread across all countries. During these four years, the GDP fell by about 29 per cent in the US, 22 per cent in Australia, 18 per cent in Czechoslovakia, 16 per cent in Germany, 11 per cent in France and Hungary, 9 per cent in Sweden, 6 per cent in the UK, and so on. The unemployment rates were accordingly high and most countries had experienced fairly high rates of deflation.

- The hyperinflation (inflation over 1000%/year) plagued several European countries, including Germany, Hungary, Austria, and Poland during the 1920s and again Hungary during August 1945 to July 1946. Several Latin American countries including Argentina, Bolivia, Brazil, Nicaragua, Peru, and Ukraine suffered from this disease during the 1980s and 1990s.

- The stagflation during 1974-75 and 1979-82 was fairly widespread throughout the world. For instance, the growth rate in the world output fell monotonously from 5.8 per cent in 1973 to 0.7 per cent in 1975 and from 4.1 per cent in 1978 to 0.4 per cent in 1982. The world inflation rate stood at two digit levels in all these years. Several countries including the US and the UK had experienced negative growth rates in most of these years, and the rest had lower than their respective trend rates in all these years. Most of the countries had suffered a two-digit inflation rate or a high one-digit rate.

Japan witnessed fast growing prosperity during the 1950s and 1960s. The Japanese economy is currently suffering from recession for over a decade. China had experienced a relatively high growth rate (two- digit level) during most of the 1960s (barring 1967, when she had the worst recession), and the 1980s and 1990s. The US suffered the worst recession after the Great Depression during 1979-82 but has performed

reasonably well during most of the 1990s.

India has had a negative growth rate in 1956-57, 1964-65, 1972-73, and 1979-80 (maximum at 6.0%), and a maximum growth rate of about 10 per cent in 1988-89. Most of the South East Asian nations had achieved high growth rates during 1986 through 1996 until they got caught up by the recent financial crisis. The growth rates in European countries were either negative or low during the periods of stagflation (1974-75, 1979-82) as well as the early 1990s, and better in most other years.

African countries and Latin American countries have witnessed even worse cycles. The world recorded the highest growth rate of 6.2 per cent in 1964 and the lowest of 0.4 per cent in 1982. In general, the 1980s and 1990s have been decades of relatively good performance in most countries.

- Since early 2001, most regions in the world are experiencing a recession which is in terms of a fall in the growth rate rather than a negative growth rate. This recession, like the Great Depression of the early 1930s, and the stagflation of the mid-70s and early 80s is well spread across countries. However, the inflation rate has been quite modest lately in most countries.

The unemployment and inflation data (Panels B and C, Table 1) further demonstrate the recurrence of business cycles. As per Arthur Okun's law, the unemployment figures are just the mirror image of the growth rate. The average inflation rate during 1964- 2000 fluctuated between 3.2 per cent in Germany and 9.1 per cent in India, with a standard deviation of 1.8 per cent and 2.8 per cent, respectively. The said figures for the world turned out to be 11.1 per cent and 5.9 per cent, respectively. Thus, the standard deviation of inflation was fairly high as well.

The fluctuations in real GDP have not always synchronized across countries. In particular, while Japan had achieved a relatively high economic growth during the 1950s and 1960s, it has suffered badly during the 1990s. In contrast, China, Malaysia, India, and even the US have done well during the 1980s and 1990s.

Table 3A.1: Economic Fluctuations (Percentages)

	USA	Canada	Japan	France	Germany	Italy	UK	China	Malaysia	India	World
Panel	**A: Growth**	**Rates (Real GDP)**									
1960	2.2	2.9	13.3	7.2	31.5	11.7	4.6	-1.4	N.A.	7.0	5.4
1964	5.7	6.7	11.4	6.5	6.6	2.8	5.2	16.5	N.A.	7.4	6.2
1970	-0.1	2.6	10.3	5.7	5.1	5.3	2.4	23.3	N.A.	5.2	3.5
1980	-0.6	1.5	3.5	1.6	1.0	4.2	-1.9	7.8	7.8	7.5	2.6
1990	1.1	-0.5	4.8	2.5	4.9	2.1	0.5	3.8	9.7	5.7	2.9
1997	3.9	4.0	0.9	2.0	2.0	1.5	3.5	8.8	7.7	5.0	4.2
2001	0.5	N.A	1.0	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	4.5-5.5	1.2
*Mean**	*2.8*	*3.7*	*5.1*	*3.0*	*2.8*	*3.2*	*2.3*	*9.2*	*7.4*	*4.5*	*3.7*
*SD**	*2.2*	*2.4*	*3.5*	*1.9*	*2.2*	*2.4*	*2.2*	*6.7*	*3.0*	*3.7*	*1.4*
Panel B: Unemployment Rates											
1964	5.0	4.3	1.1	1.4	0.4	4.3	2.6	N.A.	N.A.	N.A.	N.A.
1970	4.8	5.6	1.1	2.5	0.8	5.3	3.0	N.A.	N.A.	N.A.	N.A.
1980	7.0	7.4	2.0	6.3	2.9	7.5	6.4	N.A.	N.A.	N.A.	N.A.
1990	5.4	8.1	2.1	8.9	4.9	10.3	6.8	2.5	5.1	N.A.	N.A.
1997	5.0	9.2	3.4	12.3	12.7	12.3	5.7	3.0	2.5	N.A.	N.A.
2001	5.5	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
*Mean***	*6.0*	*7.7*	*2.1*	*6.7*	*4.6*	*8.2*	*6.7*	*2.5*	*4.6*	*N.A.*	*N.A.*
*SD***	*1.5*	*2.5*	*0.7*	*3.8*	*3.5*	*2.5*	*3.3*	*0.4*	*2.1*	*N.A.*	*N.A.*
Panel C:	**Inflation**	**Rates**									
1964	1.3	1.8	3.8	3.1	2.3	5.9	3.2	-3.7	-0.4	13.4	4.5
1970	5.9	3.4	7.7	5.9	3.4	5.0	6.4	0	1.8	5.1	6.0
1980	13.5	10.2	7.8	13.3	5.4	21.2	18.0	7.4	6.7	11.4	15.6
1990	5.4	4.8	3.1	3.4	2.7	6.4	9.5	3.1	2.6	9.0	29.4
1997	2.3	1.0	1.7	1.2	1.8	2.0	3.1	2.8	2.7	7.2	6.0
2000	3.4	1.7	-0.7	1.7	1.9	2.5	2.9	0.3	1.5	4.0	4.2
*Mean****	*4.8*	*4.9*	*4.3*	*5.5*	*3.2*	*8.1*	*7.2*	*4.25*	*3.69*	*8.56*	*11.1*
*SD****	*3.0*	*3.3*	*4.5*	*4.0*	*1.8*	*6.0*	*5.3*	*6.60*	*3.38*	*5.62*	*5.9*

Source: IMF: *International Financial Statistics,* various issues.
* For the period 1964-1997. ** For the period 1964-1997/85-86-98. ***For the period 1964-2000.

The fundamental factors behind these fluctuations are shocks in aggregate demand (AD) and/or aggregate supply (AS). These can be caused by changes in one or more of the exogenous variables (policy or non-policy ones) and the behavioural parameters of the decision-makers, viz. consumers, input supplier, and firms. The non-policy variables that affect AD include autonomous components of consumption, investment, exports and imports, which, in turn, are guided by the confidence and expectations of consumers and firms, both domestic and foreign. The non-policy variables that impinge on AS include weather/monsoon, prices of inputs, raw-materials and intermediate goods, stipulations about pollution and environment regulations, business expectations about future prices, factor supplies, technology, discovery of new natural resources, etc.

The policy variables that have a bearing on AD include money supply (or the high-powered money), government fiscal operations like government expenditure, taxation, and transfer payments, and the foreign exchange rate, tariffs, and quotas. The classists (supply-siders) believe that direct taxes (personal income tax, corporate tax, and the rebates on saving and investment) affect AS as well through incentives/ disincentives to supply more labour and save and invest more or less.

The behavioural parameters affecting AD include propensities to consume/save, invest and import, interest sensitiveness of investment and money demands, price elasticities of import and export, etc. Workers' leisure-work preference, firms' attitude towards risk and profit, industrial relations and riots, etc. constitute the behavioural parameters that affect AS. While the behavioural parameters are fairly constant in the short-run, the non-policy and policy variables do change even in the short-run. Thus, the shifts in AD and AS could be caused by a variety of factors even in the short-run, and any one or more of them could have triggered/reinforced a particular contraction or recovery.

The stagflation was triggered by the formation of a cartel by oil exporters (OPEC) leading to restricted oil supply and significant increases in the crude oil price. The increase in the energy cost led to increase in the production cost of all goods all over the world. The firms were forced to jack up their prices and hence the AS curve shifted upward. This being an adverse supply shock, while the output fell, prices went up. As a consequence, the world for the first time experienced the twin evils of unemployment and inflation at the same time.

The hyperinflation of Europe in the 1920s was triggered by war time damages and reconstruction, causing heavy debts. When the debt became un- sustainable, those countries started financing the deficits through increasing the high-powered (base) money (and thereby money supply) more and more, giving rise to hyperinflation. The Latin America's hyperinflation was caused by its attempts to grow through debts, and when debt became unsustainable, some of the countries got into external debt crisis and all of them resorted to excessive printing of currency causing hyperinflation. Needless to say, all these hyperinflations were accompanied by equally high growth in the high-powered money.

The prosperity of the 1980s and 1990s could be credited to the spread of globalization, technical progress, and the proper handling of stabilizing policies. The countries which liberalized trade and international capital flows grew faster than the others. The South-East Asian countries and China provide enough evidence to this hypothesis.

The collapse of the USSR and the poor experience of the African countries offer the added support. The part shifting of the production base from the high cost North American, Japanese, and European regions to the low cost Asian and Latin American regions has helped in bringing down inflation throughout the world. The telecommunication and computerization boom

resulted into a structural shift from the traditional industries to the knowledge-based industries and services. The busting of this boom and the speculations in foreign exchange, causing the Asian financial crisis of the 1997-98, are considered to be among the main factors responsible for the current growth recession. The growing terrorism, fluctuating monsoons, and environmental hazards have also contributed in aggravating the recession.

3A.2 STABILIZATION POLICIES

The built-in (automatic) stabilizers, viz. progressive direct taxes and social security system, are never enough to counter business cycles. Fiscal policy, monetary policy, and the foreign exchange rate system provide the necessary tools in the hands of the policy- makers to tame economic fluctuations. Governments' fiscal operations, viz. government expenditure and taxation, affect AD both directly and indirectly and AS indirectly. Government expenditure is a component of AD and taxation reduces private income thereby reducing private consumption and investment. Part of the effect of the expansionary fiscal policy is crowded out through reduction in private investment and net exports, as increased government expenditure leads to increase in interest rate, and through that the appreciation of the exchange rate (if the economy is on a floating rate system).

Stabilization policy is a strategy enacted by a government or its central bank that is aimed at maintaining a healthy level of economic growth and minimal price changes. Sustaining a stabilization policy requires monitoring the business cycle and adjusting fiscal policy and monetary policy as needed to control abrupt changes in demand or supply.

In the language of business news, a stabilization policy is designed to prevent the economy from excessive "over-heating" or "slowing down."

- Stabilization policy seeks to keep an economy on an even keel by increasing or decreasing interest rates as needed.
- Interest rates are raised to discourage borrowing to spend and lowered to boost borrowing to spend.
- Fiscal policy can also be used by increasing or decreasing government spending and taxes to affect aggregate demand.
- The intended result is an economy that is cushioned from the effects of wild swings in demand.

3A.3 UNDERSTANDING STABILIZATION POLICY

A study by the Brookings Institution notes that the U.S. economy has been in a recession for about one in every seven months since the end of World War II. This cycle is seen as inevitable, but stabilization policy seeks to soften the blow and prevent widespread unemployment.

A stabilization policy seeks to limit erratic swings in the economy's total output, as measured by the nation's gross domestic product (GDP), as well as controlling surges in inflation or deflation. Stabilization of these factors generally leads to healthy levels of employment.

The term stabilization policy is also used to describe government action in response to an economic crisis or shock such as a sovereign debt default or a stock market crash. The responses may include emergency actions and reform legislation.

3A.4 THE ROOTS OF STABILIZATION POLICY

Pioneering economist John Maynard Keynes argued that an economy can experience a sharp and sustained period of stagnation without any kind of natural or automatic rebound or correction. Previous economists had observed that economies grow and contract in a cyclical pattern, with occasional downturns followed by a recovery and return to growth. Keynes disputed their theories that a process of economy recovery should normally be expected after a recession. He argued that the fear and uncertainty that consumers, investors, and businesses face could induce a prolonged period of reduced consumer spending, sluggish business investment, and elevated unemployment which would all reinforce one another in a vicious circle.

In the U.S., the Federal Reserve is tasked with raising or lowering interest rates in order to keep demand for goods and services on an even keel. To stop the cycle, Keynes argued, requires changes in policy in order to manipulate aggregate demand. He, and the Keynesian economists who followed him, also argued the reverse policy could be used to fight off excessive inflation during periods of optimism and economic growth. In Keynesian stabilization policy, demand is stimulated to counter high levels of unemployment and it is suppressed to counter rising inflation. The two main tools in use today to increase or decrease demand are to lower or raise interest rates for borrowing or to increase or decrease government spending. These are known as monetary policy and fiscal policy, respectively.

3A.5 THE FUTURE OF STABILIZATION POLICY

Most modern economies employ stabilization policies, with much of the work being done by central banking authorities such as the U.S. Federal Reserve Board. Stabilization policy is widely credited with the moderate but positive rates of GDP growth seen in theU.S.sincetheearly1980s.Itinvolves using expansionary monetary and fiscal policy during recessions and contractionary policy during periods of excessive optimism or rising inflation. This means lowering interest rates, cutting taxes, and increasing deficit spending during economic downturns and raising interest rates, rising taxes, and reducing government deficit spending during better times.

Many economists now believe that maintaining a steady pace of economic growth and keeping prices steady are essential for long-term prosperity, particularly as economies become more complex and advanced. Extreme volatility in any of those variables can lead to unforeseen consequences to the broad economy.

Stabilizing policies have helped rescue the debt and foreign exchange crises faced by several countries including Mexico, Argentina, Thailand, and Indonesia during the 1980s and 1990s. Currently, these tools are being applied successfully in many countries, including the US and India to tame the growth of recession and to come out of the terrorist attacks. Data in Table 3A.2 indicate the broad workings of these policies in select countries, viz. India, US, and China for some selected years. A careful analysis of these results indicates the following:

Table 3A.2: Changes in policy indicators (Percentages)

Year	Money Supply Growth			Government Expenditure (% of GDP)			Fiscal Deficit (% of GDP)		
	India	China	USA	India	China	USA	India	China	USA
1969	9.80	N.A.	5.90	8.60	N.A.	19.34	2.52	N.A.	-0.50
1970	10.80	N.A.	3.80	9.00	N.A.	19.50	3.15	N.A.	1.11
1980	12.30	24.80	6.30	13.23	26.59	21.62	6.54	2.85	2.47
1990	18.90	13.40	3.80	17.27	16.81	22.43	8.12	0.81	4.10
1997	12.60	19.40	3.50	17.78	12.59	19.49	4.87	0.73	0.24
2000	10.70	21.40	-3.80	16.98	18.09	18.19	5.35	2.70	2.59
*Mean**	*14.79*	*21.38*	*5.97*	*14.28*	*18.11*	*20.86*	*5.60*	*1.17*	*2.55*
*SD**	*4.11*	*9.01*	*3.82*	*2.88*	*4.99*	*1.48*	*1.79*	*0.97*	*1.87*

Source:IMF:*InternationalFinancialStatistics*,variousissues.
*Fortheperiod1969-2000

There is no particular pattern among the growth rates in GDP, growth rate in money supply, government expenditure as a proportion of GDP, and fiscal deficit as a proportion of GDP in the three countries under analysis. It may be noted that, if the stabilizing policies are applied to counter business fluctuations,

their corresponding magnitudes would grow slower during prosperity and faster during recession.

