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**ECONOMIC
ENVIRONMENT OF BUSINESS**

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INDEX

LESSON 1: INTRODUCTION TO MACROECONOMICS	1
1.1 Learning Objectives	
1.2 Introduction	
1.3 Macroeconomic Variables: Meaning and Relationships	
1.4 Fiscal Policy, Budget Deficits, and Budget Surpluses	
1.5 Business Cycle	
1.6 National Income Accounts	
1.7 Measuring Price Changes: Real vs Nominal GDP	
1.8 Summary	
1.9 Glossary	
1.10 Answers to In-Text Questions	
1.11 Self-Assessment Questions	
1.12 References	
1.13 Suggested Readings	
LESSON 2: NATIONAL ACCOUNTS&PROBLEMS OF GDP MEASUREMENTS	25
2.1 Learning Objectives	
2.2 Introduction	
2.3 Need of National Income Accounts	
2.4 Approach to Measure Economic Activities	
2.5 Measuring GDP (Group Domestic Product)	
2.6 Practical Exercise to Calculate GDP	
2.7 Other Important Concepts	
2.8 Problems Associated with GDP Calculation in India	
2.9 Green GDP	
2.10 Summary	
2.11 Glossary	
2.12 Self-Assessment Questions	
2.13 References	
2.14 Suggested Readings	



LESSON 3: ECONOMIC GROWTH.....	50
3.1 Learning Objectives	
3.2 Economic Growth	
3.3 Growth around the World	
3.4 A Model of Production	
3.5 Solow Growth Model	
3.6 Total Factor Productivity	
3.7 Balanced Growth Path	
3.8 Steady State Growth Path	
3.9 Transition Dynamics	
3.10 Lessons for Developed and Developing Countries	
3.11 Summary	
3.12 Glossary	
3.13 Answers to In-text Questions	
3.14 Self-Assessment Questions	
3.15 References	
3.16 Suggested Readings	
LESSON 4: THE IS-LM MODEL	75
4.1 Learning Objectives	
4.2 Introduction	
4.3 Keynesian Framework	
4.4 The interaction of goods and money market explained by IS-LM Curves	
4.5 The Short-Run Equilibrium in the <i>IS-LM</i> model	
4.6 Effect of Fiscal Policy on the <i>IS</i> Curve and Changes the Short-Run Equilibrium	
4.7 Effect of monetary policy on LM curve and the Short-Run Equilibrium	
4.8 The Interaction between Monetary and Fiscal Policy	
4.9 Summary	
4.10 Glossary	
4.11 Answers to In-Text Questions	
4.12 Self-Assessment Questions	
4.13 References	
4.14 Suggested Readings	



LESSON 5AD/AS FRAMEWORK	93
5.1 Learning Objectives	
5.2 Introduction	
5.3 Supply Side Economics	
5.4 Difference between the Short Run and Long Run	
5.5 The Model of Aggregate Supply and Aggregate Demand	
5.6 Policy effectiveness and AD& AS	
5.7 Fiscal policy	
5.8 Monetary policy	
5.9 Trade and Exchange rate policy	
5.10 Summary	
5.11 Glossary	
5.12 Answers to In-Text Questions	
5.13 Self-Assessment Questions	
5.14 References	
5.15 Suggested Readings	
LESSON 6: PHILIPS CURVE , MONETARY POLICY, AND FISCAL POLICY	110
6.1 Learning Objectives	
6.2 Introduction	
6.3 Philips Curve	
6.4 Expectation Augmented Philips Curve	
6.5 Fiscal Policy	
6.6 Monetary Policy	
6.7 Neutrality of Money	
6.8 Crowding Out	
6.9 Liquidity Trap	
6.10 Role of the central Bank	
6.11 Self-Assessment Questions	
6.12 References	
LESSON 7: THEORIES OF TRADE AND BALANCE OF PAYMENT	142
7.1 Learning Objectives	
7.2 Introduction	



- 7.3 Theories of International Trade
- 7.4 Balance of Payment
- 7.5 Summary
- 7.6 Answers to In-text Questions
- 7.7 Self-Assessment Questions
- 7.8 References
- 7.9 Suggested Readings

LESSON 8: EXCHANGE RATES AND THE MUNDELL–FLEMING MODEL 185

- 8.1 Learning Objectives
- 8.2 Introduction
- 8.3 Exchange Rates and the Foreign Exchange Market
- 8.4 Capital Account Convertibility
- 8.5 The Mundell–Fleming Model
- 8.6 Summary
- 8.7 Glossary
- 8.8 Answers to In-Text Questions
- 8.9 Self-Assessment Questions
- 8.10 References
- 8.11 Suggested Readings



LESSON 1

INTRODUCTION TO MACROECONOMICS

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STRUCTURE

- 1.1 Learning Objectives
- 1.2 Introduction
- 1.3 Macroeconomic Variables: Meaning and Relationships
 - 1.3.1 Output
 - 1.3.2 Aggregate Supply
 - 1.3.3 Aggregate Demand
 - 1.3.4 Unemployment
 - 1.3.5 Inflation
- 1.4 Fiscal Policy, Budget Deficits, and Budget Surpluses
- 1.5 Business Cycle
- 1.6 National Income Accounts
- 1.7 Measuring Price Changes: Real vs Nominal GDP
- 1.8 Summary
- 1.9 Glossary
- 1.10 Answers to In-Text Questions
- 1.11 Self-Assessment Questions
- 1.12 References
- 1.13 Suggested Readings

1.1 LEARNING OBJECTIVES

After studying this chapter, you will be able to:

- Understand the subject matter of macroeconomics
- Trace the behaviour of Indian economy over the past several decades
- Define and measure the important macroeconomic variables.
- Examine the national income accounts of the economy.



1.2 INTRODUCTION

The term macroeconomics was first coined in the year 1933 by the Norwegian economist Ragnar Frisch. It emerged as a major branch of economics during the Great Depression of the 1930s. The severe economic situation during the Great Depression lent importance to the subject matter of macroeconomics. It is the study of the behaviour of the economy as a whole. John Maynard Keynes in his famous book, *'The General Theory of Employment, Interest, and Money'*, developed a framework to systematically analyse the behaviour of aggregate economic variables such as employment and output. His theories were extended and elaborated by his followers during the two decades following World War II. Keynesian economists faced major challenge in the late 1960s, when the world saw an increased interest in monetarism. Monetarism is a body of theory developed during 1940s by Milton Friedman and others. In 1970s, a new school of thought named the new classical economics came into picture. And, during 1980s, Keynesian economics was challenged by a group of economists called the supply-side economists. The real business cycle theory and the new Keynesian economics were two other major schools of thought that emerged in the 1980s and 1990s.

Alfred Marshall has defined economics as the “study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well-being.” This study material examines the branch of economics called macroeconomics, where we study the ordinary business of life in the aggregate. Here, we analyse the behaviour of the economy as a whole. The key variables under macroeconomics are total output in the economy, the aggregate price level, employment and unemployment, interest rates, wage rates, and foreign exchange rates. We will determine the levels of these variables and assess how the variables change over time. The subject matter of macroeconomics includes the rate of growth of output, the inflation rate, changing unemployment in periods of expansion and recession, and appreciation or depreciation in foreign exchange rates.

Macroeconomics is a subject that is policy-oriented. It questions, to what extent can government policies affect output and employment? To what extent the rise in the price level is the result of unplanned government policies? What governmental measures should be taken to achieve the lowest possible rates of unemployment or inflation? Do the policies of the government favour our foreign exchange rates? You will be able to analyse the effects of various policy decisions made by the government after reading this chapter.



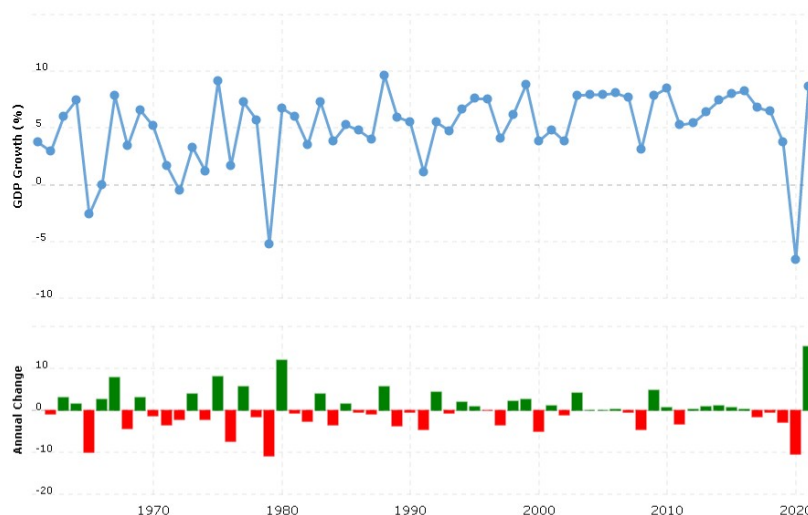
1.3 MACROECONOMIC VARIABLES: MEANING AND RELATIONSHIPS

According to estimates, India once accounted for one-fourth of the global GDP. But, when it gained independence in 1947 it was left with mass unemployment, poverty, starvation, and very few large industries. Even after a few decades of independence, the country was importing wheat and other essential commodities from outside. In this section, we see the trends of key macroeconomic variables such as output, employment, price level, etc. in the context of Indian economy.

1.3.1 Output

Since its Independence, India has come a long from being nowhere to be one of the biggest economies in the world. In 1947, India's GDP was approximately Rs 2.8 lakh crore which has increased many folds to \$3.17 trillion, making it the sixth-largest economy. Figure 1.1 shows the growth rate of output of India from the period 1960–2020. The output measure in the figure is real gross domestic product (GDP). Gross domestic product is the value of current production of goods and services. Real means that the value of the GDP has been adjusted for price change. The data measure growth in the quantity of goods and services produced. The data in the figure show considerable variation in GDP growth over the past six decades. During the 1960s and 70s, there were instances of negative growth in the GDP.

Fig 1.1: GDP Growth Trends (1960-2020)



Source: World Bank (<https://www.macrotrends.net/countries/IND/india/gdp-growth-rate>)



1.3.2 Aggregate Supply

Aggregate supply refers to the quantity of goods and services produced by an economy. Aggregate supply is a function of the price level. Just as in goods markets, higher prices bring about a greater amount of supply in the short-run. Fig 1.2 illustrates a short-run aggregate supply (SRAS) curve and a long-run aggregate supply (LRAS) curve. The real level of output of goods and services (real GDP) is on the horizontal axis and the overall level of prices in the economy is on the vertical axis.

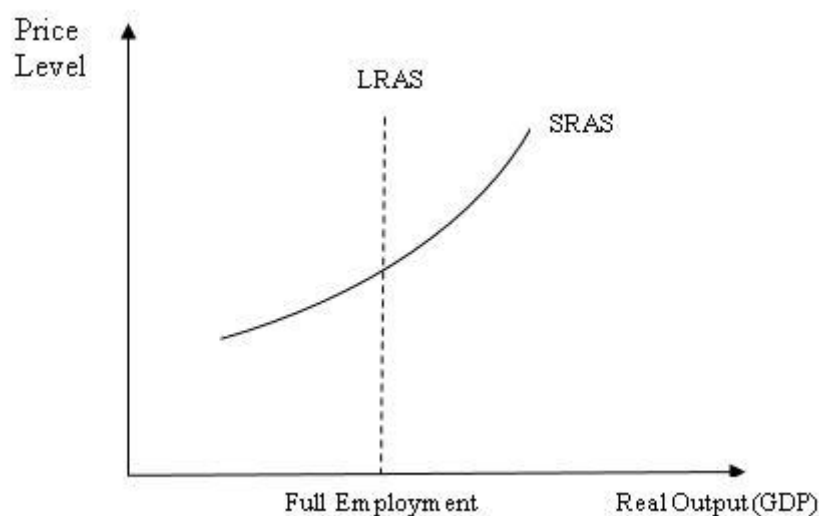


Fig 1.2: Short-run and Long-run Aggregate Supply Curve

From the figure, first we will understand why the LRAS curve is a vertical line and why the SRAS curve slopes upward. Then we will discuss the factors that cause the curves to shift over time. LRAS is not affected by the price level. LRAS is the potential (full-employment) real output of the economy. The potential output of an economy will primarily depend on three factors. Potential output is positively related to:

1. The size of the labour force in the economy
2. The size of the economy's capital stock (productive resources).
3. The technology that the economy possesses.

The amount of labour that is readily available at any given time can change as unemployment changes. The number of people employed and the number of hours they work will change as people decide to enter or leave the workforce, change jobs, businesses grow or fail. When the economy is operating at full employment, the level of real GDP on the LRAS curve



represents the level of production. Remember that there is still some unemployment even when there is full employment. There will always be some unemployment as people look for the best jobs out there, employers look for the best candidates, and as the economy changes and leaves workers from industries with declining employment without the skills needed to work in industries that are expanding.

Along the LRAS curve, there is a natural rate of unemployment that is correlated with the magnitude of real GDP. That level of output is referred to as full-employment GDP. As we will see, the economy can "operate at less than full employment GDP during a recession when cyclical unemployment is high, and (temporarily) at above full-employment GDP during periods of rapid economic growth. The LRAS curve may shift over time as the full-employment quantity of labour changes, as the amount of available capital in the economy changes, or as technology improves the productivity of capital, labour, or both.

Firms will react to changes in the prices of goods and services in the short-term. The key to understanding movements in the SRAS curve is to understand that we are allowing the prices of final goods and services to vary while holding the wage rate and the price of other productive resources constant in the short-run. When goods and services prices rise (fall), businesses have an incentive to expand (reduce) production, and real GDP will increase (decrease) above (below) the full-employment level shown by the LRAS curve. We depict real GDP as an upward-sloping function of price level along the SRAS curve to reflect this. Again, in the short-run, we are holding the money wage rate, other resource prices, and potential GDP (LRAS) constant.

Next, we identify the factors that will shift the SRAS curve. We start with the elements that also affect the LRAS curve. The SRAS and LRAS curves will both shift when the full-employment quantity of labour changes, the amount of available capital in the economy changes or as technology improves the productivity capital, labour, or both. There are some factors that will shift SRAS but not affect LRAS. While constructing the SRAS curve, we held the money wage rate and other resource prices constant. The SRAS curve will shift to the left, showing a decline in short-run aggregate supply, if wage rates or prices of other productive inputs rise. Businesses will reduce their output as the level of output that maximises profits declines when they notice a rise in resource prices. The change in money wage rates is influenced by two significant factors. One is increased unemployment, which lowers the money wage rate because there is already an excess of labour available at the current rate. On the other hand, there will be upward pressure on the money wage rate if the economy is momentarily operating above full employment levels. Expectations of inflation are the second factor that may have an impact on the money wage rate. Money wages will



rise in response to an anticipated rise in inflation, while money wages will decline in response to an anticipated decline in inflation.

1.3.3 Aggregate Demand

The aggregate demand curve shows the relation between the price level and the real quantity of final goods and services (real GDP) demanded. The components of aggregate demand are: Consumption (C). Investment (I). Government spending (G). Net exports (X-M), which is exports minus imports.

$$\text{Aggregate demand} = C + I + G + (X-M)$$

The aggregate demand curve is downward sloping because at higher price levels, consumption, business investment, and exports will decrease. There are two effects here to consider. First, people's real wealth declines as the price level rises. Since they have less accumulated wealth in real terms, individuals will spend less. This is referred to as the 'wealth effect'. Second, interest rates will increase as the price level rises. An increase in interest rates decreases business investment (I) as well as consumption (C) as consumers delay or forego purchases of consumer durables such as cars, appliances and home repairs. This is a 'substitution effect', as consumers substitute consumption later for consumption now because the cost of consuming goods now instead of later (the interest rate) has increased. This is referred to as 'intertemporal substitution', substitution between time periods. So changes in the price level cause changes in (the quantity of) aggregate demand.

Among various factors that can affect aggregate demand there are three primary factors

- Expectations about future incomes, inflation, and profits.
- Fiscal and monetary policy
- World economy.

A rise in anticipated inflation will increase aggregate demand as consumers accelerate purchases to avoid price hikes in the future. An expectation of higher incomes in the future also will cause consumers to increase purchases in anticipation of these higher incomes. An increase in expected profits will lead businesses to increase their investment in plants and equipment.

Fiscal policy refers to government policy with regard to spending, taxes, and transfer payments. An increase in spending increases the government component (G) of aggregate demand. Consumers' spending power (or disposable income) will rise as a result of lower



taxes or higher transfer payments (such as social security benefits or unemployment benefits), which will increase aggregate demand through an increase in consumption (C).

Monetary policy refers to the central bank's decisions to increase or decrease the money supply. An increase in the money supply tends to decrease interest rates and increase consumption and investment spending, increasing aggregate demand. We will look at both monetary and fiscal policy effects more closely in subsequent chapters. The state of the world economy will influence a country's aggregate demand through the net exports (X) component. Increased foreign incomes will result in greater foreign demand for the nation's exports, which will raise X. If the country's exchange rate increases (foreign currency buys fewer domestic currency units), its goods are relatively more expensive to foreigners, and exports will decrease. Additionally, since imports will be relatively less expensive, there will be greater demand for them. Net exports (exports minus imports) will tend to decline as a result of both effects, which will also reduce aggregate demand. The opposite is true when a country's exchange rate declines (currency depreciation), as exports rise, imports fall, net exports rise, and aggregate demand rises.

We show long-run equilibrium at the point where the aggregate demand curve and the LRAS curve converge in Figure 1.3. Changes in the price level of final goods and services can move the economy to long-run macroeconomic equilibrium.

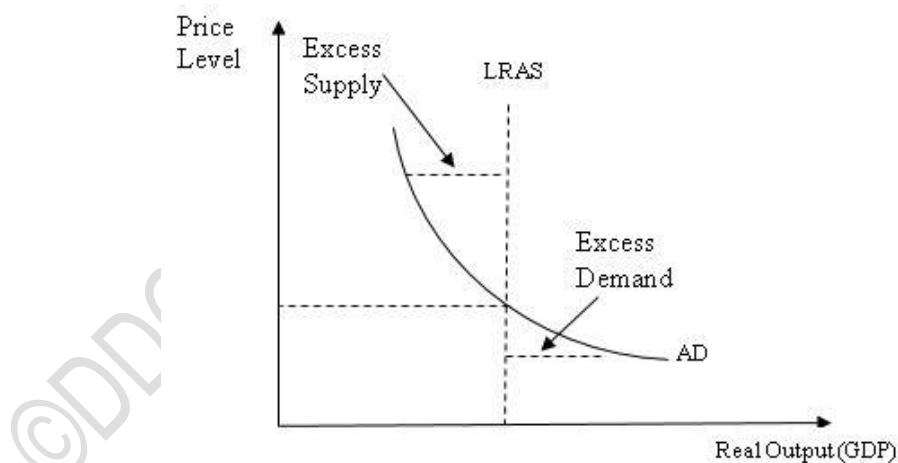


Fig 1.3: Long-Run Equilibrium Real GDP

1.3.4 Unemployment

The unemployment rate, the labour force participation rate (LFPR), and the employment-to-population ratio are the three key labour market indicators. If a person is not working but is



available to work, has actively looked for employment within the past four weeks, has been laid off and is awaiting recall, or will begin a new job within the next 30 days, they are considered to be unemployed. The unemployment rate is the percentage of people in the labour force who are unemployed. All individuals who are either employed or actively looking for work are considered to be part of the labour force.

$$\text{Unemployment rate} = \frac{\text{Number of unemployed person}}{\text{Labour Force}} \times 100$$

During expansions, the unemployment rate falls, and during recessions, it rises. The labour-force participation rate is the percentage of the working-age population who are either employed or actively seeking employment.

$$\text{Labour force participation rate} = \frac{\text{Labour Force}}{\text{Working age Population}} \times 100$$

Changes in the number of discouraged workers—those who are available for work but neither employed nor actively seeking employment—can cause short-term fluctuations in the labour-force participation rate. When the economy is growing, the labour force participation rate tends to rise; during recessions, it tends to fall. Once the expansion takes hold and they feel their chances of finding work are better, discouraged workers who stopped looking for work during the recession are motivated to do so again. The employment-to-population ratio is the percentage of the working-age population who are employed.

$$\text{Employment to Population Ratio} = \frac{\text{Number of employed person}}{\text{Working age Population}} \times 100$$

When unemployment is low (during expansions), the employment-to-population ratio tends to increase, and when unemployment is high (during recessions), it tends to decline. The employment indicators we've covered so far reflect the number of people who have jobs, but to know how much total labour is being performed, we also need to take into account the average amount of time that employees are working. To trace the effects of part-time work and overtime, we calculate aggregate hours, the total number of hours worked in a year by all employed people. Aggregate hours have shown a long-term upward trend, but they have not grown as fast as the labour force because the average workweek (weekly hours worked per person) has been declining over time. Both aggregate hours and the workweek tend to rise during expansions and fall during recessions. Aggregate hours worked is an important measure because it enables us to assess the productivity of labour, the amount of output produced per hour worked. A labour will receive a higher wage rate for being more productive. Money wage rates are adjusted for shifts in the general level of prices to produce real wage rates. The value of an hour's labour is expressed in terms of goods and services



using real wage rates. Real wage rates are calculated using total labour compensation, which includes wages, salaries, and benefits provided by the employer, and they typically fluctuate with labour productivity.

Types of unemployment

1. Frictional unemployment is a result of the economy's ongoing changes, which delay the timely placement of qualified candidates with open positions. Employees spend time and effort seeking work and employers spend time and effort seeking workers. Unemployment resulting from this job search activity referred to as frictional unemployment is a persistent problem as businesses grow or shrink and employees relocate, lose their jobs, or leave to pursue other opportunities.
2. Economic (structural) changes that result in the creation of new jobs for which the unemployed lack the necessary skills are what lead to structural unemployment. Because the unemployed workers lack the necessary skills to fill the newly created jobs, structural unemployment is different from frictional unemployment.
3. Cyclic Variations in the overall level of economic output are the root cause of cyclical unemployment. Cyclical unemployment occurs when the economy is not operating at full capacity. When there is no cyclical unemployment in the economy, there is full employment. But keep in mind that even when the economy is at full employment, there is still structural and frictional unemployment. In other words, even when the economy is at "full employment," there will still be some unemployment.

The natural rate of unemployment is the total of the frictional and structural unemployment rates. The level of output the economy can generate (theoretically) when unemployment is at the natural rate is known as potential GDP. Cyclical unemployment rises when real GDP declines below potential GDP. Cyclical unemployment declines as real GDP increases to and above potential GDP.

1.3.5 Inflation

The rise in the general level of prices is known as inflation. A price index that gauges the overall (or general) price level in relation to a base year is used to determine the rate of inflation. The percentage rate of change in the price index over a specified period is then used to calculate the inflation rate.

An ongoing rise in prices over time is referred to as inflation. A currency's purchasing power is reduced by inflation. Inflation can ultimately destroy a nation's monetary system if it



continues to grow unchecked, forcing people and businesses to use foreign currency or return to bartering physical goods.

The economy is not experiencing inflation if there is a single jump in the price level but no subsequent increases. Increases in the relative prices of some goods or in the cost of a single good alone do not constitute inflation. The cost of almost all goods and services will rise if there is inflation. We can calculate the annual inflation rate by using a numerical measure of the price level, such as the consumer price index or the GDP deflator:

$$\text{Annual Inflation Rate} = \frac{\text{Current Year Price level} - \text{Last Year Price level}}{\text{Last Year Price level}} \times 100$$

The two types of inflation are demand-pull and cost-push. Demand-pull inflation results from an increase in aggregate demand. While, cost-push inflation results from a decrease in aggregate supply.

Demand-Pull Inflation

Increased government spending, an increase in the money supply, or any other factor that raises aggregate demand can all lead to demand-pull inflation. Figure 1.4 illustrates the impact of rising aggregate demand on the price level.

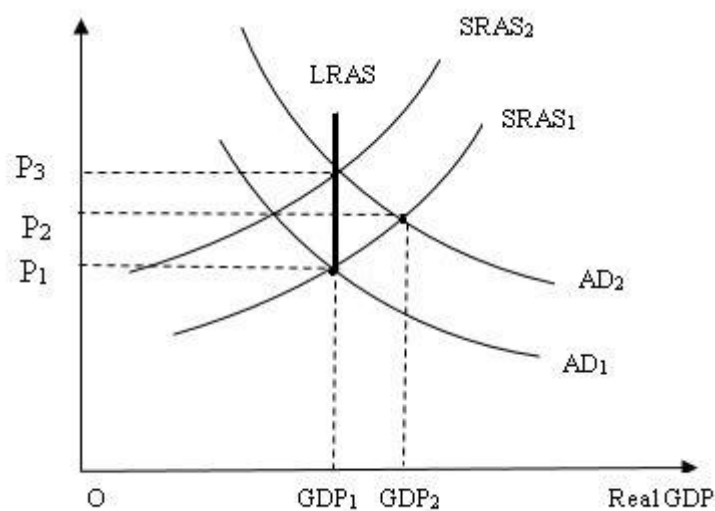


Fig 1.4: Demand-pull Inflation

In Figure 1.4, the economy begins at equilibrium with output at GDP_1 and the price level at P_1 . The aggregate demand and short-run aggregate supply curves are AD_1 and $SRAS_1$. Real



GDP is equal to potential GDP, which is represented by the long-run aggregate supply curve LRAS. Now imagine that the central bank expands the money supply, which increases aggregate demand to AD_2 . With no initial change in aggregate supply, output increases to GDP_2 and the price level increases to P_2 . Real GDP exceeds potential GDP (at full employment) as prices rise. Real GDP growth is unsustainable when it exceeds the level of full employment. When unemployment falls below its natural rate, real wages are under pressure to increase. Rising real wages result in a decrease in short-run aggregate supply (the curve shifts left from $SRAS_1$) until real GDP returns back to full-employment GDP. Demand-pull inflation would continue until the central bank slowed the expansion of the money supply and gave the economy the chance to achieve full employment equilibrium at a real GDP level equal to potential GDP.

Cost-Push Inflation

Inflation can also result from an initial decrease in aggregate supply caused by an increase in the real price of an important factor of production, such as wages or energy. The impact of a decline in aggregate supply on output and price level is shown in Figure 1.5.

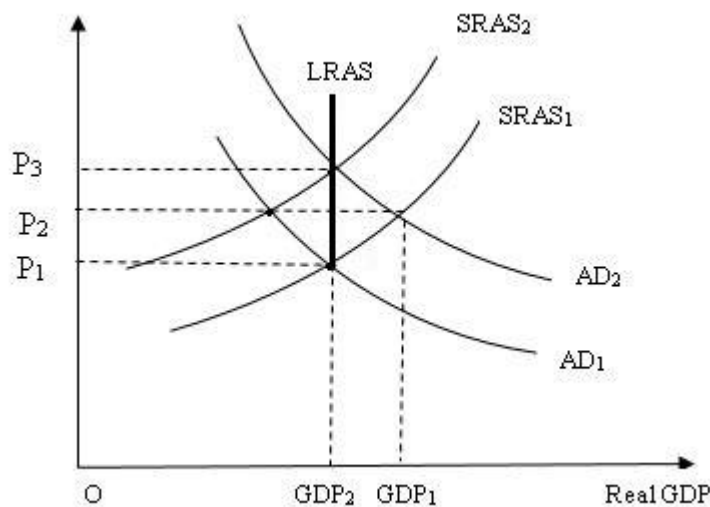


Fig 1.5: Cost-push Inflation

With no initial change in aggregate demand, the reduction from $SRAS_1$ to $SRAS_2$, raises the price level to P_2 , and decreases output to GDP_2 , while $SRAS_1$ remains unchanged. The impact on output is the main distinction between the cost-push and demand-pull effects.



While cost-push inflation results from a reduction in aggregate supply, it initially causes a decline in GDP, demand-pull effects increase GDP above full employment.

The primary indicators used to measure the inflation rates in India is Consumer Price Index (CPI) and Wholesale Price Index (WPI).

Consumer Price Index (CPI)

The retail prices of a fixed "basket" of thousands of goods and services that households buy are measured by the consumer price index (CPI). The CPI is an explicit price index in that it tracks changes in the weighted average of the prices of the market basket's goods and services over time. Because it tracks the costs of goods and services that consumers directly buy, the CPI is the price index that matters most to them. Many government pensions, including Social Security benefits, and some wage rates are indexed to the CPI, meaning that they have provisions for automatic increases geared to increases in the CPI.

The formula for the index is:

$$\text{CPI} = \frac{\text{Cost of basket at current prices}}{\text{Cost of basket at base period prices}} \times 100$$

As measured by the CPI, the inflation rate is given by the following formula:

$$\text{Inflation Rate} = \frac{\text{Current CPI} - \text{Last Year CPI}}{\text{Last Year CPI}} \times 100$$

Calculating the inflation rate based on CPI

Ex: The CPI for all items was 202.9 in June 2021 and 194.5 in June 2020. The CPI for all items less energy was 203.6 in June 2021 and 198.5 in June 2020. Calculate and interpret the inflation rate based on these two measures.

Answer: (i) All items = $\frac{202.9 - 194.5}{194.5} \times 100$

= 4.3%.

(ii) All items ex-energy = $\frac{203.6 - 198.5}{198.5} \times 100$

= 2.6%

As measured by the CPI, the inflation rate for goods excluding energy was less than the inflation rate for all items over this 12-month period. This means energy prices must have been increasing faster than the overall price level.



Wholesale Price Index (WPI)

The wholesale price index (WPI), which calculates the wholesale costs of about 3,000 items, is another widely used price index. Since many raw materials and semi-finished goods are sold at the wholesale level, changes in the WPI predict future changes in retail prices, such as those tracked by the CPI.

1.4 FISCAL POLICY, BUDGET DEFICITS, AND BUDGET SURPLUSES

The use of taxation and spending by the federal government to achieve macroeconomic objectives is referred to as fiscal policy. Fiscal policies are used to stabilize the economy. When the government receives the same amount in tax revenue as it spends during a fiscal year, the budget is said to be balanced. A budget deficit occurs when government spending exceeds tax revenue, and a budget surplus occurs when the opposite is true.

Taxes are raised and/or reduced by the government during inflationary periods and increased and/or decreased by the government during recessionary periods to deal with changes in the business cycles.

The largest component of GDP is total investment. Investment is defined as outlays for inventory and fixed productive assets. National savings, foreign borrowing, and government savings are the three main sources of funding for investments. The first two elements come from private financing sources. Government savings, the third source, are equal to the difference between government tax receipts and expenditures. Government budget deficits (borrowing rather than saving) result in a decrease in the sources of total investment, whereas budget surpluses (savings) increase those sources. Investment has a direct impact on real GDP growth. Less capital is created as investment falls, which lowers the real GDP growth rate. On the other hand, as investment increases, more capital is produced, increasing the growth rate of real GDP.

The government's decisions regarding taxes and spending have a big impact on the markets for investment capital. Taxes on capital gains have an impact on the amount saved and invested, which changes real GDP growth. The incentive to save falls as taxes imposed on capital income rise (after-tax returns on saving fall). Therefore, as taxes on capital income rise, private savings likely will fall.

The availability of government savings is impacted by fiscal policy as well. Budget deficits necessitate government borrowing, just as budget surpluses signify government saving (negative saving or dissaving). Larger budget deficits reduce savings rates, which raises the



real interest rate and causes businesses to borrow less money and invest less in physical capital. This adverse effect of a budget deficit on private investment in capital is referred to as the crowding out effect. The decrease in the growth rate of capital will reduce potential GDP.

IN-TEXT QUESTIONS

The different phases of the business cycle are:

peak and trough
inflation and deflation
expansion and contraction
employment and unemployment

The unemployment rate is defined as the number of unemployed as a percentage of the _____.

Labour force
Number of employed
Working-age population
Civilian non-institutional population.

Which of the following indicators moves inversely with the business cycle?

Aggregate hours
Unemployment rate
Labour force participation rate
Employment-to-population ratio

Which of the following would be counted as frictional unemployment?

Due to the negative growth of GDP, person X was laid off
Person X was fired from his job after he got into an argument with his foreman, and has not sought a new job
Although there were jobs available, person X was unable to find an employer with an opening
When the plant was modernized, person X lost her job because she did not have the skill needed to operate the new equipment

The value of an hour's labour in terms of goods and services is called:

Productivity
The real wage rate
The nominal wage rate
Total labour compensation.



1.5 BUSINESS CYCLE

The business cycle is characterized by fluctuations in economic activity. The two main factors used to identify the current stage of the cycle are real GDP and the rate of unemployment. There are two stages of the business cycle: expansion (where real GDP is rising) and contraction or recession (real GDP is decreasing). The business cycle's peak and trough are the transitional points between the phases. In Figure 1.6, the phases and turning points are depicted.

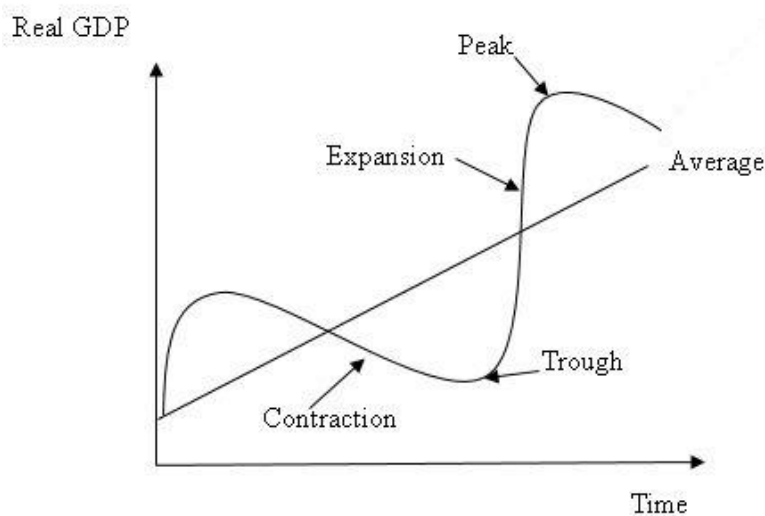


Fig 1.6: Business Cycle

Short-term, or cyclical, changes in output and employment typically result from changes in both actual and potential output. The level of output that the economy could produce at high rates of resource utilisation is known as potential output. Such abrupt changes in output result from variations in labour and capital utilisation rates. In the long-run, potential output growth—which denotes growth in the quantity of factors of production (labour and capital) that are available as well as technological advancements—becomes a significant factor in determining output growth.

1.6 NATIONAL INCOME ACCOUNTS

In subsequent chapters, we will examine macroeconomic models. These models, which are condensed versions of the economy, make an effort to capture key elements affecting aggregate variables like output, employment, and price level. This chapter begins by defining



the real-world counterparts of the variables in our models as a prelude to comprehending such relationships. Because we build our models using these relationships, it also takes into account the accounting relationships that exist between these variables. We start by describing the key variables measured in the national income accounts. Nobel Prize-winning economists Simon Kuznets and Richard Stone played pioneering roles in the development of national income accounting. In India, economists such as V.K.R.V. Rao, R.C. Dutt, Dada Bhai Nauroji, etc. played an important role in the study of national income accounting. In India, national income accounts data are published by National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Government of India.

Like the accounts of a business, national income accounts have two sides: a product side and an income side. Production and sales are tracked on the product side. The distribution of sales proceeds is measured on the income side. Gross domestic product (GDP) and gross national product (GNP) are two frequently reported indicators of total production on the product side (GNP). They differ in their treatment of international transactions. GNP includes earnings of Indian businesses overseas and Indian residents working overseas; GDP does not. Conversely, GDP includes earnings in India of foreign residents or foreign-owned firms; GNP excludes those items. For example, profits earned in India by a foreign-owned firm would be included in GDP but not in GNP. For country like India, the difference between GNP and GDP is huge as large number of residents working overseas.

Gross Domestic Product

Gross domestic product (GDP) is defined as a measure of all currently produced final goods and services evaluated at market prices. Before moving further we need to clarify some aspects of above definition.

- **Currently Produced:** The value of only currently produced goods and services is included in the GDP. It is a flow measure of output that only includes the goods and services produced during the given time period, such as a quarter or an entire year. Market transactions such as exchanges of previously produced machinery, scooters or buildings do not enter into GDP. Other market exchanges, such as those involving stocks and bonds, do not directly involve the current production of goods and services and are therefore excluded from the calculation of GDP.
- **Only Final Goods and Services:** Only the final goods and services produced by an economy are included in its GDP. Intermediate goods that are used to produce other goods rather than being sold for final consumption are not counted separately in GDP. The problem of double counting will arise if they are counted separately. For



example, we would not count the value of metal sheets used in the manufacturing of a car separately and then again when the car is sold.

- **Evaluated at Market Prices:** Market prices for goods and services are a common yardstick for estimating GDP. This makes it possible to measure things like apples, oranges, machines, clothes, etc. However, the calculation of GDP does not include goods and services that are not traded on markets. For instance, the services of housewives or the produce of kitchen gardens, as well as unreported or unlawful transactions like prostitution, gambling, and the sale of illegal drugs. GDP is sensitive to changes in the average price level because it measures the value of output in terms of market prices. At different average market prices, the same physical output will correspond to a different GDP level. In order to account for this, real GDP, in addition to GDP calculated in terms of current market prices, is also calculated. GDP can be broken down into four components that are, $GDP = \text{Consumption (C)} + \text{Investment (I)} + \text{Government Purchases (G)} + \text{Net Exports (X-M)}$

Or

$$Y = C + I + G + (X-M) \quad \dots\dots\dots (i)$$

The consumption component of GDP consists of the household sector's purchases of currently produced goods and services. Consumption can be broken down into consumer durable goods (e.g., automobiles, televisions), non-durable consumption goods (e.g., foods, beverages, clothing), and consumer services (e.g., medical services, haircuts).

Three sub-components make up the investment portion of the GDP. The largest of these is business fixed investment. Business fixed investment consists of purchases of newly produced capital goods like plant and equipment. The second sub-component of investment is residential construction investment, the building of single- and multifamily housing units. The final subcomponent of investment is inventory investment, which is the change in business inventories which may be positive or negative.

Government purchases of goods and services is the next part of GDP. This is the share of the current output bought by the government sector, which includes the central government as well as state and local governments. It should be noted that not all government spending is included in GDP because not all spending reflects a demand for goods and services that are currently being produced. Government transfer payments to individuals (e.g., Social Security payments) and government interest payments are examples of expenditures that are not included in GDP.



Net Exports is the final component of GDP. Net exports are the sum of all gross exports less all imports. Gross exports are the goods and services that are currently produced and sold to customers abroad. They are included in GDP. Imports are purchases made by domestic consumers of goods and services made elsewhere and are not appropriate to include in GDP. However, the GDP totals for consumption, investment, and government spending do include imported goods and services. To calculate the total value of goods and services produced domestically, we must first subtract the value of imports. The (net) direct impact of transactions in the foreign sector on GDP continues to be net exports.

National Income

Let's move on to the national accounts' income side. The total GNP rather than GDP serves as the starting point when calculating national income. As previously stated, GNP includes income earned by Indian residents and businesses from abroad but does not include earnings of foreign residents and businesses from India's domestic production. In order to calculate GNP from GDP, we first add the foreign earnings of Indian residents and businesses, followed by the foreign earnings of Indian residents and businesses.

The total factor earnings from the current production of goods and services make up the national income. Earnings from production factors like labour, capital, and land are referred to as factor earnings. Although GNP and national income are sometimes used interchangeably, there are some minor adjustments needed to convert between the two. Depreciation is the factor that is excluded from national income. The portion of the capital stock used up must be subtracted from final sales before national income is computed. Depreciation represents a cost of production, not factor income. Making this subtraction gives us net national product (NNP).

$$\text{GNP} - \text{Depreciation} = \text{NNP} \quad \dots\dots\dots (ii)$$

Personal and Disposable Personal Income

The basis for some accounting definitions or identities used to build macroeconomic models is the interrelationships between GDP, national income, personal income, and personal disposable income. Income earned from the current production of goods and services is measured as national income. However, it is convenient to have a measure of income received by persons regardless of source. For instance, income has an impact on a household's consumption expenditures. Therefore, the relevant income concept is all income received by persons.



Personal income is the income received by persons from all sources. When we subtract personal tax payments from personal income, we get disposable (after-tax) personal income. To go from national income to personal income, we subtract elements of national income that are not received by persons and add income of persons from sources other than current production of goods and services. The portion of corporate profits in the national income accounts that are not distributed as dividends to individuals is the first of the main items subtracted from national income to calculate personal income. These portions include corporate profits tax payments and undistributed profits (retained earnings). The contributions made by both employees and employers to Social Security are another item deducted from national income when calculating personal income.

Payments to individuals that are not in exchange for the current production of goods and services are items that are added to the national income to obtain personal income. Transfer payments come first on the list. Most of these are transfers from the government, like Social Security payments, pensions, and payments to retired government workers. Interest payments made by the government to people is also been added. Bonds previously issued by the central, state, and local governments receive interest payments from the government. These adjustments will give personal income. Personal taxes are then subtracted to obtain personal disposable income.

$$Y_D = Y - T \quad \text{..... (iii)}$$

Where Y_D is personal disposable income, Y is personal income and T is the personal taxes. Personal saving is the part of personal disposable income that is not spent. And all disposable income goes for consumption expenditures or personal saving.

$$Y_D = C + S \quad \text{..... (iv)}$$

Or, we can write it as

$$Y = C + S + T \quad \text{..... (v)}$$

If we ignore external sector for the simplification of our understanding we will have

$$Y = C + I + G \quad \text{(from eq i)}$$

Therefore, we will have

$$C + I + G \equiv Y \equiv C + S + T \quad \text{..... (vi)}$$

This identity states that expenditures on GDP ($C + I + G$) by definition equal dispositions of national income ($C + S + T$).



1.7 MEASURING PRICE CHANGES: REAL VS NOMINAL GDP

Nominal GDP, which measures currently produced goods and services valued at current market prices, has been the subject of our discussion up to this point. When the overall price level and the volume of production change, GDP calculated at current market prices will also change. For many purposes, we want a measure of GDP that varies only with the quantity of goods produced. Such a measure would be most closely related to employment. The GDP measure that changes only when quantities, not prices, change is termed real GDP. Real GDP is calculated by measuring output in terms of constant prices starting from a base year.

Real GDP changes only when production changes; nominal GDP changes whenever the quantity of goods produced changes or when the market price of those goods changes. Therefore, the two measures' movements sharply diverge when prices are changing dramatically.

Implicit GDP deflator gives the ratio of nominal GDP to real GDP (nominal GDP $\div$ real GDP), where the ratio is multiplied by 100. The ratio of nominal GDP to real GDP is a measure of the value of current production in current prices (e.g., in 2022) relative to the value of the same goods and services in prices for the base year (2011). The ratio of nominal GDP to real GDP is simply the ratio of the current price level of goods and services relative to the price level in the base year because the same goods and services are present at both the top and bottom. It is a measurement of the total (or overall) level of prices, also known as the price index.

By comparing implicit GDP deflator values across years, we can track changes in the overall level of prices. The ratio of nominal to real GDP is termed a deflator because we can divide nominal GDP by this ratio to correct for the effect of inflation on GDP—to deflate GDP. This follows because

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}}$$

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

The GDP deflator is an implicit price index since we first construct a quantity measure, real GDP, and then compare the movement in GDP in current and constant rupees to measure the price changes. We do not explicitly measure the average movement in prices. Two explicit price indices are the Consumer Price Index (CPI) and the Wholesale Price Index (WPI).



Chain-Weighted Real GDP

When real GDP is calculated using prices from a base year, two issues occur. One issue is that every time the base year is altered, we change the weights assigned to various sectors.

Second, changes in relative prices and consequent substitutions among the product categories contained in GDP. For instance, since 2005, the relative price of personal computers has decreased, and consumers' spending patterns have shifted toward computer purchases. Computers will be overstated as a GDP component if the higher 2005 prices are used to weight the computer component when calculating real GDP. Government agencies use the chain-weighted measure of real GDP to address these issues. Here, the chain-weighted measure uses the average of the prices in the current year and the year prior as weights as opposed to using prices from a base year. In order to calculate real GDP in 2020, prices from 2019 and 2021 are weighted. In practice, the base advances annually to solve the issue brought on by relative price-induced substitutions.

What is not comes under GDP?

The most comprehensive measure of a country's economic affair is the GDP. Researchers and decision-makers frequently use GDP to track both short- and long-term growth trends in any economy. It does, however, have some expectations.

Non-market productive activities: Non-market production, such as homemaker services, are not included in GDP because goods and services are valued at market prices.

Illegal economic activities: The GDP excludes both legal activities that are not reported to avoid paying taxes as well as illegal economic activities like gambling and the drug trade.

GDP does not reflect welfare: GDP does not reflect welfare or even material well-being; it measures the production of goods and services. Leisure is not given any weight. Additionally, some production-related welfare costs are not subtracted. For instance, we count the production of electricity in GDP but do not deduct the economic loss from the pollution if it results in acid rain, water pollution and dying forests. In fact, if the government spends money to try to clean up the pollution, we count that too. GDP is a useful indicator of economic activity in general, not of welfare.

GDP and Happiness: If it is not a welfare measure, one would not expect GDP to measure happiness. According to studies, Ghanaians are happier than Americans are with their lives, and Nigerians are just as happy as French people. In a society, relative income might be more significant than absolute income. The government of Bhutan has placed more emphasis on gross national happiness (GNH), not GDP.



1.8 SUMMARY

Our country has emerged as the fastest growing major economy in the world and is expected to be one of the top three economic powers in the world in the coming years. In this chapter, we have discussed about the past performance and current trends in the key macroeconomics variables of the Indian economy. India is anticipated to have the third-largest economy in the world by the year 2031. The economy's long-term growth outlook is favourable due to its young population, low dependency ratio, high savings rate, and international investments.

India is now completely self-sufficient in terms of food grains. From receiving food aid due to famine and other issues to becoming a new exporter, India has come a long way. Crop-yield-per-unit-area of all crops has grown since 1950 because of special emphasis on the sector and advancements in irrigation, technology, subsidies, and agricultural credit.

India was largely isolated from international markets until 1991. There were quantitative restrictions, export taxes, and import tariffs that applied to international trade. The FDI was also restricted by upper-limit equity participation, apart from government approval.

Due to increased production of fast-moving consumer goods, increased foreign direct investment (FDI), and ease of doing business, the manufacturing and industry sector has experienced growth in recent years. Following the country's independence, domestic sector has faced with increasing foreign competition including the threat of cheaper Chinese imports. The country has since handled the change by flattening costs, revamping management and new technology. The "Aatmanirbharat" campaign in India has also revitalised MSMEs that had fallen behind because of foreign competitors.

The services sector has the largest share of India's GDP, accounting for 53 percent in 2021-22. Nearly 25% of the workforce is employed in the services sector. The percentage of the labour force that is unemployed is known as the unemployment rate. Due to the Covid-19 lockdown, unemployment spiked in recent years and has continued to be extremely high even after more than two years of economic recovery.

1.9 GLOSSARY

Potential Output: *is the level of output that would be reached if productive resources (labour and capital) were being used at benchmark high levels.*

Consumer Price Index (CPI): *It is the measure of the retail prices of a fixed "market basket" of several hundred goods and services purchased by households*



Wholesale Price Index (WPI): *It measures the wholesale prices of approximately 3,000 items*

Price Index: *measures the aggregate price level relative to a chosen base year.*

Personal Income: *measure of income received by persons from all sources*

National Income: *is the sum of the earnings of all factors of production that come from current production*

Government Purchases: *goods and services that are the part of current output that goes to the government sector—the central government as well as state and local governments*

Net Exports: *total (gross) exports minus imports*

Investment: *is the part of GDP purchased by the business sector plus residential construction*

Capital Goods: *capital resources such as factories and machinery used to produce other goods*

Depreciation: *portion of the capital stock that wears out each year*

Gross Domestic Product (GDP): *measure of all currently produced final goods and services*

Aggregate Demand: *is the sum of the demands for current output by each buying sector of the economy: households, businesses, the government, and foreign purchasers of exports*

Trade Deficit: *the excess of imports over exports*

Unemployment Rate: *the number of unemployed persons expressed as a percentage of the labour force*

Monetary Policy: *central bank's use of control of the money supply and interest rates to influence the level of economic activity*

Money: *is whatever is commonly accepted as payment in exchange for goods and services (and payment of debts and taxes).*

1.10 ANSWERS TO IN-TEXT QUESTIONS

- | | |
|---|---|
| 1. (c) The phases of the business cycle are called expansion and contraction (or recession). | 4. (c) One of the causes of frictional unemployment is that information regarding prospective employees and employers is costly and sometimes hard to find. |
| 2. (a) The unemployment rate is the number of unemployed as a percentage of the labour force, | 5. (b) The real wage rate measures the purchasing power of an hour's |



3. (b) The unemployment rate increases when GDP decreases, and decreases when GDP increases. The other three indicators move in the same direction as the business cycle

labour. The nominal wage rate is the money value of an hour's labour. Productivity is output per hour of labour, one of the determinants of the real wage rate. Total labour compensation is one of the measures of the real wage rate.

1.11 SELF-ASSESSMENT QUESTIONS

1. What is inflation rate? Explain how inflation rate is calculated.
2. Define unemployment. And also explain the different types of unemployment.
3. Define the term gross domestic product. Explain which transactions in the economy are included in GDP.
4. What are the factors that determine the cyclical behaviour of output and employment?
5. Explain some of the major limitations of the GDP concept.
6. Define the terms personal income and personal disposable income. Explain how do these income measures differ from national income?
7. Explain the differences among the GDP deflator, the CPI, and the PPI.
8. Define potential output. Explain why is potential output difficult to measure?

1.12 REFERENCES

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1.13 SUGGESTED READINGS

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LESSON 2

NATIONAL ACCOUNTS & PROBLEMS OF GDP MEASUREMENTS

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STRUCTURE

- 2.1 Learning Objectives
- 2.2 Introduction
- 2.3 Need of National Income Accounts
- 2.4 Approach to Measure Economic Activities
- 2.5 Measuring GDP (Gross Domestic Product)
- 2.6 Practical Exercise to Calculate GDP
- 2.7 Other Important Concepts
- 2.8 Problems Associated with GDP Calculation in India
- 2.9 Green GDP
- 2.10 Summary
- 2.11 Glossary
- 2.12 Self-Assessment Questions
- 2.13 References
- 2.14 Suggested Readings

2.1 LEARNING OBJECTIVES

After studying this material, you will be able to:

- Understand the logical structure of an economy
- Understand how to measure economic activities of an economy
- Appreciate the contribution of different sectors in the economic growth of an economy
- Perceive the problems involved in measuring economic activities and limitation of national income accounting



- Differentiate between real and nominal economic indicators of an economy
- Converse about other important economic indicators which are not covered under national income accounting

2.2 INTRODUCTION

Precise measurement is an important component of a scientific study. To have a fair idea of how the economy works, we should have an accurate measure of macro-economic variables. Good measures, helps policy makers to develop policies, which are best for an economy; National Income Accounting is one such measure. In 1930's, Simon Kuznets a Noble Prize winner calculated the size of the US national income for the first time.

