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Principles of Macroeconomics – II

Units 1 to 20

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Course No. **ECONA202**
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Course Outline

Unit	Title	Credits	
		L	T
I.	**Multiplier and Accelerator** Investment Multiplier: Its working and leakages, Importance and critique. Acceleration Principle: contribution of Samuelson‟s and Hicks; Super Multiplier; Basic Concept of Business Cycle (excluding theories).	10	4
II.	**Theories of Money and Inflation** Value of money, Fisher‟s equation, Cambridge equation, Keynesian theory of money and prices, Milton Friedman‟s Restatement of Quantity theory of money. Inflation and Unemployment: Concept of inflation; determinants of inflation; relationship between inflation and unemployment: Phillips Curve in short run and long run.	12	4
III.	**IS-LM Analysis** Equilibrium of monetary and real sector: Classical and Keynesian Dichotomy; Derivation, Properties, Shifts of IS and LM Curves; Simultaneous Equilibrium in monetary and real sector.	10	4
IV.	**Balance of Payments and Exchange Rate** Balance of payments: Capital and Current Accounts, Causes and Consequences of Disequilibrium in Balance of Payments. Market for foreign exchange: determination of exchange rate under Fixed and Flexible Exchange Rates. Balance of Payments Adjustment under Fixed and Flexible Exchange Rates.	12	4

Suggested Readings:

1. Case,Karl E.& R.C.Fair, *Principles of Economics*, PearsonEducation,Inc.,8th edition,2007.
2. Errol D‟Souza – Macro Economics – Pearson Education 2008.
3. Sikdar, Shoumyen, *Principles of Macroeconomics*, 2nd Edition, Oxford University Press, India
4. Edward Shapiro – Macro economic Analysis Oxford University press..
5. Gregory Mankiw – Macro economics – 6th Edn. Tata McGraw Hill.
6. Richard T. Frogmen – Macro economics, Pearson education.
7. Eugene Diutio – Macro economic Theory, Shaum's Outline series. Tata McGraw Hill

CONTENTS

UNIT I
MULTIPLIER

STRUCTURE

1.1 INTRODUCTION

The idea of the multiplier was initially introduced by R.F. Kahn in his 1931 article, *The Relation of Home Investment to Unemployment*, published in the *Economic Journal*. Kahn's version, known as the Employment Multiplier, explored the impact of investment on job creation. Later, John Maynard Keynes expanded upon Kahn’s concept and developed the Investment Multiplier, highlighting its significance in economic growth.\

1.2 LEARNING OBJECTIVES

By the end of this unit, you should be able to:

- Define Multiplier
- Explain Investment Multiplier
- Know the workings of Multiplier
- Identify the leakages of Multiplier
- List the Assumptions of the multiplier

- Identify the shortcomings of the multiplier

1.3 THE INVESTMENT MULTIPLIER

Keynes regarded the multiplier as a fundamental component of his employment theory. In his view, the multiplier effect explains how an initial investment leads to a larger overall increase in income and employment within an economy. Keynes defined multiplier as "establishing a precise relationship, given the propensity to consume, between aggregate employment and income and the rate of investment. It tells us that, when there is an increment of investment, income will increase by an amount which is K times the increment of investment" i.e., L" Y=KL"I. According to Hansen, Keynes' investment multiplier represents the ratio of a change in income to a change in investment, expressed as K = ΔY/ΔI, where Y denotes income, I represents investment, Δ signifies change, and K is the multiplier.

In multiplier theory, a key aspect is the multiplier coefficient (K), which measures how an initial investment leads to a larger overall increase in income. The value of the multiplier depends on the marginal propensity to consume (MPC); a higher MPC results in a greater multiplier effect, while a lower MPC reduces its impact. The relationship between the multiplier and MPC can be expressed mathematically as follows:

$$\Delta Y=\Delta c+\Delta I$$

$$\Delta Y=c\Delta Y+\Delta I \quad [\Delta c=c\Delta Y]$$

$$\Delta Y-c\Delta Y=\Delta I$$

$$\Delta Y\,(1-c)=\Delta I$$

$$\Delta Y=\Delta I / 1-c$$

$$\Delta Y/\Delta I=1 / 1-c$$

$$K=1 / 1-c \quad [K=\Delta y / \Delta I]$$

Since *c* represents the marginal propensity to consume (MPC), the multiplier (*K*) is defined as K=1/1-c. Alternatively, the multiplier can also be expressed in terms of the marginal propensity to save (MPS), where *K* is the reciprocal of MPS, given by K=1/MPS.