Of the five correct ones, three are for the US (all during the worst year) and one each for India (for money supply during the worst year) and China (for fiscal deficit during the best year). This simple analysis thus suggests that the stabilizing policies were applied consistently only to tame recession in the US. In a majority of the cases, these policies were pro-cyclical thereby aggravating the fluctuations rather than countering them.

In contrast, the fiscal policy was anti-cyclical in the US and China and pro-cyclical in India. Economists differ with regard to the relative effectiveness of different stabilizing policies. The classists favour the monetary policy over the fiscal instruments as they believe that the demand for money and the other behavioural functions is relatively stable. In contrast, the Keynesians favour the fiscal policy, particularly to check recession, when the interest rate hardly responds to fiscal deficit. Both schools believe that for policies to be effective, they have to be credible. The foreign exchange rate policy has not been used much in stabilizing the economy. The other two have been applied with varied success.

The improvements in the knowledge base, technology, and transparency in policies, and recognition of the significance of macro-economic (fiscal) balance in economic growth, among other factors, are responsible for the inadequate effectiveness of policies in countering the current growth recession. Pump priming is desirable during recessions and thus easy fiscal-monetary policy mix is a good policy currently in operation in many countries.

Economic fluctuations have occurred, would continue to recur, and are not entirely bad. There are ups and downs in all walks of life and economic performance cannot be an exception. There is nothing perfect in real life and so policies cannot guarantee full freedom from fluctuations. Recessions provide opportunities to introspect, relax, learn the ways to improve performance, discover new techniques, etc. Was not Keynes motivated to revolutionize macro-economic theory and policy on experiencing the Great Depression? Similarly, was not Milton Friedman encouraged to counter the inadequacy of the Keynesian theory to account for the stagflation through his hypotheses of price expectations, natural rate of unemployment, and policy lags? His ideas got the added support from Robert Lucas and others, through their advancement of the rational expectations' hypothesis.

The new Keynesians accepted the rational expectations' theory and rationalized the wage-price rigidity hypothesis of the old Keynesian school. These, among others, have enriched our

understanding of the economy and accordingly economic fluctuations are now better understood and managed than ever before. The discoveries of new products, new technologies, and trends towards mergers and globalization, etc. have been inspired by the business cycles.

Deep or/and long recessions and unsustainable prosperity are, of course, not good. The former brings undue hardship resulting into both economic and social/psychological loss. The latter tends to raise the standard of living which no one likes to reverse. Fortunately, at least one of the three stabilizing policies analyzed above is effective under any condition to at least partially counter fluctuations. It is because of this that the world has not seen any deep recession since 1929-33, and we can safely state that such a great depression would never be there in future. Countries after countries have faced slow-down but they have all been short-lived and relatively shallow.

The credit for this goes squarely to the development in macro- economics and its application by policy-makers across the globe. These policies have been applied in the real world with varying successes. The lack of full success has been partly due to the inherent limitations of these policies and partly due to their poor applications. Needless to say, international organizations like the World Bank and IMF have helped the member nations to implement effective counter-cyclical policies, though the literature provides examples of their poor guidance/ force as well. The policies do have side effects, some of which may be undesirable, but a judicious combination of the various tools can minimize the bad effects. For example, a proper mix of an expansionary fiscal and an expansionary monetary policy would tend to raise output without raising interest rate. Also, if an expansionary fiscal or monetary policy were accompanied with a devaluation of the foreign exchange rate, we would have higher output without endangering the trade balance. Nevertheless, cycles are bad and unfortunately, in spite of vast developments in macro- economic theory and policy and technological innovations, cycles, though milder over time, have persisted and are unlikely to ever disappear

Check your progress
1. Explain the concept of economic fluctuations.
2. Explain the meaning of stabilization policies.

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3A.6 TRANSMISSION MECHANISM AND THE CROWDING OUT EFFECT

Crowding out refers to a process where an increase in government spending leads to a fall in private sector spending. This occurs as a result of the increase in interest rates associated with the growth of the public sector. Crowding out has been considered by many economists from a variety of different economic traditions, and is the subject of much debate. Thus, the phenomenon, whereby increased government expenditure may lead to a squeezing of private investment expenditure, is referred to as the crowding-out effect. Government expenditure crowds out private sector investment expenditure. Thus, the multiplier effect of government expenditure (K_G) is lessened because of the negative effect on private investment following higher interest rates. It is because of the crowding-out effect aggregate output declines but interest rate increases.

We can explain the phenomenon of crowding-out effect in terms of (i) aggregate demand ($C + I + G$) and aggregate output approach and (ii) the IS-LM approach. We have learnt that equilibrium national income is determined at that point where $C + I + G$ line cuts the 45° line. This is demonstrated by $C + I_1 + G_1$ line when the rate of interest is assumed to be r_1. In Fig. 3A.1, $C + I_1 + G_1$ line cuts the 45° line at point E, and the equilibrium national income, thus, determined is OY_1.
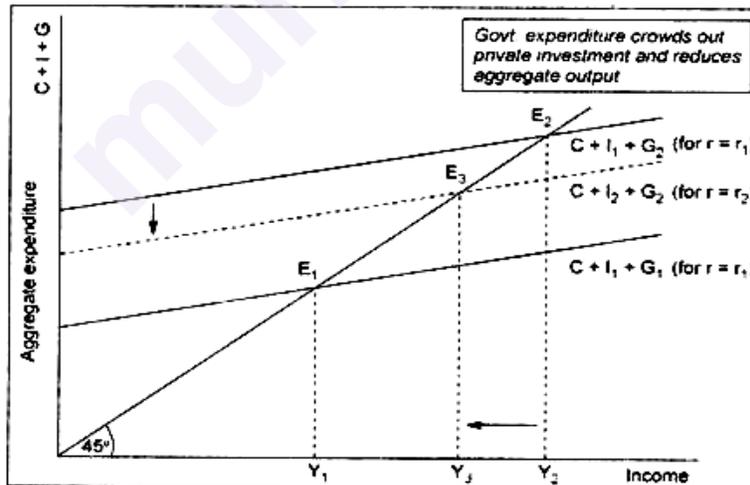

Figure 3A.1 Govt. expenditure crowds out private investment and reduces aggregate output

Let there be an increase in government expenditure from G_1 to G_2. This causes $C + I_1 + G_1$ (holding $r = r_1$) line to shift up to $C + I + G_2$ (for $r = r_1$). This causes aggregate income to rise to OY_2 (full multiplier effect). This higher income ($OY_2 > OY_1$), however, causes money demand and interest rate to rise from r_1 to

r_2, leading to a fall in private planned investment expenditure from I_1 to I_2.

This causes aggregate demand line to shift down to $C + I_2 + G_2$ (assuming $r = r_2 < r_1$). Equilibrium now occurs at point E_3. Note that equilibrium income has declined to $OY_3 < OY_2$. This is crowding-out phenomenon private sector investment is being squeezed. Here we see 'partial' multiplier effect in operation.

However, there would not have been any crowding-out phenomenon if interest rate were to decline. Suppose, central bank increases money supply to finance government expenditures. Its impact can now be felt in the money market in the form of lower interest rate. This means that higher money demand by the public can be met by excess quantity of money. This may cause interest rate to fall, causing aggregate output to rise. In other words, instead of crowding-out effect, one may experience 'crowding-in effect'.

Crowding-out phenomenon can be better explained in terms of IS-LM framework as it combines both goods market and money market. Aggregate demand-aggregate output approach does not display the links between the goods market and the money market. In Fig. 3A.2, we have drawn IS and LM curves. For simplicity, we have not considered liquidity trap effect on the LM curve. Initially, our economy is at equilibrium at point E_1. The corresponding income-interest rate combination is $r_1 - Y_1$.
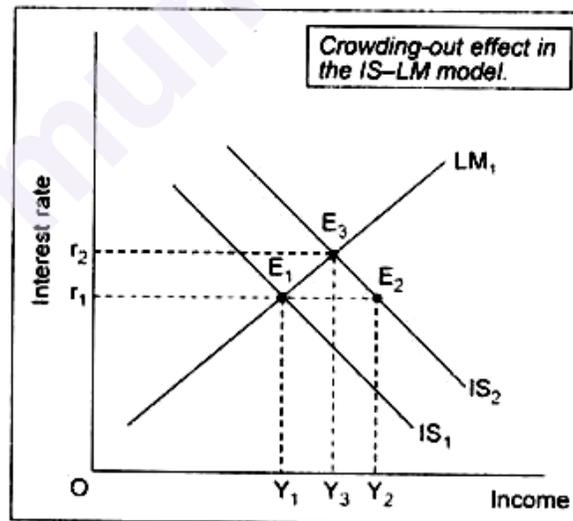

Figure 3A.2 Crowding out effect in the IS-LM model

An increase in government spending shifts the IS curve to IS_2, shifting the equilibrium point to E_2. Consequently, income rises to OY_1 from OY, (a full multiplier effect of government spending). But the economy is out of equilibrium: goods market is in equilibrium (since planned expenditure equals aggregate output),

but money market is out of equilibrium. This is because higher income causes money demand to rise.

This excess demand for money (in the money market) then pulls up the interest rate, leading to a fall in aggregate demand as it squeezes out some private investment, tending to reduce the size of the multiplier effect on income. Final equilibrium (determined by the IS-LM intersection) now occurs at point E_3 and aggregate output declines to OY_3. Note that the increase in aggregate income $(OY_3 - OY_1)$ is less than the amount indicated by the multiplier $(Y_2 - Y_1)$ having the 'full' effect. This feedback phenomenon is often referred to as a "crowding-out effect". It reduces the size of government expenditure multiplier.

It may be noted here that the strength or impact of crowding-out effect depends on the interest sensitivity of investment function (i.e., the slope of the IS curve) and interest sensitivity of the money demand function (i.e., the slope of the LM curve). The greater the value of the interest-sensitivity of the investment function and lower the value of the money demand function, greater will be the crowding-out effect, and vice versa.

3A.7 COMPOSITION OF OUTPUT AND POLICY MIX

The term policy mix refers to the combination of fiscal and monetary policy that a country uses to manage its economy. A policy mix is developed and determined by a nation's policymakers—notably its federal government and central bank. The policy mix is a pivotal part in boosting a nation's economic growth and helps keep the country on track to maintaining the strength of its economy.

- A policy mix is the combination of fiscal and monetary policy that a country uses to manage its economy.

- Fiscal and monetary policies make up a nation's economic policy - the federal government handles the former while the latter is overseen by a central bank.

- Fiscal policy involves spending and tax initiatives while monetary policy involves interest rates and the money supply.

- Although governments and central banks have different goals and time horizons, they may work together to stimulate economic growth.

3A.8 HOW A POLICY MIX WORKS

A country's economic policy consists of two components - its fiscal policy and its monetary policy. A fiscal policy consists of any spending plans and tax initiatives that a nation's government uses to boost and influence economic conditions such as inflation, employment, and demand for goods and services. Monetary policy, on the other hand, refers to any actions taken to control a country's supply of money. Monetary policy is supposed to help the nation sustain economic growth.

In most democratic countries, elected legislatures - the federal government - control fiscal policy, while independent central banks handle monetary policy. In the United States, this is the Federal Reserve System (Fed), which is made up of a dozen regional Federal Reserve Banks. Governments and central banks generally share a broad set of goals. They include low unemployment, stable prices, moderate interest rates, and healthy growth.

These policymakers may employ different tools to accomplish these goals and often stress different priorities. For instance, government budgets affect long-term interest rates, while monetary policy affects short-term ones. That's because they each have different objectives and time horizons to accomplish their goals. Governments must win popular approval from the general public and are generally voted for in four-year cycles, while central bankers are technocrats that don't directly answer to voters. This makes them much more independent.

So how does this all work? Inflation occurs when prices rise and the purchasing power of a single unit of currency declines. This means people can't afford to buy goods and services because their money doesn't stretch as far as it once did - prices are just too high. This situation spreads throughout the economy, leading to a drop in consumer and business spending and higher unemployment, to name a few effects. A nation's federal government and central bank may step in to help curb inflation through a policy mix. For instance, the government may implement tax cuts to encourage consumers to spend more money while its central bank may reduce interest rates to inject more liquidity in the financial market. The central bank may also increase the money supply to boost investment and also encourage spending.

3A.9 SPECIAL CONSIDERATIONS

There are times when fiscal and monetary policymakers actually work together. For example, the government may pass

fiscal stimulus by cutting taxes and increasing spending. The central bank may decide to provide monetary stimulus by cutting short-term interest rates. Broadly speaking, this was the policy mix that characterized the response to the 2008 financial crisis in the United States. The crisis was ushered in by a collapse in the housing market, rising interest rates, defaulting subprime borrowers. This had a domino effect that led to a crash in the global financial market, ultimately resulting in the Great Recession.

Fiscal and monetary policy can also push in different directions. The central bank might ease monetary policy while fiscal policymakers pursue austerity measures. This is what happened in Europe following the financial crisis. Or the government, eager to win popular support, may decide to cut taxes or boost spending despite a tight labor market and inflationary pressures. These actions could force the central bank to raise interest rates.

Check your progress
1. Explain the term Crowding out effect.
2. What do you understand by the use of Policy mix?

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3A.10 IS-LM IN INDIA

India embarked on a major reform to liberalize its economy in the year 1991. But there had been a gradual and effective policy-level effort to loosen import and business controls since the 1980s, which reached its culmination a decade later. India's growth story has been rewritten since then and prior to the current pandemic; India was the fifth largest economy in terms of size and the fastest trillion-dollar emerging economy in the world.

This holistic framework is premised considerably on New Keynesian theoretical philosophy, where a simple Keynesian consumption function is included along with an investment function, which is motivated by the accelerator principle. However, an augmented version of the Phillips curve is proposed, which incorporates backward-looking inflation expectation to corroborate the Indian experience where inertia plays an instrumental role in deciding the future dynamic of inflation. A two-stage least squares technique, a variant of the structural equation model (SEM), is employed for the analysis in which equations for consumption expenditure, private capital formation, external sector comprising import and export, supply side of the economy, inflation dynamic, tax collection, and money demand function are considered.

Finally, to assess the model's efficacy in predicting the effect of expansionary monetary and fiscal policy interventions, a simulation is carried out for the past 10 years from FY2009 - 2010 through 2018 - 2019. This is done by reducing the interest rate and increasing government capital formation as well as government consumption expenditure, respectively. Empirical findings from the simulation suggest the effectiveness of both fiscal and monetary policies.1 Expansionary monetary policy, as envisaged by a 100-basis point reduction in the short-term interest rate, leads to around a 4% increase in GDP.