The focus of this chapter is on national income accounts, which is widely used by the researchers, economists and policy makers to judge the robustness of an economy. The national income accounts is a conceptual framework, which measures economic activities. It uses the double-entry bookkeeping principle of business accounting.

2.3 NEED OF NATIONAL INCOME ACCOUNTS

National income accounts help to evaluate the performance of an economy, which further helps in economic planning. The major determinants of economic welfare are distribution of national income, per capita income and economic growth; all these factors are evaluated through national income accounts.

National income data combined with financial and monetary data helps to make policies on inflation. National income accounting help us to know the sector specific share in the national income, which further provides the information about the structural changes taking place in the economy. Through National Income Accounting, we can forecast the impact of various economic policies on production and employment of an economy.

2.4 APPROACH TO MEASURE ECONOMIC ACTIVITIES

Almost every country maintains a national income account because it provides a comprehensive measure of an economy's output, revenues and expenses. The national income account is based on the amount of economic activities that occurs over a given period, these economic activities can be measured by

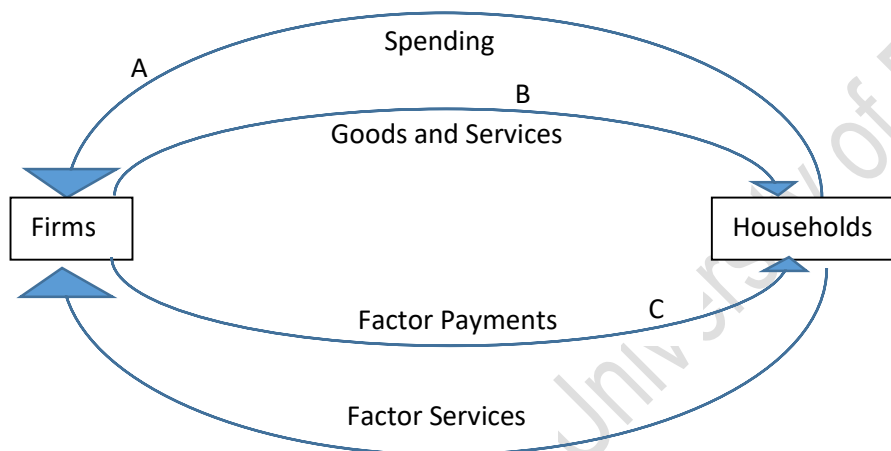
1. The final product of an economy, excluding the intermediate produce [**Product or Value Added Approach**]



2. The income earned by the factor of production [**Income Approach**]
3. The total amount of spending done in an economy [**Expenditure Approach**]

Every approach shows different perspectives for a given economy. If there is no misreporting and incomplete data, then all the three approaches will give the same measures of an economy in a given year.

Figure 2.1: Circular flow of two sectors [Household and Firms]



The arrows in the upper half of the above figure shows the flow of goods and services provided by the firms to the households and the expenditure done by the households on the purchase of these goods and services. The arrows in the lower half of the figure shows the flow of factor services rendered by the households to the firms and the payment of these factor services by the firms to the households.

We can analyse from the figure, that the same amount of money representing the aggregate value of goods and services, is moving in a circular way. Therefore, to estimate the aggregate value of goods and services during a year, we can measure it through arrow A, B, or C.

Arrow A (from Households to Firms) shows the aggregate spending; it represents the Expenditure Method

Arrow B (from Firms to Households) shows the aggregate value of goods and services; it represents the Product or Value-Added Method

Arrow C (from Firms to Households) shows the total factor income; it represents the Income Method

The monetary units of all the three methods are same for a specific year.



Illustration 2.1: Showing equivalence between the three approaches

Suppose there are only two firms in an economy, Apple Co that produces apples and sell them in an open market. The other firm, Juice Co purchases some portion of the total apples produce from the open market, process it to make apple juice and then sell them to the public.

Table 2.1: Representing the transitions of the each firm

Apple Co		Juice Co	
Transaction	Amount (Rs.)	Transaction	Amount (Rs.)
Wages paid to Employees	30,000	Wages Paid to Employees	20,000
Total Revenue Received (70,000)		Apple Purchase from Apple Co	50,000
1. Apple sold to the public	20,000	Revenue Received by selling juice in public	80,000
2. Apple sold to Juice Co	50,000		

6. Product Approach: It measures the value added of final goods and services, it does not include the value of intermediate goods and services (*Reason: to avoid double counting*). Hence,

Value added of final goods = Value added of total output-Value added of intermediate (Inputs used in production, purchased from other firms)

For Apple Co:

Value added of Apple = Rs. 70,000

For Juice Co:

Value added of Juice = Rs. 80,000*-Rs. 50,000=Rs. 30,000

Total Value added of final goods = Value added of apple +Value added of juice
 = Rs. (70,000+30,000)
 = Rs. 100,000

(*Note: Rs. 80,000 includes Rs. 50,000)

7. Income Approach: It measures the economic activity by adding all the factor payments.

For Apple Co:

Entrepreneur Net profit = Revenue –Cost (Wage)



$$= \text{Rs. } 70,000 - \text{Rs. } 30,000$$

$$= \text{Rs. } 40,000$$

$$\text{Wage of the employees} = \text{Rs. } 30,000$$

For Juice Co:

$$\text{Entrepreneur Net profit} = \text{Revenue} - \text{Cost (Wage + Amount of Input)}$$

$$= \text{Rs. } 80,000 - \text{Rs. } 20,000 - \text{Rs. } 50,000$$

$$= \text{Rs. } 10,000$$

$$\text{Wage of the employees} = \text{Rs. } 20,000$$

$$\begin{aligned} \text{Income of all the factors} &= \text{Entrepreneur Profits} + \text{Wages} \\ &= \text{Rs. } (40,000 + 10,000) + \text{Rs. } (30,000 + 20,000) \\ &= \text{Rs. } (50,000 + 50,000) \\ &= \text{Rs. } 100,000 \end{aligned}$$

8. Expenditure Approach: This approach measures the value of economic activities by adding all the spending done on final goods and services.

For Apple Co:

$$\text{Expenditure done on Apples by the households} = \text{Rs. } 20,000$$

For Juice Co:

$$\text{Expenditure done on Juice by the households} = \text{Rs. } 80,000$$

$$\begin{aligned} \text{Total Expenditure done by the Economy} &= \text{Expenditure on Apple} + \text{Expenditure on Juice} \\ &= \text{Rs. } 20,000 + \text{Rs. } 80,000 \\ &= \text{Rs. } 100,000 \end{aligned}$$

It is not coincidence that the results of all the three approaches are same. We should not have any doubt that the market value of the final goods or services must be equal to the money spend on their purchase i.e., in case of Juice Co the market value of juice Rs. 80,000 must be equal to the willingness to pay for it. This indicates that Product and Expenditure Approach will give the same results.



We can observe that, what the seller is receiving must be equal to what is spent by the buyer. Seller receipts reflect the income of an economy; it includes all the factor payments. The total expenditure in an economy is equal to this income generated, thus, income and expenditure approach gives the same results.

Therefore, we have

$$\text{Total production} = \text{Total Expenditure} \quad (i)$$

$$\text{Total Income} = \text{Total Expenditure} \quad (ii)$$

from (i) and (ii)

$$\text{Total production} = \text{Total Income} = \text{Total Expenditure} \quad (iii)$$

Equation (iii) is the fundamental identity of the national income accounting.

2.5 MEASURING GDP (GROSS DOMESTIC PRODUCT)

GDP is the broadest measure of the aggregate economic activities. It can be calculated using all the three approaches and all of them will give the same value.

- Product or Value Added Approach: Under the product approach, GDP is defined as “Total market value of all the final goods and services produced within a specified period by factors of production located within the geographical boundary of a country”. In this definition, we need to understand the concept of market value, final goods and services, value added and specified period.
- Market value: Market value of the goods and services are calculated by multiplying the quantity of goods and services by their respective market price (price at which they are sold in the market). For example: suppose economy produced 20 smart phones and 1000 pencils, if we add these two quantities this does not make any sense, as the market price of a smart phone is quite higher than the pencils. Therefore, we multiply their quantities with their respective market price, suppose the smart phone is sold at Rs. 10,000 each and pencil at Rs. 10 each. Market value = Rs. $(20 \times 10,000) + \text{Rs. } (10 \times 1,000) = \text{Rs. } 2,10,000$.
- Final goods & services: Goods and services produced for final consumption are known as final goods and services. Intermediate goods and services are those, which are used in the process of making final goods and services. As discussed earlier, to avoid double counting in the calculation of the GDP, we do not consider intermediate production.



- **Value added:** It is the difference between the value of the goods or services when it leaves the stage of production and the value when they entered into that stage of production. In calculating GDP, we can either use the value added at each stage of production or the value added of the final good or service [it is shown in the following table with an arrow]

Table 2.2: Value added in the production of barrels of petrol (in \$)

Stage of Production	Value of Sales	Value Added
• Oil drilling	5	5
• Refining	5.6	0.6
• Shipping	6.6	1.0
• Retail Sale	7	0.4
Total Value added	7	7

- **Specified period:** The period for which GDP is calculated is one year. This one year usually the financial year, in case of India it starts from 1st April of the year to 31st March of next year. GDP figures are released yearly and quarterly.

To calculate the GDP, the economy is segregated into three major sectors

- Primary Sector (includes agriculture, fishing and other allied activities)
- Secondary Sector (includes manufacturing industries)
- Tertiary Sector (includes services)

GDP is calculated by adding the gross value added from these three sectors

$$GDP_{MP} = \sum GVA_{MP}^{\text{Primary Sector}} + \sum GVA_{MP}^{\text{Secondary Sector}} + \sum GVA_{MP}^{\text{Tertiary Sector}}$$

Where

$$GVA_{MP} = \text{Value added at every stage of production or value added of final goods and services}$$

- **Expenditure Approach:** It calculates the GDP of an economy by summing the expenditure on final goods and services produced within the territories of the country in the specified period. In an open economy, there are four major groups: households, firms, government



and the rest of the world. Expenditure done by these groups summed to calculate GDP. These expenditures are:

1. Personal Consumption Expenditures or Consumption (C): The major portions of GDP constitute of consumption done by the households (Consumers) on the goods and services. The three main categories where the consumer spends its income are:
 - i. Durables: Goods, which can be used for a longer period of time. Example: car, smart phones, laptops, etc. [Note: House is not included under this head].
 - ii. Non-Durables: Good, which have a shorter life span. Examples: food, clothes etc.
 - iii. Services: These are non-physical that are opposite to goods, which we can touch and handle. Payment for services is the intangible part of an economy. Example: Doctor fee, lawyer fee etc.
2. Gross Domestic Investment or Investment (I): In economics, fixed investment means purchase of new capital, such as house, plant, equipment etc., and inventory investment means a change in the firm's inventory holdings¹.

The fixed investment can be segregated as:

 - a. Business Fixed Investment or Non-Residential Investment: Expenditure done by the firms on business structures, like, warehouse, factories, office buildings and on equipment, like, machinery, vehicles, computer, furniture. We also include computer software in this category.
 - b. Residential Investment: These are spending on the construction of new houses and apartments².
 - c. Change in the Inventories: It refers to the change in the amount of inventory during the specified period³.

¹ Economic investment is different from financial investment, which purchase of bonds, stocks or mutual funds.

² New houses and apartments are treated as capital goods, because they provide services, like shelter, for a long period.

³ To run the business smoothly firms produce more, some of the produce they are not able to sale within the same year. Value the unsold stock is known as the change in inventories.



3. Government Expenditure on goods and services (G): The expenditure done by central, state or local government on the purchase of final goods and services is known as government expenditure. Example-*goods*: school buildings, roads, defence equipment etc.; *services*: salaries of teachers, member of parliament, person working in defence etc.

Not all the government purchases are part of G. Government often provides social security, medical facilities, pension etc., all such payments are known as transfer payments. These payments are one way and nothing is purchased in exchange with them, in the current period.

4. Net Exports (NE): It is the gap between exports and imports of a country in a specified period. If domestically produced goods or services are sold in the foreign markets, then it is known as exports. If foreign produced goods or services are purchased by the domestic country, then it is known as imports. So, $NE = X - M$, where X =Exports and M =Imports.

$$GDP_{MP} = C + I + G + NX$$

9. Income Approach: This approach looks into the GDP as to who receives the income. The key component, which is calculated using this method, is National Income. In National Income calculation we include 8 types of Income, these are
- Compensation to Employees: It includes the income of the employees, such as, wages, salaries, benefits given to employees (private pension funds, social insurance). The share of this component is the largest.
 - Proprietors' Income: Proprietor means the owner of a business that does not have a separate identity from its owner, better known as unincorporated business. The profit of such kind of business comes under this head.
 - Rental Income: An income earned by a person by renting its land or structures. Royalty given to the authors and artists also comes under this category.
 - Corporate Profits: Income of the corporates, which is calculated after subtracting wages, interest, rents and other costs from the corporate revenue. It's the second major component of the national income of a country.
 - Net Interest: It is a difference between the interest received by the individual from businesses and foreign sources and interest paid by them.



- f. Tax on Production and Imports: These are the taxes, which are paid by the businesses on the production and imports, such as sales tax, excise tax, custom duties. We also minus the subsidies given by the government to these businesses. Therefore, Net Indirect Taxes=taxes-subsidies, it is an income of the government.

Factor Cost and Market Price

Factor cost is the total cost incurred on using factor inputs in the production of goods and services.

Market price is the price at which goods and services are sold in the market.

Market price =Factor Cost +Taxes-Subsidies =Factor Cost + (Net Indirect Taxes)

Example: Suppose there is only one business firm in the economy, it is producing wheat. This business firm produced 4 quintals of wheat in the specified year and sold this in the market for Rs. 1000 per quintal. This firm spends Rs. 5000 on labour and paid taxes Rs. 4000, it also received a subsidy of Rs. 3000. Then

$$GVA_{MP} = GVA_{FC} + Tax - Subsidy$$

$$GVA_{MP} = Rs. 2,000 + Rs. 5,000 - Rs. 3,000 = Rs. 4,000$$

- g. Net Business Transfer Payment: These are payments done by business to others (individuals or government or foreigner) not for wages or taxes or payment against any services. In fact, such payment is for charity, for insurance, legal settlements etc.
- h. Surplus of Government owned enterprises: The current surplus of the enterprises, which are owned by the government, such as water, electricity, sewer etc.

If we add all these 8 components, we get National Income. GDP and National Income are quite different; however, we can find one from another. To calculate GDP out of National Income, we need to address three more components, these are-

- (i) Data Measurement Errors: These are the statistical discrepancies, caused during data collection. If the data is accurately collected, then the data measurement will be 0. The discrepancy occurs due to the fact that, data is compiled from different sources to measure the production and income separately. If we add this statistical discrepancy in the National Income, we get the Net National Product.
- (ii) Depreciation or Consumption Fixed Capital: The decline in the value of goods due to use, wear and tear, obsolescence, during the specified period of calculating the



value of economic activities. To convert the gross value into net value, we subtract the depreciation from the gross value. Example: $GDP - \text{Depreciation} = NDP$, $GNP - \text{Depreciation} = NNP$.

- (iii) Net Factor Income from abroad (NFIA): defined as “difference between the aggregate amount of earnings of the country’s citizens and companies situated abroad and aggregate amount of earnings of foreign citizens and overseas companies earn in the domestic country”.

GDP and GNP

GNP (Gross National Product) is quite different from GDP. GDP is the market value of all the final goods and services produced in a specified period within the boundary of a country. GDP focuses on the final production within the territories of a country, whether a citizen does the production or a non-citizen it does not matter. GNP is the market value of all the final goods and services produced in a specified period by the country’s citizen. GNP focuses on the final production done by the citizen of that country, it does not matter whether the production took place within or outside the boundary of the country.

Distinguishing GDP and GNP is quite tricky. Consider an Apple Inc plant in Gujarat, India; this is an American based company producing smart phones. Most of the workers in the plant are Indians. All the output produced by this plant is a part of the India’s GDP, however, only a part of it is included in India’s GNP. The wages paid to the Indian workers are the part of the Indian GNP, while the profits of the plant are not. Any profit from the plant come under the US GNP, because the owner of the company is American. The profits however will not be the part of US GDP, reason being production took place outside the US territories.

We can find the GNP from GDP and vice versa, using the following formulas:

$$GNP = GDP + \text{Net Factor Income from Abroad (NFIA)}$$

$$GDP = GNP - \text{Net Factor Income from Abroad (NFIA)}$$

In the above Apple Inc plant case,

$$GNP_{\text{India}} = GDP_{\text{India}} - \text{Profits of Apple Inc in Gujarat, India}$$

$$GDP_{\text{India}} = GNP_{\text{India}} + \text{Profits of Apple Inc in Gujarat, India}$$



$$GNP_{US} = GDP_{US} + \text{Profits of Apple Inc in Gujarat, India}$$

$$GDP_{US} = GNP_{US} - \text{Profits of Apple Inc in Gujarat, India}$$

IN-TEXT QUESTIONS

Which one is not an approach to calculate the economic activities of an economy

- Income Approach
- Expenditure Approach
- Value-Added Approach
- Double-Book Keeping Approach

What is the other name for Value-Added Approach

- | | |
|----------------------|--------------------|
| Value Sum Approach | Product Approach |
| Price Added Approach | Price Sum Approach |

Value added Approach and Expenditure approach directly calculates

- Royalty comes under which head
- Compensation to Employees
- Proprietors' Income
- Rental Income
- Corporate Profit

“In personal consumption expenditure we do not consider, goods with shorter life span”, this statement is

- | | |
|-----------|-------------------------|
| True | False |
| Can't Say | Statement is incomplete |

IN-TEXT QUESTIONS

In the value added approach we include the value of

- | | |
|--------------------|-----------------------|
| Final Goods | Final Services |
| Intermediate Goods | Intermediate Services |
| Both (i) and (ii) | Only (ii) |
| Both (i) and (iii) | Both (ii) and (iv) |

Which one is true

- | | |
|---------------------|--------------------|
| Only (i) | Both (i) and (iii) |
| Both (ii) and (iii) | All |



2.6 PRACTICAL EXERCISE

a) Value Added Method

Table 2.3 (a): Calculating GDP_{MP} and NDP_{MP} using Product Method

Items	(Rs. 000')
Sales	600
Change in stock	-20
Depreciation	40
Purchase of intermediate products	300

$$GDP_{MP} = (\text{sales} + \text{change in stock}) - \text{purchase of intermediate products}$$

$$GDP_{MP} = 600 + (-20) - 300 = \text{Rs. } 280$$

$$NDP_{MP} = GDP_{MP} - \text{Depreciation}$$

$$NDP_{MP} = 280 - 40 = \text{Rs. } 240$$

Now

Table 2.3 (b): Calculating GDP_{FC} , NDP_{FC}

Items	(Rs. 000')
Tax	100
Subsidy	20

$$GDP_{FC} = GDP_{MP} - \text{Tax} + \text{Subsidy}$$

$$GDP_{FC} = 280 - 100 + 20 = \text{Rs. } 200$$

$$NDP_{FC} = NDP_{MP} - \text{Tax} + \text{Subsidy}$$

$$NDP_{FC} = 240 - 100 + 20 = \text{Rs. } 160$$

Now,

Table 2.3 (c): Calculating GNP_{MP} , NNP_{MP} , GNP_{FC} and NNP_{FC}

Items	(Rs. 000')
NFIA	100



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

$$GNP_{MP} = 280 + 100 = Rs. 300$$

$$NNP_{MP} = NDP_{MP} + NFIA$$

$$NNP_{MP} = 240 + 100 = Rs. 340$$

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

$$GNP_{FC} = 200 + 100 = Rs. 300$$

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

$$NNP_{FC} = 160 + 100 = Rs. 260 \text{ (National Income)}$$

b) Expenditure Method

Table 2.4 (a): Calculating GDP_{MP} using Expenditure Method

Items	(Rs. 000')
Personal Consumption expenditure	1800
Gross Domestic Investment	500
Government Expenditure	800
Export	100
Import	160

$$GDP_{MP} = \text{Personal Consumption expenditure} + \text{Gross Domestic Investment} + \text{Government Expenditure} + \text{Export} - \text{Import}$$

$$GDP_{MP} = 1800 + 500 + 800 + 100 - 160 = Rs. 3040$$

Now,

Table 2.4 (b): Calculating GDP_{FC} , GNP_{FC} and NNP_{FC}

Items	(Rs. 000')
Net Indirect tax	140
NFIA	100
Depreciation	200



$$GDP_{FC} = GDP_{MP} - \text{Net Indirect tax}$$

$$GDP_{FC} = 3040 - 140 = \text{Rs. } 2900$$

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

$$GNP_{FC} = 2900 + 100 = \text{Rs. } 3000$$

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

$$NNP_{FC} = 3000 - 200 = \text{Rs. } 2800$$

c) Income Method

Table 2.5 (a): Calculating NNP_{FC} using Income Method

Items	(Rs. 000')
Compensation to employees	1600
Mixed income of self-employed (proprietor's Income)	1800
Rent and Royalty	700
Profit	1200
Interest	900
Net indirect tax	500
Social security contribution by employer	300

$$NNP_{FC} = \text{Compensation to employees} + \text{Proprietor's Income} + \text{Rent \& Royalty} \\ + \text{Profit} + \text{Interest} + \text{Net indirect tax} \\ + \text{Social security contribution by employer}$$

$$NNP_{FC} = 1600 + 1800 + 700 + 1200 + 900 + 500 + 300 = \text{Rs. } 7000$$

Now,

Table 2.5 (b): Calculating GNP_{FC} , GDP_{FC} , GDP_{MP}

Items	(Rs. 000')
Depreciation	500
NFIA	1500
Net Indirect Tax	200



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

$$GNP_{FC} = 7000 + 500 = Rs. 7500$$

$$GDP_{FC} = GNP_{FC} - NFIA$$

$$GDP_{FC} = 7500 - 1500 = Rs. 6000$$

$$GDP_{MP} = GDP_{FC} + Net\ Indirect\ Tax$$

$$GDP_{MP} = 6000 + 200 = Rs. 6200$$

2.7 OTHER IMPORTANT CONCEPTS

- a) Private and Government Sector Income: Sometime it important to know the income received by private and government sector.

The income received by the private sector is known as private disposable income. It is deducted by subtracting the taxes paid to the government (by household and firms) from the sum of income incurred through private sector activities and the payment received by a private sector from the government.

$$\text{Private Disposable Income} = Y + NFIA + TP + INT - T$$

Where

Y = Gross domestic product (GDP)

NFIA = Net factor Income from abroad

TR = Transfer payments from the government

INT = Interest payments on the government's debt

T = Taxes paid to the government

Net government income is the part of the GDP which does not belong to the private sector. It is calculated by subtracting the sum of transfer payments from government to private sector and interest payment on government debt from, government revenue from taxes.

$$\text{Net Government Income} = T - TP - INT$$

If we are adding private disposable income and net government income, we get $Y + NFIA = \text{Gross National Product}$.



- b) Savings: Savings are an integral part of an Income; if we subtract consumption from the income, we get savings. Savings are segregated into private savings and government savings.

$$\begin{aligned}\text{Private savings} &= \text{Private Disposable Income} - \text{Consumption} \\ &= (Y + \text{NFIA} + \text{TP} + \text{INT} - T) - C\end{aligned}$$

$$\begin{aligned}\text{Government Savings} &= \text{Net Government Income} - \text{Government Expenditure} \\ &= (T - \text{TP} - \text{INT}) - G\end{aligned}$$

Total Saving of an Economy

$$\begin{aligned}\text{National Savings} &= \text{Private Savings} + \text{Government Savings} \\ &= (Y + \text{NFIA} + \text{TP} + \text{INT} - T) - C + (T - \text{TP} - \text{INT}) - G \\ &= Y + \text{NFIA} - C - G\end{aligned}$$

Further, using the expenditure method: $Y = C + I + G + \text{NX}$

$$\begin{aligned}\text{National Savings} &= (C + I + G + \text{NX}) + \text{NFIA} - C - G \\ &= I + \text{NX} + \text{NFIA}\end{aligned}$$

If we rearrange this

$$\begin{aligned}\text{National Savings} &= I + (\text{NX} + \text{NFIA}) \\ &= I + \text{CA}\end{aligned}$$

Where: Current Account Balance (CA) = $\text{NX} + \text{NFIA}$

If we subtract government savings from both sides, we get,

$$\text{National Savings} - \text{Government Savings} = I + \text{CA} - \text{Government Savings}$$

$$\text{Private Savings} = I + \text{CA} + (-\text{Government Savings})$$

Where: Negative government savings mean the government is running under a deficit.

- c) Real Vs. Nominal GDP:

When the economic variables calculated at the current prices, they are known as nominal variables. The GDP, which we have discussed, is calculated at the current price. It is good to calculate the GDP at the current price; however, we face difficulties if we use it for comparison. Thus, it is advisable to first convert the GDP at current price into GDP at Real Price (Base Price) and then compare.

Suppose there is an economy producing only two goods, phones and computer, we are comparing the GDP of this economy for two years, year 1 and year 2



Table 2.6: Detail of an economy

Year	Item	Quantity (Q)	Price/Unit (P) (Rs.)
1	Phone	2000	100
	Computer	1000	200
2	Phone	2200	110
	Computer	1500	250

GDP at Current Price

Table 2.7: Calculating Nominal GDP

Year	Item	Q	P	GVA=QXP	Total (Rs.)
1	Phone	2,000	100	2,00,000	4,00,000
	Computer	1,000	200	2,00,00	
2	Phone	2,200	110	2,42,000	6,17,000
	Computer	1,500	250	3,75,000	
Increase					2,17,000
Growth					54.2%

By seeing the above result, we can easily predict that the economy has grown by about 54.25% from year 1 to the year 2, but we fail to tell whether this growth is due to the increase in the price or quantity. We can address this problem by choosing a base year (constant price) for both the year and then calculate the Real GDP. Let the base year be year 1;

Table 2.8: Calculating Real GDP

Year	Item	Q	P	GVA=QXP	Total (Rs.)
1 (Base year)	Phone	2,000	100	2,00,000	4,00,000
	Computer	1,000	200	2,00,00	
2	Phone	2,200	100 (Base Year Price)	2,20,000	5,20,000
	Computer	1,500	200 (Base Year Price)	3,00,000	
Increase					1,20,000
Growth					30%

Real GDP growth is only 30%, which reflects that the growth in GDP is only due to the increase in the quantity, keeping the price effect constant. We can convert the Nominal GDP into Real GDP and vice versa.



Suppose for Computer:

$$\begin{aligned}
 \text{Gross Value Added (real)} &= \text{GVA (nominal)} / \text{GDP deflator} \\
 &= \text{GVA (nominal)} / (\text{current price/base price}) \\
 &= 3,75,000 / (250/200) \\
 &= 3,75,000 / 1.25 \\
 &= \text{Rs. } 300,000
 \end{aligned}$$

Therefore, by using the GDP deflator we can convert the nominal GDP into real GDP and vice versa. We have done this exercise for a single good; however, in an economy we are consuming many goods or a basket of goods. We consider the current price and the base price of this basket of goods to calculate the GDP deflator.

GDP deflator data is published quarterly. CPI (consumer price Index) which is published monthly is also used as the GDP deflator. The GDP deflator is often useful in knowing the inflation rate in an economy.

IN-TEXT QUESTIONS

GDP when calculated at current price is called as

- | | |
|-------------|----------|
| Green GDP | Real GDP |
| Nominal GDP | None |

Real GDP can be converted into nominal GDP by using

- | | |
|---------------------|---------------------|
| Current price | Nominal price |
| GDP Deflator | CPI |
| Both (i) and (iii) | Both (ii) and (iii) |
| Both (iii) and (iv) | Only (iii) |

Real GDP equals to Nominal GDP, if

- | | |
|----------------------------|----------------------------|
| Current Price > Base Price | Current Price < Base Price |
| Current Price = Base Price | None |

National Savings are equal to

- | | |
|---------------------|--------------------|
| I+CA | I+NX+NFIA |
| Y+NFIA-C-G | |
| Only (i) | Both (i) and (iii) |
| Both (ii) and (iii) | All |

Private Disposable Income is equal to

- | | |
|-----------------|-----------------|
| Y-NFIA+TP+INT-T | Y+NFIA-TP+INT-T |
| Y+NFIA+TP-INT-T | Y+NFIA+TP+INT-T |
| Only (i) | Only (ii) |
| Only (iii) | Only (iv) |



2.8 PROBLEMS ASSOCIATED WITH GDP CALCULATION IN INDIA

United Nations developed SNA (System of National Account), it contains all the recommendation, which are agreed internationally to measure the economic activities of an economy. India also follows this standard measure of calculating GDP. In India, NAS (National Accounts Statistics) is compiled by CSO (Central Statistical Office) under Ministry of Statistics and Programme Implementation. The various problems, which are, faced while measuring India's GDP, are:

- a) Informal Market: India has a huge informal market. The data, which is used for the calculation of GDP, is gathered only from the formal market. Informal market is completely ignored. Therefore, GDP calculated only considering formal sector is underestimated.
- b) Non-market goods and services: These are those goods and services, which are not sold under the formal market system. Example,
 - (i) Service rendered by homemaking and child care.
 - (ii) Underground economy: All the illegal activities and illegal goods sold, such as drugs, prostitution, gambling.
 - (iii) Benefits of clean air and water.
 - (iv) Value of services provided by government, such as defence, public education, buildings and maintenance of roads and bridges.
- c) Difficult to identify the good: Sometimes it is difficult to identify a good as final or intermediate.
- d) Inadequate and unreliable data.
- e) Production for self-consumption.
- f) Lack of proper occupational classification.
- g) GDP does not account externalities.

**IN-TEXT QUESTIONS**

Who compiles national accounts for India?

UPSC

NAS

MSME

CSO

GDP does not include

Value of non-traded goods

Value of goods and services from formal market

Value of goods and services from informal market

Externalities

Only (iv)

(i), (iii) and (iv)

Both (i) and (iv)

Only (ii)

2.9 GREEN GDP

The usual measure of GDP is only the indicator of economic growth; it fails to tell anything about the sustainability and wealth of an economy. These limitations are well taken care with the concept called Green GDP.

Green GDP is an indicator of economic growth, simultaneously considering the environmental factors. It attributes the triple planetary crisis that is loss due to climate change, the loss of our nature and biodiversity and loss due to pollution. Green GDP is measured by deleting the net natural capital consumption from the GDP. The natural capital consumption includes resource depletion, environmental degradation and incentives to protect environment.

Some criticise the way Green GDP is calculated, they point out that it is difficult to quantify those goods and services, which are not traded such as ecosystem. The proponents of Green GDP argue that it may be difficult to quantify or put value to non-traded goods and service, still it is a preferable alternative to GDP.

IN-TEXT QUESTIONS

_____ is measured by deleting the net natural capital consumption from the GDP

Real GDP

Nominal GDP

Green GDP

None

Triple planetary crisis is refer to

Loss due to climate change

Loss of our nature and biodiversity

Loss due to pollution

All



2.10 SUMMARY

The broadest measure of economic activities of an economy is GDP. GDP of any economy is estimated using three approaches i.e. product, expenditure and income approach. All the three approaches give the same value of the GDP. In product approach, we sum the value added of all the final goods and services produced within the domestic territory of an economy during the specified year. In expenditure approach, we add all the spending done by the different sectors of an economy in the specified period. Income approach sums up all the earnings of the different factors of production in the specified period. There are certain problems associated with measuring of GDP.

The other important concepts, which help the policy makers, are private and government sector income, national saving, real and nominal GDP. Green GDP is another important concept, which incorporates the net natural capital consumption for measuring GDP.

2.11 GLOSSARY

B

Business Fixed Investment: Expenditure done by the firms on business structures, like, warehouse, factories, office buildings and on equipment.

C

Corporate Profits: Income of the corporates, calculated after subtracting wages, interest, rents and other costs from the corporate revenue.

Compensation to Employees: Income of the employees

D

Depreciation: The decline in the value of goods due to use, wear and tear, obsolescence, during the specified period of calculating the value of economic activities.

Durables: Goods, which can be used for a longer period of time.

E

Expenditure Approach: This approach measures the value of economic activities by adding all the spending done on the final production of goods and services.

F

Factor cost: It is the total cost incurred in using factor inputs in the production of goods and services



Final Good and Services: Goods and services produced for final consumption are known as final goods and services.

G

Government Expenditure: The expenditure done by central, state or local government on the purchase of final goods and services

Gross Domestic Investment: In economics, fixed investment means purchase of new capital, such as house, plant, equipment etc. and inventory investment means a change in the firm's inventory holdings.

Gross Domestic Product (GDP): GDP is the broadest measure of the aggregate economic activities.

I

Income Approach: It measures the economic activity by adding all the factor payments.

Intermediate goods and services: Goods and services used in the process of making final goods and services.

M

Market price: Price at which goods and services are sold in the market.

Market Value: Market value of the goods and services are calculated by multiplying the quantity of goods and services by their respect market price (price at which they are sold in the market).

N

National Income Accounts: The national income accounts is a conceptual framework, which measures economic activities.

Net Exports: It is the gap between exports and imports of a country in a specified period.

Net Factor Income from abroad: It is defined as “difference between the aggregate amount of earnings of the country's citizens and companies situated abroad and aggregate amount of earnings of foreign citizens and overseas companies earn in the domestic country”

Net Interest: It is a difference between the interest received by the individual from businesses and foreign sources and interest paid by them

Non-Durables: Goods which have a shorter life span.



P

Personal Consumption Expenditures: The major portions of GDP constitute of consumption done by the households (consumers) on the goods and services.

Product Approach: It measures the value added of final goods and services, it does not include the value of intermediate goods and services

Proprietors' Income: Proprietor means the owner of a business, that does not have a separate identity from its owner, better known as unincorporated business. The profit such business is called as proprietors' income.

R

Rental Income: An income earned by a person by renting its land or structures

Residential Investment: These are spending on the construction of new houses and apartments.

S

Services: Services are non-physical that are opposite to goods, which we can touch and handle.

V

Value Added: Is the difference between the value of the goods or services when it leaves the stage of production and the value when they entered into that stage of production.

2.12 SELF-ASSESSMENT QUESTIONS

1. Three approaches of measuring economic activities in an economy, gives the same result", Justify.
2. What are the components of total spending in an economy? Why we take net exports instead of exports?
3. To know the economic growth of an economy, which one is more appropriate Real GDP or Nominal GDP? Why?
4. Why services like house making and childcare, income from gambling and other illegal activities not included in the GDP?



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2.14 SUGGESTED READINGS

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LESSON 3

ECONOMIC GROWTH

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STRUCTURE

- 3.1 Learning Objectives
- 3.2 Economic Growth
- 3.3 Growth around the World
- 3.4 A Model of Production
 - 3.4.1 Growth Paradigms
- 3.5 Solow Growth Model
 - 3.5.1 Assumptions
 - 3.5.2 The Solow Model
 - 3.5.3 Golden Path
- 3.6 Total Factor Productivity
- 3.7 Balanced Growth Path
 - 3.7.1 Views of Ragnar Nurkse
 - 3.7.2 Views of Rosenstein Rodan
 - 3.7.3 Views of W. A. Lewis
- 3.8 Steady State Growth Path
- 3.9 Transition Dynamics
- 3.10 Lessons for Developed and Developing Countries
- 3.11 Summary
- 3.12 Glossary
- 3.13 Answers to In-text Questions
- 3.14 Self-Assessment Questions
- 3.15 References
- 3.16 Suggested Readings



3.1 LEARNING OBJECTIVES

After studying this chapter, you will be able to:

- d) Understand the meaning and importance of economic growth and trend of economic growth around the globe.
- e) Explain the role of savings, investments, capital and labour in determining the steady state growth path for an economy.
- f) Describe the process of balanced growth and role of government policies in achieving sustainable growth.

3.2 ECONOMIC GROWTH

Economic growth is generally measured as a rise in annual per capita real GDP over a long period of time. This indicates three things firstly, economic growth means increase in per capita GDP not the aggregate GDP. Per capita real GDP can be calculated as

$$\text{Per capita Real GDP} = \frac{\text{Real GDP}}{\text{Population}}$$

Secondly, economic growth is about increase in real income not the nominal income. This means it considers the changes in price level.

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

And thirdly, economic growth is about long-run rise in income. A short-run rise or temporary fluctuation in per capita income due to any reason cannot be considered as economic growth until and unless it sustains for a longer duration. Economic growth is also represented by an outward shift in the Production Possibility Curve (PPC) and rightward shift in the long-run aggregate supply curve. The reason for this shift could be technical progress and increase in availability of resources.

3.3 GROWTH AROUND THE WORLD

Economic growth involves a process of transformation and every economy goes through a series of phases of growth. The phases can be different for modern and industrialized economy from a poor and under-developed economy. According to Colin Clark, each phase of growth is dominated by different sectors (i.e., primary, secondary and tertiary) of an



economy. Similarly, W. W. Rostow's growth model begins from a traditional society and reaches to maturity stage. In between it passes through to a 'transitional' and 'take-off' phases. As the economy proceeds to maturity stage, the share of primary sector (agriculture) goes on decreasing and the share of secondary and tertiary sectors in the GDP increases.

Economists like David Romer and David Weil have used inter-country growth regressions in order to explore different growth paths across economies. This gave rise to a whole new range of theoretical and empirical explorations of the determinants of growth. It was an extensive exercise that uses sophisticated statistical tools and covers much more countries of the world.

Comparative growth rates show an uneven growth path for group of countries. The reason for such uneven growth during the period of 1900-50 is partly due to two major wars and the great depression. However, post-war period have shown a phenomenal recovery of Germany, Japan and Italy have puzzled the economist all around the world. New theories were developed such as the Solow Model to explain such remarkable growth. It was argued that 'late starters' can achieve a high rate of growth because they can adopt advanced technologies invented by the early starters.

The period of 1950-60 saw a big push for planning and import-substitution, but it faded away by the 1970s, specially during '1973 oil crisis'. It was the period of high unemployment and stagnant growth around the world. By 1980s, a sign of convergence started to appear among group of economies. Economists in the western world favoured a set of policies famously known as the "Washington Consensus". It was a liberal economic policy which promoted the idea of privatization, openness, flow of investment, tax reforms etc.

Table 2.1: Rules of Good Behaviour for Promoting Economic Growth

Original Washington Consensus	"Augmented" Washington Consensus: (the previous 10 items, plus)
1. Fiscal discipline	11. Corporate governance
2. Reorientation of public expenditures	12. Anti-corruption
3. Tax reform	13. Flexible labor markets
4. Interest rate liberalization	14. Adherence to WTO disciplines
5. Unified and competitive exchange rates	15. Adherence to international financial codes and standards
6. Trade liberalization	16. "Prudent" capital-account opening
7. Openness to DFI	17. Non-intermediate exchange rate regimes
8. Privatization	18. Independent central banks/inflation targeting
9. Deregulation	19. Social safety nets
10. Secure property rights	20. Targeted poverty reduction



During 1980 to 2000 the real per-capita income grew at an impressive rate of around 2.3 percent per annum in the developing economies. That means the incomes doubled at every 30 years. Countries in the East and Southeast Asia such as China, South Korea, Thailand, Malaysia, etc shown a tremendous growth rate of 4.4 per cent per annum during this period. This also resulted in substantial improvements in social indicators in these countries such as literacy, infant mortality, life expectation, etc.

It is worth noting that two major economies of Asia i.e., China and India achieve almost a double digit growth rate after 1990s, despite the 'Asian financial crisis' of 1997–98. It is also said that the coming decade is of India which is showing its potential of becoming a global power. On the other hand, the growth rate of economies in Latin America and Sub-Saharan Africa collapsed during this period. Hence the unevenness of growth path is still continues both geographically and temporally.

3.4 A MODEL OF PRODUCTION

Economists believed that a 'production function' can explain why some economies grow rapidly than others. A production function is a mathematical equation showing a relationship between inputs (labour, capital, etc.) and outputs (automobiles, furniture's, clothes, etc.). Growth in the output means growth in income or GDP. Hence, it is important to study the role of inputs in the production function.

1. **Role of Labour:** Economists have attributed the role of population, specially working population in the economic growth of an economy. Government all around the world are putting efforts to improve the quality of labours by spending on health and education. It is believed that the more time a worker spend on his formal education and skill development the more productive he becomes. It help them to earn more and spend more, hence raising his income and standard of living.
2. **Role of Capital:** Same argument applies to the role of capital in the growth of an economy. The quality of capital stock measured in terms of efficiency and effectiveness decides the pace of growth. Technological improvement also called as 'production of knowledge' brings a significant change in the way things being carried out. It not only increases the returns to scale but also contributes in the growth of an economy.
3. **Role of the entrepreneur:** Unlike classical and Keynesian economics, modern growth theories gave more importance to the role played by entrepreneurs in the economic growth. Modern growth economists, Joseph A. Schumpeter stressed on the



role of the entrepreneurs, or businessmen. Their performance and risk taking abilities determines the speed of economic growth. For example, in western countries such as the USA, Canada and major European countries that adopted liberal economic policies have seen a significant pace of growth because of their entrepreneurs. These entrepreneurs brings investments and innovation in their businesses which increases their outputs and incomes.

2.4.1 Growth Paradigms

The base of modern growth theory were laid in the late 1950s. Tinbergen in 1959 attempted to explain the significant growth in output in Western European countries, and the United States. He developed a model using Cobb-Douglas production function along with capital and labor supply functions. Followed by Robert Solow (1956) and their neo-classical growth models that stressed on a type of production functions that operates in perfect competition and gives diminishing marginal returns to each input. This was followed by endogenous growth models in which technological progress were endogenously determined. So, let's have a look at different growth theories based on their production in briefly.

1. **Neo-classical Growth Model:** The growth path is depicted by two equations:

A production function equation that is linear and expresses the current flow of output as a function of the current stock of capital and labour.

$$Y = A K^{\alpha} L^{1-\alpha}$$

Another equation that shows how investments (savings) and depreciations affects capital accumulation.

$$\dot{K} = sY - \delta K$$

2. **AK Model:** It was the first wave of endogenous growth theory. This theory does not differentiate explicitly between capital accumulation and technological advancements. They just merged together the physical and human capital. The AK model is the neo-classical model without diminishing returns to scale. The production function used here is linear homogenous in the stock of capital.

$$Y = AK$$

This model presents a 'one size fits all' view of growth

3. **Product Variety Model of Romer (1990):** The second wave of endogenous growth models that consists of 'innovation based growth model'. Innovation results in



increasing productivity by creating new but not necessarily improved varieties of products. This model gives importance to technology spill overs (Horizontal Innovation).

4. **Schumpeterian Model:** Innovation based theory focusses on quality improvement. Hence, involves the force of ‘creative destruction’.

$$Y_{it} = A^{1-\alpha} K^{\alpha}$$

Where A represents ‘efficiency parameter’ attached to the most recent technology used in the industry i at time t.

Each intermediate product is manufactured and sold by the most recent innovator. Hence, faster growth rate implies a higher rate of firm’s turnover (Vertical Innovation).

5. **Kremer’s O-Ring Theory:** This model explains why advanced economies manufacture more complicated products, have large firms and much higher worker productivity than poor countries. It predicts that under-development is a coordination failure because despite their potential benefits, required investments do not occur and the country becomes trapped in a low level of equilibrium.

3.5 SOLOW GROWTH MODEL

Robert Solow was an American economist who won the prestigious Nobel Prize in 1987 for his work on the theory of economic growth famously known as the ‘Solow Model’. It is an exogenous growth model which focuses on long-run economic growth. Solow observed that during the Second World War, Germany and Japan suffered heavy economic losses. Yet, following the war both the countries grew quickly. In fact, they grew much faster than the US and Britain. Even in the past few decades, the GDP growth in China has been very high reaching to almost double digits. In contrast, advanced economies like the US, Canada or Britain growing around 2% per year.

Earlier, it was thought that to achieve high growth rate is to have good institutions like, property rights, honest government, political stability, a dependable judiciary and competitive and open markets. The advanced economies have it all, plus they have got more human and physical capital. But they are growing slower than India, China or Bangladesh.

The Solow model of economic growth answered this questions. It gives a clear picture of the dynamics of growth. It also help us to understand the difference between two types of growth



that is a) Catching up growth and b) Cutting edge growth. Where catching up growth is much faster than the cutting edge growth.

The simple Solow growth model explains the process of economic growth using few key variables and some basic mathematics. But before that we must keep in mind some basic assumptions of this model.

2.5.1 Assumption

The model focuses on long-run economic growth

1. There exist full employment in the economy. That is all capital and labour are fully utilized in production process.
2. There is a constant returns to scale i.e., output will increase at a same proportion as an increase in capital and labour.
3. Capital accumulation can be decomposed into capital deepening and capital widening.
4. Capital widening refers to the capital accumulation required to keep k (capital per labour) constant as L grows. Capital deepening is the capital accumulation that permits k to grow.
5. The labour force L (population) grows at a constant rate n .
6. Increase in savings and investments in the short-run, increases the national income and output. In contrast, higher saving and investment have no effect on the rate of growth in the long-run.

Based on above assumption, let's understand the Solow model in detail.

2.5.2 The Solow Model

An important part of this model is its linear homogeneous production function,

$$Y = A K^{\alpha} L^{1-\alpha}$$

also known as the *Cobb-Douglas Production function*. Where, Y is the output/GDP, K is the Physical capital like factories and machineries, L is the labour or human capital. Last but certainly not the least is A (ideas). “ A ” represents all of our knowledge about how to produce goods by using capital and labour. Everything from how to ship huge quantities of goods from one place to another with ease to how to keep diseases from spreading to how to millions of calculations in a fraction of a second. A is ideas, and better ideas mean that we can produce more output from the same inputs.



The coefficient α is the capital share (the share of income that capital receives). Therefore, output per labour is given through the following equation: $y = Ak^\alpha$ where $y = Y/L$ (output per labour and $k = K/L$ (capital per labour)

$$y = \frac{Y}{L} = \frac{AK^\alpha L^{1-\alpha}}{L} = \frac{AK^\alpha}{L^\alpha} = A \left(\frac{K}{L}\right)^\alpha = Ak^\alpha$$

So the production function represents human capital, physical capital and ideas being used together to produce output.

- **Physical Capital and Diminishing Returns:** In order to determine the impact of change in capital on output firstly, we will hold labour and ideas constant and focus on K . Here, the output is a function of the quantity of capital $Y = F(K)$. That means increasing K will increase output. For example, a farmer can grow more crops with the help of a tractor than with just a shovel.

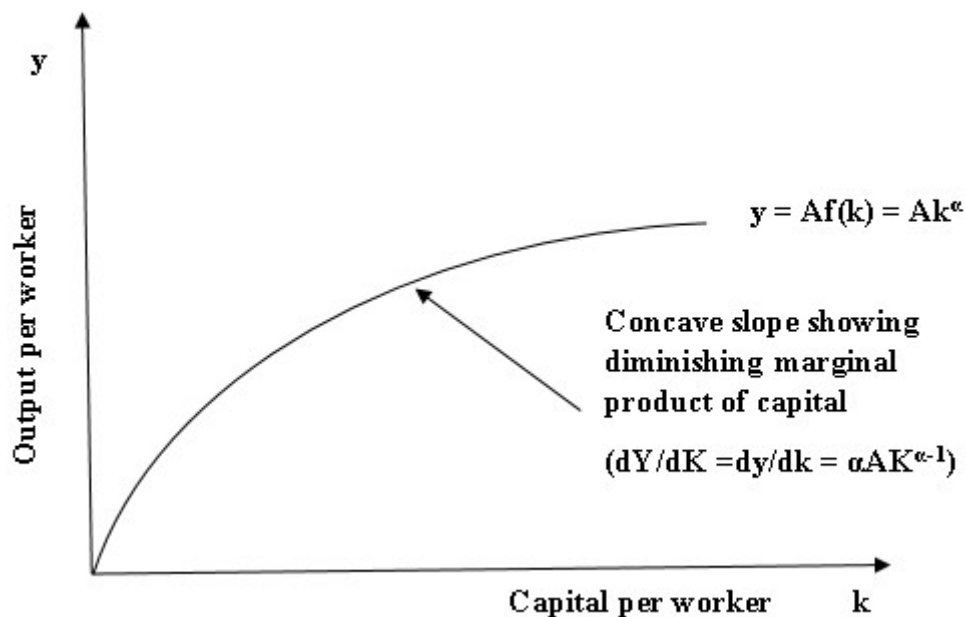


Fig. 2.2: Output per worker and Capital per worker

Fig. 2.2, depicts a positive relationship between capital and output, as capital increases the output also goes up. But another property of this kind of production function is that while more capital gives more output, it should do so at a diminishing rate. Extending our example, when the farmer allocates his tractors, the first tractor will be allocated to the



most productive work and the subsequent tractors will be allocated to less and less productive works.

We can represent both these properties in a production function using $Y = \sqrt{K}$. That means 1 unit of capital will give 1 unit of output, 4 units of capital will give 2 units of output and so on. The marginal productivity of capital measures how much additional output is produced with each additional unit of capital. The production function above showing diminishing marginal productivity of capital indicating that the marginal product of first unit of capital is very high but it goes on decreasing as the capital increases.

After the Second World War, Germany and Japan didn't left with much resources, so that the marginal productivity of the first units of capital was very high. This can be understood as, the first road between two metropolitans, or the first tractor on a farm or the first new steel factory gives a lot of additional output. Solow model says that capitals are very productive when it is less. So, capital can boost growth but because of diminishing returns, the same additions to the capital stock may get you less and less output.

- **Depreciation:** Physical capital goes through Capital rusts or Depreciation. Roads got potholes, tools wear out, and trucks break down and need to be repaired. In this model, it was assumed that depreciation increases at a constant rate as the capital stock increases.
- **Savings and Investments:** Capital accumulation depends on savings and investments. What we produce is either consumed or saved. What we saved becomes investment. Suppose we invest a constant fraction of our income (Investment = $0.3 * Y$). This can be shown as an investment curve in our graph (fig 2.3). It will mimic the shape of the output line, since investment is just a constant fraction of output.

Capital accumulation is represented by an equation

$$K' = K(1 - \delta) + I$$

Where, K is the Present capital stock, K' is the future capital stock, δ is the rate of capital depreciation and I is the level of capital investment.

$$\frac{dk}{dt} = sy - \delta k$$

Above equation shows that the change in k over time is equals to the investment (saving) per worker minus depreciation per worker. Any positive change in k will increase output per worker. Growth will stop at a point where $dk/dt = 0$.