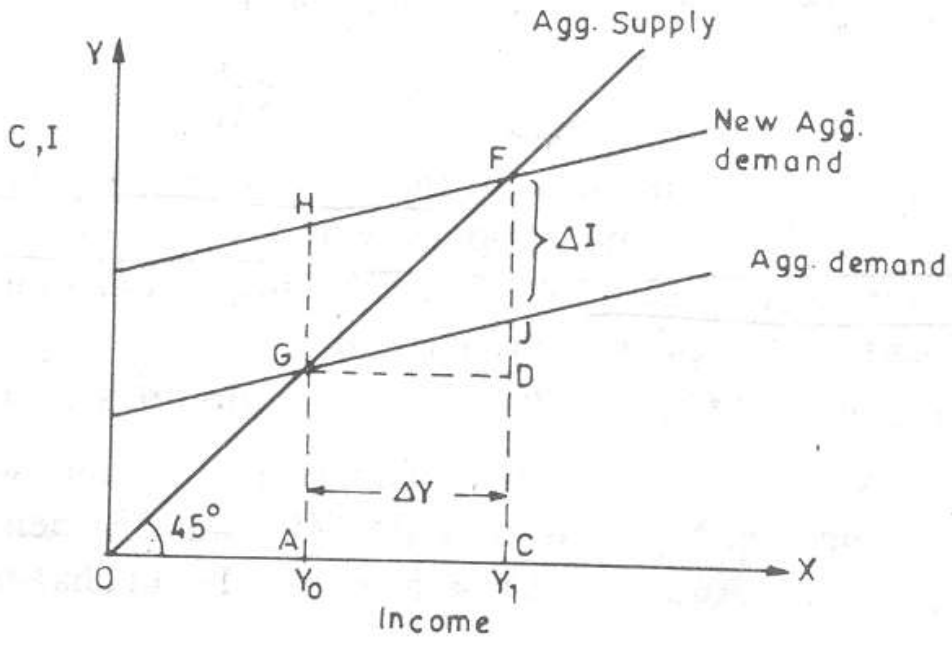


Fig. 1.1

The magnitude of the multiplier is directly influenced by the marginal propensity to consume (MPC) and inversely related to the marginal propensity to save (MPS). Since MPC always falls between zero and one (i.e., 0<MPC<1) the multiplier (K) ranges from values greater than one to approaching infinity (i.e., 1<K<∞). A multiplier of one indicates that all additional income is saved, as MPC is zero, resulting in no extra spending. Conversely, an infinite multiplier suggests that MPC is equal to one, meaning the entire increase in income is allocated to consumption, potentially leading to full employment and inflationary pressures. However, such extreme cases are uncommon, and the multiplier remains within a finite range in practical scenarios.

Self-Check Exercise-1

Q1. Define Multiplier.

Q2. Who developed the investment multiplier?

1.4 Working of the Multiplier

The multiplier operates in both forward and reverse directions. First, its forward operation explains how a change in investment influences income through its impact on consumption expenditure.

To illustrate this, consider the sequential process of income generation. An initial increase in investment boosts production, leading to higher

income and increased consumption spending. This cycle continues in a diminishing pattern until no further income expansion occurs. Keynes explained this as an instantaneous process in a static framework.

For example, assume the marginal propensity to consume (MPC) in an economy is 0.5, and investment increases by ₹100 crores. As a result, income rises by ₹100 crores in the first round. Since half of this new income is spent on consumption, another ₹50 crores is added to income in the next round, and the process continues. This pattern is presented in Table II, demonstrating how an initial investment of ₹100 crores eventually raises total income to ₹200 crores. This outcome aligns with the multiplier formula:

$$\Delta Y = K \times \Delta I, \text{ where } K=2 \text{ (for MPC = 0.5)}$$

In contrast, the reverse effect of the multiplier depends on the value of MPC. A higher MPC results in a greater cumulative decline in income when investment contracts, whereas a higher marginal propensity to save (MPS) reduces the overall contraction. Consequently, economies with a high MPC experience a more significant negative impact from the reverse multiplier effect than those with a lower MPC. Diagrammatically, when investment decreases, the investment function shifts downward, causing equilibrium income to decline. For instance, if MPC is 0.5, a reduction in investment leads to a proportional fall in income, demonstrating the reverse operation of the multiplier. Graphically, this is represented by the downward shift of the investment function, reducing equilibrium income. A similar outcome is observed when considering savings. As income increases, savings also rise to match the new investment level at equilibrium, reinforcing the multiplier effect.