On the other hand, increases in two variables, namely government consumption expenditure and public capital formation, are considered as fiscal stimuli. Results indicate that a 10% rise in government consumption expenditure results in a 19.65% increase in output, whereas a 10% higher public capital formation raises output by 24.23%. The fiscal stimulus and economic growth are only sustainable if this can also generate revenue through tax collection. In both cases, tax collection increases by around 50%. Given that tax collection is already low in India, this increase is not surprising.

3A.11 MACROECONOMIC OVERVIEW OF THE INDIAN ECONOMY SINCE 1980

The Indian economy's growth trajectory has been experiencing a gradual and consistent evolution since the 1980s. This dynamic growth can be mainly attributed to change in economic policies, adopted in different phases during the last four decades. A brief snapshot of India's macroeconomic performance during this 40-year period is presented in Table 3A.3. Internal factors, coupled with global attributes, led this journey to a distinct destination where India has been recognized as growing from an underdeveloped economy to a promising emerging power on the global economic platform. During the period 1980 - 1990, the rate of growth accelerated to an unprecedented level of 5.8% and this figure was surpassed by as few as eight out of 113 countries in the world. Post liberalization, during the period 1990 - 1995, the growth rate marginally dipped to 4.70% due to structural changes, but it witnessed a further surge in the last five years of the previous century, i.e., up to 6.84%, followed by a consistent 5.65% growth during the first five years of the new millennium.

From 2005 to 2010, the Quinquennial growth rate of GDP is estimated at an all-time high of 6.92%. This was the phase in its history when the Indian economy recorded annual y-o-y growth rates close to 8% consistently for about eight years, from the fiscal year (FY) 2003 - 04 to FY2010 - 11, except for FY2008 - 09. Following the 2008 subprime market crisis and its global impact,

the Indian economy experienced a downward trend in output growth in successive years. This decay was further aggravated by the adverse impact of poor implementation of structural reforms, like demonetization in 2016 and GST in 2017. However, many argue in favour of the long-term benefits of such reforms, which can only be judged in the due course of time.

Table 3A.3: Macroeconomic Indicators: Quinquennial Averages from 1980 through 2020

	GDP Growth Rate (%)	Government Investment Rate (%)	Private Investment Rate (%)	Private Savings Rate (%)	Inflation (%)	Fiscal Deficit to GDP (%)
1980–81 to 1984–85	5.47	10.27	8.57	13.32	9.38	5.67
1985–86 to 1989–90	5.91	10.36	8.76	16.69	8.00	7.44
1990–91 to 1994–95	4.70	8.69	12.31	20.27	10.65	6.09
1995–96 to 1990–00	6.84	7.10	15.63	22.67	6.84	5.35
2000–01 to 2004–05	5.65	6.08	17.70	27.79	4.03	5.08
2005–06 to 2009–10	6.92	7.43	26.46	33.32	7.44	4.45
2010–11 to 2014–15	6.60	7.68	30.32	32.43	7.34	4.84
2015–16 to 2019–20	6.72	7.69	27.76	29.71	3.35	3.60

A granular look at different components of aggregate-level output is a very revealing and informative exercise in assessing the dynamic growth of the Indian economy. Though lately India has been experiencing a consumption-led growth, its initial economic propulsion was fueled by the private investment rate, which consistently rose from a meager 8.57% for the period 1980 - 1985 to 30.32% in 2010 - 2015. At the same time, public investment in India witnessed a secular downward trend, mainly caused by a sharp decline in infrastructure investment by government at varying levels, including state and central.

The emergence of a middle class and transition in the demographic profile led to higher consumption in the last decade and brought down the otherwise strong resilient factor and strength of the economy, i.e., private saving. It registered steady growth from 13.23% in 1980 - 1985 to an enviable 33.23% in 2005 - 2010, cushioning its financial system against the global turmoil during the 2008 crisis. After the introduction of GST and demonetization, both the saving rate and the private investment rate declined, to 29.71% and 27.76%, respectively, during the period 2015 - 2019. Further, on the fiscal front, India's policy follows an orthodox stance to maintain a low level of fiscal deficit, which has ranged between its maximum value of 7.44% during the period 1985 - 1990 and its lowest one of 3.60% from 2015 to 2020.

Global experience suggests that any emerging nation like India is always susceptible to inflationary shocks, mainly caused by

structural factors. Although India's experience with high inflation, averaging around 9.5%, during the first one and half decades after 1980 was painful, it steered its monetary policy devices efficiently to contain inflation to a more comfortable level of an average of 6.41% in the subsequent two decades, i.e., between 1995 and 2015. The nation's Apex Bank fixed a target level of a 4% inflation rate for a painless growth, and there is evidence of success and optimism in that direction since inflation was as low as 3.35% for the period 2015 - 2020. However, towards the end of FY2019 - 2020 and thereafter, like every other country across the globe, the Indian economy was severely hit by the Covid-19 crisis. The y-o-y growth of GDP in the first quarter of fiscal year 2020 - 2021 has declined by 23.9%. The performance of various sectors reveals that all sectors except the agricultural sector have shown a declining trend in Q1 2020 - 2021. The growth rates in service components like construction, trade, transport, and tourism have declined by about 50%. The manufacturing and mining industries have marked 39.3% and 23.3% declines, respectively. On the expenditure side, the investment rate during Q1 2020 - 2021 has been as low as 22%, compared to an average of 30% in the past 10 years. Amidst this, the retail inflation in India has also surged significantly with its rates touching 7.61% in October 2020 the highest in the last six years. These signs are worrying as the monetary policy has already taken an expansionary stance to mitigate the crisis. On the fiscal front, the crisis has had a significant impact on deficits. According to the controller of general accounts (CGA) reports for September 2021, the fiscal deficit for the first two quarters has already reached 114% of the annual estimate for FY2020 - 2021.

The current study is an attempt to capture the macroeconomic dynamics in India at an aggregate level. The study covers annual data from 1980 through 2019. The theoretical underpinnings of our analysis follow the New Keynesian framework based on the microeconomic foundations of Keynesian economics. Aggregate demand is modeled under its four components, namely consumption, private investment, exports, and imports. Under this framework, government expenditure and government capital formation are considered exogenous.

Aggregate supply takes the form of a simple neoclassical production function driven by labour, capital, and exogenous technical progress. The rate of inflation is taken as a function of output gap, past inflation expectations, and exchange rate. This follows New Keynesian Phillips curve representation. The LM curve specification is determined by income and short-term rate of interest. Linking monetary policy and fiscal policy to the goods market, long-run interest rates are determined by short-term interest rates and government investment. Finally, tax is estimated as a function of per capita income.

An expansionary fiscal policy in comparison to that of a monetary one is critical to the Indian economy's structure since investment growth, induced by lower interest rates, lost its steam in propelling output due to several frictions and a weaker transmission mechanism. This necessarily implies the need to focus on prudent fiscal stances to steer the economy toward a sustainable growth trajectory in the future.

3A.12 SUMMARY

1**.** Economic fluctuations are simply fluctuations in the level of the national income of a country representing growth or contraction. The current economic model describing economic fluctuations in a market economy is the business cycle. The business cycle is a pattern of economic fluctuations describing the periods of economic growth, contraction, and the transitions in between.

2. Stabilization policy is a strategy enacted by a government or its central bank that is aimed at maintaining a healthy level of economic growth and minimal price changes. Sustaining a stabilization policy requires monitoring the business cycle and adjusting fiscal policy and monetary policy as needed to control abrupt changes in demand or supply.

3. Stabilizing policies have helped rescue the debt and foreign exchange crises faced by several countries including Mexico, Argentina, Thailand, and Indonesia during the 1980s and 1990s.Currently, these tools are being applied successfully in many countries, including the US and India to tame the growth of recession and to come out of the terrorist attacks.

4. Crowding out refers to a process where an increase in government spending leads to a fall in private sector spending. This occurs as a result of the increase in interest rates associated with the growth of the public sector. Government expenditure crowds out private sector investment expenditure. Thus, the multiplier effect of government expenditure (K_G) is lessened because of the negative effect on private investment following higher interest rates. It is because of the crowding-out effect aggregate output declines but interest rate increases.

5. The term policy mix refers to the combination of fiscal and monetary policy that a country uses to manage its economy. A policy mix is developed and determined by a nation's policymakers—notably its federal government and central bank. The policy mix is a pivotal part in boosting a nation's economic growth and helps keep the country on track to maintaining the strength of its economy.

3A.13 QUESTIONS

1. Explain the meaning of economic fluctuations.

2. Discuss the role of Stabilization policies in economic fluctuations.

3. Explain the role of transmission mechanism and crowding out effect with reference to IS-LM framework.

4. Discuss the IS-LM framework in India.

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Unit -4

"INTERNATIONAL ASPECTS OF MACROECONOMIC POLICY"

Unit Structure:

4.0 OBJECTIVES

- To enable the learners to grasp fully the theoretical rationale behind policies at the country as well as corporate level.

- To receive a firm grounding on the basic macroeconomic concepts that strengthen analysis of crucial economic policies.

4.1 INTRODUCTION

Balance of payments

The balance of payments (BOP) is a statement of all transactions made between entities in one country and the rest of the world over a defined period of time, such as a quarter or a year.

The balance of payments (BOP), also known as balance of international payments, summarizes all transactions that a country's individuals, companies, and government bodies complete with individuals, companies, and government bodies outside the country. These transactions consist of imports and exports of goods, services, and capital, as well as transfer payments, such as foreign aid and remittances.

A country's balance of payments and its net international investment position together constitute its international accounts. The balance of payments divides transactions in two accounts: the current account and the capital account. Sometimes the capital account is called the financial account, with a separate, usually very small, capital account listed separately. The current account includes transactions in goods, services, investment income, and current transfers. The capital account, broadly defined, includes transactions in financial instruments and central bank reserves. Narrowly defined, it includes only transactions in financial instruments. The current account is included in calculations of national output, while the capital account is not.

The sum of all transactions recorded in the balance of payments must be zero, as long as the capital account is defined broadly. The reason is that every credit appearing in the current account has a corresponding debit in the capital account, and vice-versa. If a country exports an item (a current account transaction), it effectively imports foreign capital when that item is paid for (a capital account transaction).

If a country cannot fund its imports through exports of capital, it must do so by running down its reserves. This situation is often referred to as a balance of payments deficit, using the narrow definition of the capital account that excludes central bank reserves. In reality, however, the broadly defined balance of payments must add up to zero by definition. In practice, statistical discrepancies arise due to the difficulty of accurately counting every transaction between an economy and the rest of the world, including discrepancies caused by foreign currency translations. The balance of payments (BOP) is the method countries use to monitor all international monetary transactions at a specific period. Usually, the BOP is calculated every quarter and every calendar year.

All trades conducted by both the private and public sectors are accounted for in the BOP to determine how much money is going in and out of a country. If a country has received money, this is known as a credit, and if a country has paid or given money, the transaction is counted as a debit.

Theoretically, the BOP should be zero, meaning that assets (credits) and liabilities (debits) should balance, but in practice, this is rarely the case. Thus, the BOP can tell the observer if a country has a deficit or a surplus and from which part of the economy the discrepancies are stemming.

4.2 THE CURRENT ACCOUNT

The current account is used to mark the inflow and outflow of goods and services into a country. Earnings on investments, both public and private, are also put into the current account. Within the current account are credits and debits on the trade of merchandise, which includes goods such as raw materials and manufactured goods that are bought, sold, or given away (possibly in the form of aid). Services refer to receipts from tourism, transportation (like the levy that must be paid in Egypt when a ship passes through the Suez Canal), engineering, business service fees (from lawyers ormanagementconsulting,forexample),androyaltiesfrompatentsand copyrights

When combined, goods and services together make up a country's balance of trade (BOT). The BOT is typically the biggest bulk of a country's balance of payments as it makes up total imports and exports. If a country has a balance of trade deficit, it imports more than it exports, and if it has a balance of trade surplus, it exports more than it imports.

Receipts from income-generating assets such as stocks (in the form of dividends) are also recorded in the current account. The last component of the current account is unilateral transfers. These are credits that are mostly worker's remittances, which are salaries sent back into the home country of a national working abroad, as well as foreign aid that is directly received.

This is a record of all payments for trade in goods and services plus income flow it is divided into four parts.

- Balance of trade in goods (visibles)
- Balance of trade in services (invisibles) e.g. tourism, insurance.
- Net income flows. Primary income flows (wages and investment income)
- Net current transfers. Secondary income flows (e.g. government transfers to UN, EU)

4.3   THE CAPITAL ACCOUNT

The capital account is where all international capital transfers are recorded. This refers to the acquisition or disposal of non-financial assets (for example, a physical asset such as land) and non-produced assets, which are needed for production but have not been produced, like a mine used for the extraction of diamonds.

The capital account is broken down into the monetary flows branching from debt forgiveness, the transfer of goods, and financial assets by migrants leaving or entering a country, the transfer of ownership on fixed assets (assets such as equipment used in the production process to generate income), the transfer of funds received to the sale or acquisition of fixed assets, gift and inheritance taxes, death levies and, finally, uninsured damage to fixed assets.

The Financial Account

In the financial account, international monetary flows related to investment in business, real estate, bonds, and stocks are documented. Also included are government-owned assets, such as foreign reserves, gold, special drawing rights (SDRs) held with the International Monetary Fund (IMF), private assets held abroad, and direct foreign investment. Assets owned by foreigners, private and official, are also recorded in the financial account.

This is a record of all transactions for financial investment. It includes:

- Direct investment. This is net investment from abroad. For example, if a UK firm built a factory in Japan it would be a debit item on UK financial account)

- Portfolio investment. These are financial flows, such as the purchase of bonds, gilts or saving in banks. They include

- short-term monetary flows known as "hot money flows" to take advantage of exchange rate changes, e.g. foreign investor saving money in a UK bank to take advantage of better interest rates – will be a credit item on financial account

4.4   THE BALANCING ACT

The current account should be balanced against the combined-capital and financial accounts; however, as mentioned above, this rarely happens. We should also note that, with fluctuating exchange rates, the change in the value of money can

add to BOP discrepancies.If a country has a fixed asset abroad, this borrowed amount is marked as a capital account outflow. However, the sale of that fixed asset would be considered a current account inflow (earnings from investments). The current account deficit would thus be funded.

When a country has a current account deficit that is financed by the capital account, the country is actually foregoing capital assets for more goods and services. If a country is borrowing money to fund its current account deficit, this would appear as an inflow of foreign capital in the BOP.

Check your progress:
1. Define balance of payments.
2. State the transactions included in the current account of balance of payments.
3. State the transactions included in the capital account of balance of payments.
4. In accounting sense balance of payments always balances: Explain.

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4.5 LIBERALIZING THE ACCOUNTS

The rise of global financial transactions and trade in the late-20th century spurred BOP and macroeconomic liberalization in many developing nations. With the advent of the emerging market economic boom, developing countries were urged to lift restrictions on capital- and financial-account transactions to take advantage of these capital inflows.

4.6 FACTORS AFFECTING THE BALANCE OF PAYMENTS

A current account deficit could be caused by factors such as.

1. **The rate of consumer spending on imports**. For example, during an economic boom, there will be increased spending and this will cause a deficit on the current account.

2. **International competitiveness.** If a country experiences higher inflation than its competitors, exports will be less competitive leading to lower demand.

3. **Exchange rate.** If the exchange rate is overvalued, it makes exports relatively more expensive leading to a deterioration in the current account.

4. **Structure of economy** – deindustrialisation can harm the export sector.