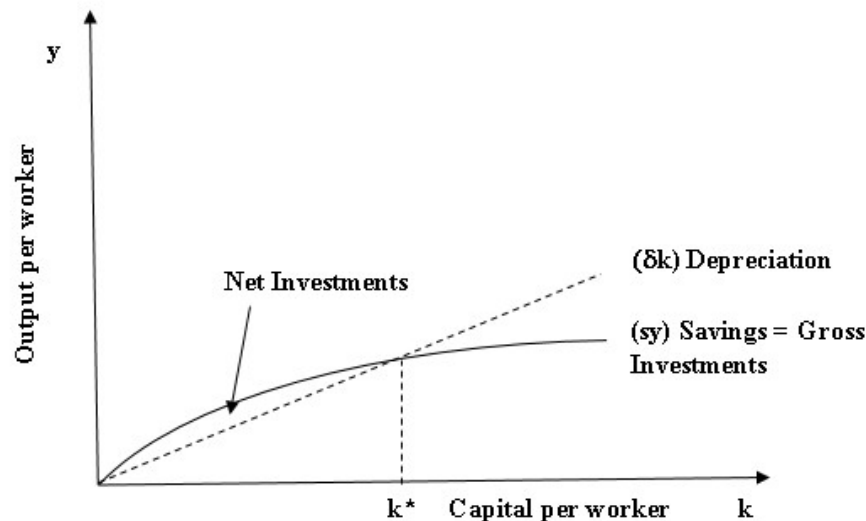


Fig. 2.3: Impact of Depreciation on Capital per Worker

The fig 2.4 below shows the steady state growth path for an economy. At this point the economy grows at a constant rate. Solow model, implies that economies converge to steady state output per worker (keeping technology constant). It also implies that, if economies have same steady states, poor economies grow faster and ‘converge’. We call this classical convergence or ‘convergence to steady state’ in Solow model.

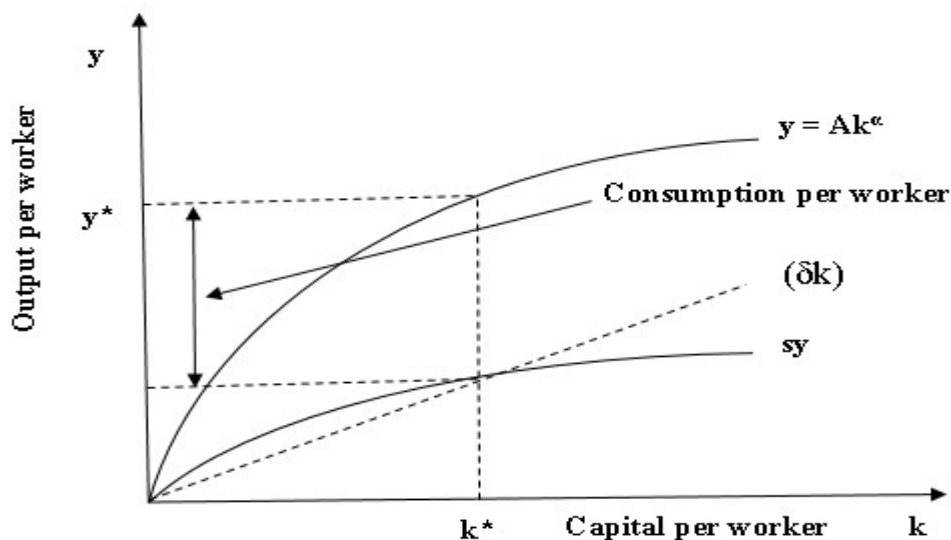


Fig. 2.4: Steady State Capital per Worker and Output per Worker



What happens if savings increased?

Now let's see the impact of increase in savings on the steady state growth path. The Solow model argued that, the saving rate s increases the economic growth rate in the short-run, but it has no effect on the rate of growth in the long-run. Please note that a higher saving rate does raise the steady-state k^* (capital/labour ratio). Hence the steady-state output per worker also increases (fig 2.5). To achieve long-term growth, investment should increase at such a rate that so that the steady-state k^* (capital labour ratio) is maintained. Fig 2.5 depicts that raising saving increases k^* and y^* to k_1^* and y_1^* respectively, but no permanent 'growth effect'.

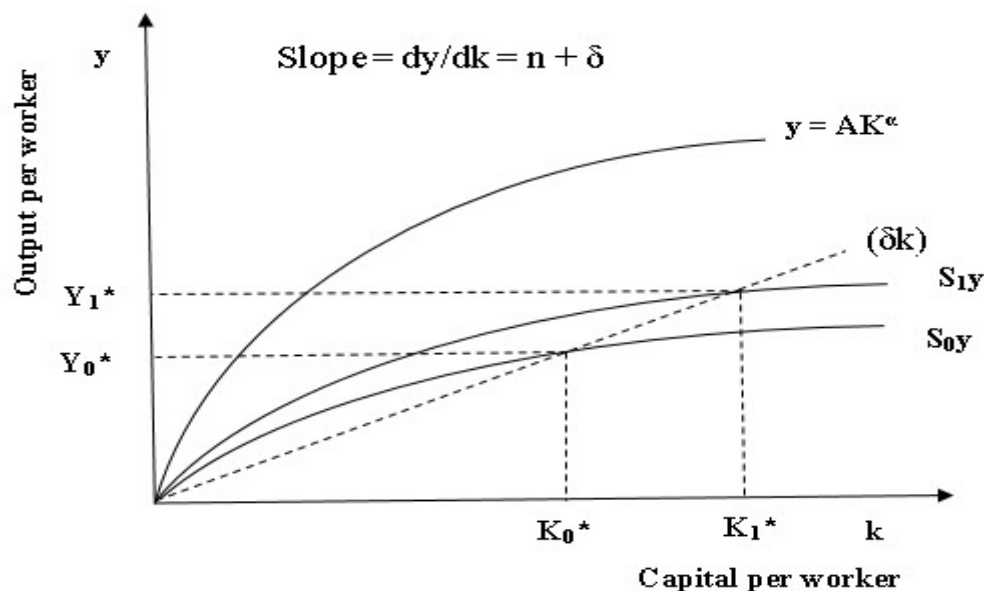


Fig. 2.5: Impact of Increase in Savings on Steady State

What if labour force grows?

According to Solow model, rise in population reduces the steady state output per worker. In the fig. 2.6, as the population rises at a constant rate n , the capital-widening term (nk) rises. Consequently, the steady-state capital/labour ratio k^* falls, resulting a fall in the steady-state output per worker. This rise in population also results in the increase in real interest rate and decrease in the real wage rate. In the fig. 2.6 we can see that rise in population shifts the capital depreciation δK line upwards to $(\delta + n)K$ and reduces the steady state k^* and y^* .

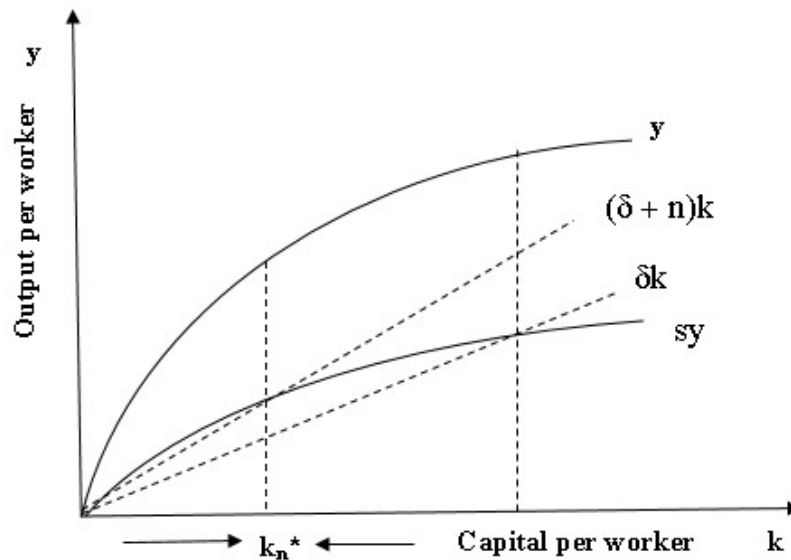


Fig. 2.6: Impact of Increase in Population on Steady State

2.5.3 Golden Path

The 'golden path' is the 'optimal' saving rate (s) that maximises per capita consumption. Fig. 2.7 depicts the golden path with k^{**} is the steady state capital per worker.

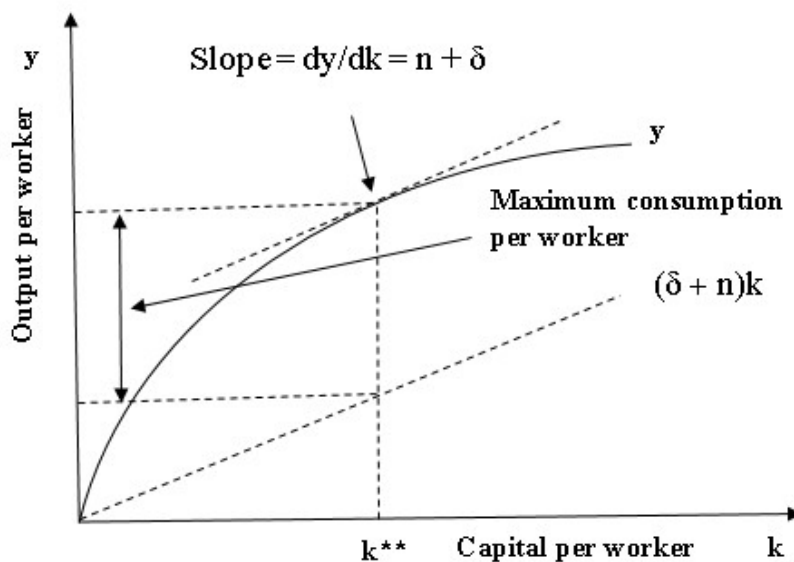


Fig. 2.7: Golden Path



Bangladesh's Economy: A Lesson for India

Bangladesh ranked 24th out of 53 countries in Bloomberg's COVID-19 resilience ranking for its economic performance during the pandemic. A brief history of the economic journey of the country is given below.

From 'basket case' to 'Asian Tiger'

Henry Kissinger once labelled Bangladesh a 'basket case' due to its higher rate of poverty and hunger. Today, the nation has steadily risen to reach a new heights and now being projected as a future 'Asian tiger'.

In 2019, the country was the world's seventh fastest growing nation, with a GDP growth that almost touched the double digit. Even during the Covid lockdowns in FY'20, the country managed a 5.24% growth rate in the GDP. And, in FY'21, the country surpasses India in average per capita income that stood at \$2,227, higher than India's \$1,947.

Prudent economic governance

With macro-economic stability as its cornerstone, Bangladesh's economy has increased by more than 270 times since its independence. The country has become the world's second-largest textile exporter after China due to its traditional labour-intensive light manufacturing industry. Bangladesh has managed to achieve macro-economic stability because of its cottage, micro, small, and medium sized enterprises (CMSMEs). They create 10 million direct employment and contribute 25% to Bangladesh's GDP.

Lesson for India

India can take lessons on macro-economic stability and fiscal policies from Bangladesh's success story. India's micro and small industries are suffering from inadequate capital. The export-oriented industries are also massively suffering. A prudent and supportive policies like Bangladesh can be a solution for Indian textiles, garments, leather and gem cutting industries.



IN-TEXT QUESTIONS

1. People in Least Developed Countries are poor because
 - a. of slow population growth
 - b. of exploitation by multinational companies
 - c. of dependence on foreign aid
 - d. of a variety of development traps
2. The Solow growth model is an example of _____ growth theory (exogenous/ endogenous).
3. Economic growth is measured as a rise in per capita real national income in short-run (True/False).
4. According to Solow model, an increase in saving rate increases the economic growth in the _____ (short-run/long-run).

3.6 TOTAL FACTOR PRODUCTIVITY

Productivity measures the ratio of inputs used i.e., (labour and capital) to produce outputs. One can measure the productivity of individual inputs such as labour or capital productivity. Another option is to measure the combined productivity of inputs also called total factor productivity (TFP). TFP is measured as the ratio of the total output by weighted average of the inputs. It is calculated to find out the growth in real output in excess of the growth in inputs. TFP also measures the efficiency of a firm. TFP helps businesses to wisely design their manufacturing policies, introduce advanced technologies and invest in training and development of human resources. TFP is known by different names such as;

- **Catch-all Term:** The production function in the Solow Model ($Y = A K^\alpha L^{1-\alpha}$) consist of an exogenous component 'A' that captures technological growth and improvement in productivity that is not related to any other factors of production.
- Economists later named it as '**Solow Residual**',
- **Solow's surprise:** The Solow model concluded that investment in capital cannot sustain long-run growth in GDP per worker. It need technological advancement (growth in A) to avoid diminishing returns to capital. In the Fig. 2.22, we can see that a rise in 'A' shifts the output per worker upwards.

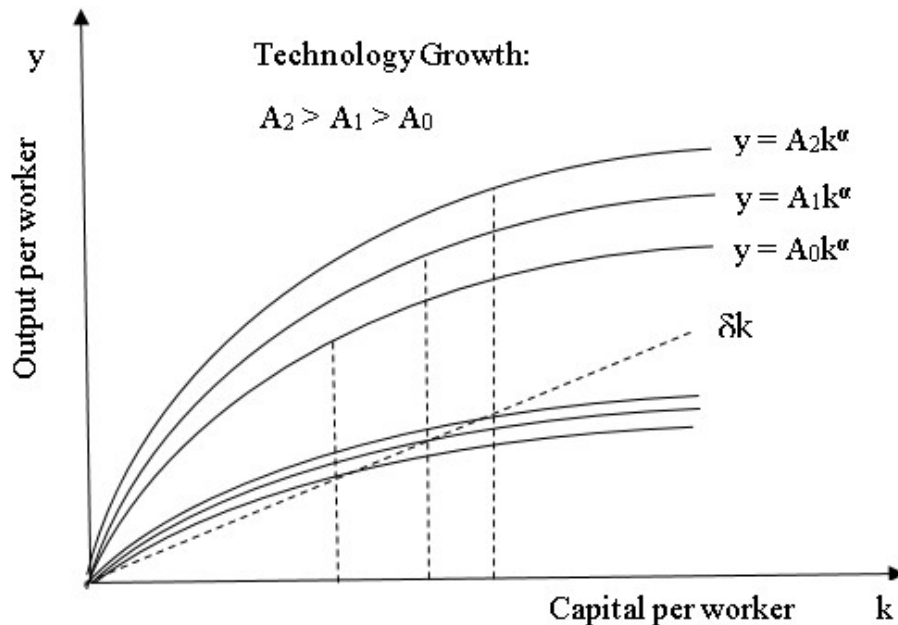


Fig. 2.8: Impact of Change in Total factor Productivity on Output

TFP is the reason why Japan has achieved higher growth rate in the post-war period. Similarly, the slowdown of growth rate of the USA from 1973 to 1990s can be attributed to poor TFP. It can be said that the rate of economic growth depends on the growth rate of inputs and the increase in TFP. Changes in Solow Residual/TFP come out of several factors:

- New ways of constructing buildings
- Newly invented machineries
- New source of power/energy
- Changes in work organizations
- Efficiency of government regulations
- Degree of monopoly in the economy
- Literacy and skills of work force

3.7 BALANCED GROWTH PATH

Ragnar Nurkse pioneered the balanced growth theory which states that in order to bring an economy out of the vicious circle of poverty the government needs to make huge investments in a number of industries simultaneously. This will not only increase the market size and



productivity of the firms but also act as an incentive for the private sector to invest. Various economist have contributed in the development of balanced growth theory which can be explained with the views of:

- Ragnar Nurkse
- Rosenstein Rodan
- W. A. Lewis

2.7.1 Views of Ragnar Nurkse

Prof. Nurkse was the main propounded of the theory balanced growth. According to him, vicious circle of poverty is the major obstacle in the growth path of a poor economy. He explained that the vicious circle of poverty operates both on the supply and demand side.

(a) Supply Side

In the fig. 2.34, we can see that how vicious circle of poverty affects the supply side of capital formation. The per capita income of the people is very low in any underdeveloped economy due to which the level of saving is also low. Since savings is the main source of investment, low savings results in low investment and hence low capital formation. This causes low productivity and in turn low productivity means low income of people. By this way a vicious circle operates in supply side.

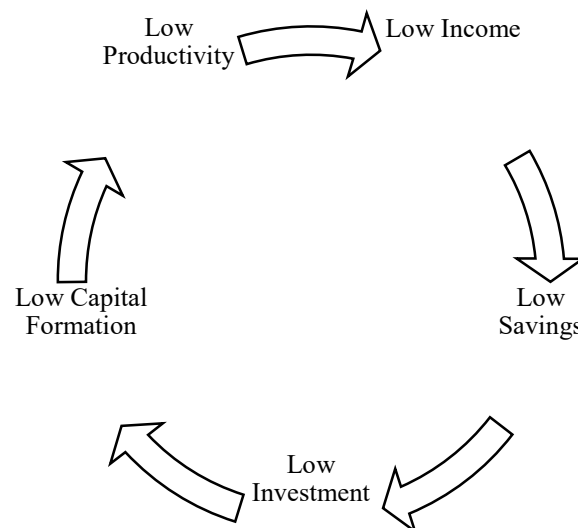


Fig. 2.9: Vicious Circle of Poverty: Supply Side

**(b) Demand Side**

The Vicious circle of poverty also operates in the demand side affecting capital formation in under-developed countries. Low income of people in poor economies results in low buying power. Lower demand means lower income for industries to invest lower their capital formation. This leads to low productivity and hence lower income for people.

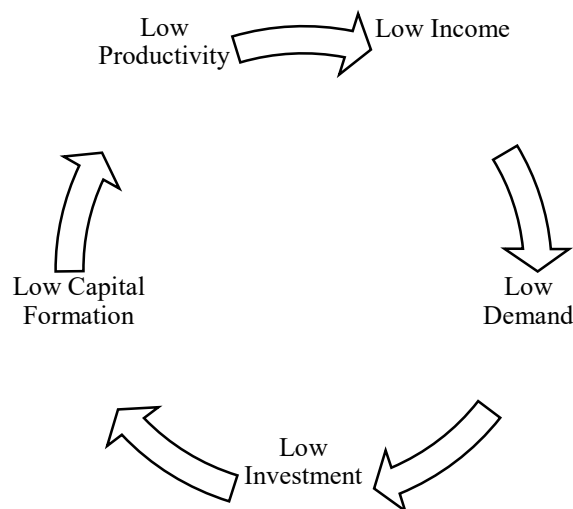


Fig. 2.10: Vicious circle of poverty: Demand Side

A balance between demand and supply side is required to maintain to break the vicious circle of poverty. This can be done only when there is high rate of capital formation in the underdeveloped economies. Nurkse suggested various ways through which the vicious circle of poverty can be broken. These are:

How to Break Vicious Circle of Poverty?

- (i) **Complementary Demand:** Investment in one industry or one sector is not sufficient to break the vicious circle of poverty. It needs simultaneous investment in several industries. This will enlarge the market size and create demand for various products simultaneously. This will raise the income level of people associated with these industries and they will act as mutual customers for each others product. Hence demand and supply both will go up breaking the vicious circle of poverty.
- (ii) **Government Intervention:** According to Nurkse, the private sector in any under-developed economy is not self sufficient to bring such a huge level of investment. So, the government must participate in economic activities and inject Huge funds in



the market through investments. This will act as a motivating factor for private sector and will bring positive change in the market.

- (iii) **External Economies:** The strategy of simultaneous investment in various industries also leads to external economies by setting up of new industries and expansion of the existing ones. This will increase the supply of products in the market causing a fall in price. Lower prices means higher demand and stimuli for industries to invest more resulting higher capital formation.

2.7.2 Views of Rosenstein Rodan

Rosenstein Rodan is another economist who propounded this theory in the year 1943 but without using the term 'balanced growth'. He argued that the Social Marginal Product (SMP) of an investment is different from its Private Marginal Product (PMP). If different firms operates their businesses according to their SMP, the economy will grow much faster than if it operated according to their PMP. Since, the SMP is greater than PMP for any firm because of the complementarity of different industries this results in profitable investment for the society.

He took the example of a shoe factory. He stated that, if a large shoe factory is setup in a suitable location where 20,000 unemployed people get work. Now if the labours spend their entire incomes on shoes, it would enlarge the shoe market. On the other hand, if series of different firms are setup, people will spend their income on different commodities. He called this 'planned industrialization'.

2.7.3 Views of W. A. Lewis

W.A. Lewis has favoured the theory of balanced growth on the basis of the following two arguments:

Firstly, in the absence of balanced growth, prices in one sector may be higher than the other sector resulting unfavourable terms of trade in the domestic market. This will cause heavy losses for the industries and hinders the investment activity. Since, balanced growth ensures equality in comparative prices in all the sectors this will create a favourable terms of trade and all the sectors will grow simultaneously.

Secondly, he argued that when an economy grows, then several bottlenecks starts to appear in different sectors. For example, increase in per capita income of people due to economic growth results in increase in the demand of high income-elastic goods. A lower production of such goods in this case will increase its prices. Balanced growth ensure that the production of such goods increases with increase in income of people.



According to Lewis, “All sectors of the economy should be developed simultaneously so that balance is maintained between industries and agriculture, production for domestic consumption and production for exports”.

ACTIVITY

With the help of World Bank/ International Monetary Fund annual data and international rankings try to comprehend the recent economic growth trends among major countries around the globe. You will find that some poor countries have shown a dramatic rise in their GDP growth rate on the other hand majority of countries have experiencing a decline or stagnant growth.

3.8 STEADY STATE GROWTH PATH

The term steady state growth is similar to the long-run equilibrium in static theory of economics. Steady state is a condition when all the variables, output, labour, capital, investments, savings, technological advancement, either grow at constant exponential rate, or are constant.

Different economists have interpreted steady state differently. Starting with Harrod, an economy is growing at a steady state when $G_w = G_n$ (where, G_w : Warranted rate of growth and G_n : Natural rate of growth). He called it ‘Razor’s Edge Growth Path. Similar theory propounded by Domar who called this growth as ‘Knife Edge Growth Path’. Joan Robinson named steady state growth as ‘Golden Age’ of accumulation. According to him, steady state is a *‘mythical state of growth not likely to obtain in any actual economy.’*

According to Meade, when the growth rate of total income and per capita income are constant along with constant population growth and no change in technology, an economy achieves steady state growth. On the other hand, Robert Solow in his model determines steady state with the help of expanding labour force and technological advancements.

Hence, it can be said that at a steady state birth rates is equals to the death rate meaning constant population. The output growth, per capita consumption and rate of depreciation all are constant indicating constant growth of real per capita income.



3.9 TRANSITION DYNAMICS

The Solow model stressed that long-run steady state growth is not depend on the saving rate and are determined entirely by exogenous elements. The model also predicts that a poor economy grows faster and tends to converge with rich countries if it satisfies some conditions. This can be explain with the help of a diagram below.

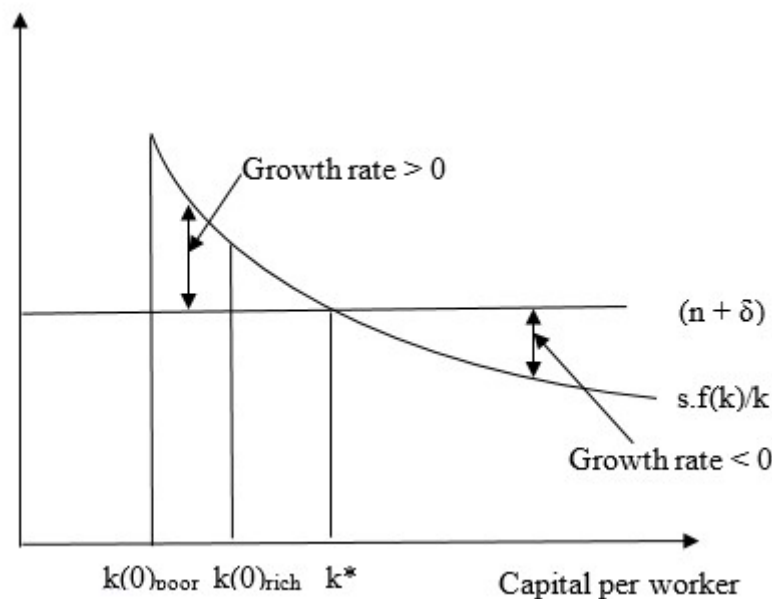


Fig. 2.11: Dynamics of the Solow model.

We can see that the growth rate of capital per labour (k) is given by the vertical distance between the saving curve ($s \cdot f(k)/k$), and the effective horizontal depreciation line ($n + \delta$). The growth rate of an economy is positive when $k < k^*$, and k moves toward k^* (k^* indicating steady state level of k). Similarly, the growth rate of an economy is negative when $k > k^*$.

It can be noted here that, the growth rate of k is approaching toward k^* from an initially low level of capital per labour. Hence, proving that a poor country can grow faster and converge to a rich country in a long-run.

3.10 LESSONS FOR DEVELOPED AND DEVELOPING COUNTRIES

History have told us that, no economy can achieve a rapid growth rate without sound economic policies, property rights, market-oriented approach, money and fiscal governance.



Various economic models have been developed to explain the movement of an economy from lower level of economic growth to higher one. Government policies, investment, entrepreneurship, foreign trade along with other factors are singled out as critical. For examples, ‘two-track’ reform policy of China, setting up of ‘export processing zones’ in Mauritius and South Korea’s system of ‘financial restraint’.

Taiwan and South Korea adopted export subsidization scheme to reduce their unfavourable balance of trade. Similarly, Singapore gave generous tax rebates to attract foreign investments. Botswana raises the level of government spending per GDP to bring macroeconomic stability. Chile provided significant financial, technological, organizational, and marketing assistance to its infant agro-industries.

As economic policies changes, an economy would move from positive to negative growth rates and back again. According to a study by World Bank (2001), sound economic policy can accelerate the growth rate and cut the poverty rates in half in developing economies. Similar study by the International Monetary Fund (2000), suggest that *“where sound macroeconomic policies have been sustained, they have raised growth and reduced poverty”*.

In most countries, growth depend upon favourable balance of trade. This has helped Germany and Japan to recover fast from second world war devastations. This has also helped China, South Korea and more recently Bangladesh to achieve high growth rate.

Resource reallocation could also be a source of growth. Economists believes that high growth rate can also be achieved by shifting resources from low productivity sectors to high productivity ones. For example, shifting labour from low productive agricultural sector to high productive manufacturing and service sectors.

New knowledge through innovations and R&D opens up new possibilities for growth. Physical and human capital accumulation cannot sustain growth in the long-run in the absence of technological advancement. Technological progress is nothing but the ‘production of knowledge’ through education, R&D and innovation.

So, government should adopt policies that encourage innovations and promote investment on R&D. Along with that ‘easy money’ policies and tax incentives also works in favour of developing economies to achieve rapid growth.



IN-TEXT QUESTIONS

5. A balanced growth strategy relies on coordinated increases in investment in several industries at once in order to create inter-locking markets for outputs. (True/False)
6. Creative Destruction is an essential aspect of _____ Model. (Schumpeterian/ Neo-classical/ AK)
7. Match the followings:

i. Razor's Edge Growth Path	a. Robinson
ii. Golden Path	b. Harrod
iii. Knife Edge Growth Path	c. Domar

i-a, ii-b, iii-c
i-b, ii-c, iii-a
i-c, ii-b, iii-a
i-b, ii-a, iii-c

3.11 SUMMARY

Economic growth is the ability of a country to produce more. This increases its real GDP. But it should be kept in mind that such increase in production in short-run is not considered as growth. Economists all around the world have developed models that depicts the stages of growth through which an economy passes. Some models give importance to savings and investments in the growth process, some believes on technological advancement and some put weight on favourable balance of trade.

The exogenous growth model suggested by Robert Solow argued that an economy moves in a steady-state growth path as a result of constant change in the growth rate of population (n) and technological advancement (A). Steady state is a situation when the output, capital, labour, savings, investments, technology all grows at a constant rate. This model also predicts that economies with same population growth rate, savings rate and depreciation rate will converge in the long-run and along this convergence path, a poor economy grows faster than rich country.

Another source of growth as suggested by Schumpeter is innovation that leads to creative destruction. According to him, entrepreneurs plays a significant role in bringing innovation in the production process that raises the productivity of labours and level of production. Prof.



Nurkse has favoured simultaneous investment in large number of industries in order to break the vicious circle of poverty and bring balanced growth in the economy. His model is also supported by other economists such as Rodan and Lewis.

Solow surprise or Total Factor Productivity is the increase in total output due to change in intangible factors such as technological advancement, level of education, research and development, etc. It is measured as the ratio of total output to the weighted average of total inputs. Various factors can affect the total factor productivity such as technological innovations, new source of power/energy, better health and education, etc.

Hence, in order to achieve a high rate of economic growth, it is important for an economy to focus on all these variables along with sound economic policies.

3.12 GLOSSARY

Capital deepening: is the process of increasing the amount of capital per labour.

Capital widening: is the process of equipping of new workers with capital, as the population grows.

Exogenous Growth Model: Where the long-term growth rates are determined by variables not explained by the model itself. The neo-classical models are example of exogenous growth model.

Horizontal Innovation: It causes productivity growth through technological progress reflected in an expansion of the number of varieties of products that is by creating new but not necessarily improved varieties of products which means a series of opening up of new industries.

Vertical Innovation: It causes productivity growth through technological progress reflected in quality improvement for an array of existing kind of products, which means continues quality enhancement within an established industry.

3.13 ANSWERS TO IN-TEXT QUESTIONS

- | | |
|---------------------------------------|------------------------|
| 1. D. | 5. True |
| 2. Exogenous | 6. Schumpeterian model |
| 3. False. It is measured in long-run. | 7. D. |
| 4. Short-run | |



3.14 SELF-ASSESSMENT QUESTIONS

1. What is economic growth? What are the major determinants of it?
2. Discuss the importance of savings and investments in economic growth.
3. Explain the Solow model of economic growth and also write its shortcomings.
4. What do you understand by the term Vicious Circle of Poverty? How it can be turned into virtuous circle of prosperity?
5. Why innovation is important for economic growth?
6. Briefly discuss the views of different economists on Steady state growth path? Why it is important for an economy to maintain this growth path?
7. Write a short note on: a) Capital Deepening b) Capital Widening.
8. Explain how endogenous growth models are different from exogenous growth models.

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LESSON 4

THE IS-LM MODEL

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STRUCTURE

- 4.1 Learning Objectives
- 4.2 Introduction
- 4.3 Keynesian Framework
- 4.4 The interaction of goods and money market explained by IS-LM Curves
- 4.5 The Short-Run Equilibrium in the *IS-LM* model
- 4.6 Effect of Fiscal Policy on the *IS* Curve and Changes the Short-Run Equilibrium
- 4.7 Effect of monetary policy on LM curve and the Short-Run Equilibrium
- 4.8 The Interaction between Monetary and Fiscal Policy
- 4.9 Summary
- 4.10 Glossary
- 4.11 Answers to In-Text Questions
- 4.12 Self-Assessment Questions
- 4.13 References
- 4.14 Suggested Readings

4.1 LEARNING OBJECTIVES

1. To develop a deep understanding of the basic macroeconomic concepts for analyzing the crucial economic policies.
2. To understand the problem of Inflation, unemployment and low income in the economy.
3. To understand the theoretical rationale behind policies framed at the country as well as corporate level.
4. To provide the learners sound knowledge of International trade and the existing complexities.



4.2 INTRODUCTION

It has always been important for students to study and understand the complexities of maintaining an economy in a stable equilibrium position. In this lesson the students will understand the Keynesian theory on which the explanation of the advanced models like IS-LM depend. Here we discuss the concept of short-run equilibrium in the money market and goods and services market. We also discuss about the monetary and fiscal policy effect on the short-run equilibrium level of income.

4.3 KEYNESIAN FRAMEWORK

Keynes in his *The General Theory of Employment, Interest, and Money*, presented a unique way to analyze the economy. He emphasised the importance of aggregate demand (AD) to bring back the economy to normalcy from the shocks of slump. Thus he suggested that an increase in aggregate demand helps to raise income as well as employment in the economy.

The Keynesian Cross

The General Theory of Employment is mainly consists of two important ideas. First, the total expenditure in an economy and second, its effect on output, employment and inflation. This theory believes that the spending plans of government, business & household largely determine the total income of an economy. And the **Keynesian cross simply depicts** how the level of income in the economy is established. It is considered one of the important components for understanding the *IS-LM* model.

Let's understand here the major assumption of Keynesian model which says that prices are constant in short run and market demand is met by the firms without increase in the level of prices. The aggregate supply curve is perfectly elastic at the given price level. This assumption indicates that since prices are somewhat static, shifts in any expenditure such as investment, consumption or government expenditures cause change in output. Hence, if government spending exceeds, for example, and all other spending plans do not change, then output will increase.

Now let's learn about Aggregate demand. It is defined by planned total expenditure (PE) on goods and services by firms, households and the government. It simply means the sum total of goods demanded in an economy.

Here we can explain the aggregate demand or planned expenditure as the sum of –



$$AD = PE = C + I + G + NX \dots\dots\dots (1)$$

Here, C means the consumption expenditure on goods and services by households, I indicate the planned investment on new capital goods such as plant, machinery, houses, etc. G stands for the government expenditure on goods and services, NX (X –M) stands for net exports. It shows the difference between the amount of goods exported (X) and the amount of goods imported (M). It gives the net expenditure on domestic goods by the foreigners.

Aggregate expenditure (AE) is defined as the total planned spending on domestic goods and services. It simply determines what is to be produced in the economy.

It is given by:

$$AE = Y \dots\dots\dots (2)$$

Now in order to understand the model of IS-LM we need to know the major components of aggregate demand or planned expenditure. Here we discuss each component one by one-

Consumption function

The consumption refers to the expenditure done by a consumer in purchasing, using and eating of consumable goods. Generally, the demand for consumable goods is not stagnant but increases with multiple reasons especially if income and families expand. And with increasing income, the level of consumption also increases. Thus, the consumption function depicts that the consumption is an increasing function of income.

Here we explain equation for understanding Consumption Function -

$$C = C_a + c Y \dots\dots\dots (3)$$

C_a = this is the independent consumption which does not rely on the income level and is constant.

C = It represents the marginal propensity to consume; it reflects the consumption increase by per unit increase in income.

Consumption and Saving

Savings (S) are portion of income which is left after spending on consumption in a closed economy (without government and foreign trade).

We can explain it as follows-

$$Y = C + I \text{ and } C + S \dots\dots\dots (4)$$

So



$$S = Y - C \dots (5)$$

The equation clearly shows that the remaining amount after spending on consumption is called savings. The savings in an economy are also an increasing function of income.

Investment

The term investment refers to the goods bought for consumption in future. Investment can be divided into two investments -fixed investment and inventory investment. The fixed investment means purchasing of the new houses, plants and equipment whereas Inventory investments refer to the difference between production and sales in a given year.

In the closed economy at the equilibrium level of income, savings are equal to investment. It is clear from the equation 4.

If we put the equation together we get-

$$C + I = C + S \dots (6)$$

We get-

$$S = I \dots (7)$$

So here we can say that the remaining income after spending on consumption is saved and it is automatically getting invested.

Government

We know that Government (G) can directly participate and influence the level of economic activity through its different policy instruments.

Here we discuss the two important policy instruments of government --

- Government expenditure on goods and services for example, building roads, dams and providing free job to public during times of Corona.
- Increase and decrease in taxes and transfer payments also affects the real income of the households.

The government basically increases or decreases its spending as per the requirement of economy in times of recession or inflation and affects the aggregate demand in the economy.

Net exports

As we know, today we are the integral part of globalization where most economies have opened their doors for exchange of various essential products and facilities. They not only



import and export goods and services but also borrow and lend in world financial markets. As we know trade is extremely important for many countries and international trade is crucial for analyzing the development in economy as it paves the way for formulating economic policies.

Net exports are the difference between the amount of goods exported (X) and the amount of goods imported (M), and reflect the state-trade surplus and trade deficit. The positive net export number shows trade surplus whereas negative number posits trade deficit.

$$NX = Y - (C + I + G)$$

The above equation shows that the domestic expenditure does not need to be equal to the output of goods and services in an open economy. If output exceeds domestic expenditure, the surplus amount of output will be exported and net exports become positive. If output falls short of domestic expenditure, we import the deficit amount of output from abroad and out net exports become negative.

Therefore, the Government makes its domestic policies in such a way that it provides a conducive environment for the exports and imports and the exchange rate, which ultimately affects the aggregate Demand in the economy.

The Economy in Equilibrium

The economy is said to be in a state of equilibrium when whatever output is produced in the economy will be sold out and there will be no surplus or deficit of inventories exist. At this point of equilibrium, all the stakeholders in the economy are in balance, which suggests that at this point of equilibrium planned expenditure is equal to the actual expenditure in the economy.

The equilibrium condition in the economy can be expressed as follows-

$$\text{Actual Expenditure} = \text{Planned Expenditure} = Y$$

Any divergence of the economy from the equilibrium point will not be a stable position and adjustments and readjustments will take place until the equilibrium will not be achieved by the economy.

Inventories play a crucial role in the establishment of equilibrium in the economy, for instance, if the economy is below the point of equilibrium, at this point planned inventories are greater than the actual inventories and this forced the firms to increase the production and it leads to increase in income until the point of equilibrium is achieved. On the other hand, if the economy is above the point of equilibrium, at this point actual expenditure is greater than



the planned expenditure, this forced the firms to cut down production and it leads to a decrease in the level of income until the equilibrium is achieved.

The below mentioned Keynesian cross explain how the level of income (Y) is determined for a given level of planned expenditures in an economy.

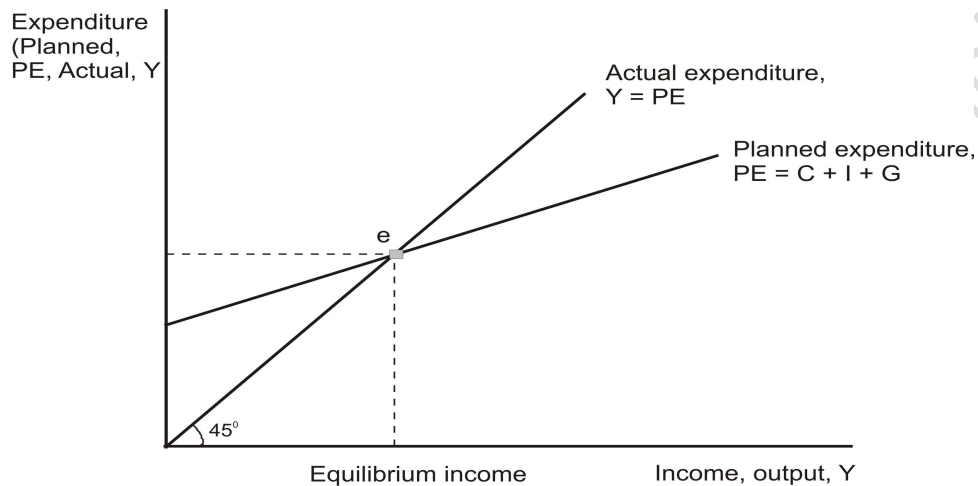


Fig. 4.1 The Keynesian Cross

Figure 4.1 illustrates the Keynesian cross where **e** is the equilibrium point where income or the actual expenditure is equal to the planned expenditure in the economy, so any point below or above leads to the disequilibrium in the economy. If the economy is below point **e** then there is more planned expenditure than the actual which leads to decrease in firms unplanned inventories and this motivates them to produce more which leads to increase in income and again the economy attains equilibrium at **e**. Similarly if the economy is above the point **e**, here the actual expenditure is more than the planned expenditure which leads to the accumulation of unplanned inventories of firm, so they are induced to cut down the production and income decreases and again the economy reaches the equilibrium point **e**.

4.4 THE INTERACTION OF GOODS AND MONEY MARKET EXPLAINED BY IS-LM CURVES

The goods market and the IS curve

After studying the Keynesian cross it is the time to study the economy as a whole, here for simplicity we divide the whole economy into goods market and the money market. The



goods market is explained by the IS curve, IS curve shows the combination of interest rate and the level of income at which the goods market is in equilibrium. It shows the points where the actual expenditure is equal to the planned expenditures in the goods market.

The derivation of IS curve can be explained by the below mentioned figure.

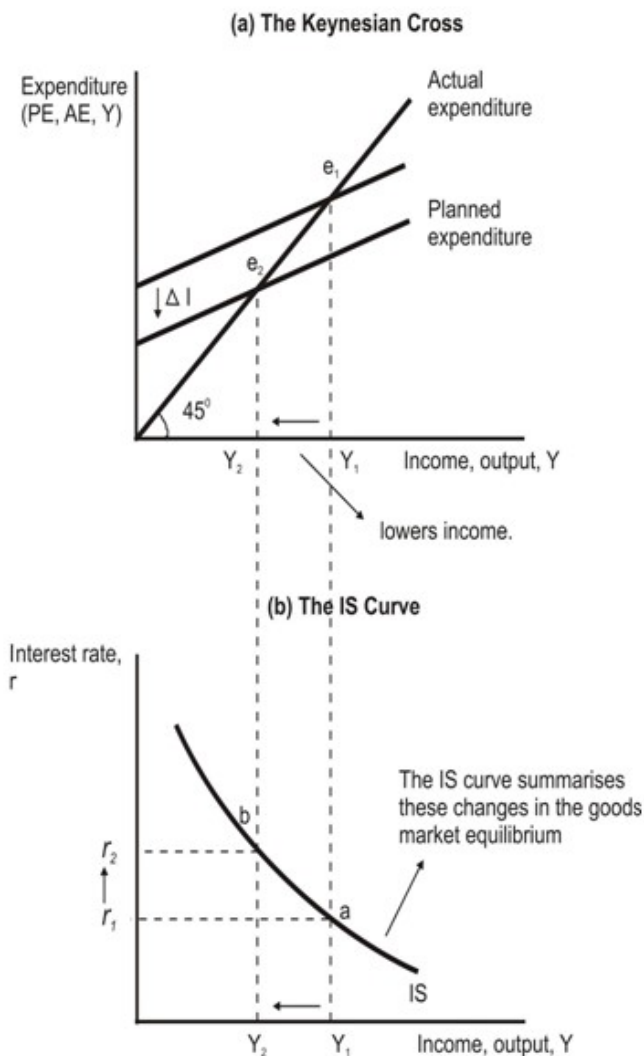


Fig. 4.2 (a) - Derivation of IS Curve from Keynesian Cross

With the help of the Keynesian cross, the IS curve is derived in Figure 4.2 (a). As per Keynesian cross, the point of equilibrium explains the equality between actual expenditure and planned expenditure. Here in the figure initially the economy is in balance at e_1 with Y_1 level of income. Any increase or decrease in interest rate will affect the planned investment in



the economy and accordingly the planned expenditure curve will shift. As we can see in the figure increase in interest rate from r_1 to r_2 will shift the planned expenditure curve downward and accordingly the new equilibrium will be established at e_2 with a lower income level. This decrease in income is equal to the multiplier times the decrease in planned investment expenditure. If we extend the equilibrium points in part-b of the figure to show the combination of interest rate and the level of income we will get the IS curve.

The IS curve summarises the equilibrium points in the goods market at which the interest rate and the level of income are equal.

The IS Curve and its relationship with the Interest Rate and Investment

In an economy, planned investment is negatively related to the interest rate. It can be expressed as follows-

$$I = I(r)$$

The above mentioned investment demand function shows a negative relationship between investment demand and the interest rate. Higher interest rates increases the cost of borrowing to businessmen so at higher interest rates they decrease their planned investment and keep their money invested in bonds and fixed deposits. On the other hand decrease in interest rate will increase the planned investment in the economy; a lower interest rate induces individuals to liquidate their fixed investments and make a more planned investment in the economy.

This negative relationship between the interest rate and the planned investment is one of the reason for the negative slope of IS curve.

Effects of fiscal policy changes on IS curve

In any economy the objective of government is to achieve higher employment and income level with stability in price level. The government can achieve these objectives by raising or controlling the aggregate demand in the economy. We have studied the components of aggregate demand from Keynesian cross.

When an economy faces recession or inflation in economic activities, it is the responsibility of government to use its fiscal policy tools to bring back the economy at the point of equilibrium. Since the fiscal policy is more effective in raising or controlling aggregate demand in the goods market, so we draw an IS curve for a given fiscal policy and will discuss the effect of its tools on this curve.

We see the effect of following fiscal policy changes on IS curve -



- First we increase or decrease the government expenditure (G) and keep the tax rates (T) fixed
- We increase or decrease the Tax rates and keep the government expenditure fixed.

Keeping the other factors constant if the government increases its expenditure, this will raise the aggregate demand by increasing consumption and investment demand in the economy. Due to increase in government expenditure the IS curve shifts upward and the economy will reach to a new equilibrium point at e_2 with higher level of income Y_2 , as illustrated in figure 4.2 (b).

On the other hand, if the government increases the tax rates while keeping the other factors fixed, it leads to a decrease in the disposable income of individuals, so accordingly the consumption and investment demand in the economy decrease, and the aggregated demand in the economy is reduced from the previous level. This increase in tax rate shifts the IS curve downward with a lower level of income than the previous level.

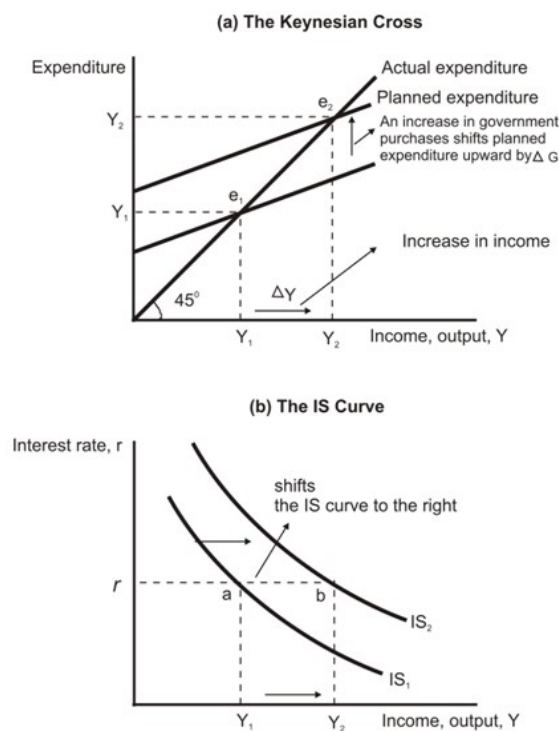


Fig. 4.2 (b) - Effect of fiscal expansion on IS curve

Figure 4.2 (b) illustrates the effect of increase in government expenditure on the level of income in the economy.



In starting the economy is in equilibrium at Y_1 level of income, increase in government expenditure leads to shift in planned expenditure curve upwards and income increase from Y_1 to Y_2 level, correspondingly in panel- b the IS curve shifts rightward.

The Money Market and the LM Curve

In the money market, the demand for real money balance and the supply of real money balance determine the interest rate. Since the supply of money is exogenously determined by the central bank of a country, so we assume it is constant. Therefore it is the demand for real money balance which plays a crucial role in determining the rate of interest in the money market.

So to understand the derivation of the LM curve we should first understand the demand for money explained by the liquidity preference theory given by Keynes.

The Theory of demand for money

The demand for money is also called the liquidity preference theory. The demand for money is a demand for real money balances, people hold money for what money is able to buy. The higher is the price level people need more nominal money balance to complete the same transaction.

As per liquidity preference theory, people demand money for three reasons. First, people demand money for complete day-to-day transactions and it depends on their level of income. An increase and decrease in income will affect the transaction demand.

Second is the demand for precautionary motives. People hold money to deal with any kind of emergency situation. It depends on the level of income. Higher-income leads to an increase in money demand for precautionary purposes.

The third and most important factor determining a demand for money is the speculative motive. People hold money to earn a return on investment. An increase in interest rate will reduce this return and a decrease in interest rate will increase the return on investment. Therefore the demand for precautionary motive is negatively related to the rate of interest.

The demand for real money balances is explained by below mentioned equation as follows-

$$(M/P)_d = L(r)$$

Here the left side of the equation shows the supply for real money balances $(M/P)_d$ and the right side of the equation shows the quantity of money demanded depends on the interest rate. Here we should know that the interest rate is the cost of holding money, so individuals hold more money at the lower interest rates and hold less money when interest rates are higher. This is the reason the demand curve for money is of negative slope.



Equilibrium in the money market

In the money market, the demand for money and the supply of money jointly determine the equilibrium interest rates. In figure-4.3 the equilibrium is illustrated with the help of the downward slope of the money demand curve and the vertical money supply curve. Here in the short run when the price level is given and the money supply is constant, it is the demand for money which determines the equilibrium interest rate. Any increase or decrease in money demand will change the equilibrium in the money market.

In the money market if there is any disequilibrium due to an increase or decrease in money demand or money supply it will change the interest rate and the level of income. Given the supply of money increases in money demand will increase the interest rate and the level of income increases, and a decrease in money demand will reduce the interest rate in the money market and the level of income decreases. The upward slope of the LM curve shows the direct relationship between the interest rate and the level of income in the money market as explained by the figure-4.3.

Income, Money Demand, and the LM Curve

After studying the demand for money, it is time to derive the LM curve. The demand for money theory explains that the interest rate in the money market is determined by the demand for money and the supply of money at the given price level.

This relationship between demand for money balance, interest rate and the level of income can be explained by the following equation-

$$(M/P)_d = L(r, Y)$$

From the above equation, we can see that the demand for money balances depends on the level of income and the interest rate in the money market. Given the price level, the money demand, interest rate, and level of income are directly related. It can be explained by the below mentioned figure.