Self-Check Exercise-2

Q1. Discuss the working of the multiplier.

1.5 Backward Operation

The previous discussion focused on the forward operation of the multiplier. However, when investment declines instead of increasing, the multiplier works in reverse. A reduction in investment causes a contraction in income and consumption, leading to a continued decline until the total reduction in aggregate income is a multiple of the initial decrease in investment.

For example, if investment falls by ₹100 crores in an economy where the marginal propensity to consume (MPC) is 0.5 and the multiplier (K) is 2, the cumulative decline in income will amount to ₹200 crores. This follows the multiplier formula:

$\Delta Y = K \times (-\Delta I)$

Substituting the values:

$-200 = 2 \times (-100)$

This demonstrates how a decrease in investment triggers a multiplied reduction in income and consumption, reinforcing the multiplier's backward operation.

Self-Check Exercise-3

Q1. Define the backward operation of the multiplier.

1.6 Assumptions of Multiplier

Keynes' multiplier theory is based on several assumptions that influence its operation. These key assumptions include:

I. The change in investment is autonomous, with no role for induced investment.

II. The marginal propensity to consume (MPC) remains constant.

III. Consumption depends solely on current income.

IV. The multiplier process occurs without delays, meaning any increase or decrease in investment leads to an immediate proportional change in income.

V. The new level of investment remains stable throughout the multiplier process.

VI. There is a net increase in investment.

VII. Consumer goods are readily available to meet rising demand.

VIII. Sufficient production capacity exists in consumer goods industries to accommodate increased demand following higher investment.

IX. Other productive resources are also accessible within the economy.

X. The multiplier effect functions within an industrialized economy.

XI. The economy is closed, with no foreign trade or external influences.

XII. Price levels remain unchanged.

XIII. The impact of consumption on investment through the accelerator effect is not considered.

XIV. The economy operates below full employment, allowing room for expansion.

These assumptions define the ideal conditions under which the multiplier mechanism effectively operates.

Self-Check Exercise-4

Q1. What are the assumptions of Keynes's theory of multiplier?

1.6 Leakages of Multiplier

Leakages refer to factors that divert income from the spending cycle, reducing the overall impact of new investment on the economy. These leakages limit the effectiveness of the multiplier by reducing the flow of income and slowing down the propagation process. The key leakages include:

1. **Savings:** A portion of income is saved rather than spent on consumption, reducing the successive rounds of income generation. The higher the marginal propensity to save, the lower the multiplier effect. For example, if the marginal propensity to save (MPS) is 1/6, the multiplier (K) is 6, whereas if MPS increases to 1/3, the multiplier reduces to 3.
2. **Preference for Liquidity:** When individuals hold on to their increased income as idle cash for transactional, precautionary, or speculative reasons, the income does not circulate in the economy, limiting the multiplier effect.
3. **Purchase of Existing Assets:** If additional income is directed toward buying old stocks, securities, or real estate instead of consumer goods, the consumption expenditure falls, thereby reducing the overall impact of the multiplier.
4. **Debt Repayment:** If people use their increased income to repay loans instead of spending it, the money exits the spending cycle. If these repayments are made to entities that do not immediately reinvest or spend the funds, the multiplier process slows down.
5. **Price Inflation:** When rising investment leads to inflation, higher prices absorb a significant portion of the increased income, reducing real consumption and limiting the potential for further increases in output and employment.
6. **Spending on Imports:** If a portion of additional income is spent on imported goods rather than domestically produced items, it results in a financial outflow from the economy, weakening the domestic multiplier effect.