Factors affecting current account deficit

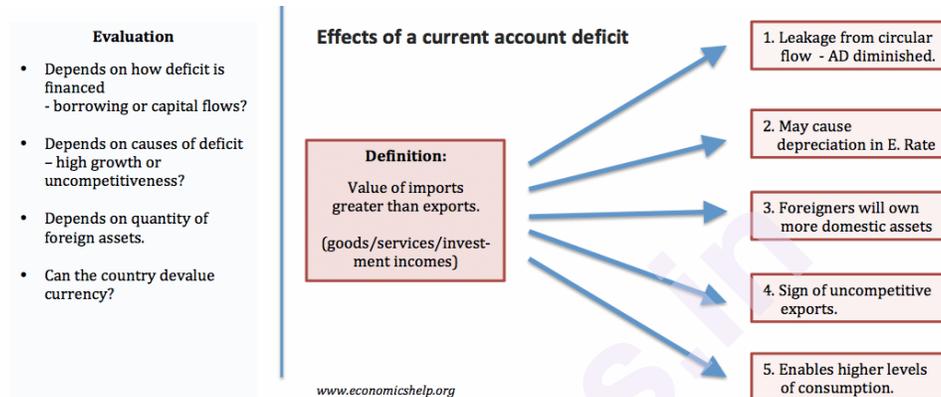## Should we be concerned about a current account deficit?

Figure 4.1 Effects of a current account deficit

Why balance of payment is vital for a country?

A country's BOP is vital for the following reasons:

*   BOP of a country reveals its financial and economic status.

*   BOP statement can be used as an indicator to determine whether the country's currency value is appreciating or depreciating.

*   BOP statement helps the Government to decide on fiscal and trade policies.

*   It provides important information to analyze and understand the economic dealings of a country with other countries.

By studying its BOP statement and its components closely, one would be able to identify trends that may be beneficial or harmful to the economy of the county and thus, then take appropriate measures.

4.7 STRUCTURE OF BALANCE OF PAYMENTS

Receipts (Credits)	Payments (Debits)
1) Exports of goods	1) Imports of goods
Trade Account Balance	
2) Exports of services	2) Imports of services
3) Interests, profits and dividends received	3) Interests, profits and dividends paid
4) Unilateral receipts	4) Unilateral Payments
Current Account Balance	
(1 to 4)	
5) Foreign Investments	5) Investments abroad
6) Short term borrowing	6) Short term lending
7) Medium and long term borrowing	7) Medium and long term lending
8)	Statistical discrepancy (Errors and omission)
Capital Account Balance	
(5 to 8)	
9) Change in reserves (+)	9) Change in reserves
Total Receipts = Total payments	

BALANCE OF PAYMENTS ACCOUNT OF A COUNTRY FOR A PARTICULAR YEAR

Credit Items (Receipts)		Debit Items (Payments)	
(1) Current Account (Rs in Crores)			
1. Merchandise Exports	200	1. a) Merchandise Imports	300
2. Services Exported	100	2. a) Services Imported	200
3. Investment Income (accrued from investment in foreign countries)	100	3. a) Investment Income (accrued by foreigners from their investment)	200
4. Unilateral Receipts	200	4. a) Unilateral payments	100
Sub Total	600	*Sub Total*	800
(2) Capital Account			
5. Long-term borrowings	200	5. a) Long-term lending's	80
6. Short-term borrowings	100	6. a) Short-term lending's	60
7. Gold shipment (Sale of gold)	100	7. a) Gold shipment (Purchase of Gold)	50
Sub Total	400	*Sub Total*	190
		8. Errors & Omissions	10
Total Receipts	1000	*Total Payments*	1000

Table 4.1 Structure of Balance of Payments

4.7.1 Errors and Omission

According to double entry book – keeping concept for every credit, there exists a matching debit and thus, there must be a balance in BOP as well. In reality BOP may not balance. Once various types of international financial flows are recorded, the statistical discrepancy, referred to as errors and omissions, is also recorded. The statistical discrepancy occurs due to complications associated with collecting balance of payments data. You can find different sources of data which occasionally differ in their approach. For instance, merchandise is shipped in March, however

the payments are received in April. If statistics are compiled on the 31st March, the numbers will differ. The errors and omissions amount is equal to the amount required to balance both the sides. It is useful to keep in mind that whenever past figures for the BOP are adjusted as time passes by, the figures for 'net errors and omissions' get smaller and smaller as the errors are located and fixed.

4.7.2 Foreign Exchange Reserves

Foreign exchange reserves exhibits the reserves that are kept in the form of foreign currencies. If the overall balance is surplus, it is moved to the official reserves account which raises the foreign exchange reserves. It may be in form of dollar, pound, gold and Special Drawing Rights (SDRs).

If there exists a deficit, a sum equal to the deficit is taken from the official reserves account bringing the BOP into equilibrium. When surplus is moved to the foreign exchange reserve, it is displayed as minus in that specific year's balance of payment account. The minus sign (-) signifies a rise in forex and plus sign (+) exhibits the borrowing of foreign exchange from the forex account in order to meet the deficit.

The BOP measures all flows of money between India and the rest of the planet. The main aspect is to understand the difference between the current account and the capital account and understand the connection between them.

Check your progress:
1. State the factors affecting the current account transactions of balance of payments.
2. Discuss the importance of balance of payments for a country.
3. Explain the role of Errors and Omission item in BOP.
4. Explain the meaning of foreign exchange reserves.

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4.8 DISEQUILIBRIUM IN THE BALANCE OF PAYMENTS

Disequilibrium is a situation where internal and/or external forces prevent market equilibrium from being reached or cause the market to fall out of balance. This can be a short-term byproduct of a change in variable factors or a result of long-term structural imbalances.

Disequilibrium is also used to describe a deficit or surplus in a country's balance of payments.

- A disequilibrium in the balance of payment means its condition of Surplus or deficit.

- A Surplus in the BOP occurs when Total Receipts exceeds Total Payments. Thus, BOP= CREDIT>DEBIT.

- A Deficit in the BOP occurs when Total Payments exceeds Total Receipts. Thus, BOP= CREDIT<DEBIT.

- Disequilibrium is when external forces cause a disruption in a market's supply and demand equilibrium. In response, the market enters a state during which supply and demand are mismatched.

- Disequilibrium is caused due to several reasons, from government intervention to labor market inefficiencies and unilateral action by a supplier or distributor.

- Disequilibrium is generally resolved by the market entering into a new state of equilibrium.

4.9 MAIN TYPES OF DISEQUILIBRIUM IN THE BALANCE OF PAYMENTS ARE:

i. Cyclical Disequilibrium:

It occurs on account of trade cycles. Depending upon the different phases of trade cycles like prosperity and depression, demand and other forces vary, causing changes in the terms of trade as well as growth of trade and accordingly a surplus or deficit will result in the balance of payments.

Cyclical disequilibrium in the balance of payments may occur because:

i. Trade cycles follow different paths and patterns in different countries. There are no identical timings and periodicity of occurrence of cycles in different countries.

ii. No identical stabilizationprogrammes and measures are adopted by different countries.

iii. Income elasticities of demand for imports in different countries are not identical.

iv. Price elasticities of demand for imports differ in different countries.

In short, cyclical fluctuations cause disequilibrium in the balance of payments because of cyclical changes in income,

employment, output and price variables. When prices rise during prosperity and fall during a depression, a country which has a highly elastic demand for imports experiences a decline in the value of imports and if it continues its exports further, it will show a surplus in the balance of payments.

Since deficit and surplus alternatively take place during the depression and prosperity phase of a cycle, the balance of payments equilibrium is automatically set forth over the complete cycle.

ii. Structural Disequilibrium:

It emerges on account of structural changes occurring in some sectors of the economy at home or abroad which may alter the demand or supply relations of exports or imports or both. Suppose the foreign demand for India's jute products declines because of some substitutes, then the resources employed by India in the production of jute goods will have to be shifted to some other commodities of export.

If this is not easily possible, India's exports may decline whereas with imports remaining the same, disequilibrium in the balance of payments will arise. Similarly, if the supply condition of export items is changed, i.e., supply is reduced due to crop failure in prime commodities or shortage of raw materials or labour strikes, etc. in the case of manufactured goods, then also exports may decline to that extent and structural disequilibrium in the balance of payments will arise.

Moreover, a shift in demand occurs with the changes in tastes, fashions, habits, income, economic progress, etc. Propensity to import may change as a result. Demand for some imported goods may increase, while that for certain goods may decline leading to a structural change.

Furthermore, structural changes are also produced by variations in the rate of international capital movements. A rise in the inflow of international capital tends to have a direct impact on a country's balance of payments.

iii. Short-run Disequilibrium:

A short-run disequilibrium in a country's balance of payments will be a temporary one, 'lasting for a short period, which may occur once in a while. When a country borrows or lends internationally, it will have short-run disequilibrium in its balance of payments, as these loans are usually for a short period or even if they are for a long duration, they are repayable later on; hence, the position will be automatically corrected and poses no serious problem.

As such, a disequilibrium arising from international lending and borrowing activities is perfectly justified. However, a short-run disequilibrium may also emerge if a country's imports exceed its exports in a given year.

This will be a temporary one if it occurs once in a way, because later on, the country will be in a position to correct it easily by creating the required credit surplus by exporting more to offset the deficit. But even this type of disequilibrium in the balance of payments is not justified, because it may pave the way for a long-term disequilibrium.

When such disequilibrium (arising from imports exceeding exports or even vice versa) occurs year after year over a long period, it becomes chronic and may seriously affect the country's economy and its international economic relations. A persistent deficit will tend to deplete its foreign exchange reserves and the country may not be able to raise any more loans from foreigners.

iv. Long-run Disequilibrium:

The long-term disequilibrium thus refers to a deep- rooted, persistent deficit or surplus in the balance of payments of a country. It is secular disequilibrium emerging on account of the chronologically accumulated short-term disequilibria — deficits or surpluses.

It endangers the exchange stability of the country concerned. Especially, a long-term deficit in the balance of payments of a country tends to deplete its foreign exchange reserves and the country may also not be able to raise any more loans from foreigners during such a period of persistent deficits.

In short, true disequilibrium is a long-term phenomenon. It is caused by persistent deep-rooted dynamic changes which slowly take place in the economy over a long period of time. It is caused by changes in dynamic forces/factors such as capital formation, population growth, territorial expansion, technological advancement,innovations, etc.

A newly developing economy, for instance, in its initial stages of growth needs huge investment exceeding its savings. In view of its low capital formation, it has also to import a large amount of its capital requirements from foreign countries and its imports thus tend to exceed its exports. These become a chronic phenomenon. And in the absence of a sufficient inflow of foreign capital in such countries, a secular deficit balance of payments may result.

4.10 CAUSES AND MEASURES OF DISEQUILIBRIUM

Overall account of BOP is always in equilibrium. This balance or equilibrium is only in accounting sense because deficit or surplus is restored with the help of capital account.

In fact, when we talk of disequilibrium, it refers to current account of balance of payment. If autonomous receipts are less than autonomous payments, the balance of payment is in deficit reflecting disequilibrium in balance of payment.

There are several factors which cause disequilibrium in the BOP indicating either surplus or deficit.

Such causes for disequilibrium in BOP are listed below:

(i) Economic Factors:

(a) Imbalance between exports and imports. (It is the main cause of disequilibrium in BOR), (b) Large scale development expenditure which causes large imports, (c) High domestic prices which lead to imports, (d) Cyclical fluctuations (like recession or depression) in general business activity, (e) New sources of supply and new substitutes.

(ii) Political Factors:

Experience shows that political instability and disturbances cause large capital outflows and hinder Inflows of foreign capital.
(iii) Social Factors:
(a) Changes in fashions, tastes and preferences of the people bring disequilibrium in BOP by influencing imports and exports; (b) High population growth in poor countries adversely affects their BOP because it increases the needs of the countries for imports and decreases their capacity to export.

(iv) Other factors;
* Cyclical fluctuations
* Short fall in the exports
* Economic Development
* Rapid increase in population
* Structural Changes
* Natural Calamites
* International Capital Movements

4.11 MEASURES TO CORRECT DISEQUILIBRIUM IN THE BOP

1. Monetary Measures:

a) Monetary Policy: The monetary policy is concerned with money supply and credit in the economy. The Central Bank may expand or contract the money supply in the economy through appropriate measures which will affect the prices.

b) Fiscal Policy: Fiscal policy is government's policy on income and expenditure. Government incurs development and non - development expenditure. It gets income through taxation and non - tax sources. Depending upon the situation government expenditure may be increased or decreased.

c) Exchange Rate Depreciation By reducing the value of the domestic currency:, government can correct the disequilibrium in the BOP in the economy. Exchange rate depreciation reduces the value of home currency in relation to foreign currency. As a result, import becomes costlier and export become cheaper. It also leads to inflationary trends in the country

d) Devaluation: devaluation is lowering the exchange value of the official currency. When a country devalues its currency, exports becomes cheaper and imports become expensive which causes a reduction in the BOP deficit.

e) Deflation: Deflation is the reduction in the quantity of money to reduce prices and incomes. In the domestic market, when the currency is deflated, there is a decrease in the income of the people. This puts curb on consumption and government can increase exports and earn more foreign exchange.

f) Exchange Control: All exporters are directed by the monetary authority to surrender their foreign exchange earnings, and the total available foreign exchange is rationed among the licensed importers. The license-holder can import any good but amount if fixed by monetary authority

2. Non- Monetary measures:

a) Export Promotion: To control export promotions the country may adopt measures to stimulate exports like: export duties may be reduced to boost exports;cash assistance, subsidies can be given to exporters to increase exports;goods meant for exports can be exempted from all types of taxes.

b) Import Substitutes: Steps may be taken to encourage the production of import substitutes. This will save foreign exchange in the short run by replacing the use of imports by these import substitutes.

c) Import Control: Import may be kept in check through the adoption of a wide variety of measures like quotas and tariffs. Under the quota system, the government fixes the maximum quantity of goods and services that can be imported during a particular time period.

1. Quotas – Under the quota system, the government may fix and permit the maximum quantity or value of a commodity to be imported during a given period. By restricting imports through the quota system, the deficit is reduced and the balance of payments position is improved.

2. Tariffs – Tariffs are duties (taxes) imposed on imports. When tariffs are imposed, the prices of imports would increase to the extent of tariff. The increased prices will reduced the demand for imported goods and at the same time induce domestic producers to produce more of import substitutes.

Check your progress:
1. What do you understand by the disequilibrium in balance of payments?
2. State the various types of disequilibrium in BOP.
3. State the different causes of disequilibrium in BOP.
4. What are the effects of disequilibrium in BOP?
5. State the monetary measures to correct disequilibrium in BOP.
6. State the non-monetary measures to correct disequilibrium in BOP.

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4.12 EXPENDITURE CHANGING POLICIES AND EXPENDITURE SWITCHING POLICIES BOP ADJUSTMENTS THROUGH MONETARY AND FISCAL POLICIES

Expenditure Changing and Expenditure Switching policies

In an open economy setting, policymakers need to achieve two goals of macroeconomic stability, viz. internal and external balances. Internal balance is a state in which the economy is at its potential level of output, i.e., it maintains the full employment of a

country's resources and domestic price levels are stable. External balance is attained when a country is running neither excessive current account deficit nor surplus (i.e., net exports are equal or close to zero). Attaining internal and external balances requires two independent policy tools (also see Swan diagram). One is expenditure changing policy and the other is expenditure switching policy.