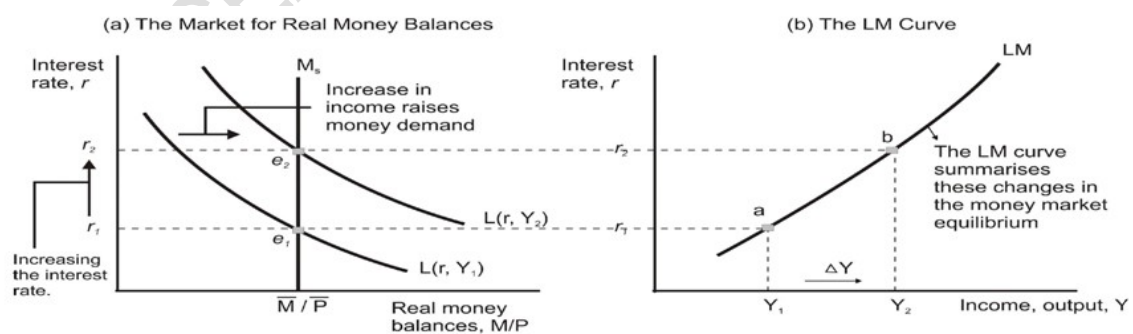


Fig. 4.3 - Derivation of LM curve



Figure 4.3 illustrates the equilibrium in the money market. In panel-b of the figure demand for money balance curve and the supply of money curve intersect and the equilibrium interest rate r_1 is determined. So if there is any increase in income from Y_1 to Y_2 demand for real money balance shifts rightward and the new equilibrium is established with a higher interest rate and a higher level of income. If we extend the equilibrium points as shown in panel-b of the figure we will get an upward sloping LM curve. The LM curve shows the combination of interest rate and the level of income at which money market will be in equilibrium.

Monetary Policy change and the LM Curve

The LM curve illustrates the equilibrium combination of interest rate and the level of income in the money market. If the central bank increase or decrease money supply the LM curves shifts upward or downward accordingly.

We can see how the LM curve shifts due to contractionary monetary policy adopted by central bank. Let the central bank decrease the money supply, it leads to decrease in supply of real money balances from M_1/P to M_2/P . keeping the level of income constant, this decrease in supply of real money balances raises the rate of interest, which maintains the equilibrium in the money market. So the decrease in money supply shifts the LM curve upward as shown in below mentioned figure-4.4. In case of increase in money supply will shift the LM curve downward.

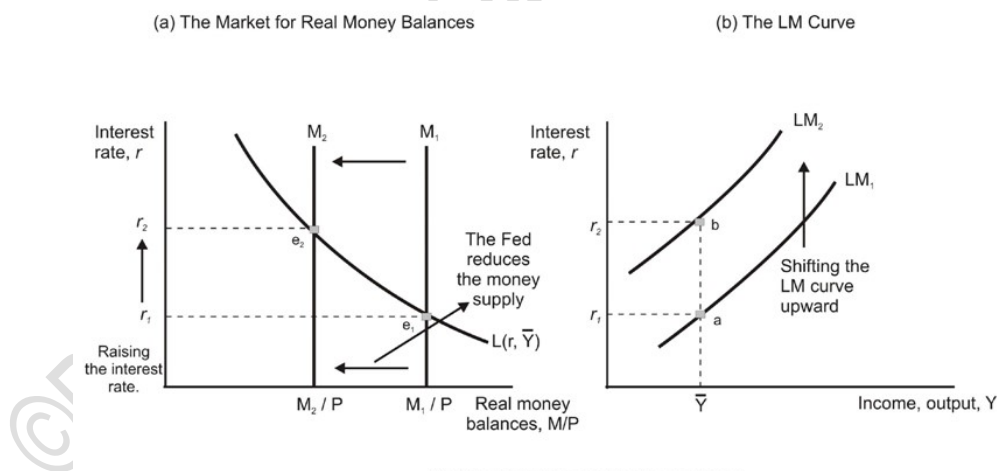


Fig. 4.4 - Effect of Money Supply on LM curve

Here In **figure 4.4** the effect of contractionary monetary policy is shown on the LM curve. In panel-a with the given level of income decrease in money supply leads to a new equilibrium in money market with a higher interest rate r_2 . Correspondingly in panel-b the LM curve shift upward.



4.5 THE SHORT-RUN EQUILIBRIUM IN THE IS-LM MODEL

As per the above discussion of the goods market and money market and the deriving the equilibrium in both the markets separately, now we establish the simultaneous equilibrium of both the markets in the economy. The IS curve shows the equilibrium points in the goods market and the LM curve shows the equilibrium points in the money market. The equilibrium will be established at the point where the IS and LM curve intersects and the equilibrium interest rate and the level of income is determined.

The IS and LM curve equations can be written as follows-

$$Y = C(Y-T) + I(r) + G \dots \dots \dots \text{IS}$$

$$M/P = L(r, Y) \dots \dots \dots \text{LM}$$

The LM curve illustrates the equilibrium combination of interest rate and the level of income in the money market and IS curve represents the equilibrium in the goods market at which the interest rate and the level of income are in equilibrium.

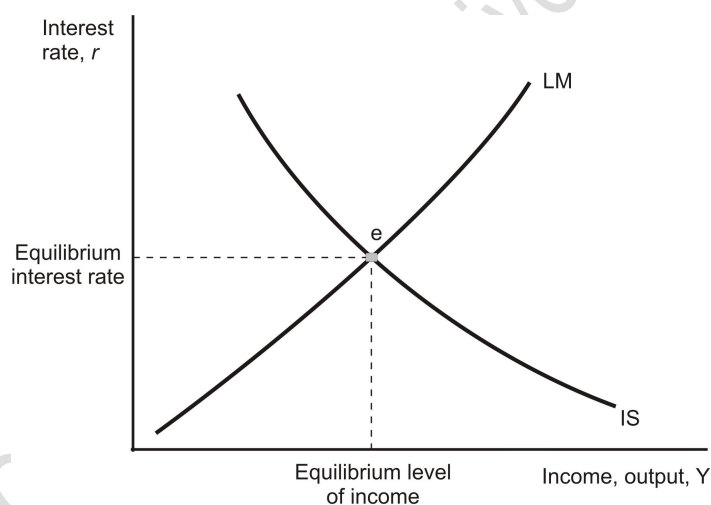


Fig. 4.5 - Simultaneous Equilibrium of Goods (IS) and Money Market (LM)

Figure 4.3 explains the joint equilibrium of goods and money market with equilibrium interest rate and the level of income is determined by the intersection of LS and LM curves.

4.6 EFFECT OF FISCAL POLICY ON THE IS CURVE AND

After establishing the simultaneous equilibrium in the goods and money market, now we study the effect of fiscal policy changes on the goods market represented by the IS curve.



We had studied from the Keynesian cross that the changes in fiscal policy affect the planned expenditure and accordingly IS curve shifts. Here we try to see how the shift in IS curve influences the level of income and interest rate at the given level of prices in the short run.

Effect of Government expenditure

Now we see the effect of government spending on the equilibrium level of income in the economy. Let the government increase its expenditure, this increase will increase the planned expenditure in the economy so the production level in the economy increases and accordingly the level of income will rise to a higher level. This increase in the level of income will push the demand for real money balances and so the interest rate increase. This increase in interest rate offsets the expected increase in investment and the level of income will increase less than the increase in the Keynesian cross.

Effect of changes in Taxes

Now we see the effect of changes in tax rates on the IS-LM model. If the government increases the tax rates on income, it will reduce the disposable income of individuals and households, and accordingly, the production level was cut down by the firms. This increase in tax rate affects both the level of income and the interest rate, so the fall in income is less than the fall in the Keynesian cross.

4.7 EFFECT OF MONETARY POLICY ON LM CURVE AND THE SHORT-RUN EQUILIBRIUM

We have studied earlier in the liquidity preference theory that the rate of interest is determined by the demand for real money balances and the supply of money.

The money market equilibrium is represented by the LM curve, it summarises the interest rate with the given level of income at the given price level.

So let us consider that the central bank increases the money supply in the economy, which leads to a shifting in the LM curve downward at a lower interest rate. People have more money than they want to hold on to the prevailing interest rate, so they started depositing it into banks or interest-bearing assets. The interest rate is keep on falling until the people are willing to keep all the extra money supplied by the central bank, this brings the money market to equilibrium. The decrease in interest rate also affects the goods market by stimulating the planned expenditure, production, and level of income.



4.8 THE INTERACTION BETWEEN MONETARY AND FISCAL POLICY

Now it is the time to understand the complexity of an economy where all things work interdependently. Whenever government applies one of the policy instruments, its efficacy depends on the support extended by other institutions in the economy.

We try to understand what will happen if government increase the tax rate. The effectiveness of this instrument as per IS-LM theory depends upon the support provided by the central bank.

Here we assume three policy responses of central bank-

First, the central keeps the money supply unchanged,

Second, the central bank reduces the money supply to maintain the same level of income,

Third, the central bank increases the money supply to maintain the same level of income.

It is important to understand that the increase in tax rates reduces the disposable income of individuals in the economy, so it leads to decrease in aggregate demand, if other factors like money supply are not increased correspondingly. On the other hand if the money supply is increased then the decrease in disposable income due to increase in tax rate is compensated and there is no decrease in aggregate demand in the economy.

So it is important to note that the effectiveness of fiscal policy depends on the response of central bank towards the money supply. Generally, while analyzing a change in one policy, we assume the other policy effects as neutral.

4.9 SUMMARY

- The equilibrium in the economy as per Keynesian cross will take place at the point where the aggregate demand or planned expenditure equals the actual output or actual expenditures
- The IS and LM curve shows the goods market and the money market respectively. They jointly determine the equilibrium in the economy, the intersection of both curves determines the equilibrium interest rate and the level of income in the economy.
- The changes in the money supply affect the LM curve, any increase in money supply will shift the LM curve downward, and a decrease in money supply will shift the LM curve upward.



- The IS curve represents the equilibrium in the goods market and any change in the fiscal policy will shift the IS curve. Any increase in government expenditure will shift the IS curve upward and a decrease in government expenditure will shift it downward.

4.10 GLOSSARY

Aggregate demand is the sum of the demands for current output by each of the sectors of the economy: households, businesses, the government, and foreign purchasers of exports.

The aggregate demand curve measures the demand for total output at each value of the aggregate price level.

The aggregate supply function is the macroeconomic analogy to the individual market supply function, which shows the output forthcoming at each level of product price. The aggregate supply function shows the total output firms will supply at each value of the aggregate price level.

Automatic stabilizers are changes in taxes and government transfer payments that occur when the level of income changes.

The autonomous expenditure multiplier gives the change in equilibrium output per unit change in autonomous expenditures (e.g., government spending).

Autonomous expenditures are expenditures that are largely determined by factors other than current income.

The average propensity to consume (APC) is the ratio of consumption to income.

The average propensity to save (APS) is the ratio of saving to income.

Consumption is the household sector's demand for output for current use. *Consumption expenditures* consist of purchases of durable goods (e.g., autos and televisions), nondurable goods (e.g., food and newspapers), and services (e.g., haircuts and taxi rides).

The consumption function is the Keynesian relationship between income and consumption.

Liquidity preference is a Keynesian term for the demand for money relative to bonds.

The life cycle hypothesis about consumption asserts that saving and consumption decisions of households reflect a plan for an optimal consumption pattern over their lifetime, subject to the constraint of their resources.

The liquidity trap is a situation at a very low interest rate where the speculative demand for money schedule becomes nearly horizontal.

Liquidity preference is a Keynesian term for the demand for money relative to bonds.



The liquidity trap is a situation at a very low interest rate where the speculative demand for money schedule becomes nearly horizontal.

Monetary policy is the central bank's use of control of the money supply and interest rates to influence the level of economic activity.

Money is whatever is commonly accepted as payment in exchange for goods and services (and payment of debts and taxes).

The money market is a set of markets for low-risk liquid assets with maturities of less than one year.

The money multiplier gives the increase in the money supply per unit increase in the monetary base.

4.11 ANSWERS TO IN-TEXT QUESTIONS

1. Use the Keynesian cross to predict the impact on equilibrium GDP of
 - a. An increase in government purchases.
 - b. An increase in taxes.
 - c. Equal-sized increases in both government purchases and taxes.
 - d. Purchases and taxes.
2. In the Keynesian cross, assume that the consumption function is given by $C = 200 + 0.75(Y - T)$.
Planned investment is 100; government purchases and taxes are both 100.
 - a. Graph planned expenditure as a function of income.
 - b. What is the equilibrium level of income?
 - c. If government purchases increase to 125, what is the new equilibrium income?
 - d. What level of government purchases is needed to achieve an income of 1,600?
3. Consider the impact of an increase in thriftiness in the Keynesian cross. Suppose the consumption function is $C = C_a + c(Y - T)$,
Where C_a is a parameter called *autonomous consumption* and c is the marginal propensity to consume.
 - a. What happens to equilibrium income when the society becomes more thrifty, as represented by a decline in C_a ?



- b. What happens to equilibrium saving?
- c. Why do you suppose this result is called the *paradox of thrift*?
- d. Does this paradox arise in the classical model? Why or why not?

4.12 SELF-ASSESSMENT QUESTIONS

1. Use the Keynesian cross to explain why fiscal policy has a multiplied effect on national income.
2. Use the theory of liquidity preference to explain why an increase in the money supply lowers the interest rate. What does this explanation assume about the price level?
3. What is liquidity trap? Discuss the measures taken by government to counter this trap and the economy will reach normalcy.

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LESSON 5

AD/AS FRAMEWORK

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SUGGESTED READINGS

- 5.1 Learning Objectives
- 5.2 Introduction
- 5.3 Supply Side Economics
- 5.4 Difference between the Short Run and Long Run
- 5.5 The Model of Aggregate Supply and Aggregate Demand
- 5.6 Policy effectiveness and AD& AS
- 5.7 Fiscal policy
- 5.8 Monetary policy
- 5.9 Trade and Exchange rate policy
- 5.10 Summary
- 5.11 Glossary
- 5.12 Answers to In-Text Questions
- 5.13 Self-Assessment Questions
- 5.14 References
- 5.15 Suggested Readings

5.1 LEARNING OBJECTIVES

- To understand the theoretical rationale behind formulating policies at the national as well as corporate level.
- To understand the fluctuations in macroeconomic indicators by using more logical assumptions.
- To understand the concept of Supply Side Economics in solving the complex economic problems of the country.
- To understand the role and significance of fiscal and monetary policies in controlling aggregate demand in the economy.



5.2 INTRODUCTION

After studying the short-run analysis of aggregate demand of the economy in lesson 4, now we will try to study the long-run effects of policy changes on the level of income in the economy. Here we also explain an alternative approach to solving economic problems of an economy. It deals with the aggregate supply in the economy and recently become very popular among policy makers.

5.3 SUPPLY SIDE ECONOMICS

As we know that the decade of 1930 is known for great depression in history. The Keynesian theory also came into light during this worldwide economic crisis. The whole world witnessed the negative sides of this economic downfall. The large number of labour force fell short of employment and a huge loss of production was registered in the face of unemployment. The entire economy was trampled and massive decline in income was seen for many years.

After the Second World War, it has also been noticed that inflation was the major issue addressed by the policymakers instead of unemployment. Then, Keynesian theorists came up with their ideas and explained it in term of excess aggregate demand and called it inflation which is caused by an increase in demand side factors. Keynesian followers also posit that to make the economy stabilized in short run, it is essential to manage the aggregate demand.

They also suggested that the economy should use fiscal and monetary policies in order to raise the aggregate demand and boost the economy towards growth by minimizing the imprints of depression or recession and unemployment.

They believed that such measures will help the economy grow and reduce the unemployment.

Apart from this, they also suggested the ways to avoid the state of inflation from an economy by adopting contractionary fiscal and monetary policy policies hence reducing the aggregate demand.

Supply-side economics means that the economy will grow by controlling the supply of goods and services. It simply believes that taxes should be reduced in order to generate employment, to speed up businesses and encourage entrepreneurial activities.

Supply side economics is considered as one of the applications of micro economic theory in the analysis of problems concerning economic aggregates – so-called "macroeconomics."



There are few renowned economists like Adam Smith, J. B. Say, Milton Friedman and Gary Becker who gave its conceptual explanations in their works.

The few Key Takeaway from Supply Side Economics are-

1. It emphasises on an increases in the supply of goods for economic growth.
2. It suggests to encourage production by reducing the tax as well as regulation and lower the interest rate.
3. It is considered as an alternative to Keynesian aggregate demand-side policy.
4. It also does not accept the view that decreasing the level or rate of increase in nominal aggregate demand necessarily results in a drop in employment and output. It stresses that limiting the growth in nominal demand accelerates the growth in employment, output, and real income.

Benefits of Supply Side Economics-

1. It bolsters and inspires for national economic growth and prosperity.
2. It motivates and creates multiple job opportunities in the economy.
3. It aims to incentivize firms, businesses and companies with tax cuts.
4. It focuses upon to cut taxes as an excellent method to stimulate the economy. The reason behind tax deduction is to augment the amount of spending money an individual or firms can use in purchasing goods and services.
5. It encourages using government projects or incentives to strengthen the economy.

Here are some examples to understand the Supply Side-Economics –

1. Purposefully encouraging free trade agreements to ensure business endeavours and investments.
2. Allowing relaxation in tax rates.
3. Allowing relaxation in selling government land for private businesses.
4. Allowing Private Set –ups to involve, participate and contribute their expertise in government newly organized projects and programmes to increase labour force as well as growth in economy.

We have learned that the concept of supply-side economics is to be found in its applications to the public economic policy issues of contemporary society. It is, therefore, to a great extent, an integral part of macroeconomic policies in the interest of more better functioning of the private market system, significant growth in the stock of capital, sound progress in the productivity of labour, and sharp increase in aggregate output.



5.4 DIFFERENCE BETWEEN THE SHORT RUN AND LONG RUN

In microeconomic theory the short run is the time period, when a firm is not able to increase the production by increasing its fixed factors and can increase its production only by increasing the variable factors. On the other hand, in the long run, production can be increased by increasing all factors in any proportion.

Here in macro economics the short run and long run difference depend on the variation in prices.

As per classical theory in long run, the economy is working at the full employment level and the prices are flexible. But the change in price level does not affect the level of employment, output, and level of income in the economy. So the aggregate supply curve, in the long run, is assumed perfectly inelastic at the given level of income.

On the other hand, the Keynesian theory has explained the theory of employment in the short run where prices are assumed constant and the firms are willing to supply an infinite amount of output at the existing price level. It is due to unemployed resources in the economy, so the cost of firms does not increase and they will not increase the prices. So the aggregate supply curve in the short run is assumed perfectly elastic at the given price level.

5.4 THE MODEL OF AGGREGATE SUPPLY AND AGGREGATE DEMAND

The aggregate demand and aggregate supply model explain the determination of the equilibrium level of income and the price level in the economy.

The interaction of aggregate demand and aggregate supply curves determines the equilibrium in the economy with a given level of income and prices. Here we see how the change in price level affects the equilibrium level of income and the level of prices in the economy.

In this model first we derive the aggregate demand curve by using the IS-LM model and then we study the factors affecting aggregate demand curve.

Aggregate Supply

Aggregate supply refers to the total quantity of production firms will produce and sell—in other words it is the real GDP. In another words, it is the total supply of output that businesses can sell in the economy—at a particular price and period.



Here we understand that the rise and fall in aggregate demand causes change in aggregate supply. For example, the rise in demand results in expansion of supply whereas the fall in demand causes decrease in supply. This concept is further divided into short-run supply and long-run supply. In the short run, supply is driven by price whereas in the long run, firms increase production.

Now we learn the formula for estimating the aggregate supply which is as follow-

$$AS = C + S$$

Here, AS means the Aggregate Supply, C means the Consumption Expenditure, and S means Savings.

Aggregate Supply Curve

The aggregate supply curve shows the number of goods or services produced in relation to price changes. Moreover, the aggregate supply, in the short run is found horizontal which means it is perfectly elastic. And aggregate supply curve in the long run, is found vertical which means it is perfectly inelastic.

This horizontal curve is based on the assumption that since there are unemployed resources in the economy so firms can produce as much as they want at the existing cost and there is no price increase in the short run, this horizontal shape indicates that the firms are willing to supply whatever amount of goods are demanded at the existing price level.

On the other hand the vertical supply curve in the long run shows that there is no change in the supply of goods whatever the price level. The vertical supply curve is based on the assumption that in the economy there is always full employment of labour and that's why the output is at its corresponding level and there is no scope for further increase in production with the existing technology.

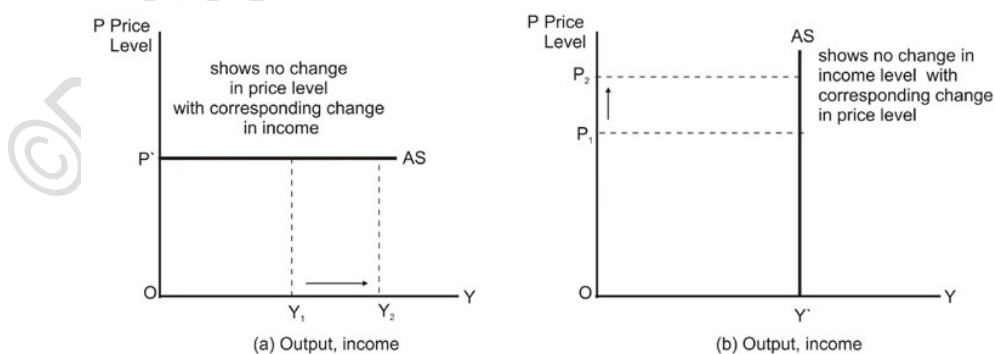


Fig. 5.1 - The short run and long run supply curves



Here in figure 5.1 we can see the shape of aggregate supply curve in short run in panel-a, and in the long run in panel-b. In panel-a supply curve is perfectly elastic at the given price level in the short run. It is clear from the horizontal slope of supply curve that the firm is willing to supply as much as required by the economy at the given price level. On the other hand in panel-b the aggregate supply curve is perfectly inelastic in the long run at the given level of income. It shows that there is no effect on the change in the price level on the level of income in the economy in the long run.

From the above discussion, it is clear that two extremes of supply curves were assumed one is vertical in the long run and horizontal in the short run. Considering both the extreme time horizons, we assume an intermediate supply curve of an upward slope, showing a positive relationship between the price level and the level of income in the economy.

Factors affecting short run Aggregate supply curve

1. Changes in wage rate
2. Prices of inputs
3. Change in labour
4. Corporate taxes and subsidies

Factors affecting long run Aggregate supply curve

1. Changes in technology
2. Change in stock of capital
3. Increase in labour force

Aggregate Demand

Aggregate demand refers to the amount of total spending on domestic goods and services and measures the total level of demand in an economy. It counts demand for each product produced in the economy. It also includes the foreign demands for the domestic products but does not include the domestic market for foreign products.

Here we have the following key takeaways of Aggregate Demand-

- Aggregate demand estimates the total consumer demand for goods and services produced.
- The variation in aggregate demand causes changes in economy's macroeconomic indicators.



- The increase in aggregate demand shows rise and growth in economy. With the growing economy, the industry expands and opportunities of employment generate. On the other hand, the decrease in aggregate demand weakens the economy, shrinks the industry and rate of production and the cuts the level of labour employed in production.
- Aggregate demand consists of foreign demand for domestic products. The economists consider aggregate demand as a benchmark for determining the country's position in international trade and export.
- It helps to understand why government increases its spending during financial crisis. Since government spending bolsters demand and increased demand boost up production, consequently level of employment also increases over the long term..

Aggregate Demand Curve

The aggregate demand curve depicts the relationship between the price level and the level of income at which the goods and services market and the money market are simultaneously in equilibrium.

Aggregate demand in the economy is the sum of the consumption demand (C), investment demand (I), government spending (G), and net exports (NX). It can be explained as follows-

$$AD=C+I+G+NX.....(1)$$

The position of the aggregate demand curve depends upon the above factors any increase in these factors will shift the aggregate demand curve upwards and a decrease will shift downwards. The confidence of consumers and investors also affects the position of the aggregate demand curve in the economy.

The supply of real money balances (M/P) also affects aggregate demand in the economy, any increase in the supply of real money balances will shift the aggregate demand curve upward, and a decrease will shift it downward.

Derivation of Aggregate Demand Curve

The aggregate demand curve describes a relationship between the price level and the level of national income.

To understand the determinants of aggregate demand more fully, we now use the *IS-LM* model with variable price level. To derive the aggregate demand curve, first, we use the *IS-LM* model to show why national income falls as the price level rises—that is, why the



aggregate demand curve is downward sloping. Second, we examine what causes the aggregate demand curve to shift.

From the below mentioned figures we can see the shift in Aggregate demand curves by expansionary fiscal and expansionary monetary policy.

The aggregate demand curve shows the set of equilibrium points in goods and money market simultaneously and shows how the change in price level changes the level of income in the economy.

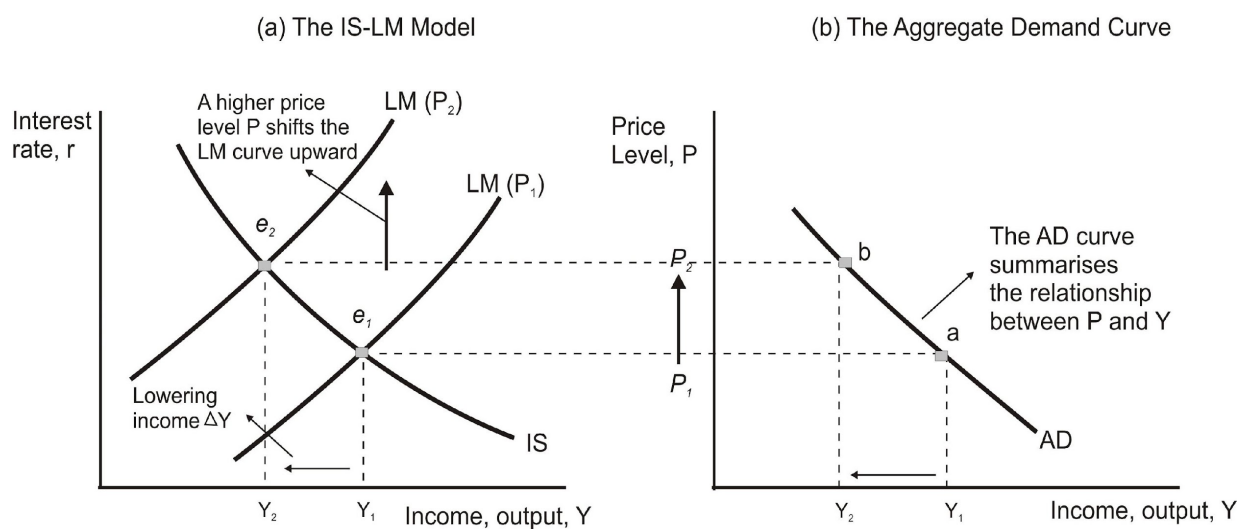


Fig. 5.2 - Derivation of the aggregate demand curve by IS - LM curves

Reasons of downward slope of aggregate demand curve

Real balance effect- real balances are the purchasing power of money balances held by the public in an economy. An increase in price level offsets the purchasing power of real money balances held by the public. This reduction in purchasing power feels them poorer, and they decrease their spending on consumption and the aggregate demand in the economy fell.

On the other hand, if the price level in the economy decreases, it leads to an increase in the purchasing power of real money balances held by the public, now they feel richer due to the increase in purchasing power, and the demand for consumption increases, and this increase in consumption spending by the public leads to increase in aggregate demand.



The effect of change in price level on the real balances due to which consumption in the economy gets affected and accordingly the aggregate demand curve becomes downward slope.

The rate of interest effect- It is the effect of change in the price level on the interest rate due to which investment demand in the economy gets affected and accordingly the aggregate demand in the economy gets affected.

Let the price level in the economy rise, due to the rise in price level people need more money to complete their transactions. This increase in demand for money at the given money supply leads to an increase in interest rates in the economy. As we know the negative relationship between investment and the interest rate, this increase in interest rate leads to a decrease in investment demand, and accordingly the aggregate demand in the economy contracts.

On the other hand if the price level decreases, this leads to more money available for the existing transactions. So at the existing supply of money people reduce their demand for money and the interest rate comes down, this reduction in interest rate leads to an increase in investment demand and accordingly the aggregate demand in the economy extends.

Foreign Trade effect- A change in price level affects the demand for exports and imports of goods in the economy are called the foreign trade effect. A rise in the level of prices makes the imported goods cheaper than the domestically produced goods and goods exported become dearer, so this leads to an increase in imports and a decrease in exports which makes the net export negative and leads to a contraction in aggregate demand in the economy. On the other hand decrease in the price level leads to an increase in exports and a decrease in imports and accordingly the aggregate demand leads to an extension.

Exchange rate effect- An increase in price level affects the exchange rate in terms of appreciation and depreciation. Appreciation affects the net exports adversely, and depreciation affects the net exports positively.

Here we are seeing the effect of an increase in price level on the capital outflow and capital inflow in the country which affects the balance of payment. Any increase in the price level leads to an increase in the interest rate and the exchange rate appreciates, inducing the foreign capital to come in order to earn a higher rate of return on investment. Contrary if the price level decreases it leads to a decrease in the interest rate and the exchange rate depreciates, and the capital moves out of the country to earn more return somewhere else, this leads to an adverse balance of payment, and contracts the aggregate demand assuming net exports constant.



Factors affecting aggregate demand

The aggregate demand curve summarizes the results from the *IS–LM* model, events that shift the *IS* curve or the *LM* curve (for a given price level) cause the aggregate demand curve to shift. For example, an increase in the money supply raises income in the *IS–LM* model for any given price level; it thus shifts the aggregate demand curve to the right. Similarly, an increase in government purchases or a decrease in taxes raises income in the *IS–LM* model for a given price level; it also shifts the aggregate demand curve to the right. Conversely, a decrease in the money supply, a decrease in government purchases, or an increase in taxes lowers income in the *IS–LM* model and shifts the aggregate demand curve to the left.

Anything that changes income in the *IS–LM* model other than a change in the price level causes a shift in the aggregate demand curve. The factors shifting aggregate demand include not only monetary and fiscal policy but also shocks to the goods market (the *IS* curve) and shocks to the money market (the *LM* curve).

The aggregate demand and aggregate supply are also get affected by the supply and demand shocks in the economy. Shocks are the disturbances that change the position of the aggregate demand and aggregate supply curves in the economy. These shocks are exogenous variable that affects the economic activities in the economy. For example, if the government announces anything for the people of the country which is going to increase their income, it leads to an increase in their consumption spending, and the aggregate demand curve shifts rightward. On the other hand, if any policy change affects the cost of production in the economy, it accordingly affects the aggregate supply curve in the economy. An increase in the cost of production or disturbance in production shifts the aggregate supply curve leftward.

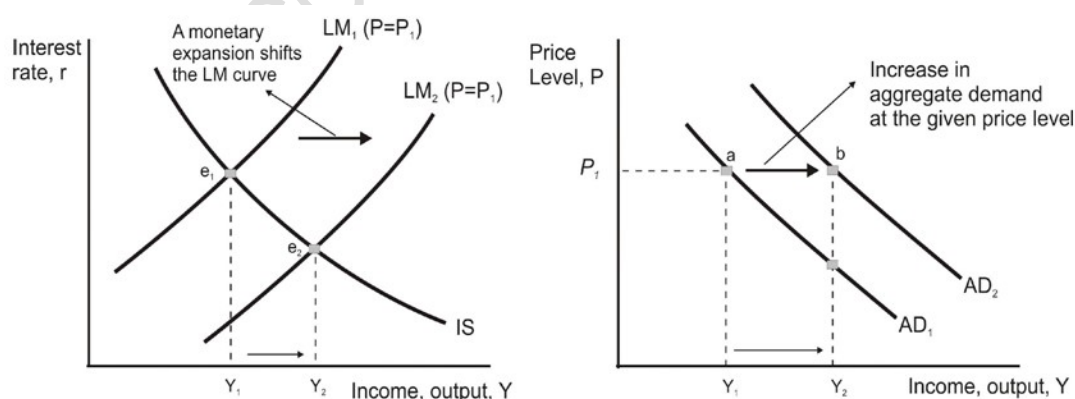


Fig. 5.3 (a) - Effect of Expansionary Monetary Policy



From **figure 5.3 (a)** we see with the given price level if there is an increase in money supply the LM curve shifts rightward or downward and so the AD curve shift rightward at a higher level of income with the same price level.

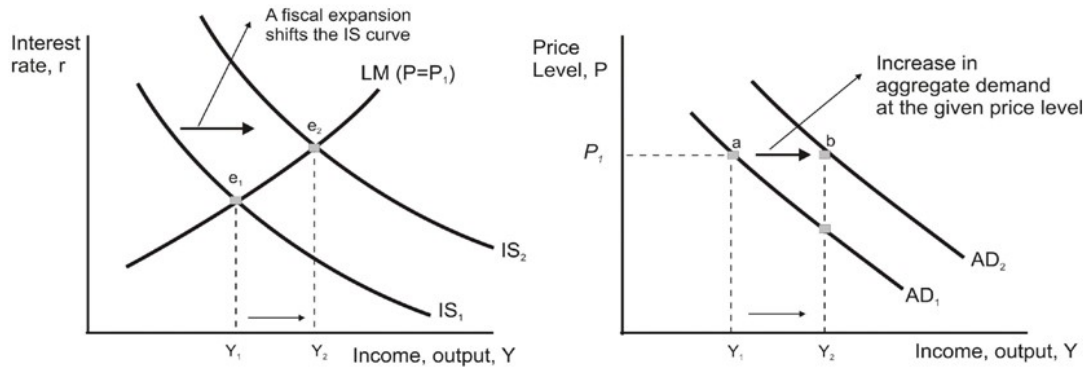


Fig. 5.3 (b) - Effect of Expansionary Fiscal Policy

From **figure 5.3 (b)** we can see due to expansionary fiscal policy the IS curve shifts towards right or upward and the new equilibrium will be at higher level of income with higher interest rate at the given price level, corresponding to this new equilibrium point AD curve also shifts towards right with the same price level new equilibrium will be at higher level of income from Y to Y_1 .

5.6 POLICY EFFECTIVENESS AND AD&AS

The objective of any government is to achieve full employment, stability in the price level, and faster economic growth, so the government has to design its macroeconomic policies in such a manner that the above-stated objectives will be achieved. Here it is important to understand that the economy will not work at the full employment level as stated by the classical school, and it is also not possible to increase output or employment without an increase in the price level as explained by Keynes in his theory.

The economy does not always work at equilibrium; there are often economic fluctuations that occur in output, employment, and price level. At times the economy finds itself in the grip of recession when levels of national output, income, and employment are far below their potential level. On the other side, the economy faces the problem of hyperinflation, where prices are increasing at a rapid rate, both economic conditions have their negative effects on the economy, and they should be contained by the appropriate macroeconomic policies.



So it is critical to see the efficacy of policies in achieving the objectives. So here we present some policies which are used by the government to achieve the objectives of any economy-

5.7 FISCAL POLICY

Fiscal policy is the use of government spending and taxation to influence the aggregate demand in the economy. In actual practice government interventions in the form of fiscal policy are required to achieve the potential output, income, and employment objectives.

In a developing economy like India government use this policy to affect the aggregate demand in the economy in times of Inflation and recession. As per the requirements government increase and decreases its spending and affects the aggregate demand.

Government purchases and government transfer payments act like increases in autonomous spending in their effects on equilibrium level of income.

The policy effectiveness depends upon so many other factors as well. Government also raises and lowers taxes and affects the disposable income of households and the aggregate demand.

Government as per requirement make surplus and deficit budget and influences the aggregate demand in the economy. It uses expansionary and contractionary policy as per the objective is to curtail or expand the aggregate demand accordingly.

Stabilizing the economy at a higher level of employment and national output is not the only objective of a macroeconomic policy. Ensuring price stability is its other goal. Both inflation and deflation have bad effects on the economy. It is therefore desirable to achieve price stability.

Fiscal policy is an important instrument to stabilise the economy, which is to overcome recession and control inflation in the economy. The fiscal policy generally aims at managing aggregate demand for goods and services in the economy. At the time of recession, the government increases its expenditure or cuts down taxes, or adopts a combination of both. To counter recession government adopts an expansionary fiscal policy, which raises government expenditure and cuts down taxes as well. The adoption of such kind of fiscal policy will lead to a government budget deficit.

On the other hand, to control inflation government reduces its expenditure or increases taxes to adopt a combination of both; it will lead to a government budget surplus.



5.8 MONETARY POLICY

Monetary policy is an important instrument of macroeconomic policy by which macroeconomic objectives can be achieved. In India, the Reserve bank of India works on behalf of the government and acts as per the objectives decided by the government. Like fiscal policy, monetary policy is also used to achieve a full employment level of output, maintain price stability, and faster economic growth in an economy.

The monetary policy is a policy formulated by the central bank, i.e., RBI (Reserve Bank of India) and relates to the monetary matters of the country. The policy involves measures taken to regulate the supply of money, availability, and cost of credit in the economy.

Monetary policy affects the demand and supply of economy, first by affecting the interest rates and then by affecting the aggregate demand. In order to squeeze or expand the aggregate demand central bank use expansionary and contractionary monetary policy.

Monetary policy is used to maintain the equilibrium between the money demand and money supply in the economy. In the case of disequilibrium between money demand and money supply, it results in inflationary or deflationary tendencies in the economy. More specifically, in times of recession monetary policy used its tools in such a manner that an adequate amount of credit should be available to the household and business sector. On the other hand, in times of inflation monetary policy is used to contract the money supply or increase the interest rate by which the excess credit will be squeezed out from the economy. It uses different instruments like open market operations and interest rate to curtail and increase money demand and money supply and accordingly the aggregate demand is managed in the economy.

It is important to note that the monetary policy has certain limitations in increasing the supply of money to achieve the expansion in economic activity. Keynes himself has stated that in times of depression, monetary policy will be ineffective in the recovery of the economy and therefore he laid stress on the adoption of fiscal policy to overcome depression.

5.9 TRADE AND EXCHANGE RATE POLICY

In an open economy, international transactions play a crucial role in augmenting the level of income in the economy. The degree of openness of an economy depends upon the amount of international transactions like capital flows, transfer payments, imports and exports reported in a year in the balance of payment. More open is the economy more is the complexities of managing it.



Trade policies, broadly defined, are policies designed to influence directly the amount of goods and services exported or imported. Most often, trade policies take the form of protecting domestic industries from foreign competition—either by placing a tax on foreign imports (a tariff) or restricting the amount of goods and services that can be imported (a quota).

In large or small open economies policies affect the trade and the exchange rates through the interest rate. In both large and small open economies, policies that raise saving or lower investment lead to trade surpluses, increase trade surplus affects the aggregate demand.

Similarly, policies that lower saving or raise investment lead to trade deficits. In economies, a protectionist or liberalized trade policies causes the exchange rate to appreciate and affects the level of aggregate demand in the economy.

5.10 SUMMARY

1. Supply-side economics gives a new perspective to policymakers to deal with the problem of high inflation and unemployment. Using fiscal policy tools like a reduction in the tax rate of firms leads to improvement in productivity and efficiency and affects the aggregate supply in the economy.
2. The model of AD-AS with variable price levels gives the complete picture of the economy. It integrates both the goods and money market at the given price level with the given level of income. It explains the effect of changes in price level on consumption demand, investment demand, and net exports in the economy.
3. Fiscal policy is an effective tool of government to manage the aggregate demand in the economy in times of recession and hyperinflation. By using fiscal policy tools like government expenditure, tax rates, and public borrowing, the government raises the aggregate demand in the goods market in times of recession. It is more effective in raising the aggregate demand in the economy.
4. Monetary policy is managed and controlled by the central bank. It balances the aggregate demand in the economy by managing the equilibrium in money demand and money supply in the money market. By affecting the interest rate and availability of credit in the economy central bank influences the aggregate demand in the economy in times of inflation and recession. Monetary policy is more effective in controlling money inflation in the economy.



5.11 GLOSSARY

Aggregate demand curve: The negative relationship between the price level and the aggregate quantity of output demanded that arises from the interaction between the goods market and the money market.

Aggregate-demand externality: The macroeconomic impact of one firm's price adjustment on the demand for all other firms' products.

Aggregate supply curve: The relationship between the price level and the aggregate quantity of output firms produce.

Fiscal policy: The government's choice regarding levels of spending and taxation.

Flexible prices: Prices that adjust quickly to equilibrate supply and demand.

Government purchases: Goods and services bought by the government.

Gross domestic product (GDP): The total income earned domestically, including the income earned by foreign-owned factors of production; the total expenditure on domestically produced goods and services.

Gross national product (GNP): The total income of all residents of a nation, including the income from factors of production used abroad; the total expenditure on the nation's output of goods and services.

Inventory investment: The change in the quantity of goods that firms hold in storage, including materials and supplies, work in process, and finished goods.

Investment: Goods purchased by individuals and firms to add to their stock of capital.

IS curve: The negative relationship between the interest rate and the level of income that arises in the market for goods and services.

IS-LM model: A model of aggregate demand that shows what determines aggregate income for a given price level by analyzing the interaction between the goods market and the money market.

Shock: An exogenous change in an economic relationship, such as the aggregate demand or aggregate supply curve.

Supply shocks: Exogenous events that shift the aggregate supply curve.



5.12 ANSWERS TO IN-TEXT QUESTIONS

1. The demand for money is most dependent upon? A. The level of prices B. The interest rate C. The availability of banking outlets D. The availability of credit card	3. Stagflation occurs when the economy experiences. 1. Rising prices and rising outputs 2. Rising prices and falling outputs 3. Falling prices and rising outputs 4. Falling prices and falling outputs
2. Which of the following is NOT a reason why the aggregate demand curves slope downward? 1. The exchange rate effect 2. The wealth effect 3. The classical monetary neutrality effect 4. The interest rate effect.	5. Which event shifts the short-run aggregate supply curve to the right? 1. A decrease in money supply 2. A decrease in oil prices 3. An increase in government spending on military equipment 4. None of the above

5.13 SELF-ASSESSMENT QUESTIONS

1. Explain the relevance of IS-LM model in developing the model of AD-AS?
2. Explain the roles of monetary and fiscal policy in causing and ending hyperinflations.
3. What is the impact of an increase in taxes on the interest rate, income, consumption, and investment?

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LESSON 6

PHILIPS CURVE, MONETARY POLICY, AND FISCAL POLICY

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STRUCTURE

- 6.1 Learning Objectives
- 6.2 Introduction
- 6.3 Philips Curve
 - 6.3.1 Lipsey's analysis of Philips Curve
- 6.4 Expectation Augmented Philips Curve
 - 6.4.1 Criticism of Philip's Curve
- 6.5 Fiscal Policy
 - 6.5.1 Mechanics of Fiscal Policy
 - 6.5.2 Flexibility of the Fiscal Policy
 - 6.5.3 Limitation of the Fiscal Policy
 - 6.5.4 Fiscal Policy and Economic Growth
- 6.6 Monetary Policy
 - 6.6.1 Objectives of Monetary Policy
 - 6.6.2 Monetary Policy during Inflation
 - 6.6.3 Role of Monetary Policy in developing Economy
 - 6.6.4 Assessment of the role of Monetary Policy
 - 6.6.5 Monetary Policy in India
- 6.7 Neutrality of Money
- 6.8 Crowding Out
- 6.9 Liquidity Trap
- 6.10 Role of the central Bank
 - 6.10.1 Functions of the central Bank
 - 6.10.2 Credit Control
- 6.11 Self-Assessment Questions
 - 6.11.1 Short Questions
 - 6.12.2 Long questions
- 6.12 References



6.1 LEARNING OBJECTIVES

- Concept of Philips Curve
- Fiscal Policy and Monetary Policy
- Neutrality of Money
- Crowding Out
- Role of central bank in India

6.2 INTRODUCTION

This unit will contain an Concept of Philip's Curve, Fiscal policy, Monetary policy and role of central bank in India. The reader will understand that implications of Philips' curve in the situation of stagflation, the major role of monetary and fiscal policy, role of central bank in India and efficacy of credit control. Money plays an important role in the functioning of economy. Money is an instrument of satisfying human wants. If it not possess this quality, it would have no value.

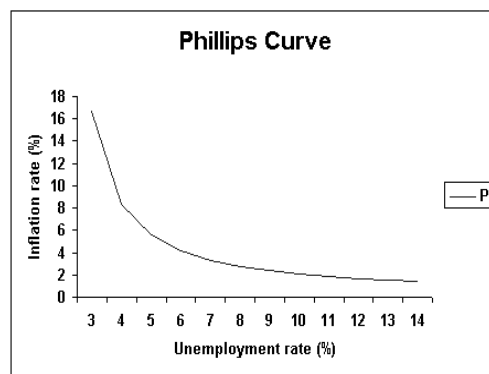
6.3 PHILIP'S CURVE

Keynes and Robinson foresaw a possibility of attaining simultaneously the dual objective of full employment and price stability without the help of either price control or wage control. This means that during recession or depression when the economy is having a good deal of excess capacity and large scale-employment of labour and idle capital stock, the aggregate supply curve is perfectly elastic. When full employment level of output is reached, aggregate supply curve becomes perfectly inelastic. With this shape of aggregate supply curve becomes perfectly inelastic. With this shape of aggregate supply curve assumed in the simple Keynesian model, increase in aggregate demand before the level of full employment, causes increase in the level of real national output and employment with price level remaining unchanged. That is, no cost has to be incurred in the form of rise in the price level (i.e. inflation rate) for raising the level of output and reducing unemployment. However, the experience of many countries with countries with strong producer pressure group shows that a fall in the level of unemployment increases pressure on prices and when the price level is stable, unemployment crosses the level which is considered 'Socially tolerable' by countries committed, in principle, to achieve full employment.

Philip's curve has been substantiated by research into the relationship between money wage-rates and the level of unemployment in UK, between 1861 and 1957 carried out by Prof.



A.W. Philips. The research made by Prof. Philips appears to support the hypothesis that the rate of change of money wage-rate can be explained by the level of unemployment and the rate of change of employment. The relation between the rate of change of money-wage rates and unemployment is likely to be curvilinear and not linear. Philips has used this curve to determine that for the UK a rate of 5.5 percent unemployment is needed if wages are to be held steady and a rate of 2.5 percent employment is needed if prices are to be held steady. This means that wages would rise by the same percentage as increase in productivity which is estimated to be 2 percent per year. In other words, wages will rise when employment is low and wages will fall but slowly because of the downward rigidity of wage rates, when unemployment is high. This inverse relationship between the nature of change of money wages and the rate of employment has come to be known as Philip's Curve.



It appears that Philip's main argument was demand – pull in nature. The level of unemployment reflects the excess demand because excess its demand in the labour market causes wage inflation and also determines an upward rise in wages. Similarly, during periods of high unemployment the excess supply of labour causes wages to move downwards.

6.3.1 Lipsey's Analysis of Philip's curve:

The statistical relationship established by Philips in the wage inflation and employment has been further analysed by Prof. Lipsey. In this connection, he has pointed out two behavioural relationships: i) a positive relation between the rate of change in the money wages –rates and the magnitude of excess demand for labour; and ii)an inverse non-linear relation between excess demand for labour and unemployment. These two relationships are found in single micro labour market.

Lipsey assumes that wages inflation is the increasing function of the proportionate excess demand for labour. He further maintains that the relation between excess demand for labour and the rate of employment is negative and non-linear which implies that the greater the



excess demand, the lower will be the level of unemployment and the lower the excess demand is zero, the labour market will be in equilibrium, but this the excess demand for labour by only the excess of number of vacancies over the number of unemployed persons. Thus, excess demand for labour can be zero only when the unemployment rate is positive. The unemployment compatible with zero excess demand is called frictional unemployment, which arises because of the lack of instantaneous matching of vacancies with unemployed workers.

The non-linear relationship means that while the unemployment rate will fall below frictional level because of the positive excess demand for labour, it can never fall below zero, however high level of excess demand may be.

Policy Implications of Philips Curve

Philips curve analysis aroused considerable interest among the policy makers particularly because of the implications of its relationship with price inflation. Changes in the price level were first related to the changes in the money wage rate and that is why Philips curve expressed the inverse relationship between the rate of price inflation and the rate of unemployment. The policy makers, therefore interpreted Philips curve as a relation between price inflation and unemployment. Thus, Philips Curve enables the policy makers to choose a given rate of inflation. It mean that inflation can be reduced only at the cost of higher unemployment or it can be increase only at the cost of lower employment.

ACTIVITY

What is Philips Curve? What are its policy implication?

6.4 EXPECTATION AGUMENTED PHILIP'S CURVE

Another important explanation of occurrence of a higher rate of inflation simultaneously with a higher rate of unemployment was provided by Friedman. He challenged the concept of a stable downward sloping Philips-curve. According to him, though there is a trade off between rate of inflation and unemployment in the short run, that is, there exists a short run downward sloping Philips Curve, but it is not stable and it often shifts both leftward or rightward. He argued that there is no long run stable trade off between rates of unemployment and inflation. According to Friedman's natural rate hypothesis though there is trade off between inflation and unemployment in the short run, the economy is stable in the long run at the natural rate of

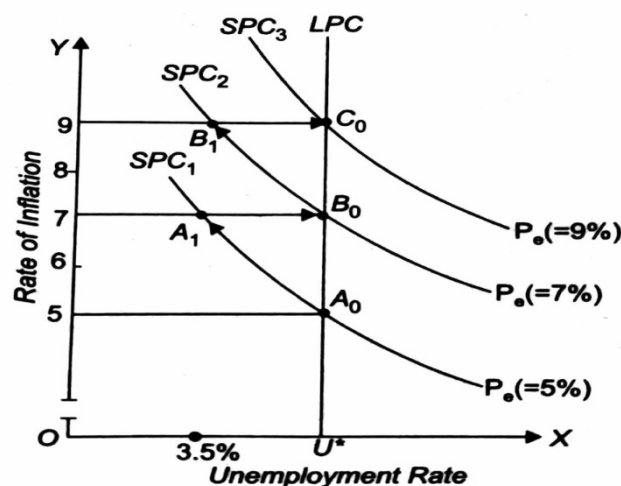


unemployment and therefore the long run Philips curve is a vertical straight line. He argues that misguided Keynesian expansionary fiscal and monetary policies based on the wrong assumption that a stable Philips Curve exist only result in increasing inflation.

Short-Run Philips Curve and Adaptive Expectations

Another important thing to understand from Friedman's explanation of shift in the long-run Philips curve is that expectations about the future rate of inflation play an important role in it. Friedman put forward a theory of adaptive expectations according to which people form their expectations on the basis of previous period rate of inflation, and change or adapt their expectations only when the actual inflation turns out to be different from their expected rate. According to this Friedman's theory of adaptive expectations, there may be a trade off between rates of inflation and unemployment in the short run, but there is no such trade off in the long run.

The view of Friedman and his follower illustrated in figure below. To begin with SPC_1 is the short run Philips Curve and the economy is at point A_0 , on its corresponding to the natural rate of unemployment equal to 5 percent of labour force. The location of this point A_0 on the short run Philips curve depends on the level of aggregate demand. Further, we assume that the economy has been experiencing a rate of inflation equal to 5%. The other assumption we make that the economy has been experiencing a rate of inflation equal to 5% rate of inflation will continue in the future.