7. **Undistributed Corporate Profits:** When businesses retain their profits in reserve funds rather than distributing them as dividends, the money does not circulate in the economy, reducing the potential for further consumption and investment.
8. **Taxation:** Higher taxes reduce disposable income, limiting the ability of individuals to spend and thus weakening the multiplier effect. Progressive taxation and commodity taxes can also lead to higher prices, further reducing real income.
9. **Utilization of Existing Stock:** If an increase in demand is met by selling previously accumulated stock instead of producing new goods, the multiplier effect halts until production resumes.
10. **Impact of Public Investment:** Government-led investment programs can sometimes deter private sector investment. Increased public borrowing may raise interest rates, making private investment less attractive. Additionally, fears of government intervention or nationalization may discourage private enterprises from expanding their investment activities.

These factors collectively weaken the multiplier process by diverting income from active circulation, thereby reducing the extent to which initial investment leads to sustained economic expansion.

Self-Check Exercise-5

Q1. What are the factors causing leakages in the multiplier process?

1.8 Criticism of Multiplier

Post-Keynesian economists have raised several objections to the multiplier theory, questioning its practical applicability and theoretical foundation. Some of the key criticisms include:

(1) Economist Gottfried Haberler argued that Keynes' multiplier is essentially tautological, meaning it is true by definition rather than being an empirically testable concept. The formula $K=1/1-(\Delta C/\Delta Y)$ simply expresses a mathematical relationship rather than revealing new insights about economic behavior. This viewpoint was also echoed by economist Alvin Hansen. Haberler has criticized Keynes' multiplier as tautological. It is a truism which defines the multiplier as necessarily true as $K= 1 / 1-(\Delta C/\Delta Y)$. As pointed out by Professor Hansen, "Such a coefficient is a mere arithmetic multiplier (i.e., a truism} and not a true behaviour multiplier based on a behaviour pattern which establishes a verifiable relation between consumption and income. A mere arithmetic multiplier, $1 / 1-(\Delta C/\Delta Y)$ is tautological."

(2) Keynes' theoretical framework of the multiplier assumes an immediate adjustment process without any time lag. It presents a static equilibrium analysis where changes in investment instantly impact income, leading to simultaneous production and consumption expenditures. However, in reality, this assumption does not hold, as there is always a delay between receiving income and spending it on consumer goods, as well as in their production. The concept overlooks the transitional phase and focuses only on the final equilibrium income level, making it less applicable to real-world economic conditions.

(3) Hazlitt critiques the Keynesian multiplier as an overemphasized concept within Keynesian economics. He argues that it lacks a precise, predetermined, or mechanical connection between investment and income, making it more of an abstract theoretical construct rather than a reliable economic tool.

(4) A key limitation of the multiplier theory is its exclusive focus on how investment affects income through consumption expenditure. It overlooks the role of consumption in driving further investment, a concept known as the acceleration principle. Economists such as Hicks and Samuelson have highlighted that economic fluctuations are better understood by considering the combined effects of the multiplier and the accelerator.

(5) Gordon identifies another major flaw in the multiplier concept—its singular focus on consumption. He suggests replacing the term "marginal propensity to consume" with "marginal propensity to spend" to provide a more accurate representation of economic behavior. Additionally, he critiques the assumption that the marginal propensity remains constant, arguing that in a dynamic economy, this is unlikely. If assumed to be fixed, it becomes difficult to accurately predict the long-term effects of changes in private investment or public spending.

(6) Keynes's multiplier theory assumes a direct and linear relationship between consumption and income, based on the idea that the marginal propensity to consume (MPC) falls between zero and one. However, empirical research suggests that this relationship is more complex and nonlinear. Gardner Ackley notes that consumption is not solely determined by current income but is influenced by a mix of past, present, and expected future income, along with other economic factors.

Several economists have also raised concerns about the validity of the multiplier concept. Prof. Hart dismisses it as an unnecessary addition to economic theory, while Stigler views it as one of the least clear aspects of Keynesian thought. Hutt goes further, arguing that the multiplier is an impractical concept that should be removed from economic discussions.

Despite these critiques, the multiplier principle remains relevant in analyzing various economic issues.

Self-Check Exercise-6

Q1. Critically examine the theory of multiplier.