Expenditure changing policy aims to affect income and employment with the goal of equating domestic expenditure or absorption and production and takes the form of fiscal or monetary policy. Expenditure switching is a macroeconomic policy that affects the composition of a country's expenditure on foreign and domestic goods. More specifically it is a policy to balance a country's current account by altering the composition of expenditures on foreign and domestic goods (see Balance of payments account). Not only does it affect current account balances, but it can influence total demand, and thereby the equilibrium output level.

4.12.1 Internal and External Balances

The interaction between internal and external balances can be demonstrated through a simple Keynesian model where consumption is a function of disposable income; current account is of the real exchange rate and disposable income (while foreign income that affects the domestic country's exports is assumed to be constant); and investment and government spending are exogenous. Internal and external balances are:

Internal balance (II): $Y = Y_f = C (Y_f - T) + I + G + CA (EP^*/P, Y_f - T)$
External balance (XX): $CA = CA (EP^*/P, Y - T) = XX$
where XX is a sustainable amount of current account deficit or surplus

When the exchange rate is flexible, fiscal expansion--either government expenditure increase or tax cuts--raises output, but worsens current account balances. Conversely, fiscal contraction improves current account balances, but lowers output. More specifically, if a country wants to raise its income level through fiscal expansion, it would have to experience a worsening in trade balances, because expansionary fiscal policy would lead to a rise in imports through improved disposable income and therefore worsens current account balances. Or, if a country with a current account deficit attempts to regain it, it could achieve that by implementing contractionary fiscal or monetary policy, so that as to reduce imports.

When a country wants to achieve both internal and external balances simultaneously, it is most effective if the country lets the value of its currency change so that change in the real exchange rate can affect both the economy's total demand and the demand for imports. Such policy to achieve current account balances by manipulating the demand for domestic and foreign goods through changes in the value of the currency is called expenditure switching policy.

When expenditure switching policy is not available -- that is, when an economy is under the fixed exchange rate regime -- expenditure changing policy through fiscal policy becomes the only available policy tool for attaining internal and external balances. In the fixed exchange rate system, monetary policy becomes unavailable because it affects the interest rate and the exchange rate. However, fiscal policy is insufficient to achieve both internal and external balances in such an environment.

4.12.2 Effects of Expenditure Changing Policy

Although it is expected that expenditure changing policy with fiscal policy changes can affect output in the short run regardless of whether the exchange rate is flexible or fixed, its effect, or the "multiplier of fiscal policy," is smaller in a open economy than that in a closed economy. That is, when fiscal expansion is implemented, that would increase money demand and thereby the interest rate, which results in discouraging private investment – the crowd-out effect. This outcome arises as long as some degree of price stickiness is assumed. Hence, some of the effect of fiscal expansion will be offset by the crowding out of investment, which makes the overall effect on income and also net exports (i.e., EX – IM = S – I) smaller than what could have been if the interest rate were assumed to be constant. Also the multiplier is smaller the more open to international trade the economy is, because more portion of income "leak out" of the system as the demand for foreign goods.

Expenditure changing policy with monetary expansion, on the other hand, involves a reduction in the interest rate in the short run, which expands income and same way; incomes rises while current account worsens in the short run. However, while monetary expansion favors private investment, fiscal expansion favors government spending. Under the fixed exchange rate system, while monetary policy becomes ineffective, the effect of fiscal policy can be larger than under the flexible exchange rate system. When expansionary fiscal policy is implemented, the interest rate would rise because of the crowd-out effect, but at the same time, the central bank would have to implement accommodative, i.e., expansionary, monetary policy to cancel the rise in the interest rate

– such an action of cancelling the effect on money supply or interest rate is called sterilization. Otherwise, the interest rate would be affected, and that would affect the capital flows across the border (given the unchanged foreign interest rate) and therefore the exchange rate. Because fiscal expansion must be accompanied with sterilization, the effect of fiscal expansion on output is larger than that under the flexible exchange rate system where the exchange rate is allowed to fluctuate to reflect the change in the interest rate.

4.12.3 Effects of Expenditure Switching Policies

Among possible expenditure-switching policies, devaluation or revaluation is the most focused policy to affect current account balances and the equilibrium level of output. Devaluation increases the domestic price of imports and decreases the foreign price of exports; therefore, it decreases imports and increases exports. However, whether devaluation leads to an improvement in current account balances depends upon the elasticities of demand for exports and imports. According to the Marshall-Lerner condition, if the sum of the elasticities of demand for exports and imports is greater than one, depreciation of the domestic currency leads to a current account improvement (see Marshall-Lerner condition). When an economy attempts to attain both internal and external balance, expenditure switching policy alone is insufficient. For example, if an economy is at the full employment level, i.e., internal balance is already attained, but if it is running current account deficits, policy makers in the economy could devalue its currency so that net exports rise. However, the improvement of current account balances would lead the economy to experience over-heating so that internal balance would disappear.

If an economy is experiencing an inflationary gap, or over-heating, while maintaining balanced current account, a revaluation policy may reduce total expenditure back to the full employment level, but lead to current account deficits. Therefore, a policy mix of expenditure switching and changing policies is usually necessary to achieve both internal and external balances (also see Swan diagram and Assignment problem,). With the assumption that the Marshall-Lerner condition holds, for any given level of expenditure, devaluation leads to improvement of net exports, or current accounts, and therefore, a rise in output. However, when prices are assumed to be sticky in the short run, expenditure switching policy with devaluation involves the crowding-out effect. That is, the increase in output also raises the demand for money and consequently the interest rate, which discourages private investment. It is the crowding-out effect that offsets part of the income increase caused by devaluation.

Hence, the new equilibrium income level will be a little lower than what could be achieved if the interest rate could remain constant. Although devaluation policy is the most focused expenditure switching policy, it is not the only one. In general, expenditure policies take the form of trade (control) policy since they are aimed at affecting the volumes of either or both exports and imports. Tariff policy can be implemented to discourage the inflow of imports, and export subsidy can be used to encourage exports, though these policies tend to be industry specific.

The most well-known tariff policy that has been actually implemented with macroeconomic ramifications is the infamous Smoot-Hawley Tariff Act of 1930. The goal of this policy was to switch demand for foreign goods to that for domestic ones at the expense of other countries to rescue domestic industries battered by the Great Depression. This policy, however, was followed by other countries that also tried to protect their domestic industries, eventually leading to rapid contraction of international trade.

4.13 SUMMARY

1. BOP Adjustment
Automatic adjustment and Policy issues

2. Policy Issues
Expenditure changing policy :- Monetary and fiscal policies
Expenditure switching policy :- Devaluation and revaluation
Exchange controls   :-   Controlling exchange rates

3. https://image.slidesharecdn.com/adjustmentinbalanceofpaymentspolicymeasures-191125173341/95/bop-adjustment-policy-measures-4-638.jpg?cb=1576259175EXPENDITURE CHANGING POLICY: MONETARY & FISCAL POLICIES

Expenditure changing policy for BOP adjustment:

Monetary Policy: Through changes in money supply and rate of interest

Fiscal policy: Through changes in government expenditure and taxes

FISCAL POLICYAND BOP ADJUSTMENT

4. Initial Position of the Economy
• Internal and external balance
• Economy has equilibrium income and rate of interest
• In the IS-LM-BP framework, income is 'Y*' and interest rate is 'r*'
• At 'Y*' and 'r*' economy is in equilibrium

• Income-interest rate combination in which internal balance and external balance can be achieved

5. https://image.slidesharecdn.com/adjustmentinbalanceofpaymentspolicymeasures-191125173341/95/bop-adjustment-policy-measures-8-638.jpg?cb=1576259175IS-LM-BP model

6. Disturbance Occurs in BOP
• Due to increase in government expenditure (G)
• G has multiplier effect
• It will shift the IS curve to the right
• IS1 will be the new curve
• Equilibrium shifts from E to H
• Increase in G leads to reduction in fund for private investment - it pushes the interest rate
• Change in rate of interest and income will disturb the BOP equilibrium

7. What Type of Disturbance? BOP deficit
• Increase in G leads to increase in income
• It increases the import
• Deficit on current account • It depends on MPI

8. BOP surplus
• Increase in G will hike the rate of interest
• It will attract capital inflow
• Surplus on capital account
• It depends on interest elasticity of capital flows

9. Effect of Government Expenditure
• Two effects in tandem
• Increase in rate of interest and income
• Increase in r leads to capital inflow
• Increase income leads to increase in import
• Current account deficit and capital account surplus
• Thus finally BOP will be in equilibrium

10. Whether final outcome would be equilibrium?
• It depends on strength and weakness of current account deficit and capital account surplus
• If surplus is unable to correct deficit, equilibrium cannot be achieved

11. What happens to BOP when govt. expenditure reduces?
• Income reduces
• Interest rate reduces
• Import reduces-current account surplus
• Capital outflow-capital account deficit.

12. Monetary Policy & Bop Adjustment
• What happens to BOP when there is any change in money supply?
• What happens to BOP when money supply increased?
• What happens to BOP when money supply decreased?

13. Difference from fiscal policy
• Impact of fiscal policy on BOP is conditional
• Depends on value of income multiplier, MPI and interest elasticity of capital flows
• Impact of monetary policy on BOP is certain
• Any change in money supply will disturb BOP equilibrium

14. Two chances : Increase in money supply OR Decrease in money supplyIncrease in Money Supply & CurrentAccount
• Income will increase
• Import will increase
• Current account deficit will be resulted

15. Increase in Money Supply & CapitalAccount
• Rate of interest will diminish
• Capital outflow will happen
• Capital account deficit will emerge

16. Increase in Money Supply & BOP equilibrium
• Both current account deficit and capital account deficit
• It surely disturb the BOP equilibrium

17. Decrease in Money Supply & Current Account
• Reduce the income
• Reduce import
• Reduce current account deficit

18. Decrease in Money Supply & Capital Account
• Interest rate increases
• Capital inflow will happens
• Capital account deficit will diminish

19. Decrease in Money Supply & BOP Equilibrium
• Both current account surplus and capital account surplus
• It surely disturb the BOP equilibrium

20. Why don't decrease in money supply for persistent BOP surplus?
• We need more income
• We need economic growth
• We need economic welfare
• We need to reduce interest rate to boost investment
• We need to give priority to income rather than external sector balance

21. Expenditure Switching Policy: Devaluation & Revaluation
   Expenditure switching policy
• Devaluation and Revaluation for BOP equilibrium
• Focus on current account balance
• During current account deficit (CAD) devaluation is recommended
• During current account surplus (CAS) revaluation is recommended

22.   Devaluation • Used during CAD
• Deliberate reduction in the value of a country's currency
• To reduce deficit through increasing export and reducing import • How?
• When currency value diminish, foreigners can purchase more
• They wish to buy from domestic economy
• It boosts export

23. Success of devaluation depends on …….
• Elasticities of demand for imported and exported commodities
• Elastic demand is required for improvement in BOP
• Market access for the foreign traders
• Need less restricted economy
• Export tax should be removed
• Production capacity of the economy
• Need to be able to produce what is required by foreign countries
• Domestic price stability
• International co-operation (No currency war is desirable)

24. Why devaluation is expenditure switching policy?
• Devaluation leads in reduction in import and increase in export
• Expenditure of domestic economy on foreign commodities switch over to domestic commodities
• Expenditure of foreigners switch over to domestic commodities

25. Devaluation for Internal and External Balance
• Insufficient for both
• Devaluation can bring external balance equilibrium
• Devaluation alone cannot bring both equilibrium
• Suppose an economy has internal balance and external imbalance
• Devaluation was resorted to correct external imbalance
• Internal balance will be disturbed when price structure changes

26. Suppose an economy has internal imbalance and external balance
• No scope for devaluationRevaluation
• Used during CAS
• Deliberate increase in the value of a country's currency
• To reduce surplus through increasing import and reducing export • How?

• When currency value increases, foreigners can purchase only less
• They wish to sell at domestic economy
• It boosts import

27. Whether devaluation & revaluation are the only parts of expenditure switching policy?
• Certainly no
• But these are major parts
• Tariff policy is an expenditure switching policy
• It helps switch expenditure from one economy to another
• Through change in import and export

28. Need for Policy Mix
• Only one policy cannot ensure BOP equilibrium
• Use of both expenditure changing and switching policies for BOP equilibrium
• That is a combination of fiscal policy, monetary policy, devaluation and revaluation
• Different effects of various policies will work together
• Both internal and external balance have to be ensured

29. Exchange Controls
   What is exchange control?
• Various forms of controls imposed by a government/central bank on currency
• Control on purchase/sale of foreign currencies by residents • Control on purchase/sale of local currency by non-residents • It is a drastic means of BOP adjustment

30. Common exchange controls
• Banning the use of foreign currency within the country
• Banning locals from possessing foreign currency
• Restricting currency exchange to government-approved exchangers
• Fixed exchange rates
• Restrictions on the amount of currency that may be imported or exported

31. Objectives of exchange controls
• To reduce import
• To control capital flight
• To ensure economic growth by permitting governments to follow independent domestic policies
• To service external debt: Need required foreign exchange repayment and interest payment
• During 1930s this was the objective in many debtor countries

32. To ensure exchange rate stability
• With partner country's or regions' currency
• To over value domestic currency
• To make import cheaper
• To import raw materials and capital goods at less price
• To reduce the foreign debt burden (Austria, Hungary and Germany did this during 1930s afterWorld War I)
• To under value domestic currency
• To make export cheaper
• To make import dearer

33. Methods of Exchange Controls
Methods Direct methods of exchange control
• Related with exchange rate and foreign currency Indirect methods of exchange control
• Tariff, export subsidy, bilateral and multi-lateral arrangements

1) Foreign exchange rate regulation through intervention
• Government intervention in foreign exchange market
• Buy or sell foreign exchange
• To control excess fluctuation
• If there is increasing rate (domestic currency in depreciation), foreign exchange will be sold
• If there is decreasing rate (domestic currency in appreciation), foreign exchange will be bought

2) Exchange restrictions
• More severe form of exchange control
• Foreign exchange earnings may be directed to surrender
• People may be given no freedom to carry foreign exchange • Not desirable in the liberalised period
• (FEMA and FERA)

Why foreign exchange may be held?
• Tour and travel
• Investment in foreign financial market
• Investment in foreign exchange market
• Transfer payments
• Import bill settlement

3) Multiple exchange rate policies
• Different exchange rates may be adopted
• Also called selective devaluation policy
• One rate (lower) to make export cheaper
• One rate (lower) to make import of essential goods cheaper
• Or dual exchange rate
• Lowering the value to increase certain exports
• Higher value to make import of certain goods less expensive

4) Exchange clearing agreements
• Bilateral or multi-lateral
• For international co-operation in the fields of trade, investment, migration, tourism, supply of arms etc.

5) Indirect methods of exchange control
• Tariff • Import duty reduces the import
• Less exchange transactions will be the result
• Import quotas
• Depress the import
• Less exchange transactions will be the result.

4.14 QUESTIONS

1. Explain the meaning and structure of Balance of Payments.
2. 'Balance of Payment always balances', examine the statement.
3. What are the factors affecting Balance of Payments?
4. Why Balance of Payments is important to a country?
5. Explain the role of foreign exchange reserves in Balance of Payments.
6. Explain the meaning and types of disequilibrium in Balance of Payments.
7. What are the causes of disequilibrium in Balance of Payments?
8. Discuss the measures to correct disequilibrium in Balance of Payments.
9. Explain the role of monetary and fiscal policies in correcting balance of payments diequibrium.