Now suppose for some reasons the government adopts expansionary fiscal and monetary policies to raise aggregate demand. The consequent increase in aggregate demand will cause



the rate of inflation to rise, say to 7 percent. Given the level of money wage rate which was fixed on the basis of inflation would continue to occur, the higher price level then expected would raise the profits of the firms which will induce the firms to increase their output and employ more labour. As a result of the increase in aggregate demand resulting in a higher rate of inflation and more output and employment, the economy will move to point A_1 on the short-run Philips curve SPC_1 in figure, where unemployment has decreased to 3.5 percent while inflation rate has risen to 7 %. It may be noted from figure that in moving from point A_0 to A_1 , on SPC_1 the economy accepts a higher rate of inflation as the cost of achieving a lower rate of unemployment.

Long-Run Philips Curve and Adaptive Expectations

This brings us to the concept of long run Philips Curve, which Friedman and other natural rate theorists have put forward. According to them, the economy will not remain in a stable equilibrium position at A_1 . This is because the workers will realise that due to the higher rate of inflation than the expected one, their real wages and incomes have fallen. The workers will therefore demand higher nominal wages to restore their real income. But as nominal wages rise to compensate for the higher rate of inflation than expected, profits of business firms will fall to their earlier levels. Their reduction in their profit implies that the original motivation that prompted them to expand output and increase employment resulting in lower unemployment rate will no longer be there. Consequently, they will reduce employment till the unemployment rate rises to the natural level of 5%. That is, with the increase in nominal wages in the economy will move from A_1 to B_0 , at a higher inflation rate of 7%. It may be noted that the higher level of aggregate demand which generated inflation rate of 7% and caused the economy to shift from A_0 to A_1 still persists.

Further, at point B_0 , and with the actual rate of inflation equal to 7 percent, the workers will now expects this 7 percent inflation rate to continue in future. As a result, the short run Philips curve SPC shifts upward from SPC_1 to SPC_2 . It therefore follows, according to Friedman and other natural rate theorists, the movement along a Philips Curve SPC is only a temporary or short run phenomenon. In the long when nominal wages are fully adjusted to the changes in the inflation rate and consequently unemployment rate comes back to its natural level, a new short-run Philips Curve is formed at the higher expected rate of inflation.

However, the above process of reduction in unemployment rate and then its returning to the natural level may continue further. The government may misjudge the situation and think that 7 percent of inflation is not too high and adopt expansionary fiscal and monetary policies to increase aggregate demand and thereby to expand the level of employment. With the new



increase in aggregate demand, the price level will rise further with nominal wages lagging behind in the short run. As a result, profits of business firms will rise further with nominal wages lagging behind in the short run. As a result, profits of business firms will increase and they will expand output and employment causing the reduction in rate of unemployment and rise in the inflation rate. With this, the economy will move from B_0 to B_1 along their short-run Philips Curve SPC_2 . After sometime, the workers will recognise the fall in their real wages and press for higher normal wages to compensate for the higher normal wages to compensate for the higher rate of inflation than expected. When this higher normal wages are granted, the business profits which will cause the level of employment to fall and unemployment rate of return to the natural rate of 5%. That is in the above figure the economy moves from point B_1 to C_0 . The new short run Philips Curve will now shift to SPC_3 passing through point C_0 . The process may be repeated again with the result that while in the short run, the unemployment rate falls below the natural rate and in the long run it returns to its natural rate. But throughout this process the inflation rate continuously goes on rising. On Joining Points such as A_0 , B_0 , C_0 Corresponding to the given natural rate of unemployment we get a vertical long run Philips Curve LPC in figure. Thus, in the adaptive expectations theory of the natural rate hypothesis while the short run Philips Curve is downward sloping indicating the trade off between inflation and unemployment rate in the short run, the long run Philips curve is a vertical straight line showing that no trade off exists between inflation and unemployment in the long run.

It is important to remember that adaptive expectations theory has also been applied to explain the reverse process of disinflation, that is, fall in the rate of inflation as well as inflation itself. Suppose in above figure the economy is originally at point C_0 with 9% rate of inflation. Now, if a decline in aggregate demand occurs, say as a result of contraction of money supply by the central bank of a country. This will reduce inflation rate below the 9 percent expected rate. As a result, profits of business firms will decline because the prices will be falling more rapidly than wages. The decline in profits will cause the firms to reduce employment and consequently unemployment will rise. Eventually, firms and workers will adjust their expectations and the unemployment rate will return to the natural rate. The process will be repeated and the economy in the long run will slide down along the vertical long-run Philips curve showing falling rate of inflation at the given natural rate of unemployment.

6.4.1 Criticism of Philips Curve

- I. The explanation provided by Prof. Philips has not been accepted by all the economists. According to some economists changes in the price level are at least as



important in determining changes in the wage-rates as unemployment, which have been ignored by Prof. Philips.

- II. The 'money illusion' among workers as suggested by the Keynes is largely absent in today's bargaining because wage earners would make every effort to retain their share of national income if this has been eroded by rise in prices.
- III. Prof. H.G. Johnson has raised doubts about the applicability of the Philips curve to the formulation of economic Policy. In this connection he says, "On the one hand the curve represents only a statistical description of the mechanics of adjustment in the labour resting on the simple model of economic dynamics with little general and well tested monetary and the and value theory behind it. On the other hand, it describes the behaviour of the labour market in a combination of periods of economic fluctuation and varying rate of inflation, conditions which presumably influence the behaviour of the labour market itself, so that it may reasonably be doubted whether the curve would continue to hold its shape if an attempt were made by economic policy to pin the economy down to a point on it".
- IV. According to Milton Friedman relationship between the volume of employment and the rate of change in money prices is fallacious, because it implies a relationship between real and nominal magnitudes.
- V. The Philips curve has virtually no practical value because it is unstable and not permanent. Relationship between inflation rate and unemployment rate as observed by Prof. Philips curve is neither stable through time within a country nor across the countries.
- VI. The powerful role played by trade unions in the determination of wage rates in the labour market and thus in influencing the wages has also been ignored.
- VII. Wages and Prices are influenced by each other. Wage first influence prices through the increase in the cost of production and then prices influence wages through their effect on cost of living. The Philips curve only consider the effects of wages on the price and ignores the effect of prices on wages.
- VIII. The Philips Curve analysis is based on the assumption that inflation is an internal phenomenon of a country but in fact inflation now is an international phenomenon.



- IX. The Philips Curve analysis fails to provide an explanation of the existence of stagflation, that is, existence of high rate of inflation with high rate of unemployment, found in all the highly industrialised countries of the world.

6.5 FISCAL POLICY

In the economic sphere, the deliberate use of fiscal policy to attain and maintain a high level of employment and a stable price level, began during the thirties, largely as a result of the apparent ineffectiveness of monetary policy as an instrument of stopping the severe unemployment caused by the great depression and the ‘new economics’ of Keynes with its emphasis on aggregate demand and the growing importance of government expenditures and taxes to influence the level of output and employment, and to change the system of income distribution. From its modest beginnings fiscal policy has now become a major instrument to achieve economic stability.

For a discussion of fiscal policy we shall treat the aggregate demand comprising personal consumption, domestic investment and government expenditures for final product and an aggregate flow of income which is allocated not only to consumption expenditures and private savings but also, in part, to taxes. The government incurs certain expenditures on the purchase of goods and services and thus adds to the private spending. In any period, by increasing this expenditure, the government can raise the level of aggregate demand and by decreasing it, can bring down the level of aggregate demand and by decreasing it, can bring down the level of aggregate demand. In the former case, it can divert less amount and in the latter case it can divert a greater amount from the stream of private expenditures through its net tax collections. The effect of government spending and taxation upon aggregate demand depends upon how much it adds by its expenditures to the spending stream and how much it withdraws through its tax collections.

Rules for Fiscal Policy

The following may be described as the rules for fiscal policy:

1. During a period of falling employment or growing unemployment the government should obviously be interested in raising the level of aggregate demand to the level of full employment, either by: a) an increase in government expenditure on the purchase of goods and services, or by b) an increase in government transfer payments, or by c) a balanced budget expansion



2. If inflation caused by excess demand is the problem, the government for slashing the excess demand should reduce the level of aggregate demand by a) an increase in taxes, or by b) a reduction in government expenditure on goods and services, or by c) a reduction in transfer payments or by d) a combination of these
3. If the level of employment and output reached is quite high, the government must try to attain the rate of economic growth necessary to realise the objectives of continued full employment and price stability.

6.5.1 Mechanics of Fiscal Policy

How does the government select the most effective alternative? The mechanics of fiscal policy can be explained with the help of three models. Assuming that there are two sectors in the economy, viz. households and businesses, we shall examine in the first model the effects of tax receipts (T) and government purchases (G) and assume government transfer payments to be zero. In the second model, government transfer payments are added. Both these models assume that tax receipts are independent of the level of income, i.e. autonomous. In the third model, the breakdown of government expenditures into purchase of goods and services and transfer payments is retained, but tax receipts are recognised as being partly dependent on the level of income and partly upon the level of government expenditures. These models simply assume certain amounts of government spending and taxation, and indicate their expansionary and contractionary effects. This will just explain the pure mechanics of the relationship between government spending, taxation and the level of income.

First Fiscal Model

In a three sector economy— households, business houses and government— the fundamental equation of income and output would be:

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

Where Y is the net national income or product and S and I are net private saving and net private domestic investment respectively. Thus, in terms of saving and investment respectively. Thus in terms of saving and investment the identity can be expressed as

$$S + (T - G) = I$$

Where (T - G) represent public saving. The equilibrium between saving and investment will be found at the level of income and output at which planned saving plus taxes are equal to planned investment plus government purchases:

$$S+T = I+G$$



Any increase in G will raise the equilibrium level of income. The new equilibrium level of income must be that at which the amount of income stream diverted from consumption into planned saving and tax payment is just equal to the amount added to the income stream in the form of investment and government expenditure.

Second Fiscal Model

In this model, we shall examine the essential difference the effects upon income of changes in government transfer payments. Net tax receipts are equal to gross tax receipts minus government transfer payments and interest on debt, or $T_g - R$. Expressing this as $T = T_g - R$ underscores the fact that R is really negative taxes, in effect an amount of gross tax receipts which is returned to individuals through government transfer and interest payments. Substituting $T_g - R$ for T , the fundamental identity for net national product now becomes:

$$C + S + T_g - R = Y = C + I + G$$

The effect upon Y of an equal increase in R or in G will be less in the case of the change in R than in the case of G , as long as the MPC, or c is less than 1. That is,

$$\frac{1}{1-c} \Delta G > \frac{1}{1-c} c \Delta R$$

Where ΔG equals ΔR

The reason for this difference is that all of any increase in G is an addition to aggregate demand whereas only part of any increase in R becomes an addition to aggregate demand. ΔG affects aggregate demand directly, but ΔR affects it indirectly through the disposable income. Assuming that there is no change in tax receipts, ΔR directly increases disposable income by the full amount of ΔR . The consumption function indicates, however, that not all of any increase in disposable income will be devoted to consumer spending; some portion of it will be devoted to personal saving. In other words, at the first step, some portion of government transfer payments will fail to appear as demand for goods and services, but at the first step all government purchase appear as demand for goods and services. Thus in the case of government purchases the full increase in government spending is subject to the ordinary multiplier, but in the case of government transfers only a part which is not diverted to saving is subject to ordinary multiplier. These amounts may be designated as ΔG and $c\Delta R$.

Third Fiscal Model

In the previous model we have analysed the effect of a change in anyone element on Y for a given value of c , assuming other elements remaining constant. In practice, a change in



anyone element is bound to effect upon the level of income. The response of consumption spending to a change in income is already included in the previous model. In the third model we would include the response of investment spending, the response of government spending, at least the response of transfer expenditure, but to avoid complications, we will continue to treat these as completely autonomous. To bring this model closer to reality we can make one modification, that is, to allow for the fact that any change in income will affect tax receipts — since a major part of the receipts come from personal and corporate taxes. Now, assuming that tax receipts vary with changes in income, we may roughly treat tax receipts as a linear function of income. Hence the tax function will be—

$$T_g = T_a + t_y$$

This function is of the same type as consumption function and the investment function, t stands for the MPT or the marginal propensity to tax. It indicates the marginal rate of tax $\Delta T_g / \Delta Y$ or the fraction of any change in income that will be diverted from income receivers to government with a given tax structure and tax rates. It is comparable to the single rate in a proportional income tax.

6.5.2 Flexibility of the Fiscal policy

The changes in the level of economic activity in the economy occur so quickly and with such suddenness that fiscal tools not being flexible cannot be geared immediately to meet the situation. That's why it has been suggested that a built-in flexibility should be introduced in the fiscal system. Built-in flexibility implies that change in tax collections and government spending occur automatically (i.e. without any decision or action), promptly and in the right direction (meaning that decreases in aggregate demand requires additional government expenditure and reduced tax receipts and increases in aggregate demand requires the opposite Steps) to stabilize the aggregate demand.

Under the built-in flexibility system the tax rates would be so fixed that in the upward swing of the trade cycle, every increase in the national income, yields from taxes would automatically go up at a rate faster than the increase in the national income without any change in the rate of tax, while the government expenditure on relief, unemployment benefits etc would fall down automatically. Owing to the operation of these two forces the budget will automatically show a surplus and thus the upswing will be automatically put under check. The process will be reversed in the downswing phase of the cycle.

This system is good in a number of ways: first it works without changes in the tax rates and so it does not require any elaborate and cumbersome legislative procedure. Second, it does



not need any forecasting before initiating the action and hence the chances of mistakes are minimized. Third, the climate is free from uncertainties and is favourable to private investment. Lastly, it is the best method of coordinating short-run and the long-run fiscal policies.

Effects of discretionary change initiated by the government

In the foregoing analysis it has been stated that built-in flexibility provides appropriately timed helpful fiscal response to cyclical fluctuations, while flexibility formula provides a greater scope for the fiscal policy to be effective. The formula device implies discretionary action. We now examine as to how far the fiscal measures, even with discretionary action, can, in practice be successful in stabilizing the situation. The government can take three measures: first **change the structure of taxation**, second **change the level of government purchases of goods and services and transfer payments** and third **change the level of taxation**

- i) **Changes in the structure of taxation:** If the government wishes to influence the level of consumption and investment in the private sector without changing the level of its revenue and expenditure, it can achieve its objective to some extent by introducing certain changes in the tax structure. For example, the government may provide largest relief in the Income-tax at lower income levels and the loss in revenue may be made up by making the tax more progressive at higher income levels; it may reduce the burden of indirect taxes and shift it to direct taxes. In times of inflation the government may find it very difficult to implement the opposite of these measures. But a relief in Income tax or excise duty might encourage personal savings and measures which might encourage the retention rather than the distribution of profits might encourage corporate savings. For encouraging private investment, the government may allow liberal depreciation deductions at the time of assessment of tax liability. But such changes have their limitations, for example higher rates of income or Corporation tax might adversely affect effort and initiative; the government may also face enormous difficulty in the choice of the tax policies which are best designed for stabilization purposes. Besides the government may also face difficulty in reconciling these policies with the objective of economic justice because many people might object to these policies on the basis that these give rise to unfair distribution of the tax burden among different income classes for different types of income.
- ii) **Changes in the level of government purchases:** During inflation the government can reduce the inflationary pressure by reducing government purchases. In practice,



the government's freedom of action in this direction is rather limited. A major portion of the total government purchases is for meeting the requirements of National defence which is dictated by needs of maintaining security rather than those of stabilization and hence drastic changes in its volume cannot be made. In advanced countries, the percentage of defence expenditure in the total budget is still higher and there is no room for any cutback. In developing countries the items of expenditure are such that expenditure cannot be reduced. Moreover, most of the expenditure is incurred on meeting the requirements of social and economic development.

During recession an increase in government spending will have a multiplier effect, there is no reduction in private expenditure to the same extent. The more its spending is concentrated on the poorer sections of the community, where the propensity to consume is higher, the greater will be the multiplier. Direct expenditure by the government on goods and services has direct as well as induced effects. Since the major part of expanded purchases has to be for public works such as roads, dams, hospitals, schools, public buildings etc; the government has a direct control over it and it can exercise a decision influence over it. Such investment spending may be increased or decreased as the situation demands. Thus unlike reduction in taxation where there is no certainty that the increase in disposable income will actually be a spent public investment achieves actual spending.

- iii) **Changes in the level of taxation:** Because of their limitations, public spending programmes are not likely to be sufficiently flexible to combat successfully the cyclical fluctuations. The government however has another device at its disposal viz., the budgetary policy. Through this policy, the government can influence private consumption by changing the amount of personal disposable income of the people by changing the level of taxation in its annual budgets. Budgetary policy is essentially a means for adjusting the relationship between taxation and government expenditure. Taxation implies and appropriation by the government of a part of private incomes. The amount so appropriated is retained in the circular flow of income only when it is spent by the government. If government taxation is less than its expenditure, the aggregate demand will increase and income will expand. If taxation is more than the government expenditure the aggregate demand will decline and income will contract. To put it in another way, if aggregate demand is less than the necessary to maintain full employment, the government through budget deficits stimulates spending out of borrowing which, if continued from year to year, will have a multiplier effect and increase the size of the national income. Conversely, during inflation, the government



by increasing taxation and keeping its expenditure constant, or by reducing its expenditure and keeping taxation constant or by some combination of both can accumulate a budget surplus and thus increase public savings to balance the deficiency in private savings. The main merit of adjusting aggregate demand on the revenue side is that it enables the national product to be divided between private and public usage according to their relative priorities. There are certain tasks which the government can do better than the private enterprise: defence, justice, health, roads etc and government must decide as to what proportion of the National Product should be spent on them. How much is to be spent by the government would be given priority and will not change according to the variations in the level of private spending for maintaining aggregate demand at full employment level. Similarly, policy of taxation can also be used for or adjusting private demand in such a way sufficient resources are released for the requirements of the public sector. If there is full employment and private demand is so high as not to leave sufficient resources for the public sector, taxation must be increased. If, on the other hand whatever resources left after government has met its expenditure are inadequate for meeting the private demand, then taxation must be reduced to allow more purchasing power to the people. In this way, full employment can be achieved without complete control of resources. Once the essential claims of the public sector on the economy have been met, the rest of the national product can be distributed according to the private enterprise system.

6.5.3 Limitations of the Fiscal Policy

The limitations of fiscal policies are as follows:

- I. The success of fiscal policy largely depends on fairly accurate forecasting of the course of trade cycles, which is an extremely difficult task.
- II. Even if we are able to know the future course of trade cycles, it is very difficult to know which with exactitude the impact of various combinations of the various instruments of fiscal policy on the different variables. Furthermore, there are administrative delays in taking decisions, especially when legislative approval is needed for changing the rates and the structure of Taxation or for undertaking any Public Work project. Again, there is lot of uncertainty due to the time lag between the implementation of official measures and their full impact on the level of income, output and employment.



- III. Increase in public investment may cause a decline in private investment because of a rise in the prices of factors due to the keen, competition from the government. The fiscal policy may not be effective in combating serious depression and hyper-inflation, because of the psychology of private investors.
- IV. A vigorous fiscal policy to combat depression may cause a vast increase in public debt which may make the debt management extremely difficult.
- V. Fiscal policy for achieving full employment may be made ineffective by rising wages which may also adversely affect the employment emanating from the spending of those who receive funds from the government. Again, if the monopolists, instead of increasing their output, increase the price of their products, no additional secondary employment will be created in the monopoly industries and thus the achievement of full employment would become impossible.
- VI. Fiscal measures may be effective only in curing unemployment resulting from a deficiency of demand and not from any other causes. Public spending may not succeed in curing unemployment caused by structural changes, Wage rise and Monopoly restrictions.
- VII. A fiscal policy for curing unemployment may create balance of payment difficulties, because the additional incomes may be spent on the purchase of imported goods. Increase in imports and decrease in exports may also partly neutralize the effect of increased public spending.
- VIII. Increase in government spending on public works projects during deflation and a decrease in the same may clash with other social and economic objectives.

6.5.4 Fiscal Policy and Economic Development

Fiscal policy can help countries in accelerating the pace of economic development by affecting the reallocation of resources between different sectors and industries and regions in accordance with the objectives of the economic plan, by changing the distribution of income on a more equitable basis, by increasing the rate of capital formation and by controlling inflation. Fiscal policy can affect the distribution of resources between different sectors and industries through the instruments of government spending and taxation. Government spending in a particular sector of the economy tends to divert resources from other sectors to that sector. Taxation of a sector or industry produces the opposite effect. It is the pattern of government revenues and expenditures which act as a Lever for mobilizing



resources among different industries and occupations and helps the reallocation of resources according to the goal in view.

The taxation policy through various exemptions, concessions and discriminating rates can influence the pattern and level of private investment and distribution of property and wealth and subsidies, grants etc; can induce investment in the sectors and industries which the government wants to develop. Through this very tools the government can make the distribution of income more rational and equitable. For example, government spending on health and education may enhance the occupational and geographical mobility of the workers; land and property taxes may change the distribution of ownership inland and property; an element of progression in the tax structure can ensure a more rational distribution or government spending on items which benefit the poorer and backward sections of the community can reduce the gap between the rich and the poor. However, from the point of view of economic development the rate of capital formation and effects of inflation are more important. In fact it is the rate of capital formation that determines the rate of economic development of a country. Capital formation can take place either through investment spending in the private sector— financed other by saving or by creation of credit or by foreign Investments; or through investment spending in the public sector— financed by taxation revenues, borrowing or deficit spending. Since the level of savings in developing countries is very low, the scope of private investment is very much limited; the flow of capital on a larger scale from other countries also doesn't have a bright chance; and so the only major source of capital formation is that of public investment through **taxation** and **borrowing**.

Taxation: Taxation is the only effective financial instrument for reducing private consumption and investment and transferring resources to the government for economic development. In the early stages of economic development a country needs use investment on building up the economic and social overheads viz., transportation and Communications, electrification, irrigation works, education and Health Services etc. Such projects don't yield any direct return and are not at all attractive to private enterprise; and have therefore to be undertaken by the state. It is also not advisable to undertake them with borrowed funds and this are to be financed through taxation. True that taxation didn't play a very critical role crucial role in the development of the existing developed countries of the world. But the situation in those countries was entirely different. Firstly, in those countries most of the development took place through private initiative. Secondly, they had the resources for developing the scientific and Technical know how. Thirdly the inequalities in the distribution of income where not so large. Fourthly, the per capita income was not as



low as in the underdeveloped countries. And so going to the conditions prevailing in these countries, state participation is considered as essential for their economic development. Not only that since establishment of a classless society has been fixed as the goal, the extension of the public sector is very important.

The taxation potential of developed countries is quite low because of the low level of income the structure of the economy political setup and inequalities in the distribution of incomes but taxation if used gradually and wisely can prove very effective in removing all these deficiencies and in raising the taxes on potential of this countries unequal distribution of income is not only socially undesirable but economically very harmful for the growth of the economy the expenditure by the rich on luxury goods which are imported from abroad is not only and productive and wasteful but also depletes the foreign exchange resources which can be profitably utilised for the import of equipment technical no technical 9 how and raw materials required for the economic development of the country hence taxation of higher incomes will not only lead to the raising of resources for economic development but also help in the profitable use of foreign exchange and in reducing the inequality in the distribution of incomes reduction of inequalities will not motive motivate the poor classes to sacrifice some of their essential needs and thus contribute to the cause of national development it must however be noted that reduction of inequalities does not imply the reduction of functional inequalities those arising from intelligence hard work skill education etc but the reduction of inequalities which arise from inheritance functional inequalities are necessary for the economic growth of a country and must be preserved to the extent necessary for the development of the country taxation of personal incomes is an important source of revenue in many developed countries but in underdeveloped countries it can only be used for strengthening equity because most of the people life on the verge of subsistence and can't be taxed a large part of income does not come through commercial channels and is directly consumed by the producers majority of the people are illiterate and cannot maintain proper accounts for assessment purposes agriculture being the predominant occupation of vast number of people cannot be brought within the fall of the tax integrity efficiency and administrative competence are far below the mark so far as the effect on incentives is concerned there would be no adverse effect on incentives of a high rate of personal income taxation if consumption of luxury goods is very high if there is voting or flight of capital or if capital is invested in speculative Enterprises otherwise the savings would be discouraged investment and the rate of capital formation will decline so in the light of the foregoing analysis it can be concluded that the taxes and masonry can be gear in the interest of economic development of a country it has the necessary potential provided



that the physical authorities act causes Li and with foresight gorging the effect of each major and making necessary changes in the tax structure and implementing with promptness scale and efficiency but the greatest difficulty with many underdeveloped countries is that the prevailing conditions do not allow the use of the tax policy for mobilizing resources for economic development because of the existence of a large non-monetary sector the difficulty of bringing the rural population in the Income-Tax net lack of integrity and efficiency in the administrative staff lack of consonance and responsibility among the taxpayer etc.

6.6 MONETARY POLICY

Paul Einzig defines monetary policy, “as including all monetary decisions and measures irrespective of whether their aims are monetary or non-monetary, and all non-monetary decisions and measures that aim at affecting the monetary system.” Monetary Policy in its narrow sense, refers to the credit control of a central bank; in its broad sense, it means all those monetary and not monetary measures which influence the cost and supply of money. Monetary policy as an instrument of economic stabilization, has been used by various countries to manage their economies, especially since the nationalisation of Central banks. Such a policy involves influencing the level and composition of aggregate demand by manipulating rates of interest and the volume of credit. The traditional instrument of monetary policy is bank rate, supplemented by open market operations and selective credit control, where necessary. Since the end of the last World War, certain other methods of credit control have been developed and attempts have been made to make monetary policy more effective and more selective in its impact on the economy.

In fact, monetary policy has a positive role to play in bringing about non-monetary reforms as an instrument to implement the economic policy of the state. Such a role has been only recognised by the governments of the various countries after the world war-ii. This is due to:

- I. The persistence of world-wide inflationary trends
- II. The inability of the governments to check such trends and to bring about stabilisation through non-monetary measures.
- III. The belief that the extent to which fiscal measures can be effectively used is limited by international and domestic political consideration and for successful fight against



inflation available instruments of monetary technique must be put in active operations.

It may be pointed out that before the Great depression of the 1930's, monetary policy was considered to be as the most effective instrument of economic stabilisation but during the depression it lost its prestige and fiscal policy occupied its place. It was only after the outbreak of the world war II, owing to worldwide inflation that the monetary policy regained its lost prestige. These days, the governments have been making uses of both monetary and fiscal policies in economic management.

Understanding Monetary Policy

Money Supply	• Currency board • Liquidity Management
Inflation	• Fluctuations • Instruments of Credit Control • Buying and Selling of Government bonds
Macro Economic Goals	• Rate of Interest • Employment level • Foreign Exchange Rate

6.6.1 Objectives of Monetary Policy

- Ensuring Price Stability
- To Promote economic growth
- Stability of Exchange rate
- Macroeconomic Goals of the economy.
- Full Employment.
- Credit Control
- Creation and expansion of financial institution & Control of Inflation
- Restrictions of Inventories



6.6.3 Role of Monetary Policy in developing economy

The chief objective of the monetary policy in developing economies should be, obviously, to raise the rate of capital formation and economic growth. This can be done by adopting a policy of cheap money and to stimulate investment by lowering the rate of interests, directing investment into desired channels through selective credit control and by undertaking public investment on a large scale. In view of scarcity and shyness of capital, some economists have suggested a policy of high rates of interest for such economies. In their opinion, high rate of interest would channelise the scarce capital only to the most productive and uses would eliminate wasteful uses of resources. It would stimulate savings and check inflation. It is true that a policy of high interest rates may be successful in doing all this but it may not be desirable to generally restrict investment just for keeping inflation under check.

In fact, a mild dose of inflation helps in raising the level of investment. But, if the inflationary pressure continues mounting up, then the monetary authority would be required to use both direct and indirect methods of credit control. Of these measures, the open market operations cannot be of much help because in such economies the bill market is generally small and undeveloped. The central bank does not have a complete control over the commercial banks and therefore they maintain an elastic cash deposit ratio. The commercial banks are also not encouraged to invest in government securities because of their low rate of interest, and they prefer to keep their reserves in liquid form. The commercial banks generally also do not borrow from the central bank.

Similarly, the bank rate policy can also not be effective because of:

- I. Lack of bills of discount
- II. The small and undeveloped bill market
- III. A large non-monetised sector
- IV. The existence of indigenous bankers, beyond the control of central bank
- V. Habit of the commercial banks to maintain large cash reserve
- VI. A large unorganised money market

The monetary policy can create a favourable climate both for saving and investment in such economies. The shape of investment would, however, depend on the policy of credit institutions and the forms of credit institutions and the forms of credit control that are adopted. In most developing countries, the commercial banks provide only short-term credit which is chiefly used for carrying inventories, purchasing land and real estate and for



financing the production of export crops. The government will have to make guarantees or provide rediscount facilities, if the commercial banks are to be induced to advance medium and long term loans. Selective credit controls can also influence pattern of investment and production. The commercial banks can differentiate between different sectors and industries in matters of cost and amount of credit, the duration, the amount of collateral, etc. If the central bank has adequate control on the commercial banks, selective control could be exercised to indirectly influence the behaviour of banks by having different rediscount rates for different types of loans or by making exception in regard to reserve requirements on a selective basis.

6.6.4 Monetary Policy in India

There is no formal structure of coordination between fiscal policymakers and monetary policymakers. However, in the six member Monetary Policy Committee, three members are nominated by the government, which does facilitate coordination between the government and RBI. Hence, both policies are supplementary in nature. On the other side, the MPC framework can hamper independence of RBI in the true sense, where the RBI functions as an agent of the government. There is a correlation between central-bank independence and macroeconomic equilibrium. Moreover, independent central banks strongly promote stability and sustainability in the macroeconomic framework (Mankiw, 2006). There is a specific inflation target of 4% (plus or minus 2%); no such specific target exists for output, growth or unemployment (Sivramkrishna, 2016). As per Article 112 of the Constitution of India, the fiscal policy is an annual financial statement of the government's receipts and expenditures prepared by the Ministry of Finance after consulting with other ministries and the Niti Aayog. Moreover, the fiscal policymakers ensure that they take care of concerns of essential stakeholders from the agriculture sector, industry and services sector before finalizing the budget. The policymakers aim to meet expectations and requirements of the stakeholders on the basis of the economic situation. Based on Article 266 of the Constitution of India, all revenues are received, loans raised and receipts from recoveries of loans granted by the government from the consolidated fund of India. All expenditures of the Government are incurred from the consolidated fund of India. Article 267 of the Constitution authorizes the Contingency Fund to be used by the Government to meet urgent unforeseen expenditures. The money in provident funds, small savings, or special funds are part of the public account. In India, under the aegis of the Finance Ministry, the department of economic affairs prepares the fiscal policy. The Reserve Bank of India is responsible for the monetary policy (Surbhi, 2015). In short, the fiscal policy is concerned with public revenue and public expenditure



while the monetary policy is concerned with a change in the money supply and change in the rate of interest. There is the possibility of political influence in fiscal policy due to the nature of the task and election pressures (Mankiw, 2014). Moreover, the politician's primary goal is to develop confidence in their policies in voters' minds so that they are re-elected. A fiscal stimulus package before an election helps to increase aggregate demand, leading to higher economic growth and lower unemployment (Blanchard, 2006).

During a recessionary period, the fundamental problem is inadequate effective aggregate demand. The first line of monetary policy against economic downturns is increasing the money supply; the central bank reduces interest rates. This decrease in the rate of interest will decrease the cost of borrowing to finance investment projects, such as new factories and new housing. It will lead to increase in investments, finally increase aggregate demand and facilitates increase in production and employment. Fiscal policy can mitigate this recessionary pressure. The government may reduce tax rates; it increases disposable income, which increases overall consumption, finally increases the aggregate demand (Mankiw, 2014). Both the fiscal and monetary policies increase aggregate output through multiplier effects based on value of marginal propensity to consume. It further induces consumption, which accordingly increases aggregate demand.

6.7 NEUTRALITY OF MONEY

Certain economists like Wicksteed, Koopmans, Hayek, Robertson, etc, advocate that the objective of monetary policy should be to keep the money neutral, i.e, to ensure that the quantity of money in circulation does not affect the prices. These economists believe that business fluctuations occur because of the changes in the quantity of money in circulation and if the disturbances caused by monetary change could be controlled or eliminated, then instead of vigorous fluctuations, only smooth adjustments to changes in technology, consumer's preferences. Or act of God will take place in the economy. A neutral money policy thus, implies two things: first, the monetary authority will have to be given authority to counter balance changes in the velocity of circulation of money caused by hoarding and dishoarding of people. Second, unless basic changes in the structure of the economy, viz., population, technology etc are compensated by changes in the quantity or velocity of circulation of money, there would be such disturbances as would be quite contrary to the neutral money theory. It should also be noted that changes in prices may even occur when money remains neutral, owing to the changes in the volume of transactions and improved productivity of the factors of production.



This theory has, therefore, been criticised on a number of points:

- I. It is based on wrong premises, i.e. it carries with it all the assumptions on which the quantity theory of money is based.
- II. It is not easy to implement this policy because it is not possible to keep the supply of money constant in actual practice without which money cannot act in a neutral fashion.
- III. Even after keeping the money supply constant at a particular level, it is not sure that the price level would be stable because other factors like technological improvements may cause changes in the level of output, which would certainly lead to a decline in the price level owing to a decline the production cost.
- IV. The policy appears to be self-contradictory, because on the one hand that protagonists of this policy advocate that the state should not interfere in the economic affairs, on the other hand for maintaining a constant supply of money they expect monetary authority to make frequent adjustments with the fundamental changes in the economy.

6.8 CROWDING OUT

The crowding out effect refers to a phenomenon where increased government deficits can lead to a rise in interest rates. This, in turn, can cause activity in the private sector to diminish. The *crowding out effect* is an economic situation that happens when both the government and the private sector are competing for access to the same funds or other resources.

When the economy isn't able to meet the demand of both groups, the government tends to be able to claim resources first. This causes private industry to be unable to obtain all the money or raw materials that it wishes to make use of. Oftentimes, **interest rates increase** significantly when the government consumes more from the private sector. This rise in rates, in turn, can cause a slowdown in economic activity. This is primarily a situation that occurs when governments and private industry compete for access to the same funds. Crowding out can happen in theory at any point. However, in practice, it tends to be a problem when the government puts much more strain on an economy's lending or industrial capacity than usual. Examples of this can occur during:

- Wartime
- Inflationary periods
- When the government runs large budget deficits



How ‘Crowding Out’ Works

Like with other goods, money itself is an economic market which reacts to the forces of supply and demand. Crowding out happens when both private individuals and companies and the government demand additional funding, and the supply of loans is not sufficient to meet that demand. When there is an inadequate supply of capital, this forces interest rates to increase to create a new market equilibrium.

Traditionally, fixed income investors are more eager to lend to the government than private enterprises because the government has the power of taxation to pay its bills. This makes government credit a safer risk than lending in the private sector. In other words, when both the government and a private company want to take out a loan, the government generally is able to obtain financing first.

When the government consumes more of the economy's private lending capacity, however, it leaves fewer loans available to everyone else in the marketplace. Private companies that would have borrowed funds to expand their factories, build new stores, or hire more employees instead may have to forgo those plans because the cost of capital becomes too high and these proposed projects no longer meet a company's hurdle rate.

Types of Crowding Out

The classical economics textbook example of the crowding out phenomenon is in interest rates and the demand for money. However, there can be other types of crowding out as well. Here are a few primary cases.

I Financial Crowding Out

Financial crowding out is the most common form. This is where the government's demand for additional borrowed funds causes interest rates to go up, and thus stifles private sector investment.

II Resource Crowding Out

Resource crowding out can happen when the government buys up a large portion of the supply of a given good, and thus makes it difficult for the private sector to meet its production schedules. This often happens during wartime when the government prioritizes the construction of armaments and other military equipment. This could cause a deficit of goods such as iron ore, steel, copper, and so on in the broader economy.



III Infrastructure Crowding Out

A tension can occur in market-based economies where both the government and the private sector provide certain infrastructure services. Suppose that the government invests more in building transportation-related assets such as ports, railroads, postal services and the like. This can discourage private companies from providing these services since it can be challenging to compete against a government-run provider which has less of a profit motive when managing its operations.

6.9 LIQUIDITY TRAP

Liquidity trap's idea was discovered originally by J.M. Keynes and Hicks (1937), as it was said to occur during the great recession of the 1930's for the first time. Since the 1970's central banks in the developed world was interested in fighting inflation rather to stimulate the economy by increasing money supply, as they follow Milton Friedman (1969, pp. 1-50) rule. In the 1990's and 2000's the main central bank's objective was to ensure the credible monetary policy with inflation target (Svensson, 2010) clearly stated. As economic agents used the same forecasting models as the central banks that time, they were able to predict monetary policy more accurate. This in turn led to decrease in economic aggregates volatility such as: output, inflation etc., which Bernanke (2004) called this period 'The Great Moderation'. Woodford (2003, p.268) shows the path of learning dynamics by economic agents, when the Taylor rule is satisfied much more in recent decade than in previous periods. In the late 1990's B. Bernanke, L. Svensson, M. Woodford and P. Krugman (Krugman, 2010) researched the Japan's lost decade. The outcome clearly shows that Japan's economy has been caught into the liquidity trap since mid-1990. Krugman (1998) argue that if liquidity trap has occurred in Japan, it can occur elsewhere anytime now.

Crisis 2008- and the quantitative easing policy in the United States, which was targeted not only to restore liquidity on the financial markets but also to lower right-tail of yield-curve, might cause elements of the liquidity trap. The aim of this paper so, is to find if some aspects of liquidity trap are visible in the United States. The literature review shows two approaches to assessing liquidity trap. The standard Keynesian view augmented by rational expectation and the monetary, which focus on monetary aggregates cointegration. If evolutions of monetary aggregates become irrelevant to prices and output, economy may be caught into liquidity trap. The paper is organized as follows: the two sections provide literature survey on Keynesian and monetary approach to liquidity trap. The third one assesses some cointegration evidence and the fourth conclude.



Liquidity trap: Keynesian approach

Liquidity trap was originally discovered by J.M. Keynes (1936) and Hicks (1937). This phenomenon is due to nominal interest rate positive only. When it is not possible to make lower nominal interest rate than zero, further monetary stimulation of aggregate demand is ineffective. Additionally LL curve is sloped upward since an increase of income and further it goes into perfect inelastic (Hicks, 1937). The model has got into standard macroeconomic textbook and was not developed much until famous Krugman's paper (1998). According to Krugman (1998), the lack of economists' interest in this field was due to the lack of faith that liquidity trap will ever happen. Krugman (1998) sheds new light on liquidity trap, which was proposed by standard IS-LM model. Krugman's model combines interest rate, consumption, money supply and expectations:

$$\frac{P^*}{P} = \frac{1}{1 + \rho} \left(\frac{y^*}{y} \right)^{\rho} \quad (1)$$

Where: i – interest rate, D – discount factor, P^* – future price level, P – current price level, y^*/y – the relation between future output (expected) and current output, ρ – relative risk aversion. The relation (1) can be viewed as a model, which assumes sticky or flexible futures prices. The risk aversion coefficient comes from agent's utility function, as they are to decide whether they won't to buy bonds at interest rate i or spend money on consumption (which drives output). Therefore if future prices remains fixed (P^*), any raise in current prices (P) will produce future deflation, as higher P means lower i and i cannot be negative. If nominal interest rate was negative, agents would hold money instead of bonds. When interest rate is close to zero bonds and money become perfect substitutes and further increase in money supply will not change neither output nor price level. The Krugman's (1998) model incorporated financial intermediation in the above. The evidence for financial intermediation to liquidity trap is also visible in the evolution of monetary aggregates. In Japan for example monetary base in years 1994-97 rose by 25.6 per cent, while bank credit rose only by .9 per cent (Krugman 1998, table 7). Similar data provided Friedman and Schwartz (1963, table A-1). Between 1930 and 1933 in the United States currency held by public rose by ca. 46 per cent, while commercial bank total deposits fall by ca. 41 per cent¹. As it was associated with banking crisis that had begun in the early 1930. Krugman's (1998) provides a way to escape the liquidity trap. This is a credible overshoot of inflation target by central bank. In other words central bank should set agent's expectations of the future price level to rise.

In the Keynesian approach liquidity trap condition can be seen through market friction in the financial intermediation sector. Bernanke and Gertler (1995) introduce the term 'external finance premium'. The premium comes from the 'lemons problem' directly. Financial intermediation assesses the borrowers' creditworthiness, which cost is incorporated to the 'external finance premium'. The level of an average 'premium' is varying over the business



cycle. Usually during the economic downturn ‘premium’ raises, which in turn makes the interest rate that entrepreneurs and consumers faces higher; even though central bank’s short-term interest rate is very low. The raise in cost of ‘lemons’ in some circumstances can sharply decrease the transaction volume, as suggested by Akerlof (1970). Kacperczyk and Schnabl (2010) shows that financial market in the United States was blocked by the problem of ‘lemons’. Liquidity trap in that sense should occur, when financial sector is reluctant to lend money to private sector in spite of high banks reserves. This condition is somehow similar to the mentioned above problem of natural interest rate, as the ‘premium’ raises the nominal interest rate. Martens and Raven (2011) evidence shows, that credit channel in the United States depressed the expectations and hence caused the liquidity trap recession recently.

6.10 ROLE OF THE CENTRAL BANK

The variation in circumstances surrounding the origins of central banks means that their roles and functions have not all evolved in the same way (Box 1). Some started life as special purpose government banks constructed to bring some order to the issuance of banknotes. Some were established to act as funding conduits for the government. Some were large commercial banks, whose dominance was subsequently boosted by the granting of monopoly rights to issue banknotes. The majority were, however, created in the 20th century (Box 1, Figure 1) specifically as central banks – public policy agencies for central banking functions. The bundle of functions that constitutes a central bank is not fully defined beyond the basic point that a central bank is the agency that conducts monetary policy and provides the means of settlement. Nor can the definition always be inferred from the functions allocated to central banks established in the 20th century, since the bundle of functions often differed substantially from country to country. This chapter explores the global diversity of functions assigned and objectives specified, noting implications for the array of governance practices observed. Some common themes are worth noting at the outset.

First, in the past few decades, a more focused concept of the role and responsibilities of the central bank seems to have emerged. Objectives have become better identified and used more actively as a means to shape the performance of the central bank. However, objectives for some functions – including the important financial stability function – remain to be spelled out clearly, limiting the completeness of governance arrangements. Second, difficult trade-offs often must be made between multiple objectives in relation to specific functions and between objectives for different functions. Those trade-offs complicate the related governance structures as well as the performance of the tasks. But just as a clear picture of the archetypical central bank seemed to be emerging, events moved the image out of focus.



The current financial crisis has brought various unsettled issues to the fore (including incomplete objectives and trade-offs) and has thus renewed some uncertainties about the future shape of central bank functions and objectives.

6.10.1 Functions of the central Bank

Functions of RBI (The India's Central Bank) Reserve Bank of India being an apex court of the centre enjoys enormous power and functions under banking system in India. It has monopoly over the issue of bank-notes and monetary system of the country. These power and functions as to issue of bank notes and currency system are governed by the Reserve Bank of India Act, 1934. Besides it the Banking Regulation Act, 1949 also empowers certain power and Function of the Reserve Bank. Main Functions of RBI Main functions are those functions which every central bank of each nation performs all over the world. Basically, these functions are in line with the objectives with which the bank is set up. It includes fundamental functions of the Central Bank. They comprise the following tasks.

- 1. Issue of Currency Notes:** The RBI has the sole right or authority or monopoly of issuing currency notes except one rupee note and coins of smaller denomination. These currency notes are legal tender issued by the RBI. Currently it is in denominations of Rs. 2, 5, 10, 20, 50, 100, 500, and 1,000. The RBI has powers not only to issue and withdraw but even to exchange these currency notes for other denominations. It issues these notes against the security of gold bullion, foreign securities, rupee coins, exchange bills and promissory notes and government of India bonds.
- 2. Banker to other Banks:** The RBI being an apex monetary institution has obligatory powers to guide, help and direct other commercial banks in the country. The RBI can control the volumes of banks reserves and allow other banks to create credit in that proportion. Every commercial bank has to maintain a part of their reserves with its parent's viz. the RBI. Similarly, in need or in urgency these banks approach the RBI for fund. Thus, it is called as the lender of the last resort.
- 3. Banker to the Government:** The RBI being the apex monetary body has to work as an agent of the central and state governments. It performs various banking function such as to accept deposits, taxes and make payments on behalf of the government. It works as a representative of the government even at the international level. It maintains government accounts, provides financial advice to the government. It manages government public debts and maintains foreign exchange reserves on behalf of the government. It provides overdraft facility to the government when it faces financial crunch.



4. **Exchange Rate Management:** It is an essential function of the RBI. In order to maintain stability in the external value of rupee, it has to prepare domestic policies in that direction. Also, it needs to prepare and implement the foreign exchange rate policy which will help in attaining the exchange rate stability. In order to maintain the exchange rate stability, it has to bring demand and supply of the foreign currency (U.S Dollar) close to each other.
5. **Credit Control Function:** Commercial bank in the country creates credit according to the demand in the economy. But if this credit creation is unchecked or unregulated then it leads the economy into inflationary cycles. On the other credit creation is below the required limit then it harms the growth of the economy. As a central bank of the nation the RBI has to look for growth with price stability. Thus, it regulates the credit creation capacity of commercial banks by using various credit control tools.
6. **Supervisory Function:** The RBI has been endowed with vast powers for supervising the banking system in the country. It has powers to issue license for setting up new banks, to open new branches, to decide minimum reserves, to inspect functioning of commercial banks in India and abroad, and to guide and direct the commercial banks in India. It can have periodical inspections an audit of the commercial banks in India.

6.10.2 Credit Control

The Reserve Bank of India has a credit policy which aims at pursuing higher growth with price stability. Higher economic growth means to produce more quantity of goods and services in different sectors of an economy; Price stability however does not mean no change in the general price level but to control the inflation. The credit policy aims at increasing finance for the agriculture and industrial activities. When credit policy is implemented, the role of other commercial banks is very important. Commercial banks flow of credit to different sectors of the economy depends on the actual cost of credit and availability of funds in the economy.

Method of credit Control:

- The lowering or raising of their discount and interest rates with a view to lowering or raising money rates generally and encouraging the expansion or contraction of credit.
- The buying or selling of securities or bills of exchange in the open market with a view to putting additional funds into the market or withdrawing funds there from and thus expanding or contracting credit.



- The rationing of credit as an alternative or an addition to raising discount and interest rates.
- The lowering or raising of the minimum cash reserve requirements to be maintained by the commercial banks as an additional means of enabling the central bank to expand or contract their capacity to create credit.
- The imposition of minimum secondary reserve requirements to be maintained by the commercial banks in the form of government securities and other specified assets, in order to restrict their capacity to extend credit for general business purpose.
- The regulations of terms and conditions under which credit repayable in instalments may be granted for purchasing or carrying consumers' durable goods, as a mean of exercising some direct control over the volume of outstanding consumer credit.

6.11 SELF ASSESSMENT QUESTIONS

1. Examine the factors which cause shifts in the short run in Philips Curve?
2. How does Philips Curve explain the trade off between unemployment and inflation? Discuss its policy implication
3. What do you mean by neutrality of money? How did the classical economist establish it?
4. Explain the concept of neutrality of money?
5. What are the Principal Objectives of Monetary Policy? Is there any conflict between these objectives?
6. Discuss the main objectives of monetary Policy?
7. Explain how fiscal policies measures can be effectively used by underdeveloped countries for their economic development
8. Distinguish between monetary and fiscal policy, and discuss their relative advantages as means of controlling inflation.
9. What are the role and functions of central Bank?

6.12 REFERENCES

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6.13 SUGGESTED READINGS

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LESSON 7

THEORIES OF TRADE AND BALANCE OF PAYMENT

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STRUCTURE

- 7.1 Learning Objectives
- 7.2 Introduction
- 7.3 Theories of International Trade
 - 7.3.1 Mercantilism
 - 7.3.2 New Trade Theory
 - 7.3.3 Theory of Absolute Advantage
 - 7.3.4 Theory of Comparative Advantage
 - 7.3.5 Modern Theory of International Trade
 - 7.3.6 Imitation Gap Theory
 - 7.3.7 Product Life Cycle Theory
 - 7.3.8 Theory of National Competitive Advantage
- 7.4 Balance of Payment
 - 7.4.1 Sub-Section 1
 - 7.4.2 Sub-Section 2
- 7.5 Summary
- 7.6 Answers to In-text Questions
- 7.7 Self-Assessment Questions
- 7.8 References
- 7.9 Suggested Readings



7.1 LEARNING OBJECTIVES

After reading the lesson, the learners are expected to understand

- Mercantilism
- New Trade Theory
- Theory of Absolute Advantage / Absolute Differences in Cost
- Theory of Comparative Advantage / Comparative Differences in Cost
- Modern Theory of International Trade / Heckscher Ohlin (H.O.) Theory
- Superiority of H.O. Theory over the Classical Theory / Difference between H.O. Theory and the Classical Theory
- The Leontief Paradox
- Product Life Cycle Theory
- Theory of National Competitive Advantage
- Meaning of Balance of Payments (BOP)
- Balance of Trade
- Balance of Trade and Balance of Payments
- Components of Balance of Payments
- Difference Between Current Account and Capital Account
- Autonomous and Accommodating Items of Balance of Payments (BOP)
- Equilibrium and Disequilibrium in the Balance of Payment
- Measures to Control Disequilibrium in Balance of Payment

7.2 INTRODUCTION

The countries today are globally linked with each other through trade in goods and services and the movement of factors of production. This helps the countries to make optimum use of their resources through specialization, in turn, making the industries and workers more productive. These outcomes further help in lowering the cost of production of a number of products which translates into higher living standards. Without international trade, most nations would be unable to provide the basic amenities to their citizens at current levels. In short, not only nations, companies and citizens benefit from international trade, modern life would be nearly impossible without it.

There are multiple motives for international expansion, some strategic in nature, some reactive. These include the ability to increase sales and profits, serve customers better, access



lower cost or superior production factors, optimize sourcing activities, develop economies of scale, confront competitors more effectively, develop rewarding relationships with foreign partners, and gain access to new ideas for creating or improving products and services.

7.3 THEORIES OF INTERNATIONAL TRADE

The goods and services that are traded between nations vary greatly. Rarely do countries adopt the export and import trade patterns of other countries; instead, they develop their own product portfolios and patterns of trade. Furthermore, the susceptibility of different countries to the changes in exogenous factors varies significantly. This chapter aims to discuss various theories of international trade in order to provide a conceptual understanding of the fundamental principles of international trade and the shifts in trade patterns. Trade is essential for the very survival of nations with scarce resources, like Singapore or Hong Kong (currently a province of China), or nations with unbalanced resources, like those in the Caribbean and West Asia. However, engaging in trade requires a logical foundation for nations with diversified resources, like India, the US, China, and the UK. A nation's trade patterns are a dynamic phenomenon rather than a static occurrence. Furthermore, a country's trade partners and product profile do alter over time. The undisputed leader in diamond polishing and trade, the Belgian city of Antwerp, had previously seen a shift in the diamond industry to India and other Asian nations. A few fundamental questions must also be addressed by managers of international businesses such as Why do countries trade with one another? Is trading a zero-sum game or a profitable endeavour for both parties? Why do trade patterns differ so greatly between nations? Can government policies influence trade? Theories of international trade provide the reason for most of these queries.