1.9 Importance of Multiplier

The multiplier concept is a key contribution to income and employment theory. While the idea was originally introduced by R.F. Kahn, Keynes expanded its scope from analyzing public works projects to understanding income generation. The multiplier remains an essential tool in economic analysis, as outlined below:

1. **Role in Investment**: The multiplier emphasizes the significance of investment in determining income and employment. Since the consumption function tends to remain stable in the short run, changes in investment drive fluctuations in income and employment. A reduction in investment triggers a downward cycle, leading to lower income and employment, whereas an increase in investment has the opposite effect. This highlights the role of investment in economic expansion.

2. **Impact on Business Cycles**: The multiplier process helps explain different phases of the business cycle. A decline in investment leads to a cumulative drop in income and employment, contributing to recessions and depressions. Conversely, rising investment can stimulate economic recovery, potentially leading to a boom. As a result, the multiplier is an important tool in analyzing business cycle fluctuations.

3. **Balancing Savings and Investment**: The multiplier plays a role in ensuring equilibrium between savings and investment. If there is an imbalance, an increase in investment can lead to a proportionally larger increase in income through the multiplier effect. As income rises, savings also increase, eventually aligning with investment.

4. **Policy Formulation**: Governments use the multiplier concept to design economic policies aimed at achieving macroeconomic stability. Some key applications include:

a) **Achieving Full Employment**: By estimating the required level of investment, policymakers can stimulate job creation. If a single round of investment is insufficient to reach full employment, continuous injections of investment can be made until the target is met.

b) **Managing Business Cycles**: The multiplier helps in mitigating economic fluctuations. During periods of inflation, reducing investment can help control rising prices by curbing income and employment growth. Conversely, in a downturn, increased investment can stimulate economic activity and job creation.

c) **Deficit Financing**: During economic downturns, lowering interest rates alone may not encourage private investment. In such cases, governments can use deficit financing to increase public spending, which, in turn, boosts income and employment through the multiplier effect.

d) **Public Investment Strategy**: The multiplier underscores the importance of public investment in stabilizing the economy. Unlike private investment, which is driven by profit motives, public investment focuses on welfare-oriented projects such as infrastructure development. Governments can stimulate economic activity by increasing public investment during recessions by effectively timing it to maximize the multiplier effect. Additionally, public investment should complement rather than replace private investment, ensuring long-term economic stability.

In summary, the multiplier concept is a crucial tool in understanding income generation, business cycles, and policy interventions. By leveraging its effects, policymakers can influence economic growth, employment, and overall stability.

Self-Check Exercise-7

Q1. What is the importance of a multiplier in the determination of income and employment in the economy?

1.10 Summary

In this unit, you were introduced to the concept of multiplier. The investment multiplier was given by Keynes. We have also gone through the working of the multiplier, the backward operation of the multiplier, the leakages of the multiplier and the criticism and importance of the multiplier. In the next unit, we will deal with the concept of acceleration principle.

1.11 Glossary

- **Employment Multiplier:** Measures the extent to which an increase in investment or economic activity leads to a larger rise in employment opportunities.
- **Investment Multiplier:** Represents how an initial rise in investment results in a more significant overall increase in national income through successive rounds of spending.

- **Marginal Propensity to Consume (MPC):** Refers to the proportion of additional income that individuals allocate to consumption rather than saving.
- **Marginal Propensity to Save (MPS):** Indicates the fraction of extra income that individuals choose to save instead of spending on goods and services.

1.12 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 1.3.

Answer to Q2. Refer to Section 1.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 1.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 1.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 1.6.

Self-Check Exercise-5

Answer to Q1. Refer to Section 1.7.

Self-Check Exercise-6

Answer to Q1. Refer to Section 1.8.

Self-Check Exercise-7

Answer to Q1. Refer to Section 1.9.

1.13 References/Suggested Readings

1. Diulio, A. E. (1974). Macroeconomic theory (Schaum's Outline series). Tata McGraw Hill.
2. Frogmen, R. T. (2013). Macroeconomics. Pearson Education.
3. Gupta, R. D., & Rana, A. S. (1997). Keynes post-Keynesian economics. Kalyani Publishers.
4. Mankiw, G. (2006). Macroeconomics (6th ed.). Tata McGraw Hill.

5. Shapiro, E. (1982). Macroeconomic analysis. Oxford University Press. Singh, R. (2012). Indian economy for civil services examinations. Tata McGraw Hill.