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Unit- Four - "International aspects of Macroeconomic policy"

Unit -4A

THE MUNDELL-FLEMING MODEL

Unit Structure:

4A.0 OBJECTIVES

- To enable the learners to grasp fully the theoretical rationale behind policies at the country as well as corporate level.

- To receive a firm grounding on the basic macroeconomic concepts that strengthen analysis of crucial economic policies.

4A.1 INTRODUCTION

In an open economy with external trade and financial transactions, how are the key macro variables (GDP, inflation, balance of payments, exchange rates, interest rates, etc) determined and interact with each other? What are the effects of fiscal and monetary policies? The Mundell-Fleming model is the standard open macroeconomic model that tries to answer these questions.

The IS-LM-BP model (also known as IS-LM-BoP or Mundell-Fleming model) is an extension of the *IS-LM model*, which was formulated by the economists Robert Mundell *and* Marcus Fleming, who made almost simultaneously an analysis of open economies in the 60s. Basically we could say that the Mundell-Fleming model is a version of the IS-LM model for an open economy. In addition to the balance in *goods* and financial markets, the model incorporates an analysis of the *balance of payments*.

Even though both economists researched about the same topic, at about the same time, both have different analyses. Mundell's paper "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates", 1963, analyses the case of perfect *mobility of capital*, while Fleming´s model, depicted in his article "Domestic Financial Policies under Fixed and under Floating Exchange Rates", 1962, was more realistic as it assumed imperfect capital mobility, and thus made this one a more rigorous and comprehensive model. However, nowadays, his model has lost cogency, as the actual world situation has more resemblance with total capital mobility, which corresponds better to Mundell's view.

In order to understand how this model works, we'll first see how the IS curve, which represents the equilibrium in the goods market, is defined. Secondly, the LM curve, which represents the equilibrium in the money market. Thirdly, the BP curve, which represents the equilibrium of the balance of payments. Finally, we'll analyse how the equilibrium is reached.

4A.2 MEANING OF THE MUNDELL-FLEMING MODEL

The basic Mundell-Fleming model — like the IS-LM model — is based on the assumption of fixed price level and shows the interaction between the goods market and the money market.The model explains the causes of short-run fluctuations in aggregate income (or, what comes to the same thing, shifts in the ad curve) in an open economy.

The Mundell-Fleming model is based on a very restrictive assumption. It considers a small open economy with perfect capital mobility.

This means that the economy can borrow or lend freely from the international capital markets at the prevailing rate of interest since its domestic rate of interest is determined by the world rate of interest. So, the rate of interest is not a policy variable in the small economy being studied.

This means that macroeconomic adjustment occurs only through exchange rate changes. In other words, the brunt of

adjustment is borne by exchange rate movements in foreign exchange markets to maintain the officially determined exchange rate. The central bank permits the exchange rate to move up or down in response to changing economic conditions.

4A.3 ASSUMPTIONS

Basic assumptions of the model are as follows:

- Spot and forward exchange rates are identical, and the existing exchange rates are expected to persist indefinitely.

- Fixed money wage rate, unemployed resources and constant returns to scale are assumed. Thus domestic price level is kept constant, and the supply of domestic output is elastic.

- Taxes and saving increase with income.

- The balance of trade depends only on income and the exchange rate.

- Capital mobility is less than perfect and all securities are perfect substitutes. Only risk neutral investors are in the system. The demand for money therefore depends only on income and the interest rate, and investment depends on the interest rate.

- The country under consideration is so small that the country cannot affect foreign incomes or the world level of interest rates.

4A.4 VARIABLES

This model uses the following variables:
- *Y* is real GDP
- *C* is real consumption
- *I* is real physical investment, including intended inventory investment
- *G* is real government spending (an exogenous variable)
- *M* is the exogenous nominal money supply
- *P* is the exogenous price level
- *i* is the nominal interest rate
- *L* is liquidity preference (real money demand)
- *T* is real taxes levied
- *NX* is real net exports

The basic assumption of this model is that the domestic rate of interest (r) is equal to the world rate of interest (r^*) in a small open economy with perfect capital mobility. No doubt any change within the domestic economy may alter the domestic rate of interest, but the rate of interest cannot stay out of line with the world rate of interest for long.

The difference between the two, if any, is removed quickly through inflows and outflows of financial capital.

It may be recalled that **"smallness"** of a country has no relation to its size. A small country is one which cannot alter the world rate of interest through its own borrowing and lending activities. In contrast, a large economy is one which has market (bargaining) power so that it can exert influence over the world rate of interest.For such a country, either international capital mobility is far from perfect, or the country is so large that it can exert influence on world capital markets.

The main prediction from the Mundell-Fleming model is that the behaviour of an economy depends crucially on the exchange rate system it adopts, i.e., whether it operates a floating exchange rate system or a fixed exchange rate system. We start with adjustment under a floating exchange rate system, in which case there is no central bank intervention in the foreign exchange market.

In such a situation, if the domestic interest rate goes above the world rate, foreigners will start lending to the home country. This capital inflow will create excess supply of funds and the domestic rate of interest r again will fall to r*.

The converse is also true. If, for some reason, the domestic rate of interest (r) falls below r*, there will be capital outflow from the home country and the resulting shortage of funds will push up r to the level of r*. Thus, in a world of perfect capital mobility, r will quickly get adjusted to r*.

Check your progress:
1. State the assumptions of Mundell-Fleming Model.
2. Discuss the various variables in Mundell-Fleming Model.

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4A.5 THE OPEN ECONOMY IS CURVE

In the Mundell-Fleming model, the market for goods and services is expressed by the following equation:

$Y = C(Y – T) + I(r*) + G + NX(e) … (1)$
where all the terms have their usual meanings. Here investment depends on the world rate of interest r* since r = r* and NX

depends on the exchange rate e which is the price of a foreign currency in terms of domestic currency.

In the Mundell-Fleming model, it is assumed that the price levels at home and abroad remain fixed. So, there is no difference between real exchange rate and nominal exchange rate. We now illustrate the equation of the goods market equilibrium in Fig. 4A.1.
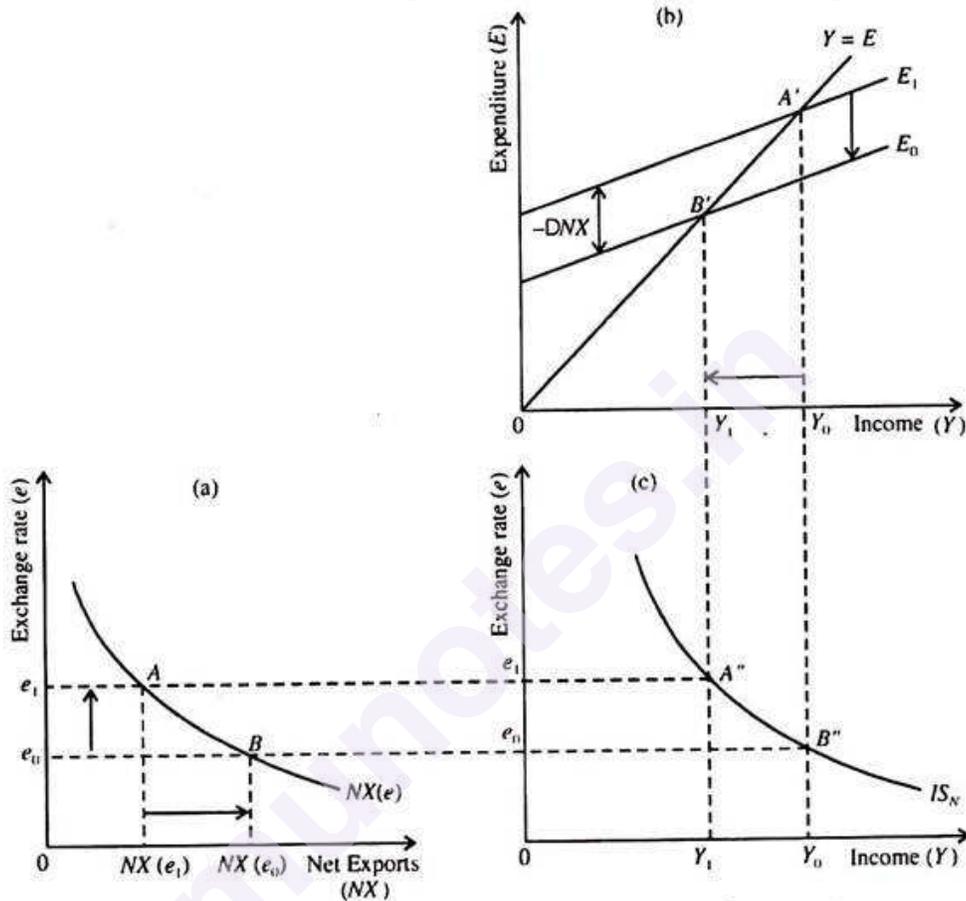

Fig 4A.1 The New is Curve

In part (a), an increase in the rate from e_0 to e_1, lowers net exports from $NX(e_0)$ to $NX(e_1)$. As a result, the planned expenditure line E_1 shifts downward to E_0. Consequently, income falls from Y_1 to Y_0. In part (c), we show the new IS curve, which is the locus of points, indicating alternative combinations of e and Y which ensure equilibrium in the goods market.

The new IS curve is derived by following this sequence:
e rises → NX falls → Y falls

The Open Economy LM Curve:
The equilibrium condition of the money market in the Mundell-Fleming model is:
$M = L(r^*, Y)$ … (2)
since $r = r^*$.

Here the supply of money equals its demand and demand for money varies inversely with r* and the positively with Y. In this model, M remains exogenously fixed by the central bank.

The new LM curve, as shown in Fig. 4A.2(b), is vertical — since the equation (2) has no relation to the exchange rate. This equation determines only Y, whether e is high or low. In Fig. 4A.2(a), we draw the closed economy LM curve as also a horizontal line showing parity between r and r*.

The intersection of the two curves at the point A determines the equilibrium level of income Y_0, which has no relation to e, shown on the vertical axis of Fig. 4A.2(b). This is why the new (open economy) LM curve is vertical. The LM_N curve of Fig. 4A.2(b) is derived from r* and the closed economy LM curve, shown in Fig. 4A.2(a).
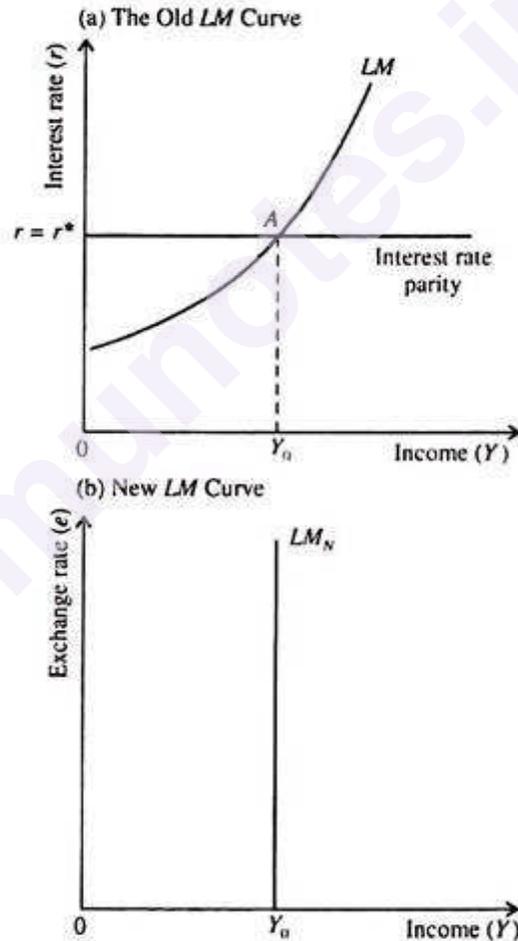
Fig 4A.2 The New is Curve

4A.6 GENERAL EQUILIBRIUM

In the Fig. 4A.3, we show the general equilibrium of goods market and the money market. The equilibrium income (Y_0) and exchange rate (e_0) are determined simultaneously at point A where the IS and LM curves intersect.
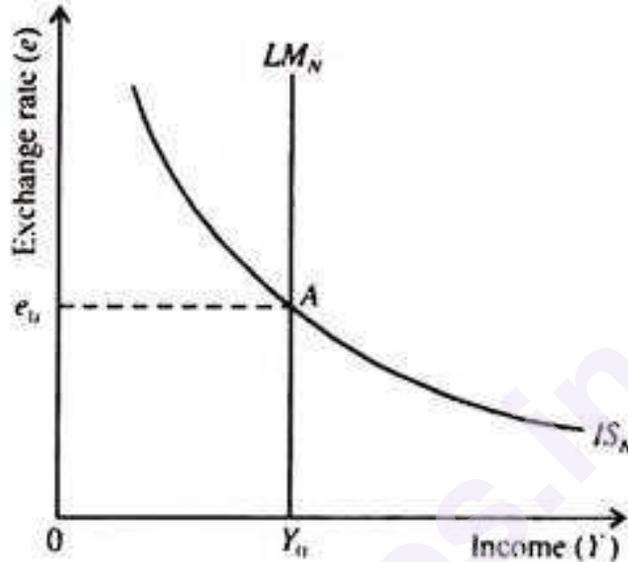

Fig 4A. 3 General Equilibrium in MF Model

4A.7 MAIN MESSAGE OF MUNDELL-FLEMMING MODEL

The main message of the Mundell-Fleming model is that the effect of any economic policy (fiscal, monetary or trade) depends on the exchange rate system of the country under consideration, i.e., whether the country is following a fixed or a floating exchange rate system. Table 4A.1 summarises the effects of three different policies in the Mundell-Fleming model.

Table: 4A.1 The Effects of Three Types of Policies in the Mundell-Fleming Model

	Exchange Rate System					
	Floating			Fixed		
	Impact on					
Policy	Y	e	NX	Y	e	NX
Fiscal (*G* rises, *T* falls)	—	↑	↓	↑	—	—
Monetary (*M* rises)	↑	↓	↑	—	—	—
Trade (Imports fall)	—	↑	—	↑	—	↑

Note : The sign — implies no effect; ↑ implies a rise and ↓ implies a fall

The Mundell-Fleming model shows how to make appropriate use of monetary, fiscal and trade policies to achieve any desired

macroeconomic objective. The influence of these policies depends on the exchange rate system. Under floating exchange rate system, only monetary policy can alter national income.

The effect of expansionary fiscal policy is totally neutralized by currency appreciation. Under fixed exchange rate system, only fiscal policy can alter Y. The central bank loses control over money supply since it has to be adjusted upward or downward for maintaining the exchange rate at a predetermined level.

4A.8 DEVALUATION, REVALUATION AS EXPENDITURE SWITCHING POLICIES

Devaluation, reduction in the exchange value of a country's monetary unit in terms of gold, silver, or foreign monetary units. Devaluation is employed to eliminate persistent balance-of-payments deficits. For example, a devaluation of currency will decrease prices of the home country's exports that are purchased in the import country's currency. While making the exported goods cheaper for other countries, devaluation also increases the prices of imports purchased in the home country. If the demand for both exports and imports is relatively elastic (that is, the quantity purchased is highly responsive to changes in price), the country's income from exports will rise, and its expenditure for imports will fall. Thus, its trade will be more in balance and its balance of payments improved. Devaluation will not be effective if the balance-of-payments disequilibrium is a result of basic structural flaws in a country's economy.