Trade theories offer an insight into the potential product portfolio and trade patterns. They also make it easier to comprehend the fundamental factors that have influenced a nation's development as a source of supplies or a market for particular goods. These fundamental economic theories also have varying degrees of influence on the guiding principles of national regulatory frameworks and those of international organizations.

7.3.1 Mercantilism

According to the mercantilism theory, a country's wealth is determined by the quantity of its accumulated wealth. Between the sixteenth and the nineteenth centuries, European colonial powers encouraged international trade to enhance their holdings of goods, which was then invested to create a potent army and infrastructure. The colonial powers mainly carried out international trade for the benefit of their native countries, which viewed their colonies as



resources to be exploited. The first ship of the East India Company arrived at the port of Surat in 1608 to carry out trade with India and take advantage of its rich resources of spices, cotton, finest muslin cloth, etc. Other European nations-such as Germany, France, Portugal, Spain, Italy-and the East Asian nation of Japan also actively set up colonies to exploit the natural and human resources. Governmental interventions that actively promoted colonial expansion and the maintenance of trade surpluses were used to implement mercantilism. Imports were restricted by national governments through tariffs and import quotas and encouraged exports by subsidizing production. The colonies provided relatively cheap sources for basic necessities like unprocessed cotton, grains, spices, herbs and medicinal plants, tea, coffee, and fruits, which were used both as consumer goods and as industrial raw materials. Thus, the mercantilism policy significantly aided and benefited the colonial powers' ability to amass wealth.

During this period, gold and silver were the most important sources of wealth. A country could earn gold and silver by exporting goods whereas importing goods would result in an outflow of gold and silver. The main principle of mercantilism was to maintain a trade surplus by maximizing exports and minimizing or restraining imports. By doing so, a country would accumulate gold and silver and consequently will increase its national prosperity.

In accordance with this principle, the mercantilist doctrine recommended intervention of the government to achieve a trade surplus. The mercantilist saw no benefit in a large volume of trade. Rather, they recommended policies to maximize exports and minimize imports. To achieve this, imports were restricted by non-tariff barriers like tariffs and quota and exports were subsidized.

In 1752, a classical economist David Hume drew attention to the basic discrepancy in the mercantilist doctrine. According to him, if England had a balance of trade surplus with France, it would result in an increased inflow of gold and silver. Consequently, there'll be an increased domestic money supply resulting in inflation in England. France would have the opposite effect due to the outflow of gold and silver. There'll be a contraction of money supply in France thereby causing the prices to fall. This change in relative prices between France and England would encourage the French to buy fewer English goods that have become relatively expensive and the English to buy more French goods that have become relatively cheaper. This would cause the balance of trade position of England to decline and that of France to improve until the English surplus was eliminated. Hence, in the long run no country could continue to have a surplus on the balance of trade according to Hume unlike what the mercantilists had anticipated.



Criticism

1. It considered trade as a zero-sum game (a situation in which gain or loss by one country is exactly balanced by loss or gain by another country). It was left to Adam Smith and David Ricardo to prove that trade is a positive-sum game (a win-win situation where no one wins at someone else's expense).
2. The importing firms, especially those that import raw materials and parts used in the manufacture of finished goods, suffer due to mercantilism.
3. It harms the consumers because restricting imports limits the choice of goods the consumers can buy.
4. Import restrictions results in product shortages that may lead to higher prices i.e. inflation. When taken to an extreme, mercantilism may invite beggar-thy-neighbour policies (an international trade policy that benefits the country that enacted it, while harming its neighbours or trade partners).

IN-TEXT QUESTIONS

Complete the following:

The main principle of Mercantilism was to _____.

The theory of Mercantilism was contradicted by _____.

The theory considered trade as a _____ game.

7.3.2 The New Trade Theory

The New Trade theory, as propounded by Prof. Paul Krugman, is a collection of economic models in international trade which focuses on the role of increasing returns to scale and network effects which were developed in the late 1970s and early 1980s. The new trade theorists relaxed the assumption of constant returns to scale and suggested that using protectionist measures to build up a huge industrial base in certain industries will then allow those sectors to dominate the world market. What was new in new trade theory was the use of mathematical economics to model the increasing returns to scale and especially the use of the network effect to argue that the formation of important industries was part dependent in a way which industrial planning and judicious tariffs might control.



The model also showed how past dependent industrial concentrations can sometimes lead to monopolistic competition or even situations of oligopoly. Thus, it explains why countries can export and import designer clothes. This means that capital-intensive countries often dominate the most profitable industries. Being the first to develop these industries, these countries gain the first mover advantage.

The New Trade Theory suggests that the government has an important role in promoting new industries and supporting the growth of key industries in a developing economy to be able to achieve economies of scale. However, government intervention might be controversial, as stated by many economists, as it may encourage inefficiency in the long run if it has poor information about the new industries it is likely to support.

Thus, the New Trade Theory recognizes that economies of scale are a key factor in influencing the development of trade. It also suggests that free trade and laissez-faire government intervention may be much less desirable for developing economies who find themselves unable to compete with established multi-nationals.

IN-TEXT QUESTIONS

Fill in the blanks

The focus of the New Trade Theory is on _____ and _____.

The increasing rate of return was modelled through _____ in this theory.

7.3.3 Theory of Absolute Advantage

In 1776, Adam Smith questioned the mercantilists' assumptions by stating that the real wealth of a country consists of the goods and services available to its citizens rather than its holdings of gold. He emphasized on the virtue of free trade that are the results of division and specialization of labour at the national and international level. However, at the international level, the division of labour requires the existence of absolute differences in cost. Absolute difference in cost arises when one country produces a commodity at a lower cost than the other country and the other country produces some other commodity at a lower cost in comparison to the first country. Thus, according to this theory, every country should specialize in the production of that commodity which it can produce more cheaply than others (i.e. enjoys absolute advantage) and exchange it for those commodities which cost less in other countries (i.e. in which it has absolute disadvantage).



To illustrate, let there be two countries A and B producing a commodity each, X and Y respectively, at an absolute lower cost of production than the other. The absolute difference in cost is illustrated in Table 1.

Table 1: Absolute Difference in Cost

Country	Commodity X (in units)	Commodity Y (in units)
A	10	5
B	5	10

The table shows that country A can produce 10 units of commodity X (10X) or 5 units of commodity Y (5Y) with one unit of labour and country B can produce 5 units of commodity X (5X) or 10 units of commodity Y (10Y) with one unit of labour. Thus, country A has an absolute advantage in the production of commodity X ($10X > 5X$) and country B has an absolute advantage in the production of commodity Y ($10Y > 5Y$). Both the countries will benefit from trade if country A specializes in the production of commodity X and country B specializes in the production of commodity Y as shown in Table 2.

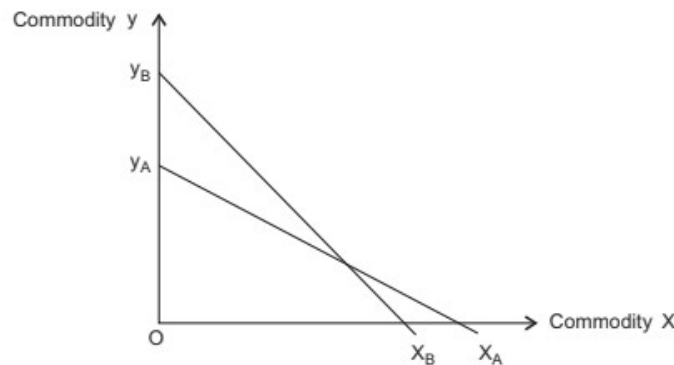
Table 2: Gains from Trade

	Production before trade (1)		Production after trade (2)		Gains from trade (2 - 1)	
Commodity → Country ↓	X	Y	X	Y	X	Y
A	10	5	20	—	+10	-5
B	5	10	—	20	-5	+10
Total production	15	15	20	20	+5	+5

By applying one unit of labour on the production of each commodity, both the countries can produce only 15 units each of the two commodities. If country A were to specialize in the production of commodity X, its total production will be 20 units of X by using both units of labour. Similarly, if country B were to specialize in the production of commodity Y alone, its total production will be 20 units of commodity Y by using both units of labour. The



combined gain from trade to both the countries will be 5 units each of commodity X and Y respectively.



The PPC of country A is $Y_A X_A$ and that of country B is $Y_B X_B$. PPC of country A shows that it can produce either OX_A of commodity X or OY_A of commodity Y. Similarly, the PPC of country B shows that it can produce either OX_B of commodity X or OY_B of commodity Y. The diagram also reveals that country A has an absolute advantage in production of commodity X ($OX_A > OX_B$) whereas country B has an absolute advantage in the production of commodity Y ($OY_B > OY_A$).

Criticism

Adam Smith's analysis of the basis of international trade is unrealistic. This is because a number of developing and underdeveloped countries have trade relations with other countries even though they do not possess absolute advantage in the production of any commodity.

IN-TEXT QUESTIONS

The theory was propounded by _____.

When one country produces a commodity at a lower cost than the other country and the other country produces some other commodity at a lower cost in comparison to the first country, it gives rise to _____.

7.3.4 Theory of Comparative Advantage

According to David Ricardo, the trade relation between two countries is determined by the comparative differences in costs and not by the absolute differences. The costs differ in countries because of geographical division of labour and specialization in production causing a country to produce one commodity at a lower cost than the other. In this way, each country



specializes in the production of that commodity in which its comparative cost of production is the least. Thus, when a country enters into trade with some other country, it will export those commodities in which its comparative cost of production is less and will import those commodities in which its comparative cost of production is high. According to Ricardo, this is the basis of international trade.

Statement of the Theory

“Each country will specialize in the production of those commodities in which it has the greatest comparative advantage or the least comparative disadvantage”.

7.3.4.1 Assumptions of the Theory

The theory of comparative advantage is based on the following assumptions:

1. There are only two countries, say India and Bangladesh producing the same two commodities, say rice and wheat.
2. Both countries have similar tastes and preferences.
3. Labour is the only factor of production and all its units are homogeneous.
4. There is no change in supply of labour.
5. Labour cost (the number of units of labour employed to produce each commodity) determines the prices of the two commodities.
6. Commodities are produced under the law of constant costs.
7. Technological knowledge remains the same.
8. There is barter system of trade.
9. There is full employment of factors of production in both the countries.
10. Factors of production are perfectly mobile within countries but perfectly immobile between countries.
11. Trade is free between two countries.
12. There are no transportation costs.
13. The international market is perfect; therefore, the exchange ratio is the same for the two commodities.

1.3.4.2 Explanation of the Theory

Given these assumptions, Ricardo shows that trade is possible between two countries when one country has an absolute advantage in the production of both commodities, but a comparative advantage in the production of one commodity than in the other. This is illustrated with an example of trade between India and Bangladesh as shown in Table 3.

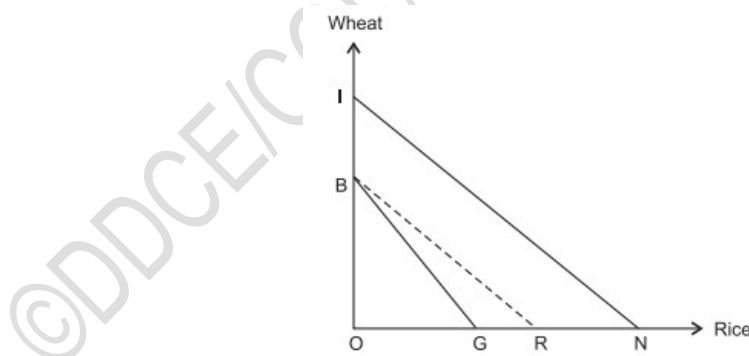
**Table 3: Man-years of Labour Required for Producing One Unit**

Country	Rice	Wheat
Bangladesh	120	100
India	80	90

The table shows that the production of a unit of rice in Bangladesh needs 120 men for a year while a unit of wheat requires 100 men for a year. On the other hand, the production of a unit of rice in India requires 80 men for a year and 90 men for a year for the production of wheat. Thus, Bangladesh uses more labour than India in producing both rice and wheat. In other words, Indian labour is more efficient in producing both the commodities. Thus, India possesses an absolute advantage in the production of both rice and wheat. But India would benefit more by producing rice and exporting it to Bangladesh because it possesses greater comparative advantage in it. This is because the cost of production of rice (80/120 men) is less than the cost of producing wheat (90/100 men). On the other hand, Bangladesh should specialize in the production of wheat in which it has least comparative disadvantage. This is because the cost of producing wheat in Bangladesh is less (100/90 men) as compared with rice (120/80 men). Thus, trade is beneficial for both the countries.

The comparative advantage theory can also be illustrated with the help of production possibility curve.

IN is the production possibility curve of India and BG that of Bangladesh. India enjoys an absolute advantage in the production of both rice and wheat over Bangladesh. It produces ON of rice and OI of wheat as against OG of rice and OB of wheat produced by Bangladesh.

**Figure 2: Comparative Difference in Cost with the help of PPC**

The slope of BR (parallel to IN) shows that India has a greater comparative advantage in the production of rice because if it gives up resources required to produce OB of wheat, it can produce OR of rice which is greater than OG of rice produced by Bangladesh. On the other hand, Bangladesh has the least comparative disadvantage in the production of OB amount of



wheat. Thus, India will export OR of rice to Bangladesh in exchange for OB of wheat from it.

1.3.4.3 Gains from Trade

Ricardo does not discuss the actual ratio at which rice and cloth would exchange and how much the two countries gain from trade. The domestic trade ratios before trade in the two countries for rice and wheat are shown in Table 4.

Table 4: Domestic Exchange Ratios

Bangladesh	India
Rice 120 : 100 Wheat (6/5) 1 : 1.2	Rice 80 : 90 Wheat (8/9) 1 : 0.89
Wheat 100 : 120 Rice (5/6) 1 : 0.83	Wheat 90 : 80 Rice (9/8) 1 : 1.13

The cost of production of one unit of rice in Bangladesh is 120 men and that of producing one unit of wheat is 100 men. It shows that the cost of producing rice is more as against wheat because one unit of rice can be exchanged for 1.2 units of wheat. On the other hand, the cost of producing one unit of rice in India is 80 men and that of producing one unit of wheat is 90 men. Thus, the cost of producing wheat is more than that of rice because one unit of rice can be exchanged for 0.89 units of wheat.

Let's assume trade begins between the two countries. Bangladesh will gain if it imports one unit of rice from India in exchange for less than 1.2 units of wheat. India will also gain if it imports one unit of wheat from Bangladesh in exchange for more than 0.89 units of rice.

Table 4 also shows that the domestic exchange ratio in Bangladesh is one unit of wheat = 0.83 units of rice and in India one unit of rice = 0.89 units of wheat. Assuming the exchange ratio between two countries to be 1 unit of wheat = 1 unit of rice, Bangladesh would gain 0.17 (1 – 0.83) units of rice by exporting one unit of wheat to India. Similarly, the gain to India by exporting one unit of rice to Bangladesh will be 0.11 (1 – 0.89) unit of wheat. Thus, trade is beneficial for both countries.

The gains from trade and their distribution are shown in Fig. 3 where the line P_1R_2 depicts the domestic exchange ratio 1 unit of wheat = 0.83 units of rice of Bangladesh and the line P_2R_1 that of India at the domestic exchange ratio 1 unit of rice = 0.89 units of wheat.

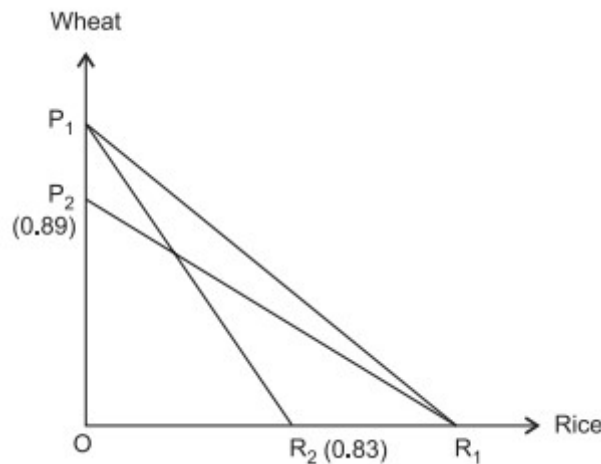


Figure 3: Gains from Trade

The line P_1R_1 shows the exchange rate of trade of 1 unit of wheat = 1 unit of rice between the two countries. At this exchange rate Bangladesh gains R_2R_1 (0.17 units) of rice while India gains P_2P_1 (0.11 units) of wheat.

Summing up, both India and Bangladesh specialize in the production of one commodity based on the comparative costs and accordingly reallocate their factors of production. Each country exports that commodity in which it has comparative advantage and imports that commodity in which it has comparative disadvantage. Both gain through trade and can increase the consumption of the two commodities.

1.3.4.4 Criticism

The principle of comparative advantage has been the very basis of international trade for centuries but it is not free from few defects. In particular, Bertin Ohlin and Frank D. Graham have criticized this theory several times. Some of the important criticisms are:

1. **Unrealistic Assumption of Labour Cost:** It is assumed that this theory considers only labour cost and ignores non-labour costs in calculating the cost of production. This is highly unrealistic because the basis of national and international transactions is money cost and not labours cost. Further, the assumption of homogeneous labour is also unrealistic because labour is heterogeneous of different kinds, skilled and unskilled or specialized and general.
2. **No Similar Tastes:** The assumption of the two countries having similar tastes and preferences is unrealistic because preferences differ with different income standards



in a country. Economic growth and development of trade relations also brings about a change in the tastes and preferences of people.

3. **Assumption of Constant Costs:** The theory assumes that commodities are produced under the law of constant costs which is unrealistic. Factually, there are either increasing or diminishing costs. The comparative advantage is increased if the costs are reduced due to large scale production whereas the comparative advantage is reduced if an increased output is the result of an increased cost of production.
4. **Transport Costs Ignored:** Ricardo ignores transport costs in determining comparative advantage in trade. This is again an unrealistic assumption as transport costs play an important role in determining the pattern of world trade. For instance, the gain from international trade can be reduced or nullified due to high transportation cost.
5. **Immobile Factors of Production Internationally:** Another unrealistic assumption of this theory is that factors are perfectly mobile nationally and perfectly immobile internationally. However, within a country, factors are not freely mobile from one industry to another or from one region to another. The greater the degree of specialization in an industry, the less is the factor mobility from one industry to another. Thus, factor mobility influences costs and hence the pattern of international trade.
6. **Unrealistic Two-Country, Two Commodity Model:** Ricardo's doctrine of comparative advantage is based on trade between two countries trading two commodities. However, in reality, international trade takes place between many countries trading in many commodities.
7. **Unrealistic Assumption of Free Trade:** Another drawback of this theory is that it assumes free trade among countries. This is not realistic. World trade is not free. The countries impose restrictions in the form of tariff and non-tariff barriers on the movement of goods to and from other countries.
8. **Neglects the Role of Technology:** Technological innovations in international trade are ignored by this theory which is unrealistic. Much is gained from innovations, research and development. For instance, technological changes help in increasing the supply of goods both nationally and internationally.
9. **One-Sided Theory:** Since the theory considers only the supply side of international trade and ignores the demand side, it is considered to be a one-sided theory.



10. **An Incomplete Theory:** The theory is considered incomplete as it simply explains how two countries gain from trade but fails to explain how the gains from trade are distributed between the two countries.

Despite these weaknesses, the theory of comparative advantage is considered to be the basis of international trade. In the words of Prof. Samuelson, “*Yet for all its oversimplifications, the theory of comparative advantage has in it a most important glimpse of truth. Political economy has found few more principles. A nation that neglects comparative advantage may have to pay a heavy price in terms of living standards and potential rates of growth.*”

IN-TEXT QUESTIONS

8. The theory of Comparative Advantage was given by _____
9. The difference in costs is due to _____ and _____.
10. The theory considers only the _____ side of international trade.

7.3.5 Modern Theory of International Trade

In his famous book ‘*Inter-regional and International Trade (1933)*’, Bertin Ohlin criticized the classical theory of international trade and formulated the General Equilibrium or Factor Endowment or Factor Theory of international trade. The Heckscher Ohlin theory of international trade is therefore the difference in prices of commodities based on relative factor endowments and factor prices as some commodities can be bought more cheaply from the other regions than in the same region where production is possible only at high prices.

7.3.5.1 Assumptions of the Theory

The following assumptions hold good for the H.O. theory:

1. It is a two X two X two model i.e. two countries, say A and B, two commodities, say X and Y, and two factors of production, say labour and capital.
2. Both commodity and factor markets are perfectly competitive markets.
3. Resources are fully employed.
4. Technology is given and constant.
5. There are quantitative differences in factor endowments in different countries, but qualitatively they are homogeneous.



6. Production functions of the two commodities have different factor intensities (i.e. capital intensive and labour intensive) that are non-reversible.
7. Factors are perfectly mobile within the country and perfectly immobile between countries.
8. There are no transportation costs.
9. There is free trade between countries.
10. Each commodity in each country is produced under the law of constant cost.
11. Tastes and preferences of consumers and their demand patterns are identical in both the countries.
12. Neither country specializes in the production of one commodity. In other words, there is incomplete specialization.
13. Production functions are different for different commodities, but are the same for each commodity in both countries. It means that the production function of commodity X is different from commodity Y but the technique of production of commodity X and commodity Y respectively in both the countries is the same.

7.3.5.2 Explanation to the Theory

Given these assumptions, Heckscher and Ohlin contend that the immediate cause of international trade is the difference in relative commodity prices caused by differences in relative demand and supply of factors (factor prices) as a result of differences in factor endowments between two countries. Fundamentally, the relative scarcity of factors (shortage of supply in relation to demand) is essential for trade between two countries. Commodities which use large quantities of scarce factors are imported because their prices are high while commodities which use abundant factors are exported because their prices are low.

H.O. theory is explained in terms of two definitions:

1. **Factor abundance (or scarcity) in terms of price criterion:** In this criterion, richness in factor endowments is explained by Heckscher Ohlin in terms of factor prices. Given the two countries A and B producing two commodities X and Y by employing labour and capital as factors of production, country A is abundant in capital if $(P_C/P_L)_A < (P_C/P_L)_B$ where P_C and P_L refer to prices of capital and labour respectively and the subscripts A and B denote the two countries. In other words, country A is abundant in capital if capital is relatively cheap in it whereas country B is abundant in labour if labour is relatively cheap in it. Thus, country A will produce and export the capital intensive good and import labour intensive good and country B will produce and export labour intensive good and import capital intensive good. In other words,



the capital abundant country will export the relatively cheap capital-intensive commodity and the labour abundant country will export the relatively cheap labour-intensive commodity.

2. **Factor abundance in physical terms:** Another way to explain the H.O. theory is in physical terms of factor abundance. According to this criterion, a country is relatively capital abundant if it is endowed with a higher proportion of capital and labour than the other country. If country A is relatively capital abundant and country B is relatively labour abundant, then measured in physical amounts $C_A/L_A > C_B/L_B$, where C_A and L_A are the total amounts of capital and labour respectively in country A and C_B and L_B are the total amounts of capital and labour respectively in country B.

Both the countries specialize and gain from trade for two reasons: first, their factor price rates are equal and second, tastes and preferences for the two commodities are similar in both countries.

But the above analysis of physical terms does not show that the capital abundant country will export the capital intensive commodity and the labour abundant country will export the labour intensive commodity.

7.3.5.3 Criticism

H.O. Theory has been criticized on the following grounds:

1. **Two-by two-by-two Model:** Ohlin has been criticized for presenting two-by-two-by-two model based on oversimplified assumptions. But, he has demonstrated in the mathematical appendix to his book that the model can be extended to many countries, many commodities and many factors.
2. **Non-homogeneous Factors:** The theory assumes that the factors of production in the two countries are homogeneous and factor endowment ratios can be calculated by measuring them. In reality, however, no two factors are homogeneous qualitatively between as well as within the country.
3. **Non-homogeneous Production Techniques:** The H.O. model assumes homogeneous production techniques for each commodity in the two countries. But, the technique of production is different in the two countries for the same commodity.
4. **Distinct Tastes and Demand Patterns:** The assumption of similar tastes and demand patterns of consumption in both countries is unrealistic. Innovations, diversifications



and accessibility of products bring about a change in the tastes and demand patterns of consumers.

5. **No Constant Returns:** It is unrealistic to assume constant returns to scale as the advantages of economies of scale are obtained by a country having rich factor endowments through lesser production and exports. Thus, there are increasing returns to scale rather than constant returns.
6. **Transport Cost Ignored:** The theory ignores transport costs in trade between two countries. But, in reality, when transport costs, loading and unloading charges and other port charges that affect the price of produced commodities in the two countries are included, they lead to price differentials for the same commodity in the two countries.
7. **Unrealistic Assumption of Full Employment and Perfect Competition:** The theory assumes full employment and perfect competition to exist in both the countries which is not true. Factually, due to the existence of differentiated products, perfect competition does not exist and each country strives to achieve full employment.
8. **Leontief Paradox has made the Theory Questionable:** Leontief's empirical study of Ohlin's theorem, known as Leontief Paradox, has led to paradoxical results that the United States exports labour-intensive goods and imports capital-intensive goods, even though it is a capital- rich country.
9. **Partial Equilibrium Analysis:** Prof. Haberler regards Ohlin's theory as, by and large, a partial equilibrium analysis. He criticized him for his failure to develop a comprehensive general equilibrium concept.
10. **Vague and Conditional Theory:** As pointed out by Haberler, "With many factors of production, some of which are qualitatively incommensurable as between different countries, and with dissimilar production functions in different countries, no sweeping a priori generalization concerning the composition of trade are possible".

Despite these criticisms, Ohlin's theory is definitely an improvement over the classical theory of trade as it attempts to address the basis of international trade in the general equilibrium setting.



7.3.5.4 Superiority of H-O Theory over Classical Theory

Heckscher- Ohlin Theory	Classical Theory
The merit of H.O. theory lies in explaining the causes of differences in comparative advantage satisfactorily.	According to Samuelson, the Ricardian theory could not explain the causes of differences in comparative advantage.
H.O. theory is scientific and focuses on the basis of international trade. It thus relates to the positive theory.	The classical theory demonstrates the gains from trade between the two countries. Thus, it is related to the welfare theory.
According to Haberler ¹ , the H.O. theory is a location theory which highlights the importance of the space factor in international trade.	The classical theory regards different countries as space less markets.
The H.O. theorem is explicitly based on the assumption of production functions of the two countries.	The classical theory is based on differences in the production of the trading countries.
The H.O. model leads to complete specialization in the production of one commodity by one country and that of the other commodity by the second country when they enter into trade with each other.	The trade between two countries may or may not lead to specialization in the classical theory.
In the H.O. theory, trade will not cease in future even if the labour becomes equally efficient in the two countries because the basis of trade is differences in factor endowments and factor prices.	In the classical theory, differences in comparative costs between two countries are due to differences in efficiency of labour. Overtime, if labour in both countries becomes equally efficient in both countries, there'll be no trade between them.

7.3.5.5 The Leontief Paradox

The first comprehensive attempt to verify the Heckscher-Ohlin model was made by Wassily Leontief in 1953. The Heckscher-Ohlin theory states that relatively capital-abundant country will export relatively capital-intensive goods and it will import relatively labour-intensive goods i.e. the goods in whose production relatively large amounts of relatively scarce factor labour are required. Leontief in his study reached the paradoxical conclusion that the United



States which possesses a relatively large amount of capital and a relatively small amount of labour in relation to the rest of the world, exported labour- intensive goods and imported capital-intensive goods. This result has come to be known as Leontief Paradox.

To test the Heckscher-Ohlin prediction, Leontief used the 1947 input-output table of the US economy. He aggregated 200 groups of industries into 50 sectors of which 38 traded their products directly on the international market. He took two factors, labour and capital and estimated their requirements for production of one million dollars worth of United States export and import competing commodities.

His results showed that in the US import-competing industries were relatively more capital-intensive than the export industries. Given the proposition that the US is relatively capital abundant, it exports labour-intensive goods. This is just contrary to the Heckscher-Ohlin theorem. Thus, it is called the Leontief Paradox.

7.3.5.5.1 Criticism

Leontief has been criticized by a majority of economists on methodological and statistical grounds. Some points of criticism are as follows:

1. **1947, an unconventional year:** Swerling did not consider 1947 as a conventional year for testing the Heckscher-Ohlin theorem because by that year the disorganization of production had not been corrected. Moreover, the United States was the only major industrial economy that was saved from the destruction of the war. Thus, Leontief study was basically a description of US trade in 1947.
2. **Low Capital-Labour Ratio Industries:** Swerling criticized Leontief for including certain industries with low capital-labour ratios like fisheries, agriculture and services like transport, wholesale trade etc. that biased his results. In response to this criticism, Leontief reworked his study by taking a much wider range of studies but the results obtained were similar to the original study.
3. **Consumption Patterns:** The impact of consumption patterns on the US exports and imports is not considered by Leontief Paradox. The consumption pattern may be biased either towards labour-intensive or capital-intensive commodities with an increase in the per capita income. Brown's study showed that the US consumption patterns had bias towards labour-intensive commodities rather than capital-intensive commodities. This contradicts the Leontief Paradox.



4. **Capital Durability:** Buchanan criticized Leontief for using “investment-requirements coefficients” as capital coefficients in his study. Therefore, he failed to take into account the difference in the durability of capital in various industries.
5. **Tariffs Not Considered:** Travis argued that the pattern of trade was often distorted by tariffs and thus reflected relative factor endowments of a country. In his study, Leontief ignored the impact of US and foreign tariffs which would have otherwise affected his results.
6. **Natural Resources Overlooked:** Buchanan criticized Leontief for neglecting the role of natural resources which were very important in determining trade patterns.
7. **Human Capital Ignored:** Leontief, in his study, only considered physical capital and ignored the value of human capital. Kenen found in his study that Leontief Paradox was reversed when human capital was added to Leontief’s physical capital.
8. **Unbalanced Trade:** When the trade is unbalanced, Leontief Paradox fails as per Lerner. He found no evidence of exports being labour-intensive when he examined US trade in 1947. He only concluded that US had a trade surplus.
9. **Factor Intensity Reversals:** Leontief’s results led to the presence of factor intensity reversals whereby a capital abundant country will export its labour-intensive goods. Leontief has been criticized for taking only one country (the US) in his study. If he had taken a second capital- abundant country, the results would have been different.

Despite the criticisms leveled against his study, Leontief retested his results by using the average composition of US exports and imports in 1951. He increased the group of industries into 192 sectors. However, the results again confirmed the Leontief Paradox though the capital intensity over US exports reduced considerably. So, the Leontief Paradox continues to persist in the US.

IN-TEXT QUESTIONS

The General Equilibrium was formulated by _____ and _____.

The H-O Theory was verified empirically by _____ and the results attained are popularly known as _____.

The theory is explained on the basis of _____ and _____ criterion.



7.3.6 Imitation gap Theory

Michael V. Posner in an article in 1961 analyzed the effect of technology on trade. The merit of the theory is that it paves the way for the development of the product cycle theory. The comparative cost theory developed by Ricardo and the factor endowment theory as given by Heckscher-Ohlin are based on the assumption of constant technology in all trading countries. The imitation gap or technological gap theory relaxes this assumption. It assumes that the same technology is not always available in all countries and there is a delay in the transmission or diffusion of technology from one country to another.

The theory simply states that technological innovation and the introduction of a new product leads to the imitation gap and the demand gap in the other country. The extent to which trade will take place between the two countries depends on the net effect of the imitation gap and the demand gap.

Consider countries X and Y. Suppose that a new product appears in country X due to the successful efforts of research and research team. The innovating firm and nation get a monopoly through patents and copyrights which turn other nations into importers of this product as long as the monopoly status remains.

The theory implicitly assumes that this new product will not be produced immediately by firms in country Y. Incorporating a time dimension, the imitation lag is defined as the length of the time (e.g., 24 months) that elapses between the product introduction in country X and the appearance of the version produced by firms in country Y. The imitation lag includes a learning period during which the firms in country Y must acquire technology and knowhow in order to produce the product.

In addition, it takes time to purchase inputs, install equipment, process the inputs, bring the finished product to market and so on. In this theory, a second adjustment is the demand lag, which is the length of time between the products appearance in country X and its acceptance by consumers in country Y as a good substitute for the products they are currently consuming. This lag may arise from loyalty to the existing brand, inertia and delays in information flows. This demand lag can also be expressed in a number of months, say 6 months.

A key point in this theory is the comparison of the length of the imitation lag with the length of the demand lag. For instance, if the imitation lag is 20 months, the net lag is 14 months., that is 20 months less 6 months (demand lag). During this 14-month period, country X will export the product to country Y.



The central point in imitation gap analysis is that once the foreign firms acquire this technology, they may become more competitive than the innovator. because of certain favourable factors (e.g., cheap labour). When it happens, the innovating country may turn into an importer of the very product it has introduced.

Firms in the developed countries, however, strive to stay ahead through frequent innovations which make the earlier products obsolete. Posner's imitation gap analysis is portrayed in Figure.

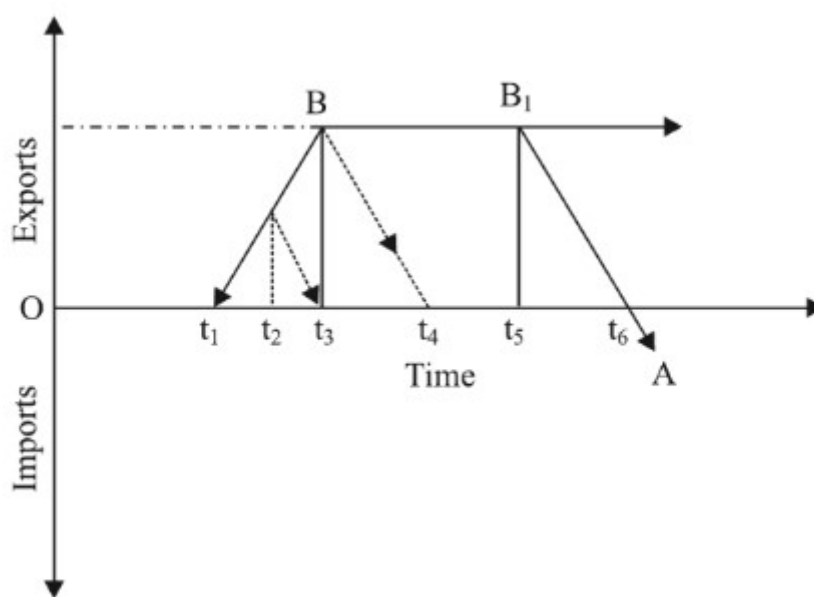


Figure 4: Imitation Gap

Posner's theory is explained in Figure 4 where time is plotted on the horizontal axis and the trade balance of the innovating country A against the imitating country B is taken on the vertical axis. Up to point t_1 , there is no trade between the two countries, in say good X. At t_1 , A innovates the new product. The demand lag in B will determine the amount of exports of A and thus the slope of t_1B . The imitation lag will determine how long country B will import the commodity from A and the extent of A's exports. If there is no imitation of the commodity in B, country A will continue to export it till exports reach the maximum level B at time t_3 . The period from t_1 to t_3 is the demand lag. If producers in B start producing the new product by time t_3 , the exports of A will decline and may even stop at time t_4 as shown by the downward arrow from B to t_4 . In this situation, the imitation lag t_3t_4 is shorter than the demand lag. If the imitation lag is longer and producers in B are unable to adopt the innovation of the new commodity till time t_5 ,



country A will continue to export it to its maximum level B_1 . As B starts producing this commodity, the imitation lag becomes shorter and exports from A continue to decline until they fully stop at time t_6 when the commodity is fully imitated in country B. If producers in B introduce an innovation in the commodity so that it is better than A's commodity, B will penetrate A's market. In this case, A will start importing it from B, as shown by the downward arrow from t_6 to A.

7.3.7 Product Life Cycle Theory

In a 1966 article, Raymond Vernon sought to explain international trade based on the evolutionary process that occurs in the development and diffusion of products to markets around the world. In his International Product Life Cycle (IPLC) Theory, Vernon points out that each product and its manufacturing technologies go through a continuum or cycle of evolution that consists of introduction, growth, maturity and decline. The location of production will shift to serve markets according to the stage of cycle a product is therein.

Introduction: Historically, a new product originated in an advanced economy, such as the US or Germany, in the Introductory stage. This is because such countries have abundant capital and research and development facilities that prove advantageous to produce new products or to produce old products in new ways. Advanced economies also have abundant, affluent (high income) consumers who are willing to try new products, which are often expensive. During the introduction stage, production of the new product takes place in the inventing country so that the producer can obtain rapid market feedback and save upon the transportation cost, since most sales are domestic. Any export sales are mainly to advanced countries having high income consumers and who are willing to spend on novelties. Since, production process is not standardized in this stage, it remains labour-intensive.

Growth: Overtime, the market grows and enters the growth phase. The sales growth attracts competitors to the market, particularly in other developed countries, who establish a manufacturing unit in their own country and develop unique product variations for the consumers of their country. However, the cost of production may still be high because of start-up problems.

Growth in sales provides an incentive to companies to develop labour-saving technology but this incentive is partly offset because competitors produce differentiated products to suit the needs of their country. Thus, the production process still remains labour-intensive though less than the introductory stage. In other words, the capital intensity is relatively more than the introductory stage. The original producing country will increase its exports,



especially to developing countries, but will lose certain key export markets in which local production is initiated.

Maturity: As the product enters the maturity stage, the production process gets more standardized and price becomes an important competitive strategy. The demand in developing countries increases on account of reduced per-unit cost of production due to capital-intensive production. The innovating country no longer commands a production advantage. Since the innovator may earn only a narrow profit margin, the innovating country shifts its production base to developing countries where they can employ less skilled labour efficiently at a lower cost for capital-intensive production. Foreign production thus, displaces the exports from the innovating country.

Decline: Once the production process is standardized, mass production becomes the dominant activity and can be accomplished using cheaper inputs and low-cost labour. Production shifts to low-income countries where competitors enjoy low-cost advantages and can economically serve export markets worldwide. The innovator country eventually becomes a net importer.

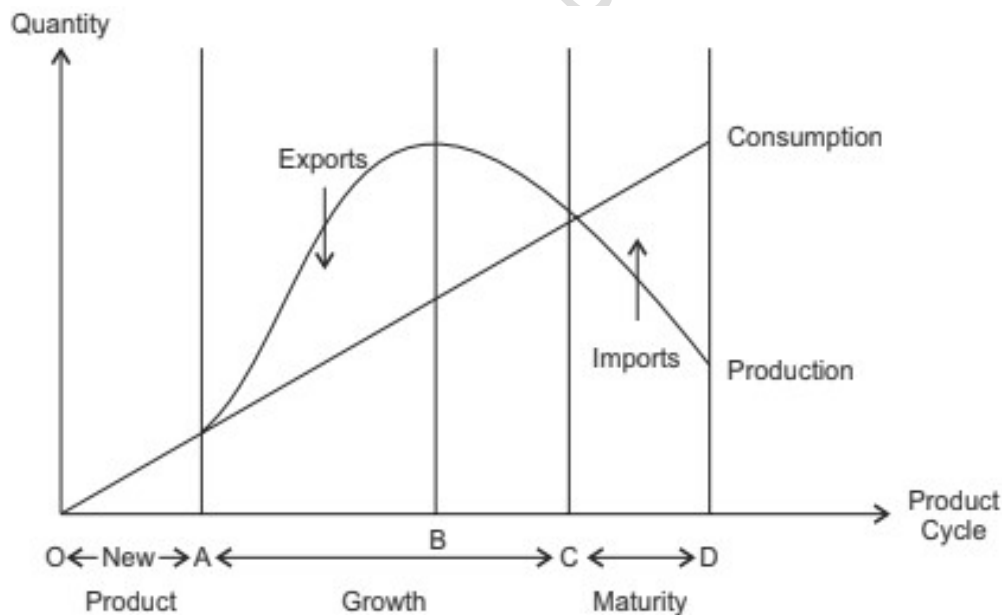


Figure 5: PLC model of international trade – innovating country

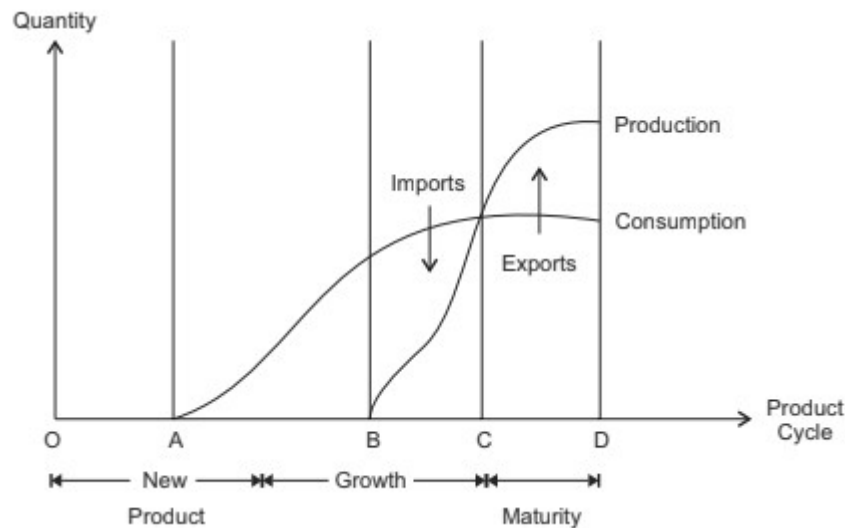


Figure 6: PLC model of international trade – imitating country

Source: Shenkar and Luo for both

1.3.7.1 Criticism

- The PLC theory holds that the location of production facilities that serve world markets shifts as products move through their life cycle. Many industrial products like steel, coal etc. or basic foodstuff like salt, sugar etc. fall outside the purview of life-cycle.
- The movement of the product from one stage to another is not certain.
- The present stage in which the product is cannot be known with certainty.
- Certain products have extremely short life cycle because of rapid innovation. Shifting production of such products from one country to another doesn't reduce their cost. Hence, there's no benefit of shifting.
- The new products are introduced simultaneously in all parts of the world due to shortened life- cycle, integration of the world economy and globalization. Thus, no leads and lags exist between markets.
- Luxury products for which cost is of little concern to the consumers aren't covered by the PLC theory.
- The production location of products requiring technical expertise to move into their next generation of models usually does not shift. This seems to explain the US dominance of medical equipment production and German dominance in rotary printing presses.



- It's difficult to predict in advance the life of the product.
- The companies today develop products for worldwide market segments and so introduce the new products at home and abroad simultaneously. In so doing, they choose an initial production location (that may or may not be in the innovating country) that will minimize costs for serving markets worldwide.

The theory was empirically satisfactory during 1950s to 1970s but the recommendations of the theory are either unclear or not fit in today's world. In context of shifting to low-cost countries, i.e. the comparative advantage, one of the economists comments, "In essence, it is the Ricardian story once again."

IN-TEXT QUESTIONS

The cycle of evolution consists of _____, _____, _____, and _____ stages.

As per the PLC theory, the innovator country eventually becomes a net _____.

7.3.8 Theory of National Competitive Advantage

Schumpeter emphasized many decades ago, "Competition is profoundly dynamic in character. The nature of economic competition is not equilibrium but a perpetual state of change. Improvement and innovation in an industry are never-ending processes. Today's advantages are soon superseded or nullified". Michael Porter, in his book, "*Competitive Advantage of Nations (1990)*" explained why a nation provides an environment in which firms improve and innovate and continue to do so faster and in the proper directions compared to their international rivals and why some nations' firms achieve technological superiority, produce more differentiated or higher quality products or products which are more attuned to customer needs than others.

Why does a nation achieve international success in a particular industry? The answer lies in four broad attributes of a nation that shape the environment in which local firms compete that promote or impede the creation of competitive advantage. These determinants are: (1) **Factor Conditions**; (2) **Demand Conditions**; (3) **Related and Supporting Industries**; and (4) **Firm's Strategy, Structure and Rivalry**. The Porter's model also points out two additional determinants that influence the four main determinants. These are **governmental policy** and the role of **chance events**.



1. **Factor Conditions:** The factors most important to competitive advantage in industries in advanced economies are not inherited but are created within a nation. To understand the role of factors in competitive advantage, it is necessary to distinguish between types of factors. The first demarcation is between advanced and basic factors. Advanced factors of production are skilled labour, knowledge, capital and infrastructure. Basic factors such as unskilled labour and raw material can be obtained by any company and do not generate competitive advantage. The second distinction is between specialized and generalized factors. Specialized factors involve narrowly skilled personnel, infrastructure with specific properties, knowledge bases in particular fields and other factors with relevance to a limited range or even to just a single industry; for e.g. a port specialized in handling bulk chemicals or a pool of venture capital seeking to fund software companies etc.
2. **Demand Conditions:** The second broad determinant of national competitive advantage is demand conditions. The main factor is home demand conditions which have influence in nearly every industry. The composition of home demand shapes how firms perceive, interpret and respond to buyer needs. Nations gain competitive advantage in industries where the home demand gives local firms a clearer or earlier picture of buyer needs than foreign rivals. It is not merely the size of the market that is important but it is the intensity and sophistication of the demand that is significant for competitive advantage. If consumers are sophisticated, they will make demands for sophisticated products and that in turn will help the production of sophisticated products. Gradually, the country will achieve competitive advantage in such production. As significant as early home market penetration so is early or abrupt saturation. Early saturation forces companies to continue innovating and upgrading as well as finding international markets for their products. In consumer electronic products, saturation in the Japanese home market is rapid and product life cycles are extremely short. This is because buyers have homogeneous tastes combined with sophistication and status consciousness. This combination gives them competitive advantage in comparison with foreign rivals.
3. **Related and Supporting Industries:** The third broad determinant is related and supporting industries. The presence of internationally competitive supplier industries in a nation creates advantages in subsequent industries. It gives efficient, early, rapid and sometimes preferential access to the most cost-effective inputs. The benefit of home-based suppliers may be found in the process of innovation and upgrading. Firms gain quick access to information, to new ideas and insights and to supplier



innovations. The presence in a nation of competitive industries, that are related, often leads to new competitive industries. Related industries are those in which firms can co-ordinate or share activities in the value chain when competing. An example is pharmaceutical firms who use the same university when testing new drugs.

4. **Firm Strategy, Structure and Rivalry:** The fourth and last broad determinant is firm strategy, structure and rivalry. Many aspects of a nation, too numerous to generalize, influence the ways in which firms are organized and managed. Some of the most important aspects are attitudes towards authority norms of interpersonal interaction, attitudes of workers towards management and vice-versa, social norms of individualistic or group behavior and professional standards. These in turn grow out of the educational system, social and religious history, family structures and many other unique national conditions. Sharp differences exist within and among nations in the goals that the firms seek to achieve as well as the motivations of the employees and managers. Domestic rivalry creates particularly visible pressure on each other to improve vigorous local competition. It not only sharpens advantages at home but pressures domestic firms to sell abroad in order to grow.

These four main determinants are influenced by the **governmental policy** through various regulatory and de-regulatory measures. Policies implemented without consideration of how they influence the entire system of determinants are as likely to undermine national advantage as enhance them.

Government affects factor conditions in many ways. Among the most important roles of government is creating and upgrading factors. The government procurement can be a positive force for upgrading national competitive advantage if they provide early demand for advanced new sophisticated products or services from local firms. The government must support the related and supporting industries in the same way as the industries that have the advantage. Government has an important role in the nurturing and reinforcing clusters.

Government's policy has numerous ways of influencing how firms are created, organized, how they manage their goals and how they compete. Sustaining and enhancing competitive advantage requires that nation's firms take a global approach to strategy. Government policy should seek to avoid currency restrictions, restrictions on foreign investments and restrictions on the inflow and outflow of skilled personnel that impede internationalization.

Few roles of the government are more important to the upgrading of an economy than ensuring vigorous domestic rivalry and this requires strong antitrust policies because a dominant domestic competitor rarely results in international competitive advantage.



The last determinant that influences the four main determinants is **chance events**. Chance events are developments outside the control of firms (and usually the nation's government) such as pure inventions, breakthroughs in basic technologies, wars, external political developments and major shifts in foreign demand. They create discontinuities that can unfreeze or reshape industry structure and provide opportunity for one nation's firms to supplant another's. Chance has played an important role in shifting competitive advantage in many industries. A shift that changed competitive advantage was the oil shock in the 1970s. The oil shock ultimately helped upgrade Japanese industry. Because Japan was especially vulnerable to energy costs and therefore, took aggressive steps towards energy conservation.

In a nutshell, the Porter's Diamond must be seen as a system wherein the effect of one determinant often depends on the state of other determinants.

7.3.8.1 Criticism

The Theory of Competitive Advantage suffers from the following criticisms/limitations-

1. Porter feels that sizeable domestic demand must be present for attaining competitive advantage but there are industries that have flourished only because of demand from foreign consumers. For eg. Nestle; a major share of its earnings comes from foreign sales.
2. Where domestic suppliers of inputs are not available, the backward linkage will be meaningless as the determinant related and supporting industries doesn't exist in that nation.
3. Availability of national resources, according to Porter, is not the only condition for attaining competitive advantage. There must be other factors also. But, a study has shown that some Canadian industries emerged on the global map only on the basis of such natural resource availability.

Nevertheless, these limitations do not undermine the significance of Porter's national competitive advantage theory, especially in advanced industries located in advanced countries.

IN-TEXT QUESTIONS

16. All determinants of the theory are influenced by _____ and _____.
17. The four broad attributes of a nation that shape the environment are _____, _____, _____, and _____.



7.4 BALANCE OF PAYMENT

In the words of Kindleberger, “*The balance of payments of a country is a systematic record of all economic transactions between the residents of the reporting country and the residents of foreign countries during a given period of time.*” In other words, it is a statement of account recording all international receipts and payments of a country with the rest of the world. Thus, the balance of payments of a country serves as an important index that reflects the true economic position of a country.

The economic transactions of a country with the rest of the world can be broadly classified as:

1. **Visible items** which include the export and import of all types of physical goods (made of matter/material) which are recorded at the ports (i.e. can be seen crossing the borders).
2. **Invisible items** which include the export and import of all types of services, like those rendered by shipping, banking and insurance companies, payment ports of interest etc., which are not recorded at the (i.e. cannot be seen crossing the borders)
3. **Capital transfers** that involve the transfer of assets. Such transfers are concerned with capital receipts and payments of a country with the other countries.