1.14 Terminal Questions

Q1. Explain the workings of the investment multiplier.

Q2. Critically examine Keynes's theory of investment multiplier.

UNIT-2
THE PRINCIPLE OF ACCELERATION

STRUCTURE

2.1 INTRODUCTION

The connection between changes in consumption and net investment was first acknowledged by economist T.N. Carver in 1903. A more detailed examination of this concept was conducted by Aftlion in 1909. The term **"acceleration principle"** was formally introduced into economic theory by J.M. Clark in 1917. Later, this principle was further expanded by economists such as Hicks, Samuelson, and Harrod, particularly in the context of business cycle analysis.

2.2 Learning Objectives

By the end of this unit, you will be able to

- Explain the meaning of the acceleration principle
- List the main assumptions of the acceleration principle
- Explain the operation of the acceleration principle
- Bring out the criticism of the acceleration principle

2.3 THE PRINCIPLE OF ACCELERATION

The acceleration principle is based on the idea that the demand for capital goods is influenced by the demand for consumer goods, as capital goods are essential for their production. This principle explains how fluctuations in consumer demand lead to corresponding changes in investment in capital goods.

Kurilara defines the **accelerator coefficient** as the ratio between induced investment and the initial change in consumption expenditure. Mathematically, it is represented as:

$$v=\Delta I/\Delta C \text{ or } \Delta I=v\Delta C$$

where:

- v represents the accelerator coefficient,
- ΔI is the change in investment, and
- ΔC is the change in consumption expenditure.

For instance, if an increase in consumption spending by ₹10 crores results in an investment rise of ₹30 crores, the accelerator coefficient is 3.

Hicks expanded this interpretation, defining the accelerator as the ratio of induced investment to the resulting changes in output. In symbolic terms, it is expressed as:

$$v=\Delta I/ \Delta Y$$

This formulation, also referred to as the capital-output ratio, suggests that the demand for capital goods is influenced not only by consumer goods demand but also by shifts in overall national output.

Self-Check Exercise-1

Q1. Define the principle of acceleration.

2.4 ASSUMPTIONS

The acceleration principle is built upon several key assumptions:

1. **Constant Capital-Output Ratio** – The relationship between capital and output remains unchanged over time.
2. **Availability of Resources** – Sufficient resources are accessible to support increased production.

3. **Full Capacity Utilization** – There is no surplus or idle capacity in existing production facilities.
4. **Sustained Demand Growth** – The rise in demand is expected to be long-term rather than temporary.
5. **Flexible Credit and Capital Supply** – Financial institutions provide adequate credit and capital to support investment needs.
6. **Immediate Investment Response** – Any increase in output leads to a proportional rise in investment without delay.

Self-Check Exercise-2

Q1. What are the assumptions of the principle of acceleration?

2.5. The Operation of Acceleration Principle

In an economy, the required capital stock is influenced by fluctuations in output demand. Any variation in output results in a proportional change in capital stock, determined by the accelerator coefficient. Mathematically, this relationship is expressed as $\Delta I = v\Delta Y$, where **v** represents the accelerator.

For instance, if a machine costs Rs 4 crores and generates an annual output of Rs 1 crore, the accelerator value **v** is 4. If an entrepreneur plans to increase output by Rs 1 crore per year, they would need to invest Rs 4 crores in this machine. This concept extends to the broader economy—when the accelerator value exceeds one, additional capital is required per unit of output, leading to net investment growth that surpasses the initial output increase.

Total investment in the economy comprises **replacement investment** (required for replacing outdated or depreciated machinery) and **net investment** (which arises from output expansion). Assuming replacement investment remains constant, gross investment fluctuates in response to changes in output-driven investment levels.

The acceleration principle can be represented mathematically as follows:

$Igt = v (Yt – Yt\text{-}1) + R$

$= v \Delta Yt + R$

In this context, Igt represents the gross investment during period t, while v denotes the accelerator. Yt and Yt-1 refer to the national output in the

current period (t) and the previous period (t-1), respectively. Additionally, R signifies the replacement investment. This equation highlights that gross investment in a given period (t) is influenced by the change in output between t-1 and t, multiplied by the accelerator (