Unit 5
Fundamentals to Macroeconomics

Part A: Concept and Measurement of National Income Accounting

Definition of National Income

- National income refers to the sum of income earned by all individuals of a nation in a particular period of time. In other words, it is the total income of the nation in a particular period of time.
- National income represents receipts total, expenditure total and the value of production. Since one man's income is another man's expenditure and each commodity is bought and sold at its market price, national income, national expenditure and national product are equal.
- **NI** $= Y_1 + Y_2 + Y_3 + \ldots + Y_n$
- $= \sum_{i=1}^{n} Y_i$

Various Concepts of National Income

- In the modern time, a number of concepts have come to be associated with the study of national income. These concepts have made the study of national income broad-based and comprehensive. Some of the important concepts of national income are explained below:
- 1. Gross Domestic Product (GDP)
- 2. Gross National Product (GNP)
- 3. Net National Product (NNP)
- 4. National Income (NI)
- 5. Personal Income (PI)
- 6. Disposable Income (DI)
- 7. Per Capita Income

Gross Domestic Product (GDP)

- The market value of all *final goods and services* produced within the domestic territory of a country during a year is called gross domestic product. In order to calculate the value of gross domestic product, all goods and services produced are multiplied by their respective prices and summed up. Symbolically,
- **GDP = $P_1Q_1 + P_2Q_2 + \ldots + P_nQ_n$**
- **= $\sum_{i=1}^{n} P_iQ_i$**
- where
- P = Market price of final goods and services
- Q = Quantity of goods and services
- i = Final product from 1 to n (number of final goods and services)

Gross Domestic Product (GDP) Contd.

- **GDP at Market Price and Factor Cost**
- GDP at MP (GDP_{MP}) = $P_1Q_1 + P_2Q_2 + P_3Q_3 + \ldots + P_nQ_n$
- GDP at FC (GDP_{FC}) = GDP at MP – Net indirect taxes
- Net indirect taxes = Indirect taxes – Subsidies
- **Potential and Actual GDP**
- **Potential GDP** is defined as the GDP of a country that would be obtained if all factors of production were fully employed. It is also known as the full employment GDP.
- **Actual GDP** is defined as the GDP actually produced or it is the actual output in an economy. Actual GDP fluctuates around the potential GDP.
- The difference between actual and potential GDP is called GDP gap.
- GDP Gap = Actual GDP – Potential GDP

Net Domestic Product (NDP)

- Gross domestic product minus depreciation is called net domestic product. When a charge for depreciation is deducted from GDP, we get net domestic product. Depreciation means wear and tear of fixed capital assets or decrease in value of fixed capital assets. It is also known as the capital consumption allowance.
- NDP = GDP – Depreciation
- **NDP at Market Price and Factor Cost**
- NDP at FC (NDP_{FC}) = NDP at MP – Net indirect taxes
- where
- Net indirect taxes = Indirect taxes – Subsidies

Gross National Product (GNP)

- Gross national product is the market value of all final goods and service produced during a year by domestically owned resource or factors of production. In other words, it is the market value of all final goods and services produced within a country in a year plus net factor income from aboard. It is broader concept than GDP because GNP is equal to GDP plus net factor income from abroad (NFIA).
- GNP = GDP + NFIA
- where
- NFIA = Net factor income from abroad
- **GNP at Market Prices and Factor Cost**
- GNP at MP (GNP_{MP}) = GDP at MP + NFIA
- GNP at FC (GNP_{FC}) = GNP at MP – Net indirect taxes
- where
- Net indirect taxes = Indirect taxes – Subsidies

Net National Product (NNP)

- Gross national product minus depreciation is called net national product. In other words, net national product is the market value of all final goods and services after allowing for depreciation.
- NNP = GNP – Depreciation
- **NNP at Market Price and Factor Cost**
- NNP at FC (NNP_{FC}) = NNP at MP – Net indirect taxes
- where
- Net indirect taxes = Indirect taxes – Subsidies

National Income (NI)

- National income is the total sum of earning of all factors of production in the form of wages, profits, rent and interest plus net factor income from abroad. In other words, national income means the sum of all incomes earned by domestically owned factors of production for their contribution in the production of goods and services.
- NDP at FC (NDP_{FC}) = W + R + I + P
- NNP at FC (NNP_{FC}) = NDP at FC + NFIA
- NI = NNP at FC
- where
- W = Wages and salaries
- R = Rent
- I = Interest
- P = Profit
- NFIA = Net factor income from abroad

National Income (NI) Contd.

- By product method, NI is calculated as follows:
- GDP at MP (GDP_{MP}) = $P_1Q_1 + P_2Q_2 + P_3Q_3 + \ldots + P_nQ_n$
- GNP at MP (GNP_{MP}) = GDP at MP + NFIA
- NNP at MP (NNP_{MP}) = GNP at MP – Depreciation
- NNP at FC (NNP_{FC}) = NNP at MP – Net indirect taxes
- NI = NNP at FC

Personal Income (PI)

- The total income received by all individuals and households of a country from all possible sources before payment of direct taxes during a year is called personal income.
- The various sources of personal incomes are: labour income, proprietor's income, rental income, interest income, and transfer payments after payment of social security taxes. In other words, it includes income received by households and incorporated business sectors (sole proprietor and partnership businesses), inclusive of transfer payments.
- PI = NI – Undistributed corporate profit – Corporate income tax – Social security contribution + Transfer payments

Disposable Income (DI)

- The total income received by all individuals and households of a country from all possible sources after payment of direct taxes is called disposable income. It is equal to personal income minus direct taxes. It is also known as the personal disposable income.
- DI = PI – Direct taxes/ Personal taxes
- Disposable income is available for households and persons for consumption. However, the total disposable income is not spent only on consumption because a part of it is saved. Thus,
- DI = Consumption + Saving = C + S

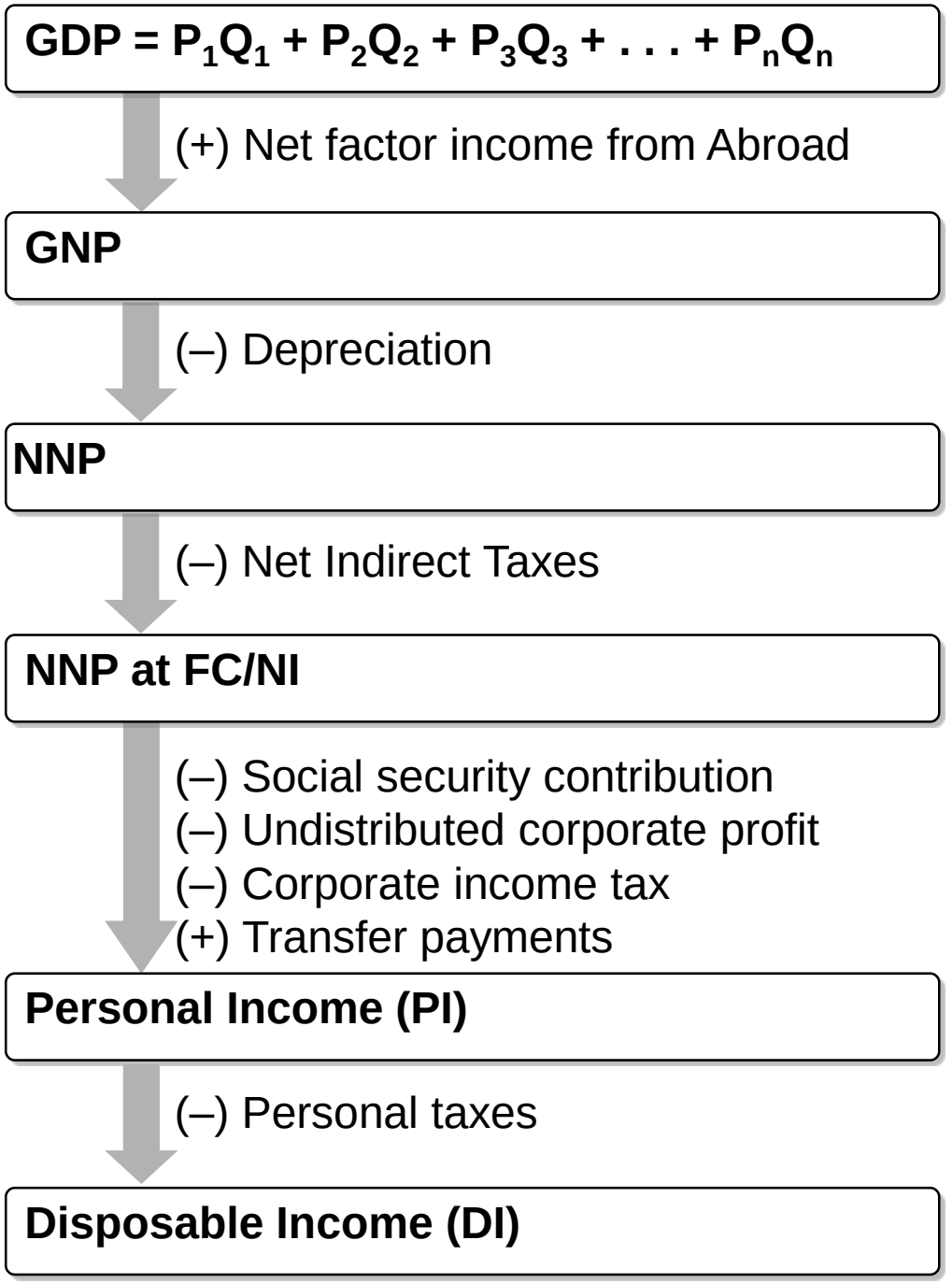
Saving/ Private Saving

- Saving is defined as the excess disposable income over the consumption expenditure. In other words, saving is the part of disposable income which is not spent on consumption of goods and services.
- S = DI – C
- where
- S = Saving
- C = Consumption expenditure
- DI = Disposable income

Per Capita Income (PCI)

- The average income of the people of a country in a particular year is called per capita income. It is expressed at the current prices. In order to find the per capita income, national income of a country in a particular year is divided by population of the country in that year.
- Per capita income = $\frac{\text{National Income}}{\text{Population}}$

The Relationship between Various Concepts of National Income



Nominal GDP, Real GDP And GDP Deflator

- **Nominal GDP** is defined as the GDP evaluated at current market prices. Therefore, nominal GDP includes all of the changes in market prices that have occurred during the current year due to inflation or deflation.
- **Real GDP** is defined as the GDP evaluated at the market prices of any base year.
- Real GDP = $\frac{\text{Nominal GDP}}{\text{GDP Deflator}} \times 100$
- **GDP deflator** measures relative changes in current level prices in comparison to the level of prices in the base year. In other words, it is the ratio of nominal GDP in a given year to real GDP of that year.
- GDP Deflator = $\frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$
- Rate of inflation = $\frac{\text{Change in GDP Deflator}}{\text{GDP Deflator of the previous year}} \times 100$

Measurement of National Income

- Production of goods and services gives rise to income; income gives rise to demand for goods and services; demand gives rise to expenditure; and expenditure gives rise to further production. Thus, there is circular flow of production, income and expenditure. Based on these three related flows, national income can be measured by using three methods: product method, income method and expenditure method.