Thus, “*the balance of payments shows the country’s trading position, changes in its net position as foreign lender or borrower, and changes in its official reserve holding.*”

7.4.1 Balance of Trade

The balance of trade (positive or negative) is the difference between the value of exports and imports of goods i.e. visible items only. Thus,

$$\text{Balance of Trade} = \text{Export of visible items} - \text{Import of visible items}$$

During a given period of time, the balance of trade is said to be balanced if the difference between the value of exports and the value of imports of visible items is zero. In other words, the country is said to have a balance of trade if the value of exports is exactly equal to the value of imports. But, it is not necessary that the country will always have a balanced balance of trade. If the value of exports exceeds the value of imports during a given time period, the country is said to have an export surplus or a favourable balance of trade. On the other hand, if the value of imports exceeds the value of exports, the country is said to have an import surplus (export deficit) or unfavourable (adverse) balance of trade.



1.4.2 Balance of Trade and Balance of Payments

The terms balance of trade and balance of payments, though related to each other, do not have the same meaning. Table 1, summarizes the difference between the balance of trade (BOT) and the balance of payments (BOP).

Table 1: Difference between the Balance of Trade and Balance of Payments

Balance of Trade (BOT)	Balance of Payments (BOP)
1. Balance of Trade is defined as the difference between the exports and imports of goods (visible items.)	Balance of payment is defined as ‘a systematic record of all economic transactions between the residents of the reporting country and the residents of foreign countries during a given period of time.’
2. BOT = Net Earnings on Exports – Net payments made for imports.	BOP = Current Account Balance + Capital Account Balance + Errors & Omissions (- Balancing item)
3. BOT is favourable if exports exceed the imports of goods and unfavourable if imports exceed the exports of goods.	BOP will be favourable if the country is able to pay off all past loans in her capital account from the surplus in the current account. However, BOP is said to be unfavourable if the country borrows from the foreigners to offset its current deficit.
4. The main factors that affect BOT are: (i) Cost of production (ii) Availability of raw materials (iii) Exchange rate (iv) Domestic price of goods	The main factors that affect BOP are: (i) All factors affecting BOT (ii) Economic policy of the government (iii) Conditions of foreign lenders.
5 In the accounting sense, BOT may be favourable, unfavourable or in equilibrium.	In the accounting sense, BOP always balances i.e. receipts are always equal to payments.
6. It is not an indicator of the economic performance of a country.	It gives a true picture of the economy's economic performance.
7. BOT is a narrow concept	BOP is a more comprehensive term.
8. BOT is a part of the current account of the BOP	BOP comprises of three accounts of which BOT is only one part of the current account.



7.4.3 Components of Balance of Payment

Broadly, the balance of payment (BOP) account includes: (i) current account (ii) capital account and (iii) official settlements account as shown in Table 2.

Table 2: Components of Balance of payments (BOP) Account

Credits (+) (Receipts)	Debits (–) (Payments)
I. Current Account	
1. Export of goods	5. Import of goods
2. Export of services	6. Import of services
3. Income received (Interest, profit and dividends received)	7. Income paid (Interest, profit and dividends paid)
4. Unilateral receipts (Transfer payments received)	8. Unilateral payments (Transfer payments made)
II. Capital Account	
9. Foreign investment	12. Investment abroad
10. Short term borrowings	13. Short-term lending
11. Medium and long term borrowing	14. Medium and long-term lending
III. Official Settlement Account	
15. Increase in foreign official holdings	16. Increase in official reserve of gold and foreign currencies.
IV. Errors and Omissions	

7.4.3.1 Current Account

The current account of the balance of payments includes all transactions relating to trade (imports and exports) in goods, services, income and current transfer and thus constitutes an important segment of balance of payments.

Components of Current Account

In the current account, the merchandise exports and imports are the most important items. For the purpose of compilation of balance of payments, exports are valued on the basis of ‘free on board’ (f.o.b.) whereas imports are valued on the basis of ‘cost, insurance and freight’ (c.i.f.). The difference between the exports and imports of a country is its balance of visible trade or merchandise trade or simply balance of trade. If visible exports exceed the visible imports,



the balance of trade is favourable whereas it is unfavourable if the visible imports exceed the visible exports.

It is, however, the invisible items of the current account, namely services, income and transfer payments, that reflect the true position of the balance of payments account. While service transactions include costs of travel, transportation, insurance, communications, royalties, financial and computer services, and other business services that are becoming increasingly important, income and transfers include receipts and payments of interests and dividends on investments and gifts, donations, grants etc, respectively.

The net value of these visible and invisible trade balances is the balance of the current account that may be favourable or unfavourable.

Current Account Deficit/Surplus

A nation's current account balance may be either a deficit or a surplus, depending on whether its total receipts from other countries are less than or greater than its total payments to other countries. A current account deficit occurs when a country sends more money abroad than it receives from abroad. If the nation receives more money from abroad than it sends, it has a current account surplus.

7.4.3.2 Capital Account

The capital account of the balance of payments shows an international flow of loans and investments between residents of a country and the rest of the world. In other words, the capital account represents a change in the asset and liability status of the residents of a country or its government. In short, capital account transactions record long term as well as short term capital receipts and payments.

Components of Capital Account

The main components of capital account as classified by the Reserve Bank of India are as follows:

1. Loans/Borrowings

- (i) *Commercial Borrowings*: Commercial borrowings include borrowings by the government and the private sector from the world money market at the market rate of interest without considerations of any concession.
- (ii) *External Assistance*: External assistance includes borrowings by the country from the foreign countries under concessional rate of interest. Thus, borrowings as external assistance involve a lower rate of interest as compared to the interest rate prevailing in the open market.



2. Foreign Investment

- (i) *Foreign Direct Investment (FDI)*: Foreign Direct Investment refers to the purchase of assets in the world market by acquiring control over them. For e.g., purchase of a firm or setting up a plant by RELIANCE INDUSTRIES in the rest of the world.
- (ii) *Portfolio Investment*: when the residents (industry/firm) of a country purchase shares in the foreign companies or bonds issued by foreign government over which they have no control is referred to as portfolio investment. For e.g., the Reliance Industries buys shares in foreign companies.

3. Banking Capital

Banking capital refers to the capital transactions in the form of foreign exchange transactions and investment in foreign currency and securities by the foreign branches of Indian commercial banks. It also includes deposits made by non-residents and changes in gold and foreign exchange reserves with the RBI.

4. Other Capital

All movement of capital not included above are recorded under this head.

Thus, capital account in the balance of payments shows international lending and borrowing of long-term as well as short term capital.

7.4.3.3 Official Settlement Account

The official settlement account is in fact a part of the capital account. The official settlement account measures the change in nation's liquid and non-liquid liabilities to foreign official holders and the change in a nation's official reserve assets during the year.

The official reserve assets of a country include its gold stock, holdings of its convertible foreign currencies and SDR's and its net position in the IMF.

7.4.3.4 Errors and Omissions

Imperfect compilation procedures and different data sources may lead to imbalances in the balance of payment account. This imbalance is termed as 'net error and omissions' and is explicitly identified in the BOP statement. In simple terms, net errors and omissions is the difference between the current balance and the capital balance.

7.4.5 Difference between Current and Capital Account

The following differences between the current account and the capital account of the balance of payments account have been enumerated below:



Current Account	Capital Account
1. Payment for currently produced goods and services is recorded in the current account. Interest earned or paid on claims, gifts and donations are also included.	Payment of debts and claims is recorded in the capital account.
2. The level of national income is directly affected by the current account of the balance of payment. In other words, receipts and payments in the current account cause a respective increase and decrease in the flow of income in the economy.	The capital account influences the volume of assets held by the country. It, however, does not affect the level of national income directly.

7.4.6 Autonomous and Accomodating Items of Balance of Payments (BOP)

In the words of Sodersten and Reeds, “*transactions are said to be autonomous if their value is determined independently of the balance of payments.*” Thus, all those items of BOP accounts are termed as autonomous items or ‘above the line’ items that are :

- (a) related to such transactions that are undertaken for profit motive
- (b) independent of BOP considerations-positive/negative or favorable/unfavorable, and
- (c) not meant to establish BOP identity.

Since all transactions in the current account and capital account are autonomous items, their balance determines the deficit or surplus of balance of payments. If the autonomous payments exceed the autonomous receipts, the balance of payment is said to be in deficit and vice-versa.

Accomodating items, also known as compensatory items are short-term capital flows, such as drawings from SDR, borrowings from IMF or central banks of other countries etc., which have to be made to correct the disequilibrium in the autonomous items of balance of payment. According to Sodersten and Reed, “Accomodating items are determined by the net consequences of the autonomous items.” Thus accommodating items often referred to as ‘below the line of items’, are meant to bring about equality between the payment and receipts of foreign exchange by compensating the surplus or deficit in the autonomous items. In the accounting sense, therefore, the balance of payments always balances i.e. it is always in equilibrium theoretically. Table 3 summarizes the relationship between the autonomous and accommodating items.

**Table 3: Relationship between Autonomous and Accomodating Items.**

Trade balance	a	Autonomous items
Transfer payment balance	b	
Current account balance	$c = (a + b)$	
Long-term capital balance	d	
Basic balance	$e = (c + d)$	Accomodating items
Short term private non-liquid capital balance	f	
Allocation of SDR's	g	
Errors and omissions	h	
Net liquid Balance	$i = (e+f+g+h)$	
Short term private liquid capital balance	J	
Official Settlements Balance	$k = (i + j)$	

Sodersten and Reed thus point out that “essentially the distinction between autonomous and accommodating items lies in the motives underlying a transaction, which are almost impossible to determine”.

7.4.7 Equilibrium and Disequilibrium in the Balance of Payment

Factually, when we speak about the equilibrium and disequilibrium in the balance of payment, we refer to only the basic balance i.e. we only consider the autonomous items and exclude the accomodating items. If there is neither a deficit nor a surplus in the overall balance of payment, when accomodating items are excluded, the balance of payment of a country is said to be in equilibrium. On the contrary, the balance of payment is said to be in disequilibrium if there is either a deficit or surplus.

Disequilibrium in the balance of payments is undesirable and harmful for the country concerned. However, a deficit balance of payment creates more difficulties for the economy than the surplus balance of payment as the burden of bringing about adjustments in it falls more heavily on the countries having a deficit.

7.4.8 Measures to Control Disequilibrium in Balance of Payment

The disequilibrium in the balance of payments can be corrected (controlled) by adopting the measures as discussed below.

7.4.8.1 Automatic Measures

The equilibrium in the balance of payments of an economy can be restored automatically after some time period. For e.g., under the gold standard, the disequilibrium in the balance of payments of the concerned country was automatically corrected through the outflow and



inflow of gold. Similarly, under the paper standard, the disequilibrium in the balance of payment is automatically corrected through the fluctuations in the exchange rate. For e.g., in a situation of an adverse balance of payment, the demand for foreign exchange becomes more than its supply. As a result, the exchange value of the currency goes down. Consequently, the exports are encouraged and the imports are discouraged. The opposite happens in a favorable balance of payments situation.

However, the automatic measures were not very effective in the short run as well as in dealing with a serious disequilibrium in the balance of payments. Thus, deliberate measures had to be undertaken by the concerned country in order to bring about an improvement in its balance of payments.

7.4.8.2 Deliberate Measures

In order to improve the disequilibrium in the balance of payment situation, the concerned country has to resort to certain deliberate measures that can be classified as follows—

1. Trade Measures

The trade policy measures refer to the measures adopted by the economy to promote exports and reduce imports in order to improve the balance of payments.

(a) **Export Promotion** – Exports can be pushed up by the government by:

- (i) Reducing or completely abolishing the export duties. The goods become cheaper in foreign countries thereby encouraging exports.
- (ii) Giving subsidies and cash assistance to the exporters. This helps in cutting down their production costs on one hand and improving their competitive position in the international market on the other.
- (iii) Providing incentives to the exporters in the form of tax exemption on exportable goods.

(b) **Import Control** – The deficit in the balance of payment can be kept in check by reducing imports. The imports can be cut down by:

- (i) Imposing new import duties or tariffs and increasing the existing import duties. The price of the imported goods rises. They become more expensive in the domestic economy and as a consequence the demand for imported goods will decline. This helps in reversing the deficit in the balance of payment.



- (ii) Adopting the import quota system. The volume of imports are restricted by quotas by applying quantitative restrictions i.e. the imports of the country cannot exceed the quota fixed by the government. If, however, the importers import more than the fixed quota, they have to pay a penal rate of import duty.
- (iii) Prohibiting the imports of certain commodities, which are considered non-essential from the national perspective.

2. Monetary Measures

The disequilibrium in the balance of payments is dealt with by the government by adopting the following monetary measures that are used individually or jointly:

- (i) **Money Contraction** – Currency contraction leads to an automatic fall in the prices of goods and services. As a result, imports are discouraged and exports are encouraged. Consequently, the disequilibrium in the balance of payments is reduced. However, certain economists do not favour currency contraction as a method to improve balance of payments. This is because a fall in prices of goods and services may cause the producers to incur heavy financial losses due to which they may be compelled to close down their business. Thus, utmost care must be taken while using this method to remove the disequilibrium in the balance of payment.
- (ii) **Devaluation** – When the value of domestic currency in terms of foreign currency is deliberately reduced by the government in order to improve its balance of payments, it is referred to as devaluation. It means that the exports are encouraged because foreigners pay less for the devalued currency and imports are discouraged because the residents of the country whose currency has been devalued pay more for foreign currencies. Let's explain this with an example. Suppose, a commodity is worth \$5 in the U.S.A. If the exchange rate is \$1 = ₹60, the price of the commodity in terms of Indian currency (₹) is ₹300 ($5 \times 60 = 300$). Now, if the Indian government devalues its currency such that the exchange rate increase from \$1 = ₹60 to \$1 = ₹70, the price of the same commodity in terms of Indian currency will be ₹350 ($5 \times 70 = 350$). Thus while the domestic price of imported goods increases; the exports get an additional ₹10 (₹70 instead of ₹60) in domestic currency for every dollar earned by them. Therefore, they can afford to reduce the price of their exports in order to increase their sales.



- (iii) **Exchange Controls** – Exchange controls is yet another method to bring about equilibrium in the balance of payments. Under this method, the exporters are required to surrender their foreign exchange earnings to the central bank in exchange for domestic currency. The foreign exchange so surrendered to the central bank is then rationed out among licensed importers. Thus, imports are kept within limit. Similarly, all importers buy foreign exchange from the central bank to make payments for imports. In such a case, the central bank may provide foreign exchange for the imports of only essential goods. Thus, the volume of imports is restricted by utilizing the exchange control system.

3. Miscellaneous Measures

Apart from the monetary and trade measures as discussed above, the following other measures are undertaken to improve the balance of payments.

- **Foreign Loans:** Deficit in the balance of payments can be corrected by government borrowings from foreign banks, foreign governments or international financial institutions like the IMF, the World Bank etc. Since the repayment of these loans is spread over a long period, this helps the government to remove the deficit in the balance of payments by utilizing the time spread in improving the foreign exchange position.
- **Foreign Investment:** The government tries to attract foreigners to make investment in the country by offering them various incentives and concession, for example raising the domestic rate of interest and/or offering tax concessions to foreign investors etc. Consequently, there is more capital inflow in the economy from abroad that helps the government to reduce the deficit in the balance of payments.
- **Tourism Development:** In order to earn foreign exchange, the government attracts foreign tourists to visit the country in increasing numbers by offering them various facilities like good hotels, transport facility, concessional travel etc. This helps in increasing the foreign exchange earnings of the country which is utilized by the government to reduce the balance of payments deficit.
- **Foreign Remittances:** The government encourages foreign remittance by giving various incentives to people working abroad. This helps in more inflow of foreign exchange which in turn helps in reducing the deficit in the balance of payment.
- **Import Substitution:** Production of substitutes of imported goods is encouraged by the government by providing various incentives and concessions to the domestic industries. This helps the government in saving foreign exchange by replacing imported goods with their substitutes.

**IN-TEXT QUESTIONS**

18. BOP is a _____ recording all international receipts and payments of a country with the rest of the world.
19. The difference between the exports and imports of visible items is known as _____.
20. When the value of domestic currency in terms of foreign currency is deliberately reduced by the government, it is referred to as _____.

7.5 SUMMARY

This chapter discusses various theories of international trade so as to develop a conceptual understanding of the fundamental principles underlying international trade. Early trade was based on the theory of mercantilism that measured the wealth of a nation by the size of its accumulated treasures of gold and silver. In order to accumulate such financial wealth, the theory suggested a nation should encourage exports and discourage imports. Since one country's gain was dependent upon another's loss, trade was considered to be a zero-sum game. However, the later theories of specialization promulgated that trade enhances the overall global wealth by way of enhancing world production. The theory of absolute advantage emphasizes that a country should produce and export those goods that it can produce more efficiently than others. The theory of comparative advantage advocates that even if a country does not have an absolute advantage in the production of any goods, it should produce those goods that it can produce more efficiently than others.

As per the Heckscher-Ohlin factor endowment theory, a nation will export the commodity whose production requires an intensive use of the nation's relatively abundant and cheap factors and will import the commodity whose production requires the intensive use of the nation's scarce and expensive factors. However, the Leontief paradox does not support the factor endowment theory and finds that the US exports more labor-intensive commodities and imports more capital-intensive products. Posner's Imitation gap theory simply states that technological innovation and the introduction of a new product leads to the imitation gap and the demand gap in the other country. The extent to which trade will take place between the two countries depends on the net effect of the imitation gap and the demand gap. The new trade theory brings in the concept of economies of scale leading to increase in returns, enabling countries to specialize the production of such goods. The shifting patterns of markets as well as manufacturing bases are aptly explained by the theory of international



product life cycle. The theory of competitive advantage emphasizes upon environmental factors, such as factor conditions, demand conditions, related and supporting industries, firm strategy, structure, and rivalry as determinants of national competitiveness. The trade theories also provide guiding principles for the regulatory framework and trade promotion strategies to a varying extent to national governments and international organizations.

A country's balance of payment is the summary of all economic transactions of a country that have taken place between the country's residents and the residents of other countries during the specified period. The constraints in the growth of India's exports, as summarized in the chapter, include India's adoption of the import substitution rather than export promotion strategy, overprotection to Indian industry from external competition, high import tariffs and other barriers, inadequate infrastructure, and complexity of trade procedures.

7.6 ANSWERS TO IN-TEXT QUESTIONS

1. Trade Surplus	11. Eli Hecksher; Bertin Ohlin
2. David Hume	12. Wassily Leontief; Leontief Paradox
3. Zero sum game	13. Price; physical
4. Increasing returns to scale; network effects	14. Introduction; growth; maturity; decline
5. Mathematical economics	15. Importer
6. Adam Smith	16. Government policy; chance events
7. Absolute difference in costs	17. Factor conditions; demand conditions; related and supporting industries; firm's strategy, structure, and rivalry
8. David Ricardo	18. Statement of account
9. Geographical division of labour; specialization in production	19. Balance of trade
10. Supply	20. Devaluation

7.7 SELF-ASSESSMENT QUESTIONS

1. Analyze the product life cycle theory of international trade in detail. What criticisms are levelled against it?
2. What are the main differences between the factor proportions and product life cycle theories of international trade?



3. Explain Porter's theory of national competitive advantage as a theory of international trade.
4. How is the factor proportion theory superior to the classical theory of international trade?
5. Critically examine the Leontief Paradox.
6. What are the assumptions and criticisms of Ricardo's theory of international trade?
7. Explain the absolute and comparative advantage theory of international trade.
8. What are the main sources of national competitive advantage? What are the sources of competitive advantage that explain the success of a product that you think is very successful in your country?
9. Critically examine the Heckscher-Ohlin theory of international trade.
10. What is the balance of payment account? What are its different components?
11. (a) The balance of payment account is a cash flow statement that records the flow of foreign exchange from all international transactions over a period of time.' Discuss.
(c) List the constituents of the current account and capital and financial account of the balance of payment accounts.
12. Discuss the various components of Balance of Payment Account.
13. "Balance of Payments always balances." Elucidate. How do you explain disequilibrium in balance of payments?
14. What are the causes of an adverse balance of payments? Give suggestions to remove an unfavourable balance of payments.
15. Distinguish between:
 - Balance of Current Account and Balance of Capital Account
 - Autonomous and Accommodating Transactions
 - Deficit and Disequilibrium in Balance of Payments.

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LESSON 8

EXCHANGE RATES AND THE MUNDELL– FLEMING MODEL

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STRUCTURE

- 8.1 Learning Objectives
- 8.2 Introduction
- 8.3 Exchange Rates and the Foreign Exchange Market
 - 8.3.1 Demand and Supply in the Foreign Exchange Market
 - 8.3.2 Exchange Rate Determination: Flexible Exchange Rates
 - 8.3.3 Exchange Rate Determination: Fixed Exchange Rates
 - 8.3.4 Pegging the Exchange Rate
 - 8.3.5 Current Exchange Rate System
- 8.4 Capital Account Convertibility
- 8.5 The Mundell–Fleming Model
 - 8.5.1 Imperfect Capital Mobility
 - 8.5.2 Perfect Capital Mobility
- 8.6 Summary
- 8.7 Glossary
- 8.8 Answers to In-Text Questions
- 8.9 Self-Assessment Questions
- 8.10 References
- 8.11 Suggested Readings



8.1 LEARNING OBJECTIVES

After reading this chapter, you will be able to:

- Understand the meaning of exchange rates and how it is determined.
- Differentiate between various types of exchange rate regimes.
- Understand the concept of capital account convertibility
- Determine the equilibrium level in money market and goods market with the help of Mundell-Fleming model.

8.2 INTRODUCTION

Over the past three decades, financial markets in India and other countries have become much more interconnected. Greater capital flows and a stronger correlation between asset returns across nations are two effects of financial market integration. The Indian economy has opened up significantly, proving that the globalisation you read about is indeed a reality. Other chapters emphasise the connections between the Indian economy and the economies of other countries through examples and perspectives. These relationships take centre stage because in this chapter we explicitly discuss the macroeconomics of open economies. This chapter examines how exchange rates are set, the current global monetary system, as well as how our domestic economy and global economy interact. We start by describing the various exchange rate systems used to determine exchange rates in currency markets. Then the current global monetary system's actual exchange rate arrangements are examined. After that a comparison of pegged and flexible exchange rate systems is made. Finally, the risks posed by some rising trade imbalances are assessed.

The main topic of discussion of this chapter is exchange rates. The price of one currency in relation to the other is known as the exchange rate between two currencies. On 1st March 2023, the price of an American dollar was ₹ 81.72 (\$1 = 81.72 rupees), and the price of a euro was ₹ 86.90. When Indian residents want to buy foreign goods or assets, as well as when foreign residents want to buy Indian goods and assets, exchanges between the Indian rupee and other currencies take place. In this chapter we will examine how exchange rates are set between India and other nations.



8.3 EXCHANGE RATES AND THE FOREIGN EXCHANGE MARKET

Demand for foreign exchange is the term used to describe the demand for foreign currencies by domestic residents. The market where different national currencies are exchanged is known as the foreign exchange market. For instance, this market is where Indian citizens sell their rupees in order to buy foreign exchange (foreign currencies). To understand how the balance of payments accounts and transactions in the foreign exchange market are related, we must first acknowledge that all foreign purchases made by Indian residents as well as all foreign transfer payments (also known as foreign exchange debits, which is a general term for an aggregate of foreign currencies in the balance of payments accounts) also represent demands for foreign currencies, or demands for foreign exchange.

The European exporter will demand payment in Euro even though the Indian resident purchasing the European car does so in rupees. Therefore, on the foreign exchange market, rupees must be converted into Euro. Take another example, in order to purchase a share of stock on the London Stock Exchange, an Indian rupee must first be converted into British pounds by the broker. The overall foreign spending by Indian citizens indicates a demand for foreign currency. When viewed from the perspective of the rupee, we can say that the total foreign expenditure of Indian residents represents an equal supply of rupees in the foreign exchange market. On the other hand, all of the foreign income earned by residents of India reflect equal earnings of foreign exchange. For instance, Indian exporters will demand payment in rupees, and foreign buyers must exchange their money for rupees in order to purchase our goods. The total credits in the balance of payments accounts then equal the supply of foreign currency, or the demand for rupees, which is the same thing.

8.3.1 Demand and Supply in the Foreign Exchange Market

The foreign exchange market is where exchange rates between different national currencies are decided. To understand this process, we make the following assumptions. At first, we do not include central bank official reserve transactions. We assume that central banks do not intervene in the foreign exchange market. This assumption will be relaxed later in this section. For the sake of simplicity, we also assume that there are only two nations: "Europe" and "India," with euro and rupee as their official currency.

In this straightforward scenario, the exchange rate is the relative price of the two currencies, which we express as the price of the euro in terms of rupees. For example, if the price of the euro is 100 rupees, then 1 euro trades for 100 rupees; at 125 rupees, the exchange rate (price of the euro) is higher, and 1 euro equals 125 rupees, ($0.80 \text{ euro} = 100 \text{ rupees}$). It's crucial to



keep in mind that when the exchange rate is expressed in this way, a higher exchange rate denotes an increase in the price of foreign currency (or foreign exchange). When the exchange rate rises, we refer it as an appreciation of foreign currency or the depreciation of rupee.

Alternately, a drop in the exchange rate indicates a decrease in the price of foreign exchange (the price of the euro). The rupee has appreciated while the euro has depreciated. Figure 8.1 displays the foreign exchange supply and demand schedules plotted against the exchange rate (π). Foreign expenditures such as Imports, purchases of foreign assets, and transfers made by Indian citizens abroad are all considered demands for foreign currency. Figure 8.1 depicts a downward sloping demand curve (D_{fe}), indicating a fall in the demand for foreign exchange as the price of foreign exchange (price of euros) rises. The reason is that rising foreign exchange rates will make foreign goods more expensive in rupees. As a result, imports will decrease and the demand for foreign exchange will decrease.

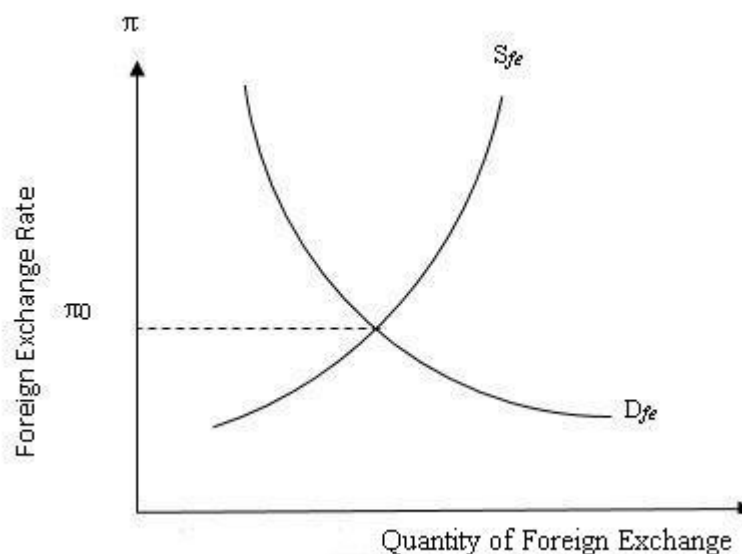


Fig 8.1: Demand and Supply in the Foreign Exchange Market

Keep in mind that we are holding all prices except the exchange rate, constant. Let's say you're thinking about spending 200 euros on a handbag made in France. The handbag will cost ₹ 20,000 if the exchange rate, or the price of the euro in terms of rupees, is 100 (200 euros = ₹ 20,000 at a 100 euro to rupee exchange rate). The price of the handbag will increase to ₹ 25,000 if the exchange rate increases to 125 (200 euros = ₹ 25,000 at 0.08 euro to the rupee). The cost of imported goods in rupees increases as the exchange rate rises. Now take



into account the demand for foreign exchange for transfers to foreign countries and the purchase of foreign assets. We do not find a clear correlation between the volume of international transfers and the exchange rate. It is unclear how the change in the exchange rate will affect international aid initiatives, or gifts to foreign nationals. When buying foreign assets, an increase in the exchange rate will increase the price of foreign stocks or bonds in rupees, just like it does when buying imported goods. However, a proportional increase in the interest or dividend payment on the foreign bond or stock, again expressed in rupees, will also follow a rise in the exchange rate. For instance, at an exchange rate of 100 (1 euro = 100 rupees), a French bond that costs 800 euros and pays 80 euros in interest a year would cost 80,000 rupees and pay 8000 rupees in interest a year.

The bond will cost ₹1,00,000 and have an annual interest payment of ₹ 10,000 at a conversion rate of 125 (0.80 euro = 100 rupees). In either scenario, the bond generates an annual return of 10%. As a result, we would not necessarily anticipate that a change in the exchange rate would have any impact on the demand for foreign assets. Only the fact that imports decrease as the exchange rate increases contribute to the downward slope of the demand for foreign exchange.

Figure 8.1 depicts the supply schedule for foreign exchange with a positive slope indicating the supply of foreign exchange rises as the exchange rate rises. As the exchange rate (price of euros) rises, exports from India to Europe become more affordable. Once more, we are maintaining the fixed rates of all other prices, including the rupee value of Indian exports. For instance, Europeans would pay 5 euros per bushel for Indian wheat that sells for 500 rupees per bushel at an exchange rate of 100 but only 4 euros at an exchange rate of 125. As the exchange rate rises, there should be an increase in the demand for Indian exports. Observe, however, that at the higher exchange rate, a given rupee volume of exports earns less foreign currency (fewer euros). For instance, if the exchange rate increased by 10% and the volume of exports in rupees increased as a result, foreign exchange earnings would remain unchanged. India would sell 10% more but make 10% less in euros on average. The foreign demand for our exports must be more than unit elastic, which means that a 1 percent increase in the exchange rate (which results in a 1 percent decline in the price of the export good to Europeans) must result in an increase in demand of more than 1 percent, in order for the supply of foreign exchange to increase as the exchange rate rises. If this requirement is satisfied, the volume of our exports in rupees will increase more than proportionately to the increase in the exchange rate, and the earnings of euros (the supply of foreign exchange) will rise as the exchange rate increases. In Fig 8.1, we have made this assumption.



8.3.2 Exchange Rate Determination: Flexible Exchange Rates

We have not yet included central bank intervention (official reserve transactions). Only autonomous transactions in the balance of payments accounts are included in the supply and demand schedules in Figure 8.1. Let's keep making this assumption and examine how, in the absence of intervention, the exchange rate is set. In this situation, we would anticipate a change in the exchange rate to clear the market and balance the supply and demand of foreign currency. This equilibrium exchange rate is shown as π_0 in Figure 8.1. A flexible exchange rate system, or floating rate system as it is sometimes referred to, is one that determines exchange rates without the involvement of a central bank.

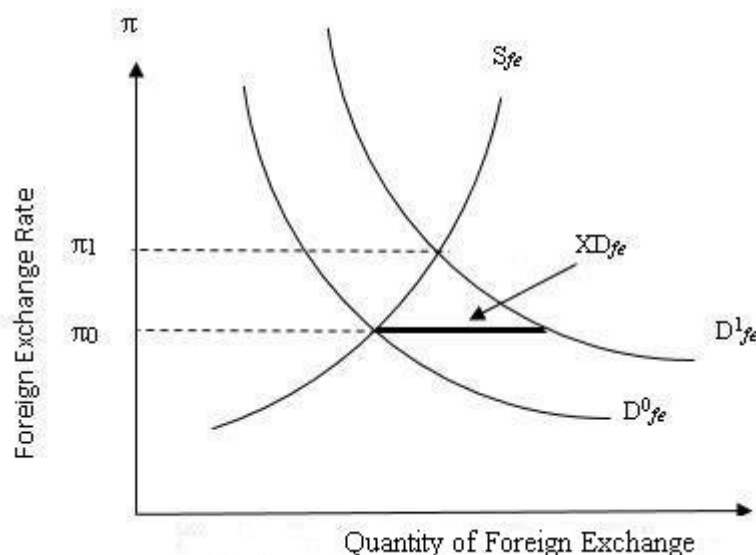


Fig 8.2: Effect of Increase in the Demand for Imports

A set of international laws governing the determination of exchange rates is known as an exchange rate system or regime. The central banks have an especially easy set of rules to follow in a totally flexible or floating rate system because they have no control over the level of the exchange rate. The market determines the exchange rate. We investigate the impact of a shock that increases the demand for foreign exchange in order to better comprehend the operation of a flexible exchange rate system. Let's say that Indian consumers become more interested in imported goods. Assume, for instance, that rising gas prices lead to a switch from SUVs to small, foreign cars that are more fuel-efficient. The result of this increase in import demand would be a shift to the right in the foreign exchange market's demand schedule, such as from D_{fe}^0 to D_{fe}^1 , as shown in Figure 8.2. India has a higher demand for



imports at a given exchange rate, which causes a higher demand for foreign currency. There is currently an excess demand for foreign currency at the initial equilibrium exchange rate π_0 , (shown as XD_{fe} in Figure 8.2). The exchange rate must increase to the new equilibrium value of π_1 . Because the price of imported goods in rupees increases along with the exchange rate, the increase in the exchange rate will result in a decrease in the amount of imports that are demanded. Additionally, since Indian exports are now less expensive to foreign buyers due to the increase in the exchange rate, the demand for exports will grow. The supply and demand for foreign exchange are once again equal at the new equilibrium with the higher exchange rate (π_1). The rise in import demand causes the rupee to lose value.

India's exchange rate system hasn't always been completely flexible. Central banks, including the RBI, have intervened in the foreign exchange market to affect the values of their currencies to varying degrees during this time. The characteristics of the current global monetary system are covered later. Before we get started, it is helpful to look at how the foreign exchange market functions under the system of fixed, or pegged, exchange rates, which is the complete opposite of a completely flexible rate system.

8.3.3 Exchange Rate Determination: Fixed Exchange Rates

An international monetary system is a set of regulations governing the setting of exchange rates and deciding which assets will serve as official reserve assets. The Bretton Woods system, established after World War II, is an example of a fixed exchange rate system. Near the end of the war, negotiations took place to create the international monetary agreements that made up this system (at Bretton Woods, New Hampshire). To run the Bretton Woods system, the IMF was established. The United States was required to set a parity, or par value, for its currency in terms of gold in accordance with IMF regulations. Due to the dollar's link to gold, other countries would set their currency parities in terms of dollars, which also fixed the value of these other currencies in terms of gold.

The United States consented to uphold the fixed exchange rate (originally \$35 per ounce) between the dollar and gold. After a period of post-war adjustment, other nations agreed to maintain convertibility with the dollar and other currencies but not with gold. The other nations agreed to keep their currency values versus the dollar within a 1% range on either side of parity. Given that the US held roughly two-thirds of the world's official gold reserves at the time, the US's differential obligation to other IMF members regarding convertibility into gold seemed reasonable.



8.3.4 Pegging the Exchange Rate

We look at how a nation can "peg," or fix, the level of its exchange rate in order to understand how a system of fixed exchange rates operates. In order to accomplish this, we go back to our two-country example and assume that India wants to fix its exchange rate in relation to the euro, which we are using to represent the currencies of the rest of the world. We ignore the 1% margin that was just mentioned and assume that the RBI wants to set the rupee's exact par value, such as at a conversion rate of 100 rupees to 1 euro. Figure 83 shows how the foreign exchange market functions under this fixed exchange rate system.

Assuming a flexible rate system, we assume that the official fixed exchange rate of 100 is below the equilibrium rate of 125 (0.80 euro = 100 rupees) shown in Figure 8.3. In such a case, the rupee would be considered to be overvalued and the euro to be undervalued at the fixed exchange rate. According to this terminology, if the exchange rate were set by the market, it would have to increase for the market to be cleared if the price of the euro was compared to the rupee. What stops this from occurring? Just to refresh your memory, the demand and supply schedules we created for the foreign exchange market only measure autonomous transactions; they do not account for accommodating transactions carried out by central banks to finance payments imbalances.

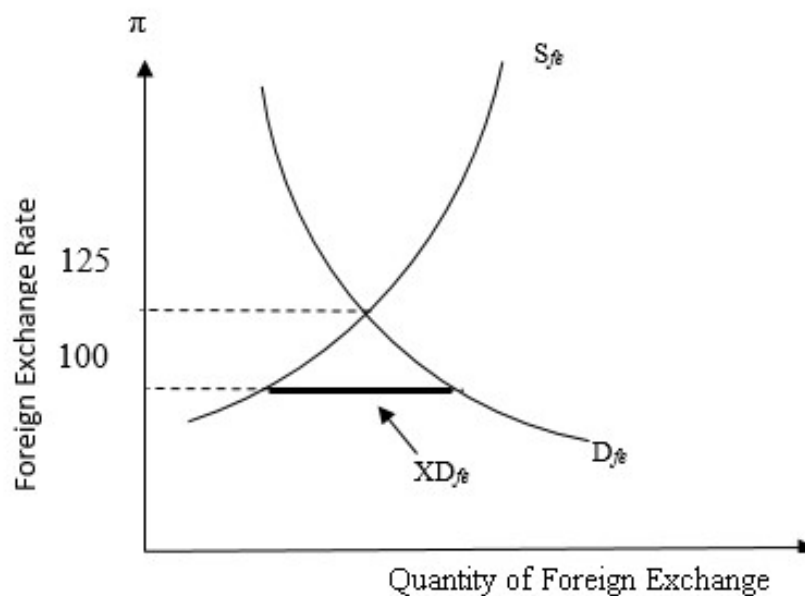


Fig 8.3: Foreign Exchange Market with a Fixed Exchange Rate



To fix the exchange rate at a value that is not in equilibrium, like the 100 rupees in Figure 8.3, such central bank intervention is necessary. India must be prepared to buy and sell rupees at that exchange rate in order to maintain the rate at 100. The exchange rate cannot drop below that level because no one would sell elsewhere for less if the RBI agreed to buy 1 euro for 100 rupees. In a similar manner, the exchange rate is unable to increase above 100 due to the central bank's willingness to sell euros at that level. With the exchange rate below the equilibrium rate in the scenario shown in Figure 8.3, there is an excess demand for foreign exchange (euros), denoted in the figure as XD_{fe} . The RBI can supply foreign exchange, i.e., exchange euros for rupees on the foreign exchange market, to prevent the exchange rate from rising. As an alternative, the European Central Bank might step in. To meet the excess demand for euros and keep the price of the euro at the set exchange rate, this bank would supply euros (sell euros and buy rupees).

8.3.5 Current Exchange Rate System

In 1971, the Bretton Woods system broke down. For major industrialised nations, the current global exchange rate determination system is best described as a managed float (or in the case of the countries in the euro area, for a group of countries). Although some allow for varying degrees of exchange rate flexibility, developing countries frequently have fixed exchange rate systems. A managed or "dirty" float combines elements of a fixed rate system and a flexible exchange rate system (the managed part). The exchange rate is permitted to fluctuate for a nation with a managed float in response to market forces. The central bank can, however, step in to stop any unfavourable or disruptive changes in the exchange rate. We will now examine the issue of how central banks have decided to intervene in the foreign exchange markets and how an undesirable or disruptive movement in the exchange rate has been defined in practise. There is also discussion of the causes of the Bretton Woods system's failure.

Exchange Rate Arrangements

The exchange rate policies of the nations that are IMF members are compiled in Table 8.1. As was just mentioned, there is no single system for determining exchange rates. Some nations set their exchange rates within a narrow range of 1% or less, either to a single currency or to a basket of currencies. This is the 42-nation group that the table's "fixed peg arrangements" label refers to. Pegged arrangements within bands are another group that adheres to a fixed exchange rate policy, albeit with a larger band. Between fixed and flexible rates, the currency category known as "crawling pegs" modifies the value of its currency in relation to a central rate in response to a number of economic indicators (such as domestic versus foreign inflation rates). The group labelled "participate in an exchange rate



mechanism" comprises the European nations that have adopted a common currency, the euro, but float as a group relative to other currencies. More information about this exchange rate setup is provided later in the chapter. The 77 countries listed next in the table all have managed floats but have floating rate systems. The last group, dubbed "other," uses a different system for determining exchange rates. Among the nations with floating exchange rates are the United States, Canada, the United Kingdom, and Japan.

Table 8.1: Exchange Rate Arrangement of IMF Member Countries

Exchange Rate Arrangements	No. of Countries
Fixed peg arrangements	42
Pegged arrangements within bands	14
Crawling pegs	5
Participate in an exchange rate mechanism	17
Managed floating and float independently	77
Other	34

Source: IMF, *International Financial Statistics*

How much managing? How much floating?

To prevent disruptive changes in their exchange rates, central banks intervene in the foreign exchange markets in a managed float. Their exchange rates float otherwise. The degree to which industrialised nations intervened in the foreign exchange market varied significantly during the post-1973 era. The American central bank frequently intervened in the foreign exchange market in the 1970s. For instance, the U.S. government organised a significant support programme for the dollar's price in November 1978. The Reagan administration declared in 1981 that central bank intervention would only take place when it was absolutely necessary to stop chaos in the foreign exchange market brought on by crisis situations. U.S. intervention in the foreign exchange market significantly decreased after this change in how one should define a disruptive movement in the exchange rate. The current exchange rate system prevents the price of the dollar from floating freely even in the absence of U.S. central bank intervention because other central banks buy or sell dollars to affect the value of their currencies relative to the dollar. For instance, European central banks sold dollars from their reserve holdings in 1981 and 1984 to halt the rise in the price of the dollar, which would have resulted in a decline in the value of their respective currencies (a rise in their exchange rate



relative to the dollar). Then, with the signing of the Plaza Accord in September 1985, coordinated intervention by the central banks of the major industrialised nations to devalue the dollar began (raising the U.S. exchange rate). For reasons that will be discussed later, these central banks reversed course in 1987 and once more intervened jointly to support the dollar. The main currency market interventions in recent years have involved Asian central banks buying dollars. To keep the value of its currency pegged, the Bank of China amassed enormous reserves. To prevent (or at least limit) the appreciation of the Japanese yen, the Bank of Japan has also purchased a significant amount of dollars. To increase their stock of reserves, other Asian central banks have spent hundreds of billions of dollars on purchases.

Advantages of Alternative Exchange Rate Regimes

Each nation, or group of nations, selects an exchange rate regime within the current framework for determining exchange rates. The selection of the degree of exchange rate flexibility is a crucial component of this choice. A nation makes a decision along a spectrum that, at one end, calls for total exchange rate flexibility and, at the other, a rigid peg. Other considerations when choosing an exchange rate regime include the quantity and kind of reserve assets to hold, as well as the currency to use as the basis for any currency pegs. However, the exchange rate regime's choice of degree of flexibility is crucial. Economists and central bankers have long disagreed about the relative advantages of pegged (fixed) versus flexible exchange rates. We examine the main justifications offered for and against each system in this section.

Advantages of Exchange Rate Flexibility

We start with the justifications put forth for exchange rate flexibility. One benefit of more exchange rate flexibility is that it would free policymakers from worrying about balance of payments deficits, allowing them to focus on domestic objectives. Potential conflicts between internal balance (domestic goals) and external balance would be eliminated (balance of payments equilibrium). Secondly, exchange rates that are flexible would protect the domestic economy from shocks to the global economy.

Policy Independence and Exchange Rate Flexibility

According to our earlier analysis, a country's central bank would lose official reserve assets if it intervened in the foreign exchange market to finance a balance of payments deficit. The central bank would eventually run out of reserves as a result of ongoing deficits. The central bank would need to implement measures to close the balance of payments deficit before reserves ran out. Here is where there may be a conflict between domestic objectives and the



balance of payments. We look at the relationship between the major balance of payments items and the level of domestic economic activity to better understand the nature of the conflict.

The Trade Balance and the Level of Economic Activity

Figure 8.4 shows the domestic national income on the horizontal axis, along with imports (Z) and exports (X) on the vertical axis. The import schedule is drawn sloping upward because the demand for imports depends positively on income. Because income has a positive impact on consumption, this relationship follows. Consumption of both domestic and imported goods rises as income rises. Additionally, as domestic national income rises, the need for imported inputs will grow (e.g., imported crude oil). The export schedule, however, is horizontal. The foreign demand for imports includes the demand for Indian exports. Foreign income determines the demand for imports from abroad. India views foreign income and consequently the need for exports as exogenous factors.

The relative price levels in the two countries as well as the level of the exchange rate are additional factors that affect both Indian demand for imports as well as foreign demand for Indian exports. These factors determine the relative costs of the goods produced by the two countries for the citizens. For the time being, we will assume that both price levels and the exchange rate are constant. Exports and imports will be equal if income is at $Y_{TB} = 0$, as shown in Figure 8.4. (where TB, the trade balance, equals zero). With this level of income, import demand equals exogenous export level. However, there is no reason to believe that the equilibrium level of income will be $Y_{TB} = 0$. The overall economy's aggregate demand and supply, not just that of the international sector, will determine equilibrium income.

Assume, for instance, that the equilibrium income in Figure 8.4 is at Y_0 , above $Y_{TB} = 0$. At Y_0 , there is a trade deficit because imports are higher than exports. In earlier chapters, we have seen how, at least according to the Keynesian perspective, aggregate demand management can influence equilibrium income. These policies could then be used to raise equilibrium income to the point where exports and imports are equal, or $Y_{TB} = 0$. This would be a position of external balance for the economy, which in a fixed exchange rate system means balance of payments equilibrium, if the other current account items and the financial account were in balance (official reserve transactions deficit equals zero). In Figure 8.4, the decision-maker could, for instance, use a stringent fiscal strategy like a tax hike to lower income from Y_0 to $Y_{TB} = 0$.

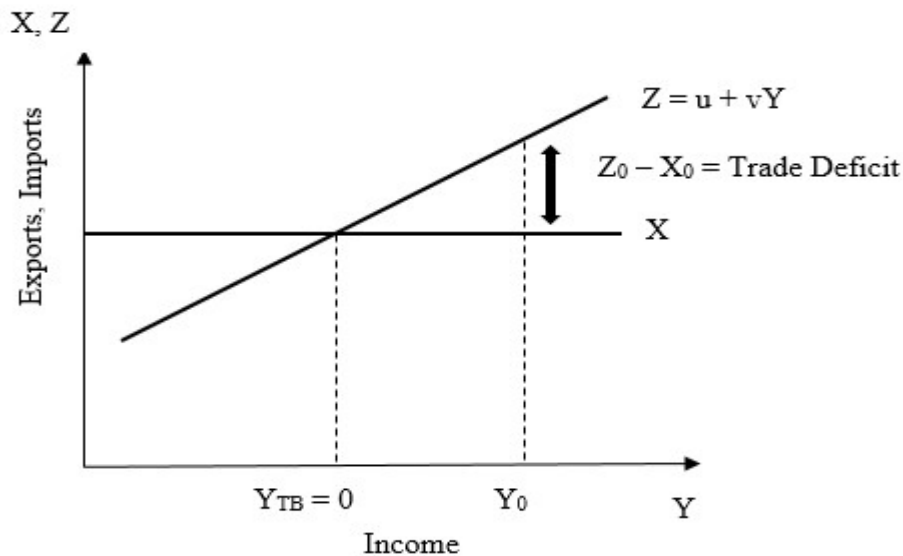


Fig 8.4: Trade Balance and the Level of Economic Activity

Politicians, however, also have domestic objectives. Achieving internal balance requires the use of policies for aggregate demand management in the Keynesian framework in order to pursue goals for unemployment and inflation. The issue is that there is no evidence to support the notion that the level of income that results in external balance is also the level that is best for achieving domestic objectives. Assume, for instance, that Y_0 in Figure 8.4 represents the ideal level in terms of domestic goals. Internal balance would be upset and an unfavourably high unemployment rate would result from using a restrictive fiscal policy to reduce income to $Y_{TB} = 0$. However, if income is kept at Y_0 , there will be a trade deficit and no external balance in the economy.

Capital Flows and the Level of Economic Activity

Expected rates of return on assets in each country serve as the main determinants of capital flows between countries. With a fixed exchange rate system, asset returns are not affected by anticipated exchange rate movements (except at times when there is speculation that the official exchange rate is to change). The different countries' interest rates will serve as indicators of the relative rates of return. If we assume that other countries rates of return are constant, the amount of capital entering a given nation will positively depend on the level of that nation's interest rate (r); that is,

$$F = F(r) \quad (8.1)$$



where F is the net inflow of capital (a negative value of F represents a net outflow or deficit on the financial account). Therefore, how the interest rate changes in response to changes in economic activity will determine how those changes affect the balance on the financial account. Start by taking into account the rises in economic activity brought on by expansionary monetary policies. By lowering the interest rate, an expansionary monetary policy will increase aggregate demand. The balance on the financial account will suffer as a result of the lower interest rate. As foreign assets become comparatively more appealing, foreign investment in India will decrease while Indian investment abroad will rise. As we saw in the section before, increases in income for any reason lead to an increase in imports while maintaining export levels, which worsens the trade balance. The trade balance and the financial account will worsen if the increased income is the result of an expansionary monetary policy. What if, on the other hand, the rise in economic activity was the result of an expansionary fiscal strategy? With a fixed money supply, the interest rate will rise as income rises due to an increase in the demand for money. In this instance, an increase in interest rates coincides with an increase in income. As a result, the increase in interest rates will encourage a capital inflow even though the trade balance is getting worse. The relative strength of these two effects of the fiscal policy-induced expansion—the favourable effect on the financial account or the unfavourable effect on the trade balance—determines whether the overall effect on the balance of payments is favourable or unfavourable.

As a result, we discover that in a fixed exchange rate system, there may be conflicts between domestic objectives, like a low unemployment rate, and the objective of external balance, as determined by the balance of payments equilibrium. With regard to monetary policy, the conflict is particularly severe because expansive policy actions have negative effects on both the trade balance and the financial account. The price level serves as a final link between the balance of payments and economic activity. Expansive aggregate demand policies, whether monetary or fiscal, will raise prices unless the economy is still far from reaching full employment. With a fixed exchange rate, an increase in domestic prices will result in higher imports and lower exports for a constant level of foreign prices. Indian citizens will generally find foreign goods to be less expensive, while foreign consumers will find Indian exports to be more expensive. The direct negative impact that an economic expansion has on the trade balance for both monetary and fiscal policies is reinforced by this price effect on the balance of trade.