In contrast to devaluation, **revaluation** involves an increase in the exchange value of a country's monetary unit in terms of gold, silver, or foreign monetary units. It may be undertaken when a country's currency has been undervalued in comparison with others, causing persistent balance-of-payments surpluses.

- A revaluation is a calculated upward adjustment to a country's official exchange rate relative to a chosen baseline, such as wage rates, the price of gold, or a foreign currency.

- In a fixed exchange rate regime, only a country's government, such as its central bank, can change the official value of the currency.

- In floating exchange rate systems, currency revaluation can be triggered by a variety of events, including changes in the interest rates between various countries or large-scale events that impact an economy.

4A.8.1 Understanding a Revaluation

In a fixed exchange rate regime, only a decision by a country's government, such as its central bank, can alter the official value of the currency. Developing economies are more likely to use a fixed-rate system in order to limit speculation and provide a stable system. A floating rate is the opposite of a fixed rate. In a floating rate environment, revaluation can occur on a regular basis, as seen by the observable fluctuations in the foreign currency market and the associated exchange rates.

4A.9 EXPENDITURE – SWITCHING POLICIES: DEVALUATION

A significant method which is quite often used to correct fundamental disequilibrium in balance of payments is the use of expenditure-switching policies. Expenditure switching policies work through changes in relative prices. Prices of imports are increased by making domestically produced goods relatively cheaper. Expenditure switching policies may lower the prices of exports which will encourage exports of a country. In this way by changing relative prices, expenditure-switching policies help in correcting disequilibrium in balance of payments.

The important form of expenditure switching policy is the reduction in foreign exchange rate of the national currency, namely, devaluation. By devaluation we mean reducing the value or exchange rate of a national currency with respect to other foreign currencies. It should be remembered that devaluation is made when a country is under fixed exchange rate system and occasionally decides to lower the exchange rate of its currency to improve its balance of payments.

Under the Bretton Woods System adopted in 1946, fixed exchange rate system was adopted, but to correct fundamental disequilibrium in the balance of payments, the countries were allowed to make devaluation of their currencies with the permission of IMF. Now, Bretton Woods System has been abandoned and most of the countries of the world have floated their currencies and have thus adopted the system of flexible exchange rates as determined by market forces of demand for and supply of them.

However, even in the present flexible exchange rate system, the value of a currency or its exchange rate as determined by demand for and supply of it can fall. Fall in the value of a currency with respect to foreign currencies as determined by demand and supply conditions is described as depreciation.

If a country permits its currency to depreciate without taking effective steps to check it, it will have the same effects as

devaluation. Thus, in our analysis we will discuss the effects of fall in value of a currency whether it is brought about through devaluation or depreciation. In July 1991, when India was under Bretton-Woods fixed exchange rate system, it devalued its rupee to the extent of about 20%. (From Rs. 20 per dollar to Rs. 25 per dollar) to correct disequilibrium in the balance of payments.

Now, the question is how devaluation of a currency works to improve balance of payments. As a result of reduction in the exchange rate of a currency with respect to foreign currencies, the prices of goods to be exported fall, whereas prices of imports go up. This encourages exports and discourages imports. With exports so stimulated and imports discouraged, the deficit in the balance of payments will tend to be reduced.

Thus policy of devaluation is also referred to as expenditure switching policy since as a result of reduction of imports, people of a country switches their expenditure on imports to the domestically produced goods. It may be noted that as a result of the lowering of prices of exports, export earnings will increase if the demand for a country's exports is price elastic (i.e., $e_r > 1$). And also with the rise in prices of imports the value of imports will fall if a country's demand for imports is elastic. If demand of a country for imports is inelastic, its expenditure on imports will rise instead of falling due to higher prices of imports.

Devaluation: Marshall Lerner Condition. It is clear from above that whether devaluation or depreciation will lead to the rise in export earnings and reduction in import expenditure depends on the price elasticity of foreign demand for exports and domestic demand for imports.

Marshall and Lerner have developed a condition which states that devaluation will succeed in improving the balance of payments if sum of price elasticity of exports and price elasticity of imports is greater than one. Thus, according to Marshall-Lerner Condition, devaluation improves balance of payments if

$e_x + e_m > 1$

where

e_x stands for price elasticity of exports
e_m stands for price elasticity of imports

If in case of a country $e_x + e_m < 1$, the devaluation will adversely affect balance of payments position instead of improving it. If $e_x + e_m = 1$, devaluation will leave the disequilibrium in the balance of payments unchanged.

4A.10 INCOME-ABSORPTION APPROACH TO DEVALUATION

Further, for devaluation to be successful in correcting disequilibrium in the balance of payments a country should have sufficient exportable surplus. If a country does not have adequate amount of goods and services to be exported, fall in their prices due to devaluation or depreciation will be of no avail.

This can be explained through income-absorption approach put forward by Sidney S Alexander. According to this approach, trade balance is the difference between the total output of goods and services produced in a country and its absorption by it.

By absorption of output of goods and services we mean how much of them is used up for consumption and investment in that country. That is, absorption means the sum of consumption and investment expenditure on domestically produced goods and services.

Expressing algebraically we have;
$B = Y - A$
Where:
B = trade balance or exportable surplus
Y = national income or value of output of goods and services produced
A = Absorption or sum of consumption and investment expenditure

It follows from above that if expenditure or absorption is less than national product, it will have positive trade balance or exportable surplus. To create this exportable surplus, expenditure on domestically produced consumer and investment goods should be reduced or national product must be raised sufficiently.

To sum up, it follows from above that for devaluation or depreciation to be successful in correcting disequilibrium in the balance of payments, the sum of price elasticities of demand for a country s exports and imports should be high (that is, greater than one) and secondly it should have sufficient exportable surplus. The devaluation will also not be successful in the achievement of its aim if other countries retaliate and make similar devaluation in their currencies and thus competitive devaluation of the exchange rate may start.

After Independence India devalued its currency three times, first in 1949, the second in June 1966 and third in July 1991 to correct the disequilibrium in the balance of payments. The devaluation of June 1966 was not successful for some time to reduce deficit in the balance of payments.

This is because the demand for bulk of our traditional exports was not very elastic and also we could not reduce our imports despite their higher prices. However devaluation of July 1991 proved quite successful as after it our exports grew at a rapid rate for some years and growth of imports remained within safe limits.

4A.11 DEVALUATION AND THE BALANCE OF TRADE: THE J CURVE

What Is a J Curve?

A J Curve is an economic theory which states that, under certain assumptions, a country's trade deficit will initially worsen after the depreciation of its currency—mainly because in the near term higher prices on imports will have a greater impact on total nominal imports than the reduced volume of imports. This results in a characteristic letter J shape when the nominal trade balance is charted as a line graph.

- The J Curve is an economic theory that says the trade deficit will initially worsen after currency depreciation.

- The nominal trade deficit initially grows after a devaluation, as prices of exports rise before quantities can adjust.

- Then, as quantities adjust, there is an increase in imports as exports remain static, and the trade deficit shrinks or reverses into a surplus forming a "J" shape.

- The J Curve theory can be applied to other areas besides trade deficits, including in private equity, the medical field, and politics.

4A.12 UNDERSTANDING A J CURVE

The J Curve operates under the theory that the trading volumesofimportsandexportsfirstonlyexperience microeconomic changes as prices adjust before quantities. Then, as time progresses, export volumes begin to dramatically increase, due to their more attractive prices to foreign buyers. Simultaneously, domestic consumers purchase less imported products, due to their higher costs.

These parallel actions ultimately shift the trade balance, to present an increased surplus (or smaller deficit), compared to those figures before the devaluation. Naturally, the same economic rationale applies to the opposite scenarios—when a country experiences a currency appreciation, this would consequently result in an inverted J Curve.

The lag between the devaluation and the response on the curve is mainly due to the effect that even after a nation's currency experiences a depreciation, the total value of imports will likely increase. However, the country's exports remain static until the pre-existing trade contracts play out.

Over the long haul, large numbers of foreign consumers may bump up their purchases of products that come into their country from the nation with the devalued currency. These products now become cheaper relative to domestically-produced products.

4A.13 J-CURVE EFFECT

The J Curve effect a depreciation in the exchange rate can cause a deterioration of the current account in the short-term (because demand is inelastic). However, in the long-term, demand becomes more price elastic and therefore, the current account begins to improve.

The J-Curve is related to the Marshall-Lerner condition, which states:
• If (PED x + PED m > 1) then a devaluation will improve the current account.

The J-Curve is an example of how time lags can affect economic policy. It also shows the link between microeconomic principles (elasticity) and macroeconomic outcomes (current account). The current account on the balance of payments measures the net value (X-M) of exports and imports of goods, services and investment incomes.
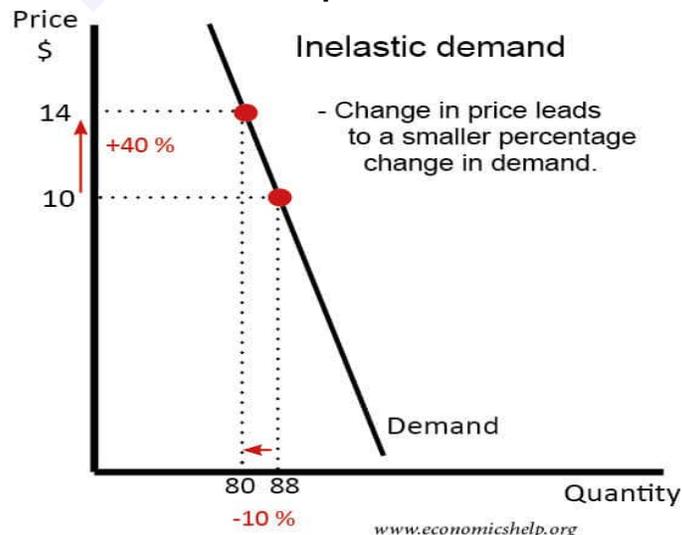
4A.13.1 Short-term effect of depreciation

Figure 4A.4

- In the short-term, a fall in the price of exports will only cause a smaller percentage rise in quantity demanded.

- A rise in the price imports will cause a smaller percentage fall in demand for imports. Therefore, the value of imports actually rises (we spend more on imports)

- Therefore, if demand is inelastic, following a depreciation, we actually get a worsening of the current account
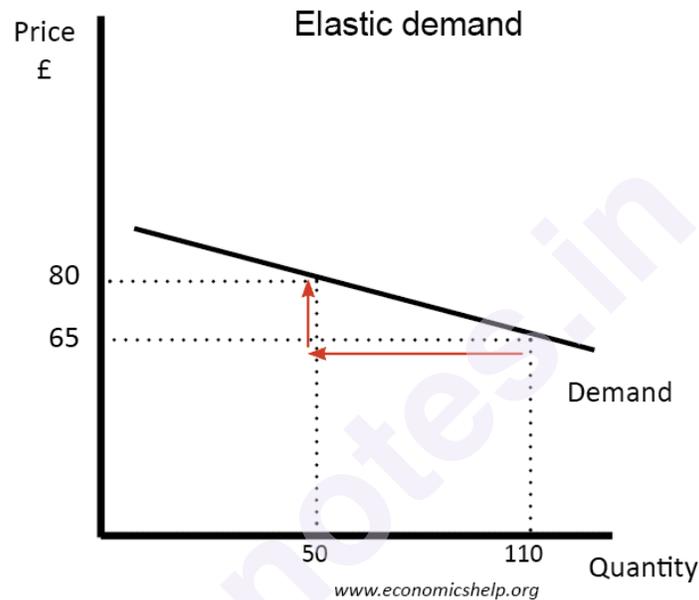
4A.13.2   Long-term effects

Figure 4A.5

In the long-term, demand for exports and imports will tend to become more price elastic. (more sensitive to price)

- Therefore, a fall in the price of exports will cause a bigger percentage rise in quantity demand. (And therefore we get a bigger rise in the value of exports) When demand is elastic, the value of exports rises – and we get an improvement in the current account position.

- Also, if demand for imports is price elastic, then there will be a bigger percentage fall in demand for imports. In this case, the total spending on imports starts to fall.
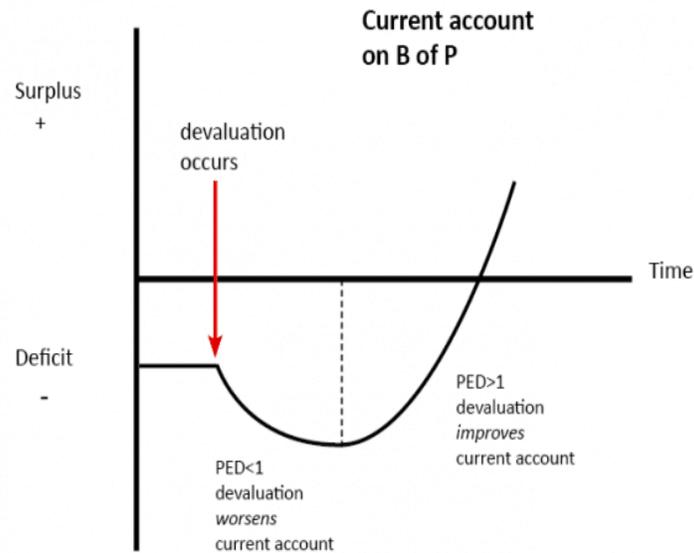
Figure 4A.6

In the future, the trade deficit may continue to improve if global demand picks up.

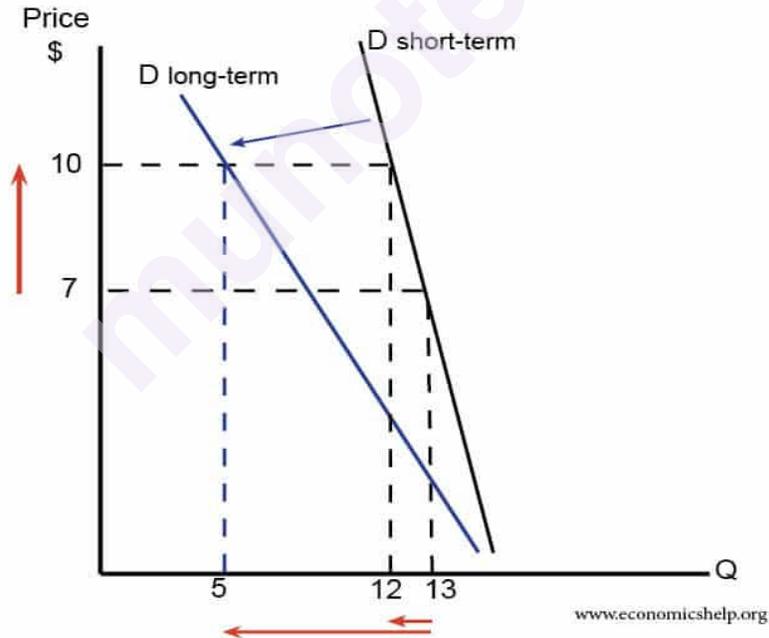### 4A.13.3 Why is demand more price elastic in the long-term?