Product Method

- Product method measures national income at the phase of production in circular flow. In this method, the national income is measured from the output of the economy in a given period. All the goods and services produced during a year in the economy are measured at the market price.
- This method is common in many countries but there is more possibility of double counting. Double counting means certain items are counted more than once while calculating national income. It leads over estimation of NI. To avoid the problem of double counting, following two methods are used:
- **1. Final Product Method**
- In the final product method, national income is estimated by finding the market value of all final goods and services produced in an economy in a year. The various steps to the estimation or calculation of national income according to this method are as follows:

Product Method Contd.

- The market value of all final goods and services produced within the country in a year is calculated which is known as GDP at MP.
- **GDP at MP = Market value of all final goods services produced in the country**
- **= Money value all final goods and services produced in all economic sectors (agriculture, industry, trade and service) within a country in a year**
- **= $P_1 Q_1 + P_2 Q_2 + P_3 Q_3 + \ldots + P_n Q_n$**
- **= $\sum_{i=1}^{n} P_i Q_i$**
- By adding the net factor income from abroad (NFIA) to GDP at MP, we get GNP at MP
- **GNP at MP = GDP at MP + NFIA**
- In order to get NNP at MP, depreciation is deducted from GNP at MP
- **NNP at MP = GNP at MP – Depreciation**
- Further deducting net indirect taxes from NNP at MP, we obtain NNP at factor cost which is national income.
- **NNP at FC = NNP - Net Indirect taxes**
- **NI = NNP at FC**

Product Method Contd.

- **2. Value Added Method**
- In the value added method, the value added or created at different stages of production is counted for estimating national income. Thus, according to this method, national income is the sum of total value added by different producing units of a country in their production process. Value added means the addition to the value of raw materials and other inputs during the process of production.
- **Gross value added = Value of output – Cost of intermediate goods**
- ***Value added*** is the difference between the value of goods as they leave a stage of production and the cost of the goods as they entered that stage. In calculating GDP, we sum up the value added at each stage of production.

Product Method Contd.

Producer	Stage of Production	Value of Output (Rs.)	Cost of Intermediate Goods (Rs.)	Gross Value Added (Rs.)
Farmer	Wheat	100	-	100
Miller	Flour	150	100	50
Baker	Bread	250	150	100
	Total	500	250	250

Product Method Contd.

- The various steps in the calculation of NI by value added method is given below:
- Net Value Added = Gross value added – Depreciation – Net Indirect Taxes
- NDP at FC (NDP_{FC}) = Sum of net value added in all sectors of an economy, i.e. primary sector, secondary sector and tertiary sector or service sector
- NNP at FC (NNP_{FC}) = NDP at FC + NFIA
- NI = NNP at FC
- Alternative Method
- GDP at MP (GDP_{MP}) = Net value added + Depreciation + Net indirect taxes
- GNP at MP (GNP_{MP}) = GDP at MP + NFIA
- NNP at MP (NNP_{MP}) = GNP at MP – Depreciation
- NNP at FC (NNP_{FC}) = GNP at MP –Net indirect taxes
- NI = NNP at FC

Income Method

- Income method measures national income from the side of factor income. This method is also known as the factor payment method. According to this method, the incomes received by all the residents of a country for their productive services during a year are added up to obtain national income. Thus, income method consists of income earned by all factors of production in the form of wages and salaries, interest, rent and profit.

Income Method Contd.

- The important elements or components in the calculation of national income by income method are as follows:
- 1. Wages and salaries
- Compensation of employees = Wages and salaries + Employers' contribution to social security + Bonus + Money value of other facilities
- 2. Rent
- 3. Interest
- 4. Profits
- Profit = Undistributed profit + Dividend + Corporate income tax
- 5. Net indirect taxes
- Net indirect taxes = Indirect taxes – Subsidies
- 6. Net factor income from Abroad
- 7. Depreciation
- 8. Mixed income or income from self-employment

Income Method Contd.

- The method of calculating NI by income method is as follows:
- NDP at FC (NDP_{FC}) = Wages and salaries + Rent + Profit + Interest + Income from self employment + Mixed income or proprietor's income
- NNP at FC (NNP_{FC}) = NDP at FC + NFIA
- NI = NNP at FC
- **Alternative Method**
- GDP at MP (GDP_{MP}) = Compensation of employees + Rent + Profit + Interest + Income from self employment + Mixed income or Proprietor's income + Depreciation + Net indirect taxes
- GNP at MP (GNP_{MP}) = GDP at MP + NFIA
- NNP at MP (NNP_{MP}) = GNP at MP – Depreciation
- NNP at FC (NNP_{FC}) = NNP at MP – Net indirect taxes
- NI = NNP at FC

Income Method Contd.

- This method requires the careful specification of what is to be included under the heading of income. In general, we may include only these particular income flows that originate with the production of goods and services. The following incomes are not considered as income and hence excluded from NI:
- 1. Amount received from the sale of *used goods or second hand goods* such as buildings, automobiles or any other goods produced in an earlier time period because what they receive in payment is not “income” in the sense of something generated in the course of producing the output of the current period.
- 2. Amount received from sale of *stocks or bonds*.
- 3. Amount received from the government in the form of *transfer payment* because recipients provide no good or service in exchange.
- 4. Income received by people from other individuals for which *no productive service is provided.*

Expenditure Method

- In order to calculate national income by expenditure method, the economy is divided into four major sectors: household, government, business and foreign. These are the major markets for the output of an economy. In one year, the total expenditures of these sectors on final output constitutes the nation’s GDP at MP. GDP at MP is, therefore, the sum of total final expenditures made by household, government, business and foreign sectors.

Expenditure Method Contd.

- The components of national income by this method are as follows:
- 1. Personal consumption expenditures
- 2. Government expenditure
- 3. Gross private domestic investment
- Gross private domestic investment (I) = Net fixed capital formation + Depreciation + Change in stock
- Change in stock (Change in Inventories) = Closing stock – Opening stock
- 4. Net exports
- Net export = Export – Import = (X – M)
- 5. Net indirect taxes
- Net indirect taxes = Indirect taxes – Subsidies
- 6. Net income from Abroad
- 7. Depreciation

Expenditure Method Contd.

- The calculation of national income by expenditure method involves following steps:
- GDP at MP (GDP_{MP}) = C + I + G + (X – M)
- GNP at MP (GNP_{MP}) = GDP at MP + NFIA
- NNP at MP (NNP_{MP}) = GNP at MP – Depreciation
- NNP at FC (NNP_{FC}) = NNP at MP – Net indirect taxes
- NI = NNP at FC
- where
- C = Private consumption expenditure
- X = Export
- I = Private investment expenditure
- M = Import
- G = Government expenditure
- X – M = Net export
- NFIA = Net factor income from abroad

Expenditure Method Contd.

- The use of expenditure approach to measure NI requires careful specification of what is to be included under the heading of expenditures. There are certain exclusions from expenditures:

- It must include only expenditures on the purchase of goods and services produced during a specified time period. It must exclude *expenditures on previously produced goods.*
- It must also exclude all expenditures for the *purchase of used assets.*
- It must exclude *purchase of financial assets*, such as stock and bonds there is no production of goods or services corresponding to expenditures for mere pieces of paper.
- It must also exclude *transfer payment*, i.e. expenditures by the government for which the government does not receive a good or service in exchange.
- *Expenditures on intermediate goods,* such as fertilizers and seed by farmers, should be excluded. This is because we have to avoid double counting.

- **Numerical Examples 1**
- Let, an economy produces only four goods paddy, cloth, shoes and biscuit. Calculate GDP at MP, GNP at MP and NI from following hypothetical data:

Description	Quantity (units)	Price (Rs.)	Amount (Rs.)
Paddy	1,000	1,000	---
Cloth	5,000	500	---
Shoes	2,000	400	---
Biscuit	1,500	20	
Raw materials used			1,500,000
Net factor income from Abroad			200,000
Net Indirect taxes			400,000
Depreciation			500,000

- **SOLUTION**
- GDP at MP = $P_1Q_1 + P_2Q_2 + P_3Q_3 + P_4Q_4$ – Market value of raw materials used
- = (1,000 × 1,000) + (5,000 × 500) + (2,000 × 400) + (1,500 × 20) – 1,500,000
- = 4,330,000 – 1,500,000
- = Rs. 2,830,000
- GNP at MP = GDP at MP + Net factor income from Abroad
- = 2,830,000 + 200,000
- = Rs. 3,030,000
- NI = NNP at FC
- = GNP at MP – Depreciation – Net indirect taxes
- = 3,030,000 – 500,000 – 400,000
- = Rs. 2,130,000

- **Numerical Examples 2**
- From the following hypothetical data, find GDP at market price and GDP at factor cost:

Items	Rs. in billion
Net Indirect taxes	38
Depreciation	34
Net income from Abroad	– 3
Rent	10
Profit	25
Interest	20
Wages and salaries	170
Employer's contribution to social security scheme	30
Mixed income (Income from self employment)	5

- **SOLUTION**
- GDP at market price = Rent + Profit + Interest + Wages and salaries + Mixed income (Income from self employment) + Employer's contribution to social security scheme + Depreciation + Net indirect taxes
- = 10 + 25 + 20 + 170 + 5 + 30 + 34 + 38
- = Rs. 332 billion
- GDP at factor cost = GDP at market price – Net indirect taxes
- = 332 – 38
- = Rs. 294 billion
- *Alternatively,*
- GDP at factor cost = Rent + Profit + Interest + Wages and salaries + Mixed income (Income from self employment) + Employer's contribution to social security scheme + Depreciation
- = 10 + 25 + 20 + 170 + 5 + 30 + 34
- = Rs. 294 billion

- **Numerical Examples 3**
- Calculate NI, PI and DI and personal saving from the following hypoth