Exchange Rate Flexibility and Insulation from Foreign Shocks

The ability of flexible exchange rates to protect an economy from certain shocks is cited by proponents. Consider a nation that is initially in a state of macroeconomic equilibrium with



an optimal level of unemployment, an optimal price level, and equilibrium in the balance of payments to understand the justification for this assertion. Now imagine that there is a global recession and that foreign income decreases. Because foreign income determines the demand for this country's exports (import demand), it will decline along with the global recession. This decrease in export demand will be reflected in the foreign exchange market as a leftward shift in the foreign exchange supply schedule. The foreign recession will cause the supply schedule to change from S_{fe}^0 to S_{fe}^1 , as shown in Figure 8.5.

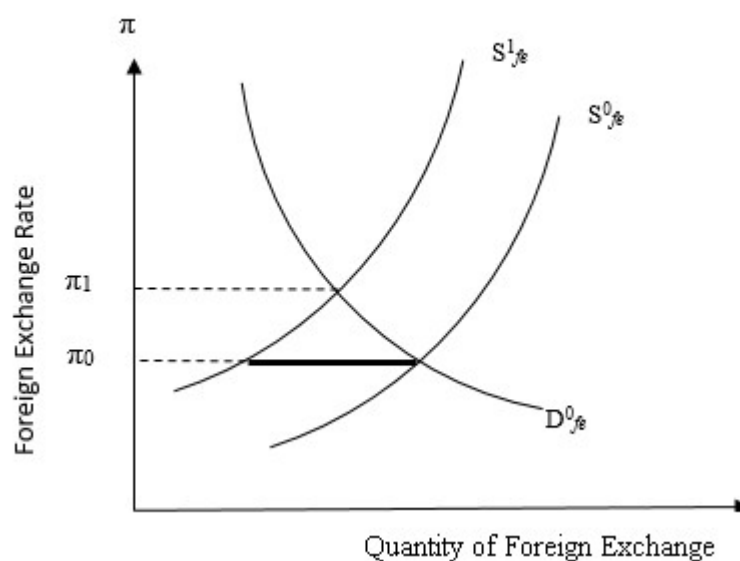


Fig 8.5: Insulation of the Domestic Economy in a Flexible Exchange Rate System

The nation would experience a balance of payments deficit equal to distance AB in Figure 8.5 under a fixed exchange rate system. Additionally, the recession abroad will have contractionary effects on the domestic economy; aggregate demand will fall, and income will decline because export demand is a portion of aggregate demand (the foreign demand for domestic output). A system with flexible exchange rates will see an increase in the exchange rate as a result of the excess demand for foreign currency (equal to the balance of payments deficit AB) brought on by the international recession. With the higher exchange rate π_1 , point C will represent the new equilibrium. The deficit in the balance of payments will be eliminated by the increase in the exchange rate. Take note of yet another feature of the transition to a new equilibrium. As we proceed to point C, the rise in the exchange rate boosts export demand while reducing import demand. The increase in exports brought on by the increase in the exchange rate will cause the aggregate demand to increase. The decline in



imports brought on by the increase in the exchange rate will also have an expansionary effect; domestic aggregate demand will rise as people start purchasing domestic goods instead of imports. In the flexible exchange rate scenario, we can observe that changing the exchange rate counteracts the contractionary impact of a foreign recession on the domestic economy. In this way, a system of flexible exchange rates protects an economy from external shocks.

Arguments for Fixed Exchange Rates

Supporters of fixed exchange rates think that a system like this will create a more stable environment for the expansion of global trade and foreign investment. They also contend that more effective policy coordination between industrialised economies and a fixed exchange rate system will increase macroeconomic stability. The world economy experienced a period of freely fluctuating exchange rates following the collapse of an earlier fixed exchange rate system at the beginning of the 1930s. Ragnar Nurkse, a Norwegian economist, presented the following arguments in opposition to flexible exchange rates based on this experience: Freely fluctuating exchange rates have three significant drawbacks. First of all, they add a risk component that tends to deter international trade. Where a forward exchange market exists, the risk may be mitigated through "hedging" operations; however, such insurance, if available at all, comes with a cost.

Secondly, as a means of adjusting the balance of payments, exchange fluctuations involve constant switching of labour and other resources between production for the domestic market and production for export. Such changes may be expensive and upsetting; they frequently lead to frictional unemployment, and they are unquestionably wasteful if the exchange-market conditions that necessitate them are temporary.

Thirdly, it has been demonstrated through experience that fluctuating exchanges cannot always be counted on to encourage adjustment. A significant and persistent change in the exchange rate may lead to expectations of further movement in the same direction, which could lead to speculative capital transfers that disrupt the equilibrium.



8.4 CAPITAL ACCOUNT CONVERTIBILITY

The current account and capital account make up the balance of payments account, which is a statement of all transactions between a nation and the outside world. The capital account is made up of the cross-border movement of capital through investments and loans, whereas the current account primarily deals with the import and export of goods and services. The ability of a country's currency to be converted into any other foreign currency (such as the US dollar, British pound, or Euro) and back again is referred to as capital account convertibility. It is the ability to exchange domestic financial assets for foreign financial assets at market exchange rates. Unrestricted capital movement would eventually result from full capital account convertibility. Due to the unfavourable current account situation—India had a sizable current account deficit—the Indian rupee was not granted full capital account convertibility. The government wanted to make sure that imports of essential goods and commodities could be made with foreign currency at a lower cost.

India approached the full convertibility of the rupee for capital accounts with caution in light of the Mexican crisis. The ensuing East Asian financial crisis supported the partial convertibility of capital accounts. In the past, partial capital account convertibility was allowed in certain circumstances. Complete capital account convertibility can encourage capital inflows into the nation, but if circumstances worsen, there is a sizable risk of capital outflows from the home nation. This may result in greater exchange rate volatility and even a crisis akin to the one that hit East Asia. This year, as the government and RBI work to permit more foreign participation in domestic bond markets, the process of capital account convertibility is likely to advance.

Evolution of capital account convertibility

India's path to opening its economy was set in motion by the recommendations of the Narasimham Committee in 1991. The nation had switched to a market-determined exchange rate and full current account convertibility within five years. Current account and, to some extent, capital account transactions were further liberalised with the passage of the Foreign Exchange Management Act, 1999. Foreign direct investment (FDI) is largely unrestricted in India, where it has contributed nearly 50% of all FDI inflows since 1991 over the past five years. The highest amount ever invested by FPIs was 10.8 billion dollars in the IPOs of Indian companies in 2021. Progress on this front has been slow over the three decades since liberalisation started, and the capital account is currently only partially open.



Importance

The irregular inflows and outflows of domestic and foreign capital can cause excessive currency appreciation or depreciation and have an adverse effect on the stability of the money supply and the financial system. Following the 1997 currency crisis in East Asian nations, India was praised for its caution in opening up its capital account. According to the S. S. Tarapore committee's report on fuller capital account convertibility, which was published in 2006, even nations with sound fiscal positions have experienced currency crises and sharp declines in exchange rates. According to the report, excessive exchange rate appreciation makes exporting industries unprofitable and makes imports much more competitive, worsening the current account deficit. The Indian government has made numerous efforts to achieve complete convertibility of the capital account. Increased foreign portfolio investment limits in the Indian debt markets, for instance.

- Launching the Fully Accessible Route (FAR), which allows NRIs to invest without restrictions in certain government securities.
- Relaxing end-user restrictions to ease the external commercial borrowing framework.
- Permitting inward FDI in the majority of sectors.
- Permitting FDI from Indian-incorporated businesses that is a multiple of their net worth.

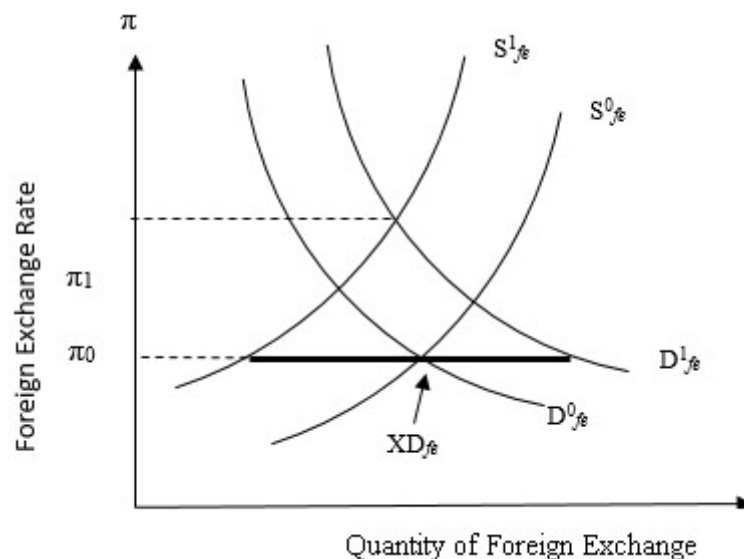


Fig 8.6: Effect of an Expansionary Monetary Policy: Flexible Exchange Rates

Flexible Exchange Rates

**IN-TEXT QUESTIONS**

The increase in the value of foreign commodities is known as devaluation. (True/False)

Select the correct statements about the balance of payments.

Exchange control is a measure intended to improve the adverse balance of payments

Import substitution is a measure intended to improve the adverse balance of payments

Currency devaluation is a measure intended to improve the adverse balance of payments

All of the above

Foreign exchange market is a _____ market. (Forward market, Spot market or both)

The foreign exchange is determined by the supply of foreign currency alone. (True/False)

The foreign exchange transactions that are dependent on other transactions are known as _____. (Autonomous transactions/Accommodating transactions)

8.5 THE MUNDELL-FLEMING MODEL

All economies are open to some extent, as they are engaged in trade and capital flows with other nations. We examine monetary and fiscal policy in an open economy model in this section. How are the outcomes of policy changes different in an open economy versus a closed economy? Depending on whether exchange rates are fixed or flexible, how do they differ? In the earlier discussed system of fixed exchange rates, we take into consideration any conflicts that might occur between internal and external balance. We provide examples to show why when exchange rates are flexible, those conflicts do not occur. There are various macroeconomic frameworks for open economies. The Mundell-Fleming model, referred to as the workhorse model for open economy macroeconomics.

The IS-LM model has an open economy version called the Mundell-Fleming model. The two equations in the closed economy IS-LM model are as follows:

$$M = L(Y, r) \quad (8.2)$$

$$S(Y) + T = I(r) + G \quad (8.3)$$



The money market equilibrium is represented by equation (8.2) and the goods market equilibrium is represented by equation (8.3) (IS schedule). While maintaining a constant level of aggregate prices, the model simultaneously determines the nominal interest rate (r) and the amount of real income (Y). What adjustments are necessary to analyse an open economy? The LM schedule won't be changed when an open economy is taken into account. Equation (8.2) states that in order for there to be an equilibrium, the real money supply—which we assume is under the control of the domestic policy maker—must equal the real demand for money. The policy maker has control over the nominal money supply, but since prices are assumed to be fixed at a certain level, changes in the nominal money supply also affect the real money supply. The goods market equilibrium condition for a closed economy serves as the basis for the equation (8.3):

$$C + S + T \equiv Y = C + I + G \quad (8.4)$$

which, when C is subtracted from both sides, reduces to

$$S + T = I + G \quad (8.5)$$

If we add imports (Z) and exports (X) to the model, equation (8.4) is replaced by

$$C + S + T \equiv Y = C + I + G + X - Z \quad (8.6)$$

and the IS equation becomes

$$S + T = I + G + X - Z \quad (8.7)$$

where net exports ($X-Z$) is the contribution of the foreign sector to total demand. The open economy IS equation can be written as follows if we move imports to the left-hand side and identify the variables that each component of the equation depends on.

$$S(Y) + T + Z(Y, \pi) = I(r) + G + X(Y^f, \pi) \quad (8.8)$$

Investment and saving are the same to those in the closed economy model. Income has a positive impact on imports. The exchange rate (π) has a negative impact on imports. Therefore, a rise in the exchange rate will increase the cost of goods from abroad while decreasing imports. Indian exports are actually imports for other nations, and it is positively depends on foreign income (Y^f) and the exchange rate. The reason for the relationship is that an increase in the exchange rate reduces the cost of rupees measured in terms of the foreign currency and lowers the price of Indian goods for foreign residents.

As depicted in Figure 8.7, it is possible to show that the open economy IS schedule is downward sloping. Low investment levels will be the result of high interest rates. To satisfy



equation (8.8), income must be low at these high interest rates in order for imports and saving rates to be low. Alternatively, at low interest rate levels, which lead to high levels of investment, the equilibrium of the goods market necessitates high imports and saving; as a result, Y must be high. We hold four variables constant when constructing the open economy IS schedule in Figure 8.7: taxes, government spending, foreign income, and the exchange rate. These factors cause the schedule to change. The schedule is shifted to the right by expansionary shocks like an increase in government spending, a reduction in taxes, a rise in foreign income, or a rise in the exchange rate. The increased demand for our exports makes an increase in foreign income expansionary.

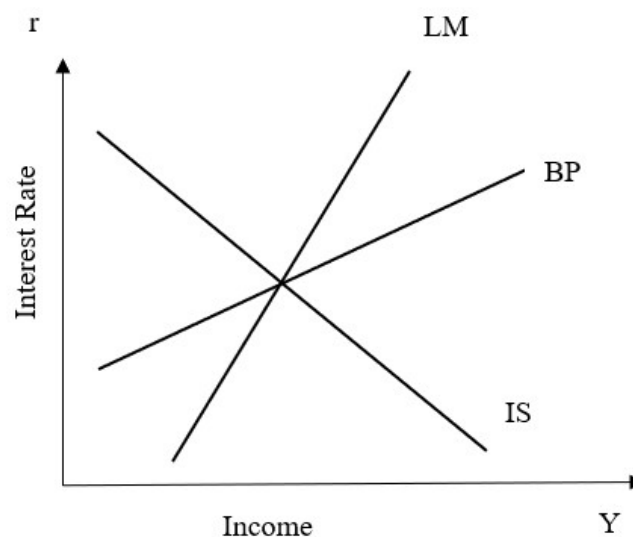


Fig 8.7: Open Economy IS– LM Model

The increased demand for our exports makes an increase in foreign income expansionary. In addition to increasing exports and decreasing imports for a given level of income, an increase in the exchange rate causes a shift in demand from imported to domestic goods. For the same reason, an autonomous decline in import demand is expansionary. The IS schedule is shifted to the left when these variables change in the opposite direction. In fig 8.7, our open economy model includes a balance of payments equilibrium schedule, the BP schedule in addition to the IS and LM schedules. All interest rate-income combinations that lead to balance of payments equilibrium at a specific exchange rate are plotted on this schedule. Equilibrium in the balance of payments signifies that there is no balance in the official reserve transaction. The BP schedule equation can be expressed as



$$X(Y^f, \pi) - Z(Y, \pi) + F(r - r^f) = 0 \quad (8.9)$$

In equation (8.9), the first two terms together make up the trade balance (net exports). The net capital inflow, or the surplus or deficit in the financial account in the balance of payments, is the third item. The difference between the domestic interest rate and the foreign interest rate ($r - r^f$) determines positively the net capital inflow. Increased demand for Indian financial assets (such as bonds) at the expense of foreign assets results from an increase in the interest rate differential between India and other countries. As a result, net capital inflow rises. The opposite happens when the foreign interest rate increases. The assumption is that the foreign interest rate is exogenous. Figure 8.7 illustrates the BP schedule is positively sloped. While export demand remains constant as income rises, import demand does. A higher interest rate will result in an increase in capital inflow, which is necessary to maintain balance of payments equilibrium. Now take into account factors that impact the BP schedule. The schedule will move horizontally to the right as π increases. A higher level of income will be needed for balance of payments equilibrium for a given level of interest rate, which fixes the capital flow, at a higher exchange rate. For this reason, a higher level of income that will stimulate import demand is required for balance of payments equilibrium. The higher exchange rate promotes exports and discourages imports. The BP schedule will also move to the right in response to an exogenous increase in export demand (caused by an increase in Y^f) or a decrease in import demand. If exports increase, for instance, at a specific interest rate that fixes the capital flow once more, a higher level of income and consequently of imports is needed to re-establish the balance of payments. The BP schedule is moved to the right. The BP schedule would also move to the right in response to a decline in the foreign interest rate because, for a given domestic interest rate (r), the decline in the foreign interest rate results in an increase in capital inflow. Imports and consequently income must increase for the balance of payments to be in equilibrium.

There is one thing to note about the BP schedule before we look at the effects of various policy changes. If capital mobility is imperfect, the BP schedule will be upward sloping. Domestic and foreign assets (such as bonds) are substitutes in this situation, but they are not perfect ones. Investors would move to equalise interest rates across nations if domestic and foreign assets could perfectly substitute one another, or in a situation known as perfect capital mobility. Investors would shift to an asset with a temporarily higher interest rate if it existed until the rate of the other asset was lowered to make it equal. Perfect capital mobility implies that $r = r^f$ in the context of our model. This equality implies a horizontal BP schedule. Interest rates do not necessarily need to be equal if the assets are imperfect substitutes. Foreign assets may not be a perfect substitute for Indian assets due to factors such as differential risk on



international assets, exchange rate risks, transaction costs, and a lack of knowledge about the characteristics of foreign assets.

8.5.1 Imperfect Capital Mobility

In this section, we assume that these factors are enough to make domestic and foreign assets less than perfect substitutes. We start with the scenario of fixed exchange rates to examine monetary and fiscal policy under the assumption of imperfect capital mobility.

Policy under Fixed Exchange Rates

Monetary Policy

Think about what would happen if the money supply increased from M_0 to M^1 . In Figure 8.8, the LM schedule moves to the right, from $LM(M_0)$ to $LM(M_1)$ as a result of the increase in the money supply (M_1). With a decrease in interest rates from r_0 to r_1 and an increase in income from Y_0 to Y_1 , the equilibrium shifts from E_0 to E_1 . What happened to the payment balance? First, keep in mind that every point below the BP schedule represents a deficit in the balance of payments, while every point above the schedule represents a surplus. A deficit in the balance of payments results when we move from an equilibrium point on the BP schedule to points below the schedule, such as by raising income or lowering the interest rate, or both. As a result, after the increase in the money supply, we move from point E_0 to point E_1 , and the balance of payments also moves into deficit.

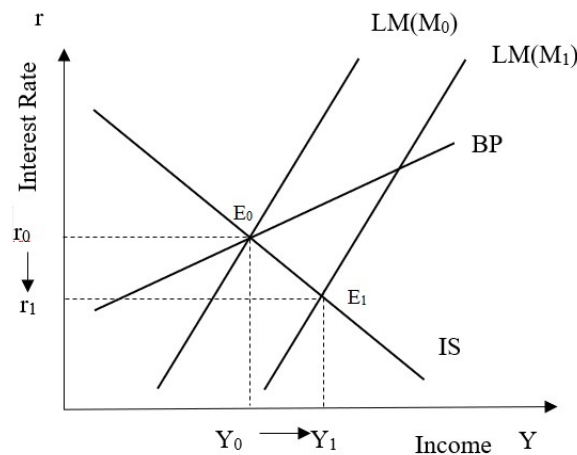


Fig 8.8: Monetary Policy with a Fixed Exchange Rate

The expansionary monetary policy boosts income, encourages imports, and drives down interest rates, which results in a capital flight (F declines). Potential conflicts between the



objectives of domestic policy and the external balance are raised by the fact that, starting from a point of equilibrium, an expansionary monetary policy results in a deficit in the balance of payments. Moving to point E_1 and income level Y_1 may be preferable on domestic grounds if the level of income, Y_0 , at point E_0 in Figure 8.8 is low in comparison to full employment. Due to the limited foreign exchange reserves, there will be a balance of payments deficit at point E_1 , which cannot continue indefinitely.

Fiscal Policy

Figure 8.9 shows the results of increasing government spending from G_0 to G_1 in the case of fixed exchange rates. Government spending growth causes the equilibrium point to shift from E_0 to E_1 , moving the IS schedule to the right from $IS(G_0)$ to $IS(G_1)$. The interest rate increases from r_0 to r_1 , and income increases from Y_0 to Y_1 . Figure 8.9 illustrates the new equilibrium point, where we are above the BP schedule and the balance of payments is in surplus. The BP schedule in Figure 8.9 is flatter than the LM schedule, which is how we arrive at this conclusion. As shown in Figure 8.10, an expansionary fiscal policy action would result in a balance of payments deficit if the BP schedule were steeper than the LM schedule. The BP schedule will become more steep as capital flows become less sensitive to interest rates. The rise in interest rate needed to maintain balance of payments equilibrium as we move to a higher income (and therefore import) level will be greater the smaller the increase in capital inflow for a given increase in the interest rate (given the fixed value of r^f); this means that the BP schedule will be steeper. The BP schedule will also become more steep the higher the marginal propensity to import.

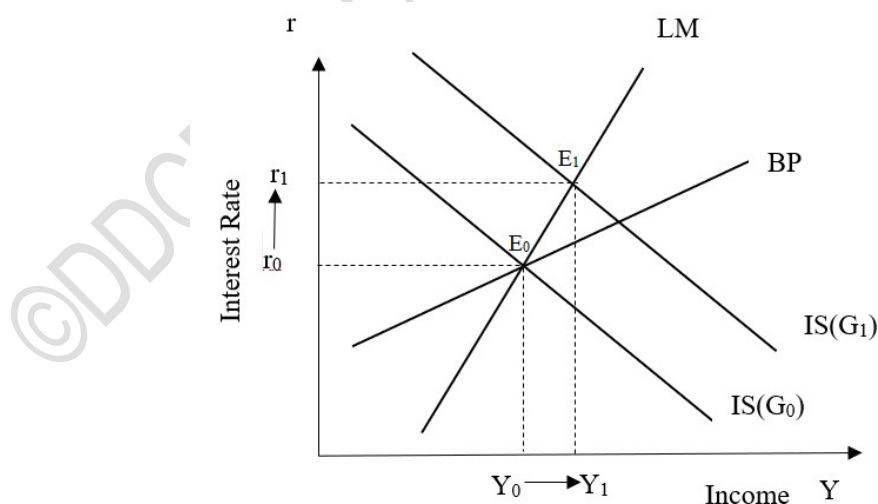


Fig 8.9: Fiscal Policy with a Fixed Exchange Rate



A given increase in income will result in a greater increase in imports if the marginal propensity to import is higher. A larger compensatory increase in capital inflow and, as a result, a larger increase in interest rate will be needed for the balance of payments to return to equilibrium. Income rises as a result of the expansive fiscal policy action shown in Figures 8.9 and 8.10. A worsening trade balance results from increased income, which also raises interest rates and improves the financial account. A steeper BP schedule will have a larger negative impact on imports and the trade balance and a smaller positive impact on capital flows.

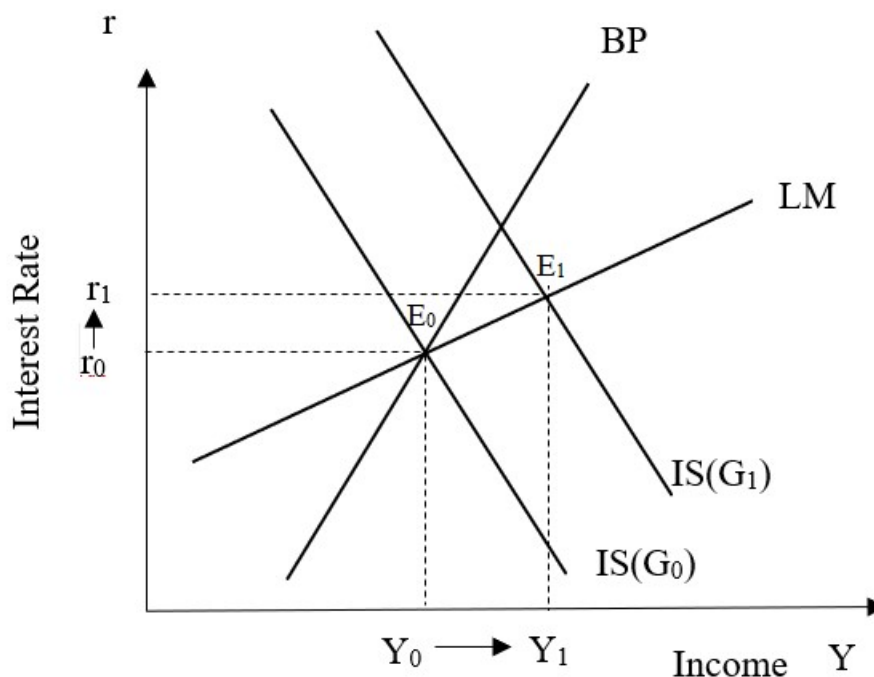


Fig 8.10: Fiscal Policy with a Fixed Exchange Rate: An Alternative Outcome

Therefore, the steeper the BP schedule, the more likely it becomes that an expansionary fiscal policy action will result in a balance of payments deficit. Finally, take note that whether an expansionary fiscal policy action results in a balance of payments surplus or deficit depends on the slope of the BP schedule in relation to the slope of the LM schedule. Given the slope of the BP schedule, the likelihood that the LM schedule will be steeper than the BP schedule—a condition necessary for a surplus to result from an expansionary fiscal policy action—increases as the LM schedule gets steeper. This conclusion is reached because, other factors being equal, the steeper the LM schedule, the greater the increase in interest rate



(which results in the favourable capital inflow), and the lesser increase in income (which produces the unfavourable effect on the trade balance).

Policy under Flexible Exchange Rates

Monetary Policy

Now let's consider the scenario in which there is no central bank intervention and the exchange rate is completely flexible. In the foreign exchange market, the exchange rate is adjusts according to supply and demand. Consider first the same monetary policy measure that was previously examined, namely an increase in the amount of money from M_0 to M_1 . Figure 8.11 shows the results of this expansionary monetary policy action in the scenario of a flexible exchange rate. Prior to a change in the exchange rate, the expansion of the money supply has the immediate effect of advancing the economy from point E_0 to point E_1 . The interest rate falls from r_0 to r_1 . Income increases from Y_0 to Y_1 , and we move to a point below the BP schedule where a balance of payments deficit is beginning to emerge. To clear the foreign exchange market in a flexible exchange rate system, the exchange rate will increase from π_0 to π_1). This adjustment was previously depicted in Figure 8.6. The BP schedule will move to the right as the exchange rate increases; in Figure 8.11, the schedule moves from $BP(\pi_0)$ to $BP(\pi_1)$.

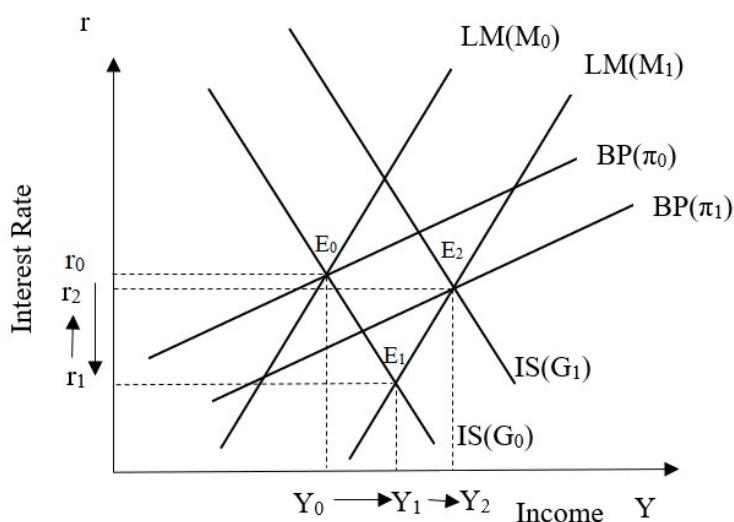


Fig 8.11: Monetary Policy with a Flexible Exchange Rate

Due to the fact that exports increase and imports decrease as the exchange rate rises, IS schedule also moves to the right, from $IS(\pi_0)$ to $IS(\pi_1)$. With the interest rate at r_2 and the



income at Y_2 , the new equilibrium is depicted at point E_2 . Following an expansionary monetary policy, the exchange rate adjustment adjusts the balance of payments and resolves any potential inconsistency between internal and external balance. It is important to note that the income increase brought on by the expansionary monetary policy action is higher in the flexible rate case than it is in the fixed rate case. Income would only increase to Y_1 in Figure 8.11 or Figure 8.8 with a fixed exchange rate. A flexible exchange rate would allow the increase in the exchange rate to further boost income by boosting exports and lowering import demand (for a given income level). Therefore, monetary policy is a more effective stabilisation tool in a regime of flexible exchange rates than in a regime of fixed rates.

Fiscal Policy

The effects of an increase in government spending from G_0 to G_1 with a flexible exchange rate are shown in Figure 8.12. The initial effect—again, the result prior to the exchange rate adjustment—is a change in the IS schedule from $IS(G_0, \pi_0)$ to $IS(G_1, \pi_0)$ which causes the economy to move from E_0 to E_1 . Income increases as the interest rate increases (from r_0 to r_1) (from Y_0 to Y_1). With the slopes of the BP and LM schedules depicted in Figure 8.12 (the BP schedule being flatter than the LM schedule), this expansionary policy action leads to a small balance of payments surplus. For the foreign exchange market to clear in this scenario, the exchange rate must decrease from π_0 to π_1 . In Figure 8.12, the BP schedule will move to the left as the exchange rate declines, from $BP(\pi_0)$ to $BP(\pi_1)$. Because the decline in the exchange rate will cause exports to decline and imports to increase, the IS schedule will also move left, from $IS(G_1, \pi_0)$ to $IS(G_1, \pi_1)$.

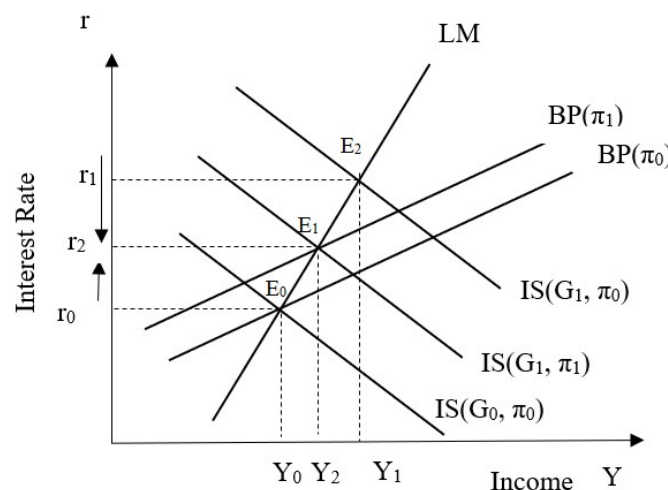


Fig 8.12: Fiscal Policy with a Flexible Exchange Rate



The expansionary impact of the fiscal policy action will be partially offset by the exchange rate adjustment. The new equilibrium point will be at Y_2 , which is higher than Y_0 but lower than Y_1 , the level that would have been reached if the exchange rate had been fixed. However, unlike monetary policy, there is no clear correlation between the effectiveness of fiscal policy and the type of exchange rate regime. A balance of payments deficit will result from an expansionary fiscal policy for a specific exchange rate if the BP schedule is steeper than the LM schedule, as shown in Figure 8.10. The exchange rate must increase in the flexible exchange rate regime due to an incipient balance of payments deficit in order to bring the foreign exchange market back into equilibrium. The shift to the right in the BP and IS schedules will reinforce the initial expansionary impact of the rise in government spending. In contrast to the fixed exchange rate case, the expansionary fiscal policy action would have a greater impact on income in this scenario. Though this alternate result is theoretically possible, most economists believe the result shown in Figure 8.12 is more likely. They think adopting an expansionary fiscal strategy will result in lower exchange rates (raise the value of the domestic currency). This assumption is supported by the idea that there is a significant amount of global capital mobility, which makes the BP schedule relatively flat and likely to be flatter than the LM schedule (see Figure 8.12).

8.5.2 Perfect Capital Mobility

We have assumed up to this point that while domestic and foreign assets can be substituted, they are not a perfect substitute. In this section, we examine monetary and fiscal policy for the scenario of perfect capital mobility, where assets are perfect substitutes. Capital can move freely between nations in this case, asset risk differences between nations are insignificant, and transaction costs are negligible.

In the Mundell–Fleming model, the assumption of perfect capital mobility means that the BP equation (8.9) is replaced with the condition

$$r = r^f \quad (8.10)$$

The BP schedule is horizontal due to the assumption of perfect capital mobility. A balance of payments equilibrium can only exist when the domestic interest rate is equal to the exogenously determined foreign (world) interest rate because massive capital flows result from any interest-rate differential. Prior to examining the effects of policy in the scenario of perfect capital mobility, take into account the assumption that the domestic interest rate must, in an ideal situation, equilibrate with the exogenously determined foreign rate. Although we also assumed that the foreign interest rate was exogenous, imperfect capital mobility could



result in a difference between the domestic interest rate and the foreign interest rate. Two possibilities exist in that situation.

One is that we are thinking about a small nation whose actions have no bearing on the global economy. In addition to being assumed to be exogenous, an expansionary monetary policy that lowers the domestic interest rate has no impact on the global interest rate or income in other nations. Another possibility is that the nation is large, like India, but that we were just ignoring the impact of its actions on other economies and, consequently, ignoring potential repercussive effects. These were thought to be of secondary importance. Only the first assumption is reasonable in the perfect capital mobility. Due to capital mobility and the domestic country's small size, which prevents it from having an impact on global financial market conditions, the domestic interest rate must adjust to reflect global rates. We would need to model the impact of Indian policies on the global interest rate in order to consider India as the perfect capital mobility case. To think that the interest rate in India is entirely unaffected by the interest rate in the rest of the world is unrealistic.

Policy Effects under Fixed Exchange Rates

Monetary Policy

We will see that perfect capital mobility renders fixed exchange rates completely ineffective for monetary policy. We need to think more about the connection between money supply and foreign exchange market intervention in order to fully comprehend this result. Previously, we found that an expansionary monetary policy produced a balance of payments deficit when there was a fixed exchange rate. With this context in mind, think about what an expansionary monetary policy would do in the scenario of perfect capital mobility. Assume, in keeping with the previous discussion, that a small nation like New Zealand expands its money supply. Figure 8.13 shows how the increased money supply causes the LM schedule to move from LM (M_0) to LM (M_1). For a brief period, the interest rate in New Zealand moves from r_0 to r_1 . The interest rate in New Zealand is currently lower than the foreign (global) interest rate. In the scenario of perfect capital mobility, there will be a significant capital outflow when the domestic interest rate is lower than the foreign interest rate. The sale of New Zealand assets by investors will result in the sale of New Zealand currency. Through sterilised intervention in the foreign exchange market, the central bank of New Zealand is unable to return the situation to equilibrium in this instance. As long as New Zealand's interest rate is lower than the foreign rate, the massive capital outflow will continue.

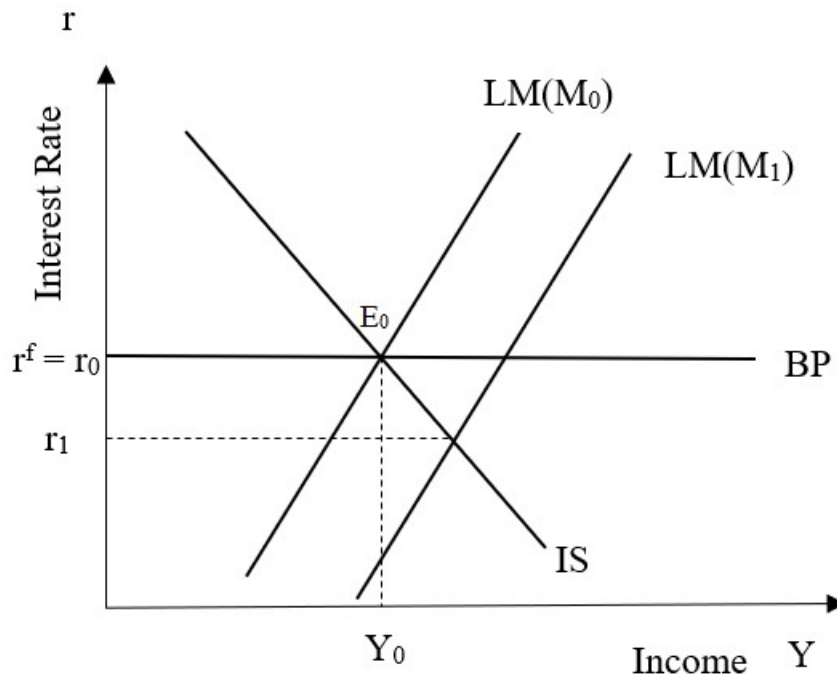


Fig 8.13: Monetary Policy with a Fixed Exchange Rate

Sterilized intervention would simply mean that the central bank of New Zealand would quickly run out of foreign reserve assets. The central bank must allow its intervention to reduce the money supply through the method described at the beginning of this section in order to restore equilibrium. Until the LM schedule shifts back to the original position, LM, the money supply will decline (M_0). The New Zealand interest rate will be brought back to parity with the foreign interest rate at this point (E_0). The money supply will stop declining as a result of the capital outflow. The money supply and income will also have returned to their initial levels at this point. The monetary policy change will have had no effect at all.

Fiscal Policy

Regarding fiscal policy, the situation is quite different. The ideal capital mobility case is shown in Figure 8.14 to show how an increase in government spending would affect the economy. The shift of the IS schedule to the right from IS (G_0) to IS (G_1) is a direct result of the increased spending (G_1). Spending growth causes a huge capital inflow by raising the domestic interest rate above the foreign interest rate. The domestic central bank must step in and, in this instance, purchase foreign exchange using New Zealand dollars. The money supply in New Zealand will increase as a result of this action. To change the LM schedule to LM (M_1) and bring back parity between domestic and foreign interest rates at point E_1 , the



New Zealand central bank will need to continue purchasing foreign currency. The expansionary impact of the rise in government spending is strengthened by this endogenous increase in the money supply. The output increases to Y_1 rather than Y'_1 .

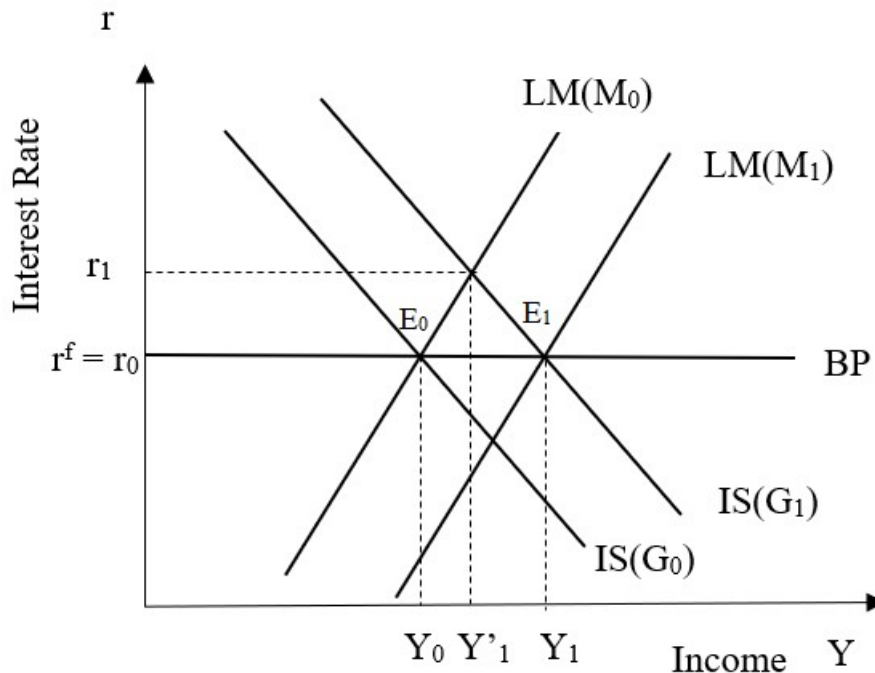


Fig 8.14: Fiscal Policy with a Fixed Exchange Rate

This expansionary fiscal policy is extremely effective in a fixed exchange rate system with perfect capital mobility because there is no increase in the domestic interest rate and consequently no crowding out of private-sector spending.

Policy Effects under Flexible Exchange Rates

The situation is reversed in a flexible exchange rate system. Here, we discover that monetary policy works effectively while fiscal policy completely fails.

Monetary Policy

Once again, we take into account a rise in the money supply from M_0 to M_1 . Figure 8.15 demonstrates how this increased money supply causes the LM schedule to change from LM (M_0) to LM (M_1). Similar to the fixed exchange rate scenario, the expansion of the money supply causes the New Zealand interest rate to temporarily drop below the foreign interest rate, which results in a significant outflow of capital. However, in a flexible exchange rate



system, the New Zealand central bank does not intervene in the foreign exchange market as a result. Instead, the New Zealand exchange rate increases and the value of the New Zealand dollar decreases as investors sell New Zealand assets and as a result, sell New Zealand dollars. This increase in the exchange rate causes a shift to the right in the IS schedule as well as an increase in New Zealand exports and a decrease in New Zealand imports. New Zealand dollars continue to be sold up until the exchange rate sufficiently increases from π_0 to π_1 and shifting the IS schedule from $IS(\pi_0)$ to $IS(\pi_1)$.

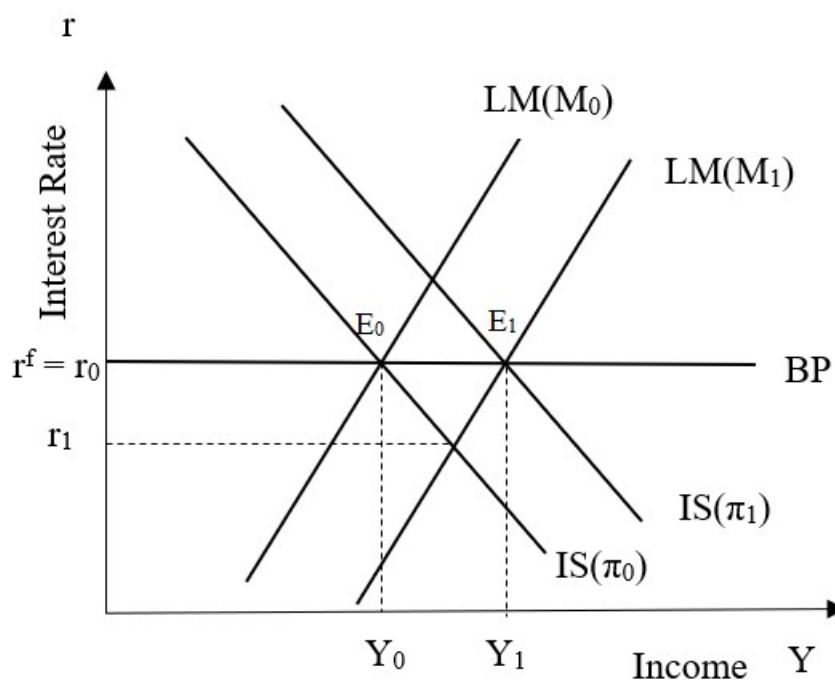


Fig 8.15: Monetary Policy with a Flexible Exchange Rate

The New Zealand interest rate has now (E_1) been brought back into parity with the foreign interest rate. Revenue has increased to Y_1 . Perfect capital mobility and flexible exchange rates make monetary policy very effective. Income increases by the full amount of the LM schedule's horizontal shift. Notice that the interest rate, which is now fixed at the foreign exchange rate, is no longer the mechanism by which monetary policy is implemented. Instead, it is accomplished through net exports and the exchange rate.

Fiscal Policy

Figure 8.16 shows the results of an increase in government spending under conditions of perfect capital mobility and flexible exchange rates. Increased government spending causes



the IS schedule to shift from $IS(G_0, \pi_0)$ to $IS(G_1, \pi_0)$. As a result, the domestic interest rate increases above the foreign interest rate, moving towards r_1 in the figure. With a flexible exchange rate, this movement results in a significant inflow of capital, which lowers the exchange rate (the domestic currency to appreciate). As a result, imports increase while exports decline. This shifts the IS schedule to the left. Only when the IS schedule has completely shifted back to $IS(G_0, \pi_0) = IS(G_1, \pi_1)$ and the domestic interest rate is once again equal to the foreign interest rate the equilibrium is restored. The pressure on the exchange rate to fall and the capital inflow both stop at this point. At this point, income has also returned to its starting point. This makes the fiscal policy completely ineffective.

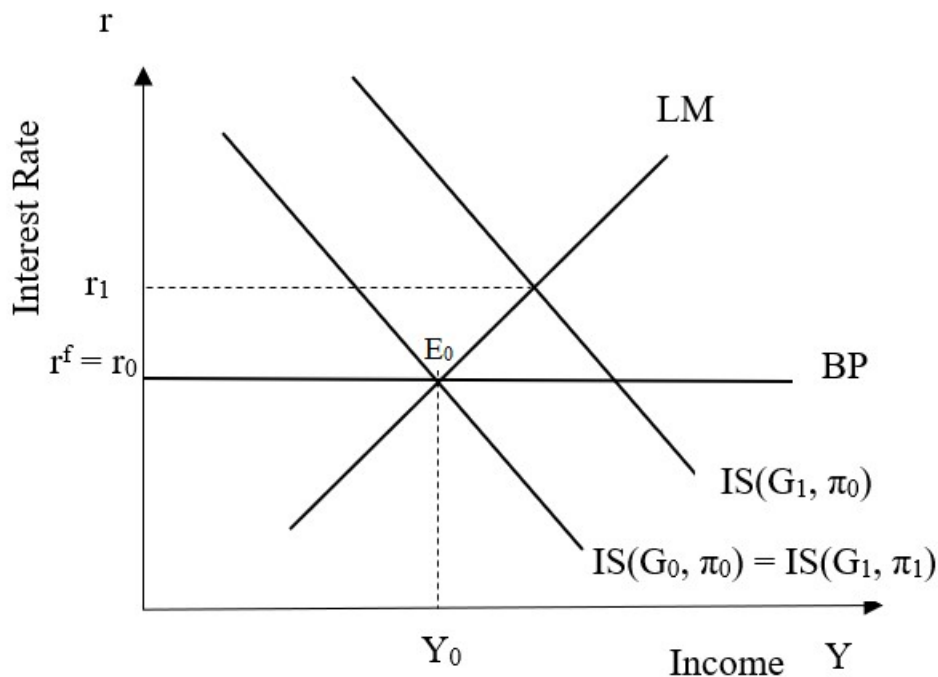


Fig 8.16: Fiscal Policy with a Flexible Exchange Rate

8.6 SUMMARY

This chapter has dealt with the determination of exchange rates and the related issue of how the global monetary system is set up. The ideal level of flexibility in exchange rate determination is a key question in the field. The majority of the major currencies experienced a managed float after the Bretton Woods system broke down. Throughout the period of floating exchange rates, the US dollar's value has been quite irregular. There have been calls



for changes to the international monetary system during times of sharply fluctuating currency values in order to provide more stability of exchange rates.

In order to achieve greater exchange rate stability, national macroeconomic policies would probably need to be better coordinated. Effective international policy coordination is hampered by a number of factors, not the least of which are the divergent political ideologies and industrial configurations of the major world economies. Freeing nations from the need to coordinate policies, floating exchange rates come at the expense of extremely volatile exchange rates. Growing current account imbalances among the major economies of the world have recently prompted calls for better policy coordination.

In this chapter, we have also examined within an open economy version of the IS-LM model, monetary and fiscal policy for both cases of imperfect and perfect capital mobility. Between the two cases, there are clear differences. The following results are particularly striking when perfect capital mobility is assumed: If the exchange rate is fixed, neither fiscal nor monetary policy will have any effect. If the exchange rate is flexible, neither will have any effect. Though there are some quantitative differences, our findings are more in line with the closed economy IS-LM model when capital mobility is imperfect.

One study came to the conclusion that the world capital markets were probably "two-thirds or three-fourths of the way but no further than that" towards perfect capital mobility based on the situation in the middle of the 1980s. Over the past 40 years, capital markets have advanced further in that direction. A preference for the model with imperfect capital mobility but a comparatively flat BP schedule may result from this trend. However, it is challenging to make a generalisation that applies to all nations. Government controls on capital movements exist in some countries, though their prevalence is declining. These controls severely limit capital mobility. The assumption of perfect capital mobility is preferable for other nations whose capital markets are closely integrated with those of a large neighbour, such as Canada and Austria.

8.7 GLOSSARY

Balance of Payments: *The balance of payments accounts keep track of all economic exchanges of goods and assets between the home country and foreign residents.*

BP schedule: *The BP schedule displays the combinations of r and Y that, at a specific exchange rate, will balance supply and demand in the foreign exchange market.*



Bretton Woods System: *It was a pegged exchange rate system set up at the end of World War II.*

Capital Account Convertibility: *This refers to the freedom to carry out investment transactions free from restrictions, i.e., there are no limits on the amount of rupees an Indian resident may convert into foreign currency in order to purchase any foreign asset.*

Exchange Rate: *It is the value of a nation's currency in relation to other currencies.*

Exchange Rate System: *It is a set of rules for determining exchange rates between currencies.*

Financial Account: *It keeps track of foreign residents' purchases of Indian assets (capital inflows) and Indian residents' purchases of foreign assets (capital outflows).*

Foreign Exchange: *It is a general term to refer to an aggregate of foreign currencies.*

LM Schedule: *It displays combinations of r and Y that represent money market equilibrium.*

IS Schedule: *It displays combinations of r and Y that represent equilibrium in the goods market.*

Sterilization: *A central bank may use sterilisation as a form of monetary action to reduce the impact of capital inflows and outflows on the money supply.*

8.8 ANSWERS TO IN-TEXT QUESTIONS

- | | |
|---|---|
| 1. True | 4. False. It is determined by both the supply and demand in the foreign exchange market |
| 2. (d) All of the above | |
| 3. It is both a Forward market and a Spot market. | 5. Accommodating transactions |

8.9 SELF-ASSESSMENT QUESTIONS

- Define balance of payments accounts. Describe the various items that are listed in the balance of payments accounts.
- Describe how a fixed exchange rate system determines a country's exchange rate.
- Describe the Bretton Woods system, which was established at the end of World War II and remained in place until 1973.
- Explain how, in a fixed exchange rate system, the trade balance and the level of economic activity are related.



- Explain the connections between balance of payments equilibrium and both expansionary monetary and fiscal policies within a fixed exchange rate system, taking into account the impact on the trade balance and the financial account.
- "The adoption of a flexible exchange rate regime would liberate monetary and fiscal policy for use in achieving domestic goals of full employment and price stability." Comment.
- What are some of the relative benefits and drawbacks of fixed exchange rates in comparison to flexible exchange rates?
- Analyse the effects of the following policy actions for both the fixed and flexible exchange rate cases in the Mundell-Fleming model under the assumption of imperfect capital mobility: a. A decrease in the amount of money. b. A reduction in public spending.
- Explain why, even with perfect capital mobility, fixed exchange rates render monetary policy completely ineffective.
- What does it mean to sterilise the effects of interventions in the foreign exchange market? Describe how sterilisation functions when capital mobility is insufficient.

8.10 REFERENCES

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