Figure 4A.7

- In the short-term, firms and consumers may have contracts to keep buying the good.
- It takes time to find alternatives.
- The higher price of imports will be an incentive for domestic firms to increase production, but this takes time
- Elasticity and time

4A.13.4 Evaluation of the J-Curve effect

Many factors affect the current account apart from the exchange rate

- The current account will depend on consumer spending and the rate of economic growth.

- It also depends on consumer spending in foreign countries (hence demand for exports)

- It depends on Inflation (e.g. depreciation can cause imported inflation which reduces the competitiveness of exports)

- Firms may engage in insurance policies to hedge against exchange rate movements.

The Marshall Lerner condition

This states that, for a currency devaluation to lead to an improvement (e.g. reduction in deficit) in the current account, the sum of price elasticity of exports and imports (in absolute value) must be greater than 1.

- If (PED x + PED m > 1) then a devaluation will improve the current account.

- If (PED x + PED m > 1) then an appreciation will worsen the current account.

This is because the effect on the current account depends on the total value and not just the quantity of exports.

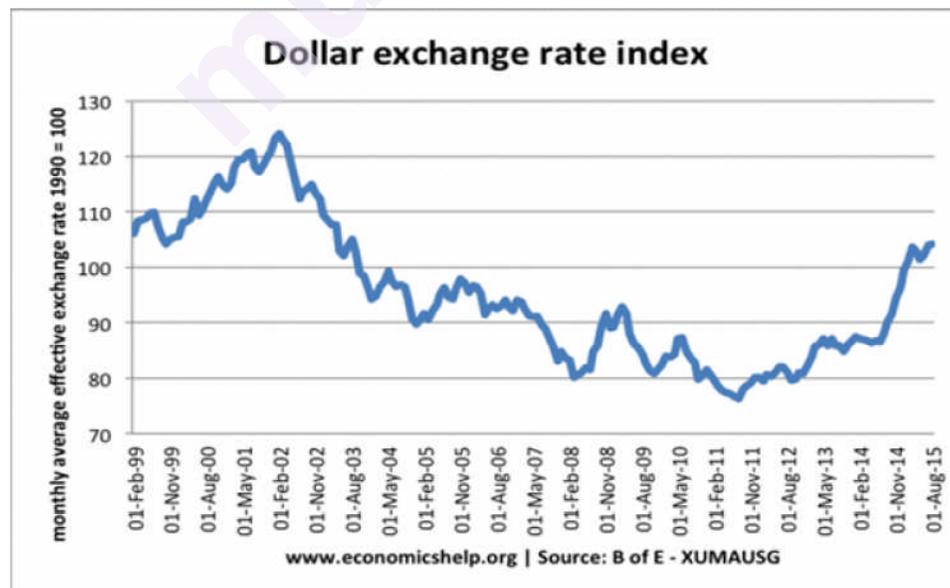### 4A.14.5 Example US depreciation and current account

Figure 4A.8

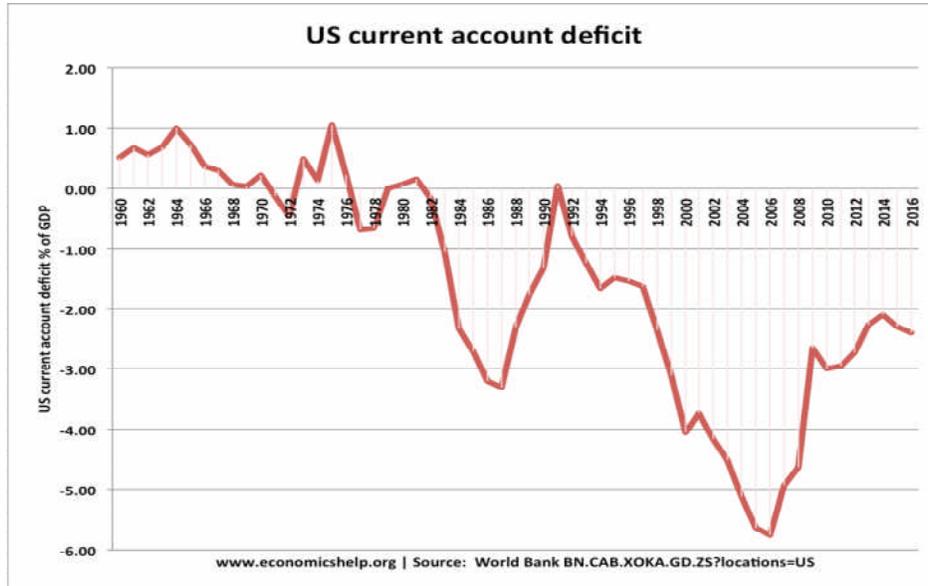From early 2002 to 2008, there is a steady depreciation in the US dollar.

Figure 4A.9

- From 2002 to 2006, there is a deterioration in the current account (also caused by strong domestic consumption)

- After 2006, there is a sharp improvement in the current account. Suggesting that the J-Curve may be coming into play – the current account is finally responding to the depreciation in the dollar.

- However, the sharp improvement in the current account from 2006 was also due to the slowdown in the US economy and a decline in consumer spending on imports.

4A.14.6 Example UK devaluation 2008-09

Figure 4A.10

Sharp devaluation in the value of the pound from 2007 to 2009.
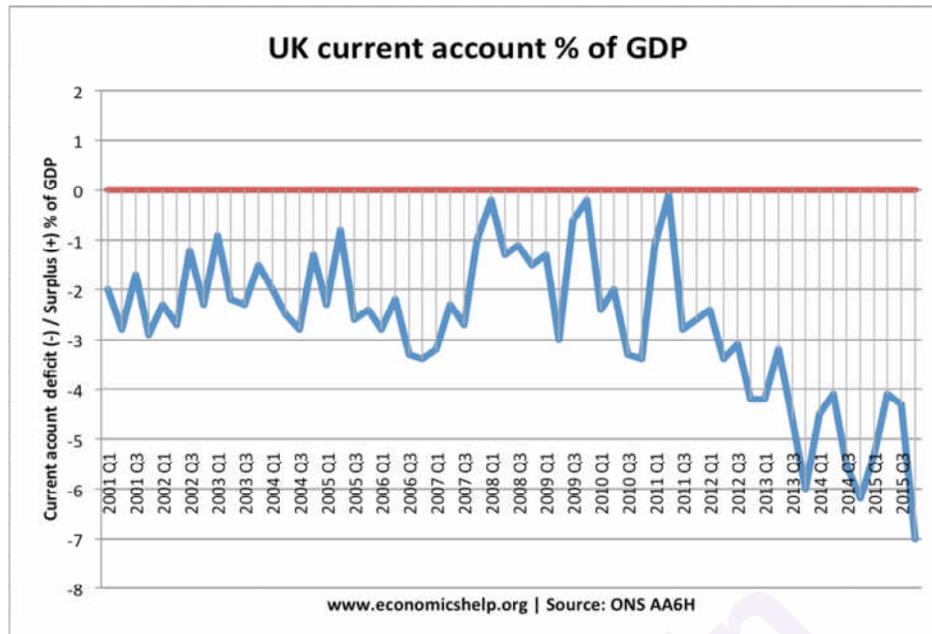UK Current account 2001-2015

Figure 4A.11

During the depreciation of 2007-09, there is no discernable improvement in the UK current account – it is volatile, but remains in deficit.In the longer-term, after the depreciation, we might expect an improvement in the current account, but actually, it worsens.This is not helpful for trying to prove the J-Curve effect. But, it shows many factors can influence the current account balance of payments other than the exchange rate. This includes

- State of the economy (in a recession demand for import spending falls)

- Consumer demand in other countries (e.g. Eurozone recession hit demand for UK exports)

- Productivity and competitiveness of manufacturing industries – relative to main competitors.

Lowering of the value of a currency of a country tends to raise its exports by making its goods cheaper for foreigners. On the other hand, devaluation or depreciation makes the imports from abroad expensive in terms of domestic currency (rupees in case of India) and therefore the imports tend to fall.With exports increasing and imports declining, it is expected that devaluation (depreciation) will reduce a country's trade deficit. As a matter of fact, in recent years when a country experienced a severe disequilibrium in the balance of trade or balance of payments, it devaluated its currency to raise exports and reduce imports and thus to restore equilibrium in the balance of payments.

However, it may be noted that the effect of devaluation or depreciation on balance of trade is ambiguous and quite uncertain because a good deal depends on the price elasticity of exports and imports of a country. For example, if the price-elasticity of exports in terms of a foreign currency of a country is less than unity, the value of exports in terms of a foreign currency will fall as increase in physical volume of exports will be more than offset by the depreciation of the currency. On the other hand, if the demand for imports is inelastic, they will not decrease despite devaluation.

Many economists are of the view that devaluation is likely to worsen the balance of trade for the few quarters (probably three to six) after the initial devaluation. However, they think after a time lag, the balance of trade may improve. In fact, a concept called J. Curve effect has been put forward. According to this, after the initial depreciation the balance of trade moves according to the shape of the letter J.

This means that in the first few quarters following devaluation the balance of trade becomes worse and after that it becomes positive and starts improving. This J-curve effect is shown in Fig.4A.12 where along the X-axis we measure time, that is, quarters after devaluation and on the Y -axis we measure the balance of trade. If the value of balance of trade is positive, that is, if the balance of trade lies above the zero line and the curve rises the balance of trade improves.
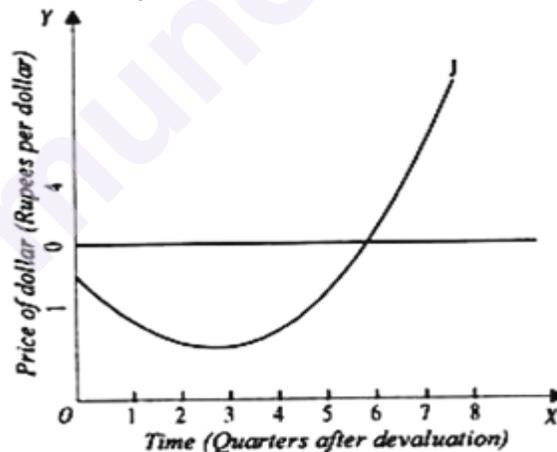

Figure 4A.12 The Effect of Devaluation on the Balance of Trade: The J. Curve

If the balance of trade is negative, it will be below the zero line and if the curve slopes down, it implies that balance of trade worsens. It will be seen from Fig.4A.12 that in the first few quarters, the balance of trade remains negative and also deteriorating and then starts improving and ultimately in the long run turns positive.

Now, pertinent question arises how the .J-curve comes about. We will explain this with reference to devaluation

(depreciation) of rupee. It may be recalled here that balance of trade is equal to the value of exports minus value of imports. Thus;

Balance of Trade = Value of Exports in Rupees – Value of Imports in Rupees

It may be noted that value of both exports and imports is equal to the volume of exports or imports multiplied by the rupee price of exports and imports respectively. The depreciation (devalu-ation) of the currency affects both the volume and rupee price of exports and imports. First, depreciation (devaluation) of currency increases the volume of exports and reduces the volume of imports, both of which have a favourable effect on the balance of trade, that is, they will lower the trade deficit or increase the trade surplus.

Secondly, as a result of devaluation, rupee-price of exports is not likely to change much in the short run. The rupee-price of exports depends on the domestic price level and, in the short run, the devaluation (depreciation) of rupee will have only a very small effect on the domestic price level.

On the other hand, the rupee- price of imports increases immediately after devaluation. Imports into India from abroad would be more costly because as a result of devaluation a hundred rupee note will buy fewer US dollars and pound sterling's than before. Thus, a rise in the rupee-price of imports has a negative effect on the balance of trade, that is, it will tend to increase the trade deficit or reduce the trade surplus.

Price effect and quantity effect of devaluation. An example will make clear the negative effect of depreciation or devaluation on the balance of trade as a result of devaluation or depreciation. Suppose the rupee cost of a particular US machine goes up from Rs. 50,000 to 60,000 following the devaluation of rupee from Rs. 46 per dollar to Rs. 44 per dollar.

Thus with the rise in price of a US machine, Indians will spend more on a US machine than before. This is a price effect. But increase in the price of the US machine will lead to the decrease in the quantity demanded of US machines by the Indians. This is the quantity effect. Now, the net effect of devaluation on the value of imports depends on whether quantity effect is larger than price effect or vice versa. And this depends on the price elasticity of imports.

It therefore follows that net effect of devaluation (depreciation) on the balance of trade could go either way. The historical experience shows that initially the negative effect

predominates. This is because whereas the effect of devaluation/depreciation on the price of imports is quite fast, it takes some time for quantity of imports to decline in response to the rise in rupee-price of imports and the value of exports to increase in response to the fall in price of exports in terms of foreign currency.

According to the J-Curve Effect, the initial effect of devaluation/depreciation on the balance of trade is negative and when in the long run imports and exports adjust to the changes in prices, the net effect on the balance of trade becomes positive. The more price elastic is the demand for exports and imports, the greater the improvement in the balance of trade in the long run.

4A.14 DEVALUATION AND INFLATION

The devaluation or depreciation of currency tends to raise the price level in the country and thus increase the rate of inflation. This happens because of two reasons. As a result of depreciation/devaluation, prices of imported goods rise. In case of imports of consumer goods rise in their prices directly leads to the increase in the rate of inflation.

In case of imports of capital goods and raw materials, the rise in their import prices will not only directly raise the price level but as they are used as inputs in the production of other goods, rise in their imports prices will also push up the cost of production of these other goods and thus will bring about cost-push inflation.

Second, depreciation makes the exports cheaper and therefore more competitive in the world markets. This causes the exports of goods to increase and reduces the supply and availability of goods in the domestic market which tends to raise the domestic price level. Besides, due to higher prices of imported goods, people of a country tend to substitute domestically produced goods for the now more expensive imports.

As a result, the aggregate demand or expenditure on domestically produced goods and services will increase causing either expansion in output of goods or rise in their prices or both. However, if the economy is working close to the capacity output, the effect will be more on raising prices of goods.

4A.15 SUMMARY

1. Basically the Mundell-Fleming model is a version of the IS-LM model for an open economy. In addition to the balance in goods and financial markets, the model incorporates an analysis of the balance of payments.

2. The Mundell-Fleming model is based on a very restrictive assumption. It considers a small open economy with perfect capital mobility.

3. The main message of the Mundell-Fleming model is that the effect of any economic policy (fiscal, monetary or trade) depends on the exchange rate system of the country under consideration, i.e., whether the country is following a fixed or a floating exchange rate system.

4. Devaluation, reduction in the exchange value of a country's monetary unit in terms of gold, silver, or foreign monetary units. Devaluation is employed to eliminate persistent balance-of-payments deficits.

5. In contrast to devaluation, revaluation involves an increase in the exchange value of a country's monetary unit in terms of gold, silver, or foreign monetary units. It may be undertaken when a country's currency has been undervalued in comparison with others, causing persistent balance-of-payments surpluses.

6. A J Curve is an economic theory which states that, under certain assumptions, a country's trade deficit will initially worsen after the depreciation of its currency—mainly because in the near term higher prices on imports will have a greater impact on total nominal imports than the reduced volume of imports. This results in a characteristic letter J shape when the nominal trade balance is charted as a line graph.

4A.16 QUESTIONS

1. State and Explain the Mundell-Fleming Model.
2. Explain the General Equilibrium in goods and money market in Mundell-Fleming Model.
3. Explain the role of devaluation as expenditure switching policies in BoP adjustment.
4. Explain the J curve effect in Balance of Trade.

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