Items	Rs. in billion
Wages and salaries	2,000
Mixed income from self employment	1,000
Rental income	300
Interest income	500
Dividend	3,000
Undistributed profit	1,000
Corporate income tax	600
Depreciation	250
Net factor income from Abroad	200
Indirect taxes	1,000
Subsidies	500
Personal taxes	500
Transfer payments	800
Social security contribution	1,000
Private Consumption	5,000

- **SOLUTION**
- NDP at FC = Wage and salaries + Rental income + Interest income + (Dividend + Undistributed profit + Corporate income tax) + Mixed income from self employment
- = 2,000 + 300 + 500 + (3,000 + 1,000 + 600) + 1,000
- = Rs. 8,400 billion
- NNP at FC = NDP at FC + Net factor income from Abroad
- = 8,400 + 200 = Rs. 8,600 billion
- NI = NNP at FC = Rs. 8,600 billion
- PI = NI – Undistributed profit – Corporate income – Social security contribution – Transfer payments
- = 8,600 – 1,000 – 600 – 1,000 + 800
- = Rs. 6,800 billion
- DI = PI – Personal taxes = 6,800 – 500 = Rs. 6,300 billion
- Personal saving = DI – Private consumption
- = 6,300 – 5,000 = Rs. 1,300 billion

- **Numerical Examples 4**
- Consider the following hypothetical national income data and answer the following questions:

Items	Rs. in crore
Consumption of fixed capital (Depreciation)	600
Government expenditure	2,000
Net factor income from Abroad	100
Private final consumption expenditure	8,000
Net exports	– 100
Opening stock	300
Closing stock	400
Gross private investment	2,300

- a. Calculate GDP at MP.
- b. Calculate GNP at MP.

- **SOLUTION**
- a. GDP at MP = Private final consumption expenditure + Gross private investment + Government expenditure + Net export
- = 8,000 + 2,300 + 2,000 + (–100)
- = Rs. 12,200 crore
- b. GNP at MP = GDP at MP + NFIA
- = 12,200 + 100
- = Rs. 12,300 crore

- **Numerical Examples 5**
- Calculate GDP at MP and GNP at MP from the following data by both income and expenditure method.

Items	Rs. in crore
Rent	20
Private final consumption expenditure	400
Interest	30
Dividends	45
Undistributed profits	5
Corporate tax	10
Government final consumption expenditure	100
Net domestic capital formation	50
Compensation of employees	400
Depreciation	10
Net indirect taxes	50
Net factor income from Abroad	– 10
Net export	10

- **SOLUTION**
- **Income Method**
- Profit = Dividend + Undistributed profit + corporate tax
- = 45 + 5 + 10
- = Rs. 60 crore
- GDP at MP = Rent + Interest + Profit + Compensation of employees + Net indirect taxes + Depreciation
- = 20 + 30 + 60 + 400 + 50 + 10
- = Rs. 570 crore
- GNP at MP = GDP at MP + NFIA
- = 570 + (–10)
- = Rs. 560 crore

- **Expenditure Method**
- GDP at MP = Private final consumption expenditure + (Net domestic capital formation + Depreciation) + Government final consumption expenditure + Net export
- = 400 + (50 + 10) + 100 + 10
- = Rs. 570 crore
- GNP at MP = GDP at MP + NFIA
- = 570 + (–10)
- = 570 – 10
- = Rs. 560 crore

Part B: Consumption, Savings and Investment Functions

Consumption Function

- **Meaning of Consumption**
- Consumption is defined as the part of income that is devoted on goods and services in order to derive mental or physical satisfaction. In other words, it is the use of economic resources to satisfy current human needs and wants which means that consumption is the purchase of goods and service and act of using these goods and services to satisfy human needs and wants.
- **Concept of Consumption Function**
- Consumption function refers to the general income consumption relationship. In other words, it is the functional relationship between total consumption and total income. It shows how consumption expenditure varies with the given changes in income. There is positive relationship between consumption and income. It means higher the income, higher will be consumption and vice verse. Likewise, consumption function is also known as the propensity to consume.

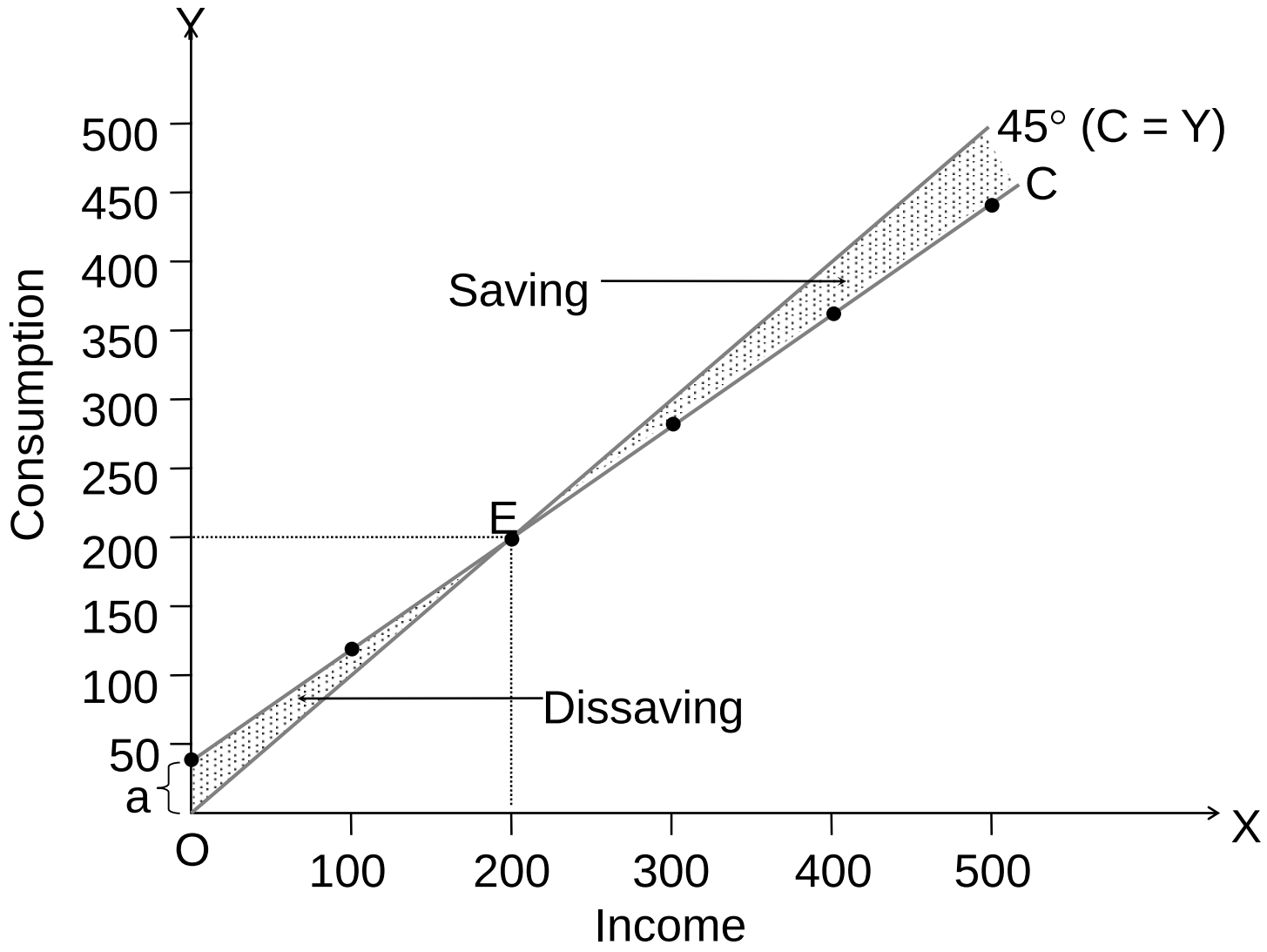
Consumption Function Contd.

- The consumption function is expressed as follow:
- **$C = f(Y_d)$**
- where
- C = Consumption
- Y_d = Disposable income
- Y_d = National income – Taxes = Y – T
- The consumption function can also be written algebraically as
- **$C = a + b\,Y_d$**
- where
- C = Consumption expenditure
- a = Autonomous consumption
- b = Marginal propensity to consume (MPC) $(0 < MPC < 1)$
- Y_d = Disposable income

Consumption Function Contd.

Income (Y)	Consumption (C)	Saving (S) (S = Y – C)
0	40	– 40
100	120	– 20
200	200	0
300	280	20
400	360	40
500	440	60

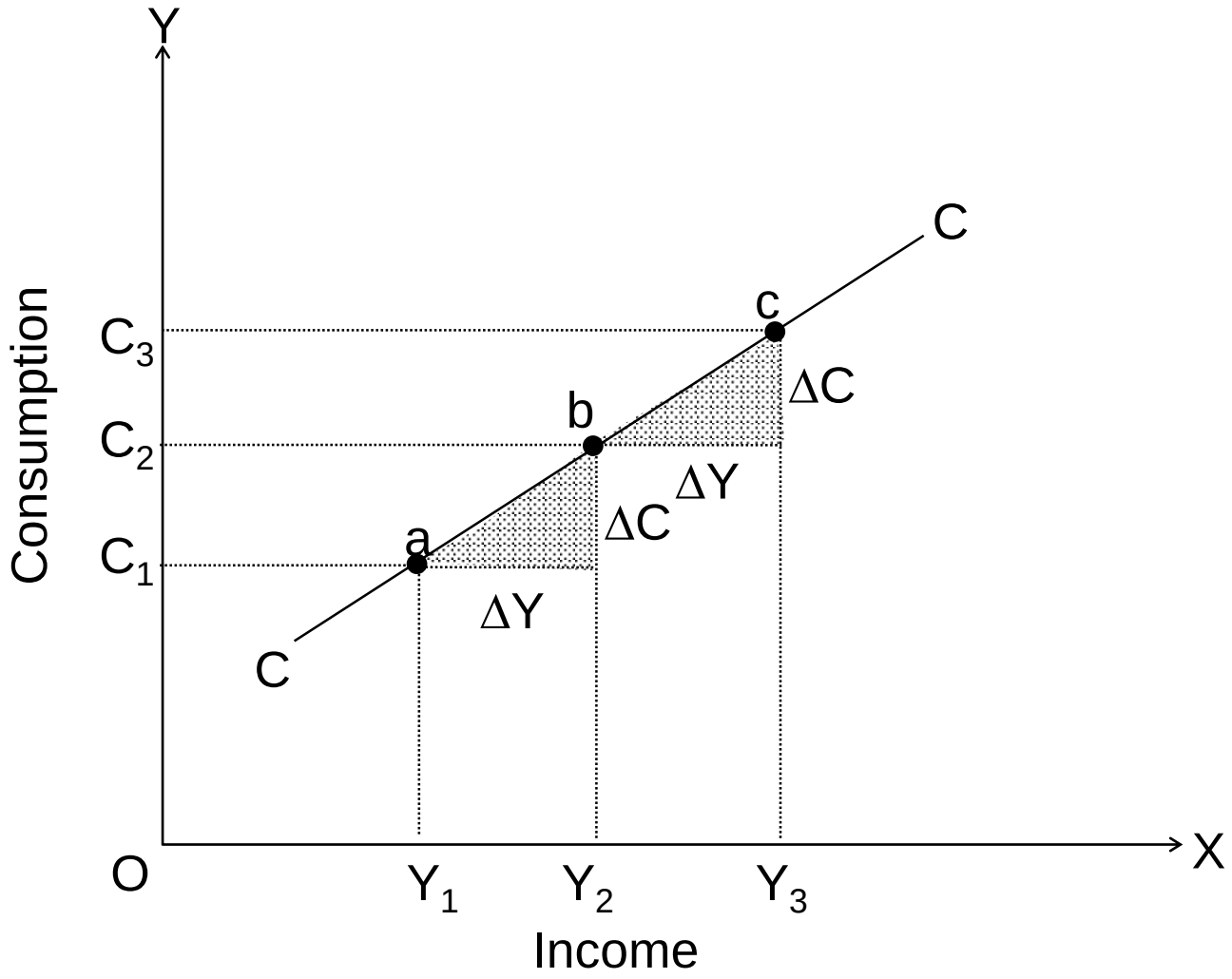
Consumption Function Contd.



Classification/ Types or Technical Attributes of Consumption Function

- The consumption function or propensity to consume has been divided into two parts: average propensity to consume and marginal propensity to consume, which are explained as follows:
- **1. Average Propensity to Consume (APC)**
- Average propensity to consume is defined as the ratio of aggregate consumption and aggregate income. It is calculated by dividing consumption expenditure by income. It tells us the level of consumption at a given level of income. Symbolically
- $APC = \frac{C}{Y}$
- where
- APC = Average propensity to consume
- C = Consumption
- Y = Level of income

Income (Y)	Consumption (C)	APC = $\frac{C}{Y}$
100	100	1.00
200	180	0.90
300	260	0.86
400	340	0.85
500	420	0.84
600	500	0.83



Classification/ Types or Technical Attributes of Consumption Function Contd.

2. Marginal Propensity to Consume (MPC)

Marginal propensity to consume is defined as the ratio of change in consumption to the change in income. It shows that by how much total consumption changes when there is change in income by one unit. It is calculated by dividing change in consumption by change in income.

Symbolically

$$\textbf{MPC} = \frac{\Delta C}{\Delta Y}$$

where

MPC = Marginal propensity to consume

DC = Change in consumption

DY = Change in income

Properties of MPC

1. MPC is greater than zero but less than one
2. MPC of poor is greater than MPC of the rich
3. The short-run MPC is stable

Saving Function

Meaning of Saving

Saving is defined as the part of income that is not spent on consumption. In other words, the portion of disposable income not spent on consumption of consumer goods and services is called saving.

S = Y – C

where

S = Saving

Y = Income

C = Consumption expenditure

Saving Function Contd.

Concept of Saving Function

Saving function states the relationship between income and saving. There is positive relationship between saving and income. It means that the higher the income, the higher will be saving and vice-versa. Symbolically,

S = f(Y)

Since,

S = Y – C

or, S = Y – (a + bY) [∵ C = a + by]

or, S = Y – a – bY

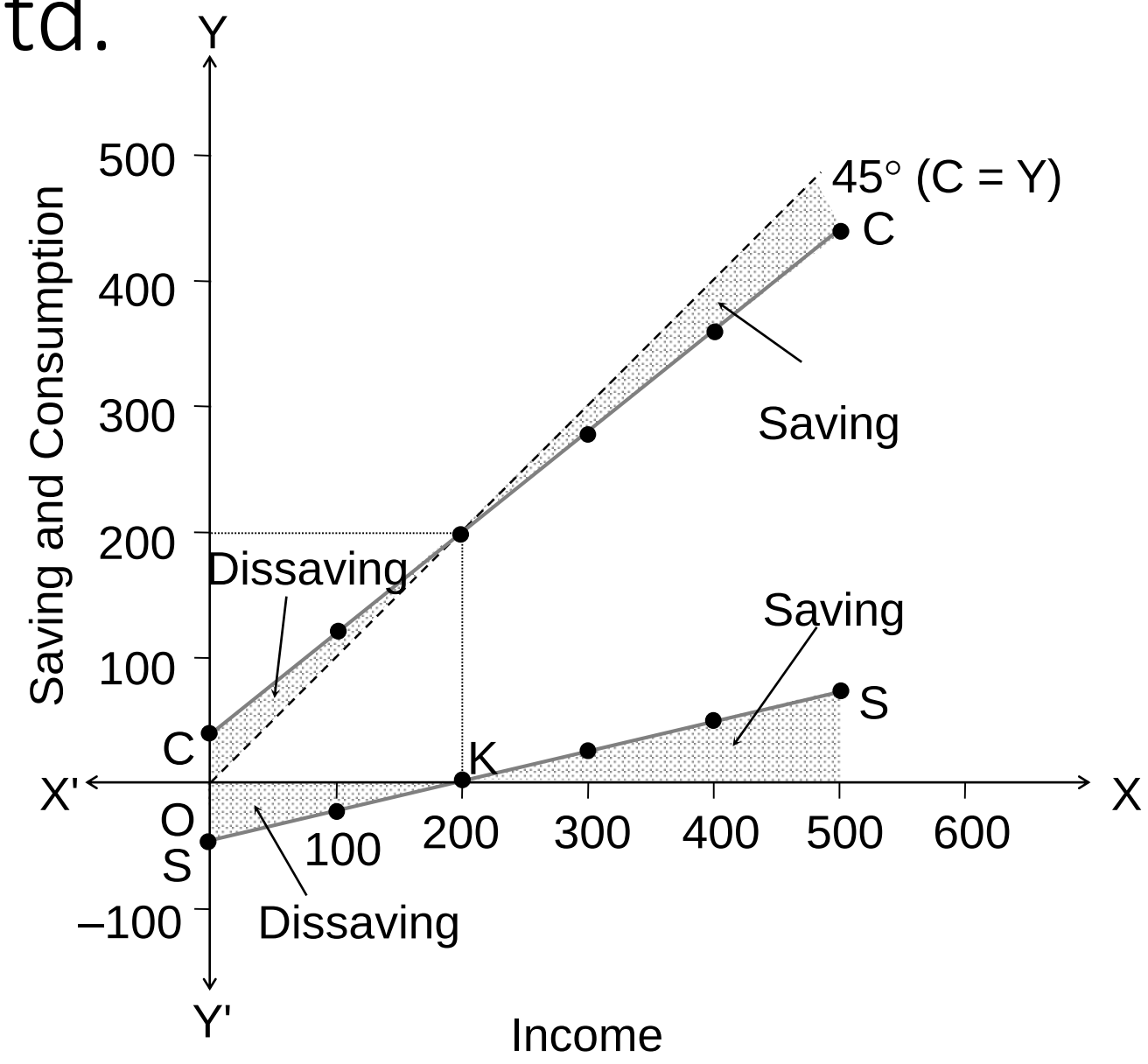
or, S = – a + Y – bY

or, S = – a + (1 – b)Y

or, S = – a + sY [∵ 1 – b = s]

Saving Function Contd.

Income (Y)	Consumption (C)	Saving (S) (S = Y – C)
0	40	–40
100	120	–20
200	200	0
300	280	20
400	360	40
500	440	60



Classification/ Types or Technical Attributes of Saving Function

There are two technical features in connection to the relationship between saving and income, average propensity to save (APS) and marginal propensity to save (MPS).

1. Average Propensity to Save (APS)

The APS is the ratio of total saving to total income. It is expressed as,

$$\textbf{APS} = \frac{S}{Y}$$

where

S = Saving

Y = Income

- APS is always positive, i.e., APS > 0.
- We know that,
- **Y = C + S**
- Dividing both sides by Y,
- $\frac{Y}{Y} = \frac{C}{Y} + \frac{S}{Y}$
- or, 1 = APC + APS
- or, APC + APS = 1
- ∴ APS = 1 – APC

Classification/ Types or Technical Attributes of Saving Function Contd.

2. Marginal Propensity to Save (MPS)

MPS is the ratio of change of saving resulting from one unit change in income. It is expressed as the ratio of change in total saving to the change in total income. It can be expressed as

$$MPS = \frac{\Delta S}{\Delta Y}$$

where

ΔS = Change in saving

ΔY = Change in income

MPS is always between 0 to 1.

$0 < MPS < 1$

- We know that,
- $Y = C + S$ ... (i)
- or, $Y + \Delta Y = (C + \Delta C) + (S + \Delta S)$ ... (ii)
- From equation (ii) – (i),
- $\Delta Y = \Delta C + \Delta S$
- Dividing both sides by ΔY,
- or, $\frac{\Delta Y}{\Delta Y} = \frac{\Delta C}{\Delta Y} + \frac{\Delta S}{\Delta Y}$
- or, $1 = MPC + MPS$
- or, $MPS = 1 - MPC$

Investment

In general, investment means buying old shares, bonds or property. But in economics, such activities are only known as transfer of ownership because this sort of investment does not increase the aggregate income and employment. This is also known the financial investment. Thus, in economics, investment is defined as the part of income, which is devoted on purchase on those goods, which are used for further production of other goods or earning income. Such type of investment is known as the real investment. There are different opinions regarding investment function. According to classical economists, investment is the negative function of rate of interest.

I = f(i)

where

I = Investment

i = Rate of interest

But Keynesian concept is different. According to him, investment is the function of rate of interest (i) and marginal efficiency of capital (MEC).

I = f(MEC, i)

Classification/ Types of Investment

1. Gross investment and net investment

Gross investment: The total amount of expenditure made in new capital goods during a year is known as gross investment, which includes the depreciation value.

Gross investment (GI) = Net investment + Depreciation

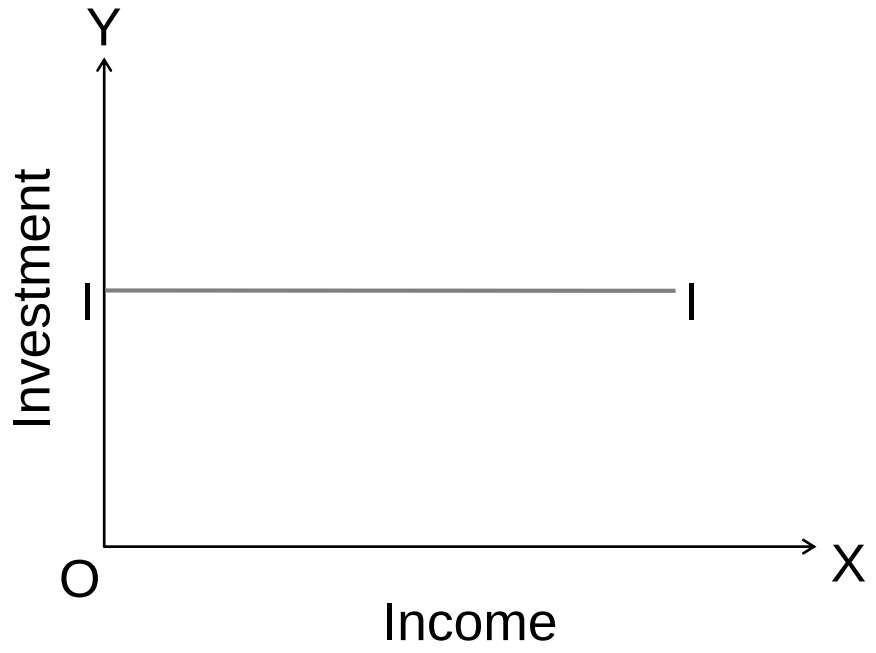
Net investment: If depreciation is deducted from the gross investment, then net investment will be obtained. Thus,

Net investment (NI) = Gross investment – Depreciation

Classification/ Types of Investment

- **2. Induced investment and autonomous Investment**
- **Induced investment:** The investment that varies with the change in national income is called induced investment. Induced Investment is the function of income, I = f(Y).

- **Autonomous investment:** Autonomous investment is not affected by the change in income. Therefore, it is called income inelastic. This investment does not depend upon the profit motive.



Classification/ Types of Investment

3. Ex-ante investment and ex-post Investment

The planned or anticipated investment is known as ex-ante investment. On the other hand, the actually realized investment is known as ex-post investment. The ex-ante and ex-post investment may not be equal.

4. Private investment and public investment

The investment made by an individual, private investor, private enterprise or businessman with the motive of earning profit is known as private investment.

The investment made by the government or various bodies of the government is known as public investment.

Part C: Inflation, Deflation and Business Cycles

Inflation

- Generally, inflation is a substantial and rapid rise in the general price level which causes a decline in the purchasing power of money. To be inflation, the following conditions should be fulfilled:
- 1. The price level is raising not the price of a single commodity.
- 2. The price rise must be continuous.
- 3. The price rise must be significant (large enough).

Types/ Kinds of Inflation

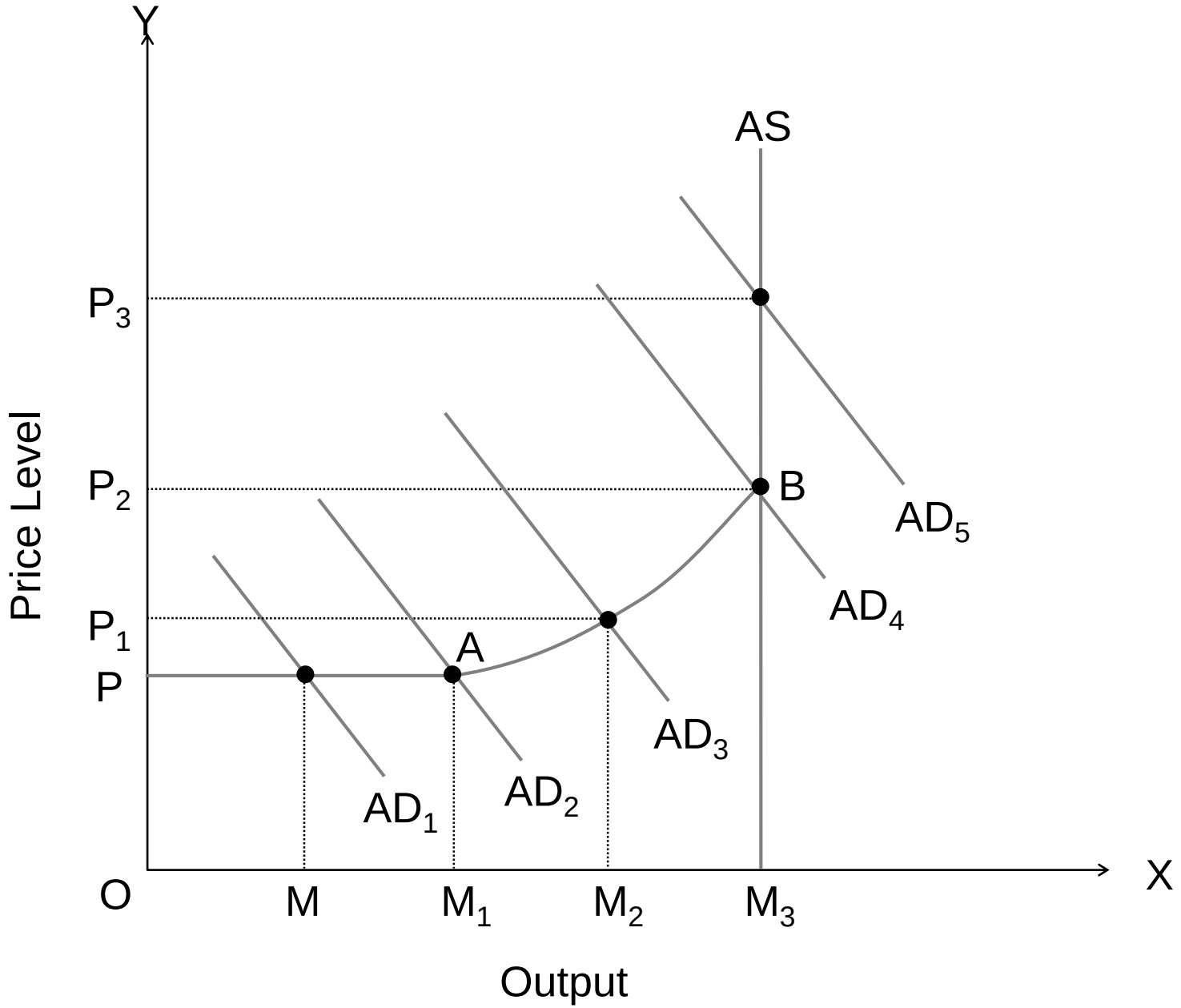
- 1. On the Basis of Speed
  - a. Creeping inflation
  - b. Walking inflation
  - c. Running inflation
  - d. Hyper inflation
- 2. On the Basis of Inducement
  - a. Wage induced inflation
  - b. Profit induced inflation
  - c. Scarcity induced inflation
  - d. Deficit induced inflation
  - e. Currency induced inflation
  - f. Credit induced inflation
  - g. Foreign trade induced inflation

Types/ Kinds of Inflation

3. On the Basis of Time
   a. Peace time inflation
   b. War time inflation
   c. Post war inflation
4. On the Basis of Scope
   a. Comprehensive inflation
   b. Sporadic inflation
5. On the Basis of Government Reaction
   a. Open inflation
   b. Suppressed inflation
6. On the Basis of Employment Level
   a. Partial inflation
   b. Full inflation
7. Other Types
   a. Ratchet inflation
   b. Stagflation
8. On the basis of Cause

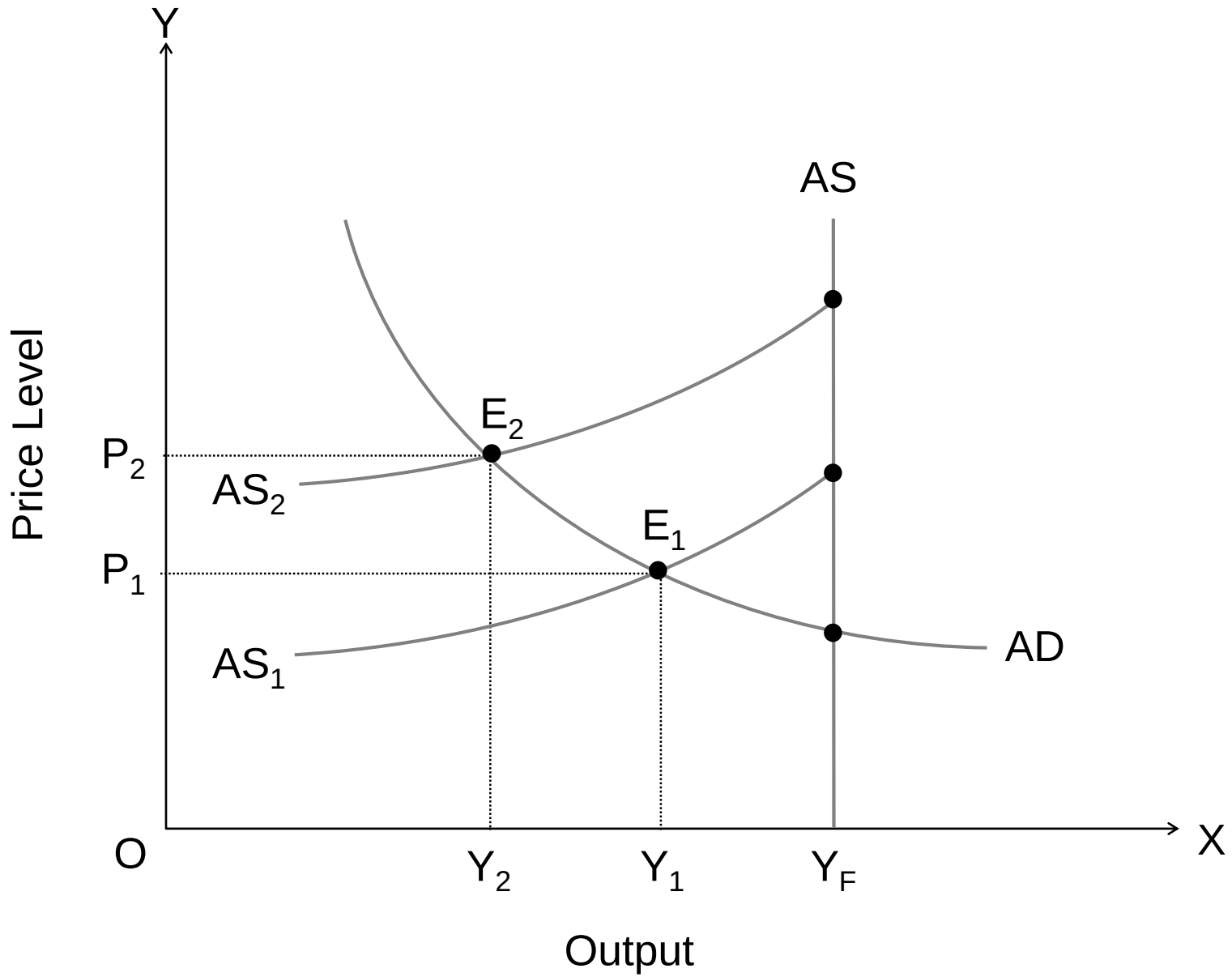
Theories of Inflation: Demand Pull and Cost Push Inflation

- **Demand Pull Inflation**
- Demand pull inflation occurs when aggregate demand for goods and services exceeds the supply of these goods and services at the existing price level . There are two theories of demand pull inflation.
- According to Keynes, inflation occurs when aggregate demand for final goods and services exceeds the aggregate supply of goods and services at full-employment.


Y
AS
P3
P2
P1
P
Price Level
B
A
AD5
AD4
AD3
AD2
AD1
O
M
M1
M2
M3
X
Output

Theories of Inflation: Demand Pull and Cost Push Inflation Contd.

- **Cost Push Inflation**
- Cost push inflation is also known as supply side inflation. Cost push inflation occurs due to the increase in cost of production. Cost of production increases due to the increase in wage cost, increase in profit margin, supply shock, etc. Thus, cost push inflation is caused by the increase in wage rate, increase in profit rate and supply shock. The different types of cost push inflation are as follows:
- 1. Wages push inflation
- 2. Profit push inflation
- 3. Supply shock inflation


Y
AS
Price Level
E2
P2
AS2
E1
P1
AS1
AD
O
X
Y2
Y1
YF
Output

Computation of Rate of Inflation

- The *consumer price index* number is also known as cost as living index number. Consumer price index is a measure of the overall cost of the goods and services bought by typical consumers.
- **Method of Constructing Consumer Price Index**
- **1. Aggregate expenditure method or weighted aggregate method:** In this method, quantities consumed in the base year are taken as weight.
- $CPI = \frac{\sum p_1 q_0}{\sum p_0 q_0} \times 100$
- **2. Family budget method:** In this method, first price relatives of all commodities are calculated and then weighted.
- $CPI = \frac{\sum \left(\frac{p_1}{p_0} \times 100\right) p_1 q_0}{\sum p_0 q_0} = \frac{\sum pw}{\sum w}$
- where
- $P = \frac{p_1}{p_0} \times 100$ (Price relative)
- $w = p_0 q_0$ (Value of the commodity consumed)

How the Consumer Price Index is Calculated?

- 1. Selection of basket
- 2. Finding the prices
- 3. Computing the basket's cost
- 4. Choice of a base year and computing the index
- $$\text{CPI} = \frac{\text{Price of basket of goods and services}}{\text{Price of basket in the base year}} \times 100$$
- 5. Computing the inflation rate
- $$\text{Rate of Inflation} = \frac{\text{Change in CPI}}{\text{CPI of Previous Year}} \times 100$$
- $$= \frac{\text{CPI of current year} - \text{CPI of previous year}}{\text{CPI of previous year}} \times 100$$
- Since, CPI is equal to GDP deflator, following formula can also be used to calculate inflation.
- $$\text{Rate of Inflation} = \frac{\text{Change in GDP Deflator}}{\text{GDP deflator of Previous Year}} \times 100$$
- $$= \frac{\text{GDP Deflator of current year} - \text{GDP Deflator of previous year}}{\text{GDP Deflator of previous year}} \times 100$$

Deflation

- **Concept of Deflation**
- Deflation is the opposite of inflation. It is defined as the situation of fall in general price level or increase in value of money.
- Only those falls in prices which result in unemployment, over production and fall in the economic activity are deflationary. In short deflation is accompanied by falling employment level, output and income.

- **Causes of Deflation**
- The causes of deflation are as follows:
- 1. Reduction in money supply,
- 2. Control of bank credit by central bank,
- 3. Sudden increase in output and
- 4. Increase in rate of taxes.

Business Cycle

- Business cycle is a major feature of the *capitalist or free market economic system*. It refers to the regular upward and downward fluctuations in the aggregate economic activities in the economy. These expansions, recessions, contractions and revivals of aggregate economic activities occur and reoccur in an unchanged sequence. In the decade 1930s, great depression was seen in the world that created new revolution in the field of economics. This depression proved **'Say's law of market'** wrong because his view, supply creates its own demand did not work. During 2008 /09 AD, also whole world faced the problem of economic recession that started from USA due to failure of real state market.

Meaning of Business Cycle

- The regular pattern of expansion and contraction in aggregate economic activities such as economic growth, employment, *price level*, etc. is called business cycle. It is also known as trade cycle.
- In the free market or capitalist economy, aggregate economic variables or macroeconomic variables like national income, employment level, price level, etc. along with their determinant factors keep on changing from time to time.
- In short, trade or business cycle is the upward and downward movements or fluctuations in aggregate economic activities such as output, employment, income, price, rate of interest, demand, etc. In general, business cycle created in one sector, fully affects the whole economy.

Characteristics of Business Cycle

- 1. Cyclical nature
- 2. Regularity
- 3. Economy-wide phenomenon
- 4. Wave like movement
- 5. Self-enforcing or cumulative
- 6. International
- 7. Feature of capitalist economy
- 8. Unequal effects

Phases of Business Cycle

- Basically, there are two phases of business cycles namely, prosperity or expansion phase and depression or contraction phase. But these two phases are interconnected by other two phases known as recession and recovery phase. These four phases have distinct characters and also affect economy in different ways. It is also necessary to note that there is no any starting point as such of this cycle, neither there is any standard time duration of these phases. These four phases of business cycle can be described as follows:

Phases of Business Cycle Contd.

- **Depression (Contraction)**
- Depression is the most critical and fearful stage of a business cycle. This can be regarded as the first phase of business cycle. In this phase, all economic activities are far below the normal rate of growth. The level of price, credit, wages, profit, production, employment, etc. are at low level. There are also business failures. Hence, the weak firms are compelled to leave the business.
- **Features of Depression**
- 1. Decrease in output (production),
- 2. High degree of unemployment and low level of income,
- 3. Decrease in demand and fall in price level,
- 4. Excessive decrease in price of raw materials and agricultural output,
- 5. Decrease in credit demand due to decrease in investment,
- 6. Decrease in rate of interest and increase in bank liquidity,
- 7. Decrease in construction works, and
- 8. State of hopelessness or pessimism everywhere in the economy.

Phases of Business Cycle Contd.

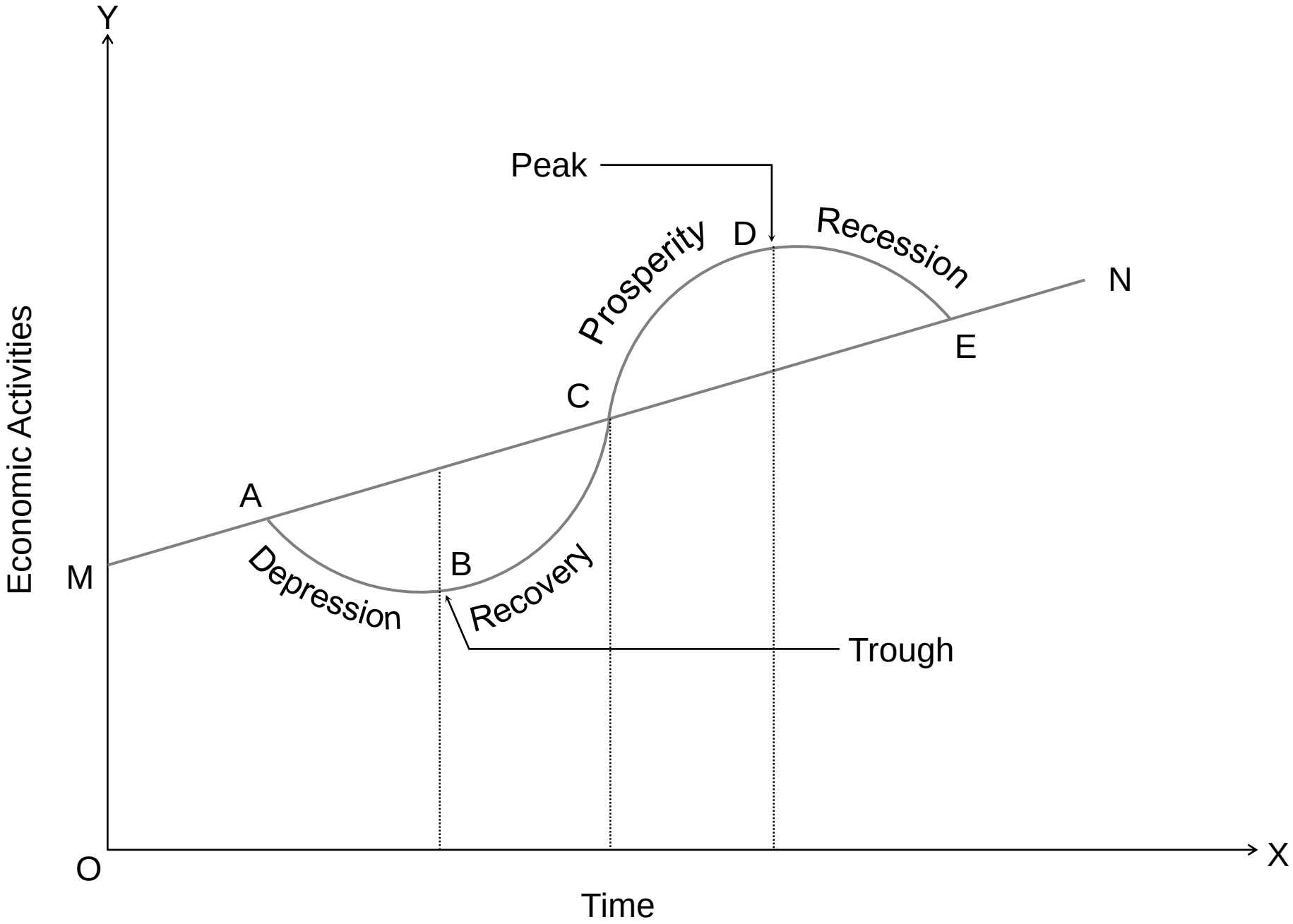
- **Recovery (Revival)**
- Recovery is another phase of business cycle. This phase can be regarded as the second phase. In this phase, all economic activities slowly improve and move towards the state of prosperity. Revival may be caused due to new expectations and political changes or government intervention. The economy suffering from depression, many attempts are carried out by government and private business firms such as banks to increase economic activities.
- **Features of Recovery**
- 1. Increase in output and employment,
- 2. Increase in income and demand,
- 3. Increase in price level,
- 4. Increase in wages and interest rate,
- 5. Improvement in financial market, and
- 6. Increases in marginal efficiency of capital and profit.

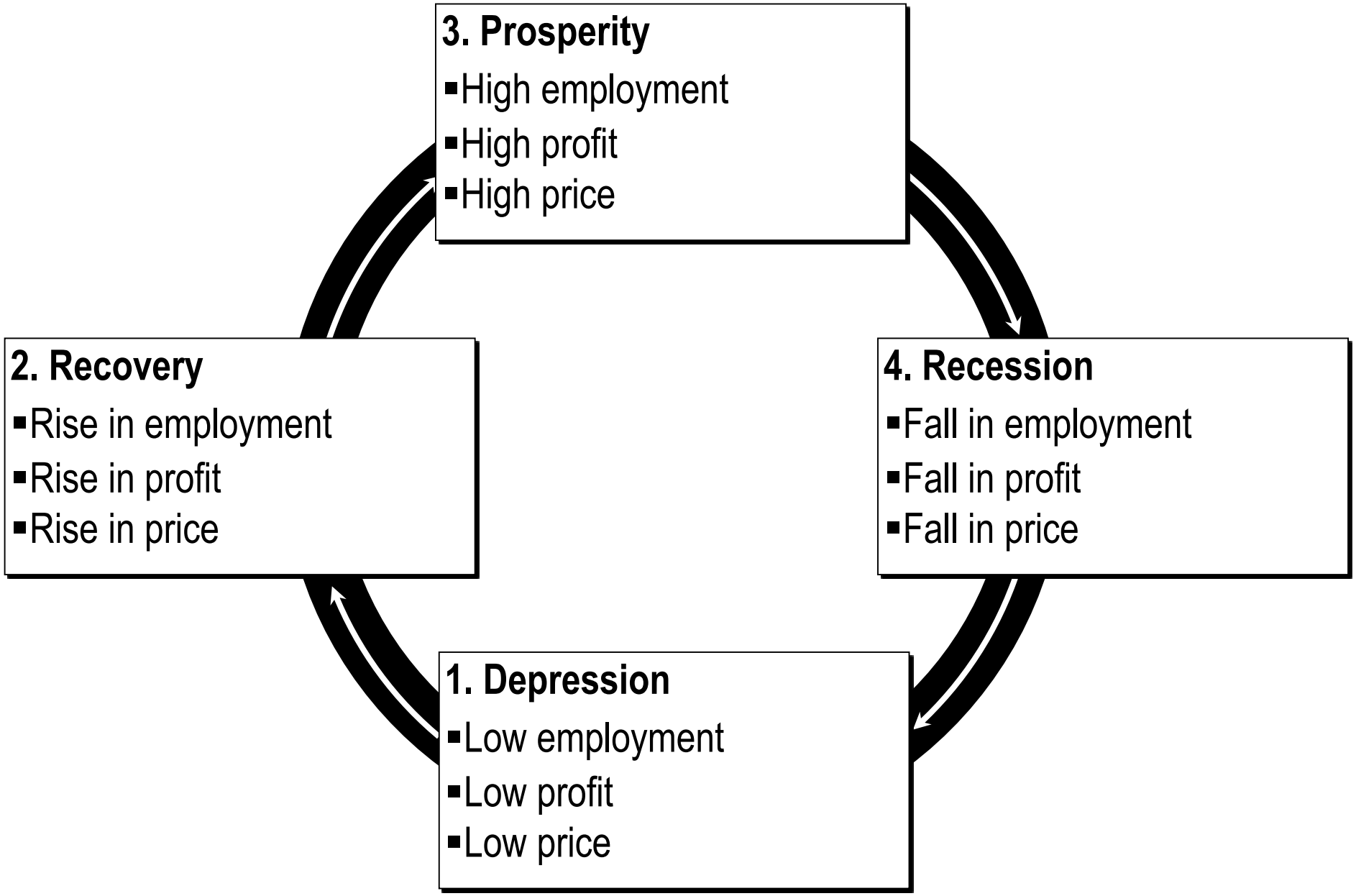
Phases of Business Cycle Contd.

- **Prosperity**
- Prosperity phase emerges after recovery. This phase can also be regarded as the third phase of business cycle as the best phase of business cycle. During this phase of business cycle, all macroeconomic variables increase rapidly. The macroeconomic variables like national income, employment and price level rise at a high level. The factors of production also remain employed or there are no idle resources.
- **Features of Prosperity**
- 1. Excessive increase in the output and employment,
- 2. Increase in demand, price, wages and interest rates,
- 3. Increase in profit margin due to excessive increase in price relative to the increase in cost of production,
- 4. Excessive increase in investment and production,
- 5. State of optimism every where in the economy,
- 6. Full utilization of all factors of production, and
- 7. Increases in loans and bank credit.

Phases of Business Cycle Contd.

- **Recession**
- In business cycle, after the phase of prosperity, the phase of recession starts. This phase starts basically due to fall in consumption of individuals and households. The main cause of fall in consumption is rise in price at the high level. When consumption declines, there will be rise in *business inventory* and the entrepreneurs or business people become pessimistic. So, the business organization will reduce their production and some industries will shut down.
- **Features of Recession**
- 1. Fall in employment, output and income,
- 2. Fall in price level,
- 3. Fall in aggregate demand,
- 4. Fall in profit margin,
- 5. Fall in bank credit supply and demand for bank credit, and
- 6. Pessimism all around the economy.


Y
Economic Activities
Peak
Prosperity
D
Recession
N
E
C
A
M
Depression
B
Recovery
Trough
O
X
Time


3. Prosperity
▪High employment
▪High profit
▪High price
4. Recession
▪Fall in employment
▪Fall in profit
▪Fall in price
1. Depression
▪Low employment
▪Low profit
▪Low price
2. Recovery
▪Rise in employment
▪Rise in profit
▪Rise in price

Part D: Balance of Payment and Exchange Rates

Balance of Payment

- Balance of payment is defined as the systematic record of receipt and payment of a country with the rest of the world. It is a broader concept than balance of trade because it includes both import and export of visible and invisible items. Visible items include import and export of physical goods. The record of these visible items is available in the port. On the other hand, invisible items include all the services exported and imported such as banking, insurance, investment, donation, etc.
- Balance of payment is the complete statement of country's receipts and payments in foreign exchange. It includes total amount of balance of trade, fees of international banks, rewards for services, capital transfer, tourism expenses, transportation services, gifts, donations, remittance of money, etc.

Features of Balance of Payment

- Balance of payment has the following features:
- It is a systematic record of all the economic transactions between one country and the rest of the world.
- It includes all the transactions: visible and invisible.
- It is the annual statement.
- It adopts a double book keeping system. It has two sides: credit side and debit side. Receipts are recorded on the credit side and payments on the debit side.
- In the accounting sense, total credits and total debits in the balance of payment statement always balance.
- When receipts are equal to payments, the balance of payment is in equilibrium; when receipts are greater than payments, there is surplus in balance of payments, and when payments are greater than receipts, there is deficit in the balance of payment.

Components/ Structure of Balance of Payment

- The account of balance of payment is classified into three types: current account, capital account, and cash account. They are described as follows:
- **1. Current account:** Current account is related to the current transactions of a country with other countries.
- **2. Capital account:** Capital account is related to the transaction of capital.
- **3. Cash account:** Cash account is the record of foreign exchange reserve.

Exchange Rate

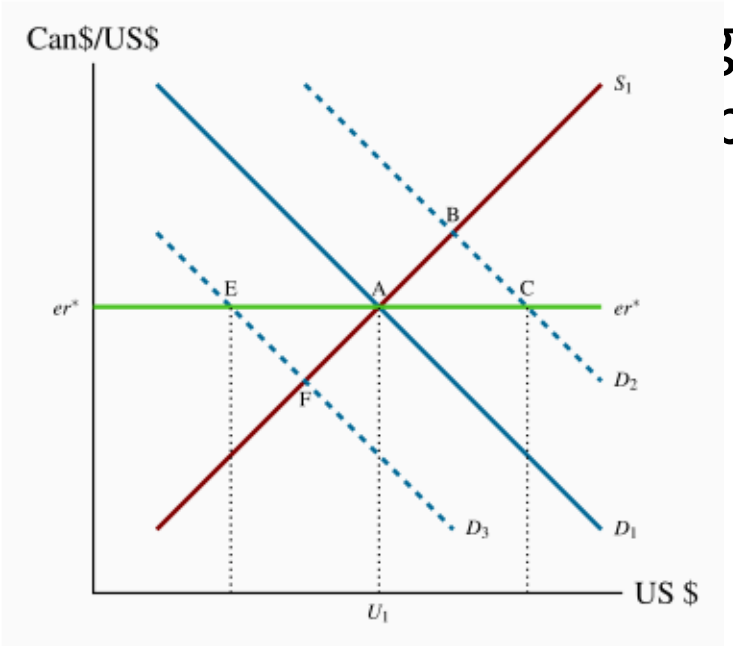
- Exchange rate is defined as the rate at which one country's currency can be turned into another's. The foreign currencies are exchanged or transferred in foreign exchange market. Thus, an exchange rate is simply the rate at which one currency can be exchanged for another currency. For example, if the rate of exchange between US dollar and Nepalese rupees is $1 = NRS 110, this tells us that each US dollar we give up purchases 110 Nepalese rupees.
- The foreign exchange rate is the important determinant of the prices of exports and imports in international trade. The change in foreign exchange rate has direct impact on external trade balance and domestic economy. It provides us a basis for understanding the causes and impacts of fluctuation in foreign exchange rate on the performance of an economy.

Types of Exchange Rate

- 1. Flexible exchange rate
- 2. Fixed exchange rate
- 3. Spot rate
- 4. Forward rate
- 5. Long rate
- 6. Multiple rate
- 7. Two-tire rate system

Fixed Exchange Rate

- Fixed exchange rates refer to a system in which the value of a currency is pegged or fixed to another currency, a basket of currencies, or a commodity like gold. The central bank or monetary authority of a country actively intervenes in the foreign exchange market to maintain the exchange rate at the predetermined level.



ge rate regime, the value of the currency
ble and predictable in relation to other

Flexible Exchange Rate

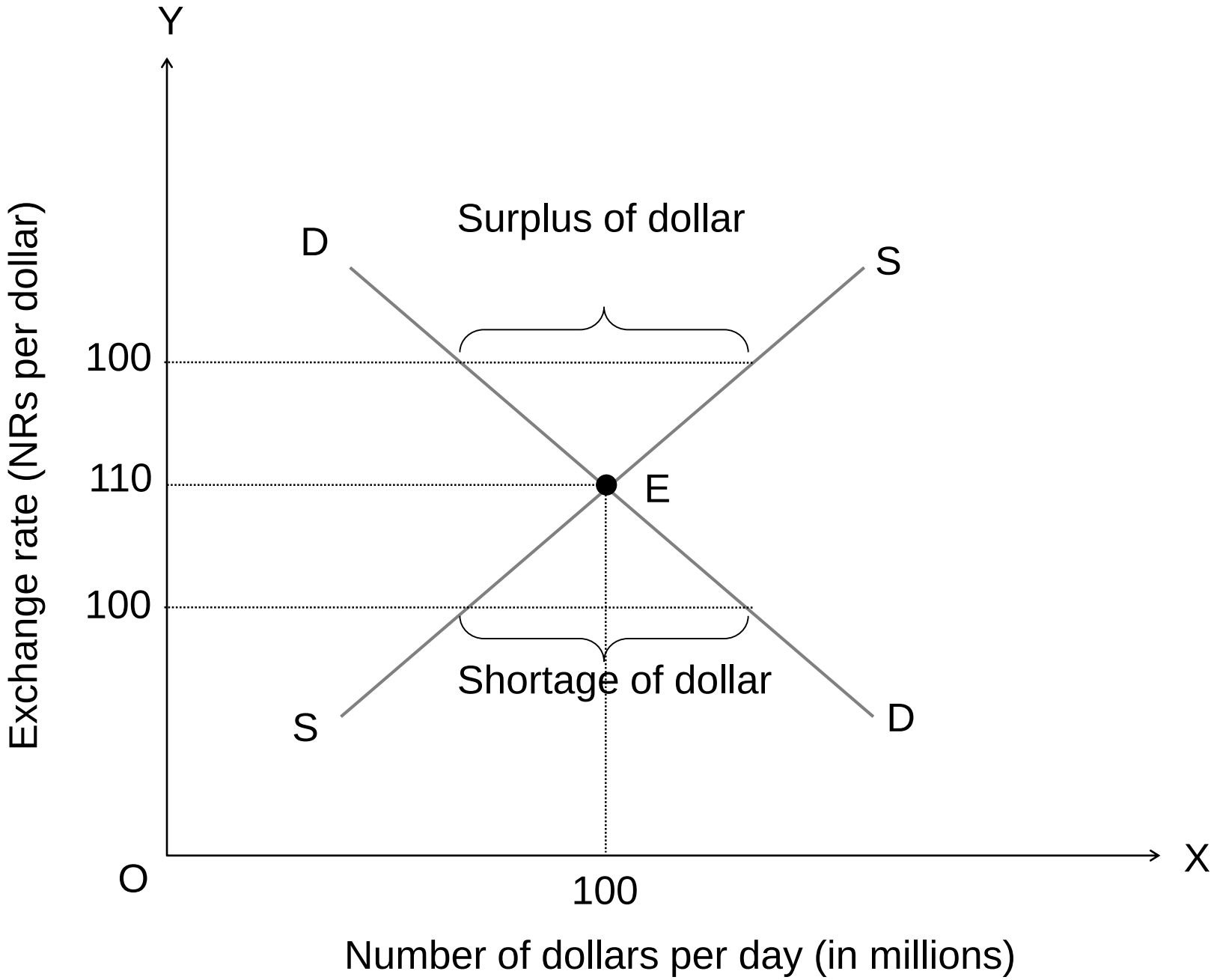
- Flexible exchange rates, also known as floating exchange rates, are determined by market forces of supply and demand in the foreign exchange market. In this system, the value of a currency is not fixed or pegged to any specific rate. Instead, it fluctuates freely based on various economic factors, such as interest rates, inflation, economic performance, and market speculation. The exchange rate adjusts continuously to reflect changing economic conditions and market expectations.

Exchange Rate Determination (Demand Supply Approach)

- According to demand-supply approach exchange rate of a nation's currency in terms of any foreign currency depends on the market demand for and supply of the nation's currency. In the floating or flexible exchange system, the exchange rate is determined by the forces of demand for and supply of foreign exchange.
- **1. Demand for Foreign Exchange (Demand for US dollar):** The demand for dollars by those who hold NRS depends on the desires of those people and business to use dollar to purchase US goods and services and to invest in US financial and physical assets.
- **2. Supply of Foreign Exchange (Supply of US dollar):** The supply of dollars offered in exchange for foreign currency (Nepalese Rupees/NRS) depends on the willingness of holders of dollars to purchase NRS.

Determination of Equilibrium Exchange Rate

- The equilibrium foreign exchange rate (the equilibrium price of US dollar in terms of NRS) is determined in the foreign exchange market by the interaction of demand for and supply of foreign exchange (US dollar). It is shown in figure.


Y
Surplus of dollar
D
S
100
110
E
100
Shortage of dollar
S
D
Exchange rate (NRs per dollar)
O
100
X
Number of dollars per day (in millions)

Part E: Monetary and Fiscal Policies

Monetary Policy

- There are mainly two sub-divisions of macroeconomic policy. They are fiscal policy and monetary policy. Here, we deal with monetary policy which is concerned with the management of the money supply in the economy. It is used for achieving certain given objectives of economic policy. The common objectives of economic policy are the attainment of full employment, price stability, balance of payment equilibrium and rapid economic growth.
- The monetary policy is one of the important macroeconomic policies which is practiced by the monetary authority or central bank to achieve predetermined objectives through the changes in money supply, credit, and interest rate in the economy.

Types of Monetary Policy

- **1. Expansionary (or ease or cheaper) monetary policy:** An expansionary monetary policy is an action taken by the monetary authority (Central Bank) to increase the money supply (i.e. to increase monetary base or its rate of growth). Monetary authority can use its tools, individually or collectively to expand the supply of money. Central bank can purchase treasury bills and bonds in open market, decrease the bank rate or discount rate and reduced the required reserve ratio to increase the money supply in the economy.
- **2. Contractionary (or tight or dearer) monetary policy:** Contractionary money policy is opposite of expansionary monetary policy. It is an action taken by the monetary authority (central Bank) to decrease the money supply (i.e. to decrease monetary base or its rate of growth). Monetary authority can use its tools, individually or collectively to decrease the supply of money. Central bank can sell treasury bills and bonds in open market, increase the bank rate or discounted and increase the required reserve ratio to decrease the money supply in the economy.

Instruments of Monetary Policy

- 1. General / Quantitative / Indirect Instruments of Monetary Policy
- a. Open market operation
- b. Bank rate or discount rate
- c. Minimum reserve requirement ratio

- 2. Selective / Qualitative / Direct Instruments of Monetary Policy
- a. Margin requirement while rediscounting or lending
- b. Regulation of consumer credit
- c. Rationing of credit
- d. Moral suasion
- e. Use of publicity
- f. Direct action
- g. Interest rate ceiling
- h. Differential re-discounts rates for different bills according to the purposes
- i. Different CRR for different deposits
- j. Port-folio regulations

Goals/ Objectives of Monetary Policy

- 1. Full employment
- 2. Price stability
- 3. High economic growth
- 4. Higher level of employment
- 5. Balance in External payment and stable exchange rate

Indicators of Monetary Policy

- 1. Money supply
- 2. Interest rate
- 3. High power money

Targets of Monetary Policy

- The specific values of macroeconomic variables including interest rate, money supply, bank credit and exchange rates that a monetary authority pursues in the course of conducting monetary policy are called targets of monetary policy. The choice of target of the monetary policy is determined through which money supply affects economic growth, employment and prices. The target problems arise because the monetary policy cannot directly and quickly affect the ultimate objectives through its instruments. In order to become good target for monetary policy, the target variable should be early measurable, attainable and closely related to the higher level goal variables. The main targets of monetary policy are money supply, interest rates and bank credit.

Fiscal Policy

- Fiscal policy is the means by which a government adjusts its levels of spending in order to monitor and influence a nation's economy. In other words, fiscal policy is the policy that involves the use of government spending, taxation and borrowing to affect the level and growth of aggregate demand, output and employment.
- Fiscal policy is the use of instruments like public revenue, expenditure and borrowing to have beneficial effects and remove unbeneficial effects on the economy. Through its fiscal policy, a government changes the amount of its budgets needed and attempts to fulfill its targeted objectives.

Classification / Types of Fiscal Policy

- **1. Expansionary Fiscal Policy:** The fiscal policy which increases aggregate demand by increasing government expenditure or by lowering taxes is called expansionary fiscal policy. This type of policy is reflected in the government budget. Due to expansion of government spending and lowering the taxes, expansionary fiscal policy either increases budget deficit or reduces the budget surplus. Such type of fiscal policy is adopted during economic depression.
- **2. Contractionary Fiscal Policy:** The fiscal policy which reduces aggregate demand by either reducing government expenditure or by increasing taxes is called contractionary fiscal policy. Due to reduction in government expenditure and increase in taxes, contractionary fiscal policy results into either increased budget surplus or decreased budget deficit. Such kind of fiscal policy is used during inflationary pressure.

Methods of Fiscal Policy

- 1. Automatic stabilization fiscal policy
- 2. Discriminatory fiscal policy
- 3. Compensatory fiscal policy

Instruments of Fiscal Policy

- 1. Budget
- 2. Taxation
- 3. Government expenditure
- 4. Public borrowing
- 5. Public works

Objectives of Fiscal Policy

- 1. Full employment
- 2. Economic growth and development
- 3. Price stability
- 4. Efficient allocation of financial resources
- 5. Reduction in inequalities of income and wealth distribution
- 6. Balanced regional development
- 7. Reducing the deficit in the balance of payment
- 8. Capital formation
- 9. Development of infrastructure
- 10. Economic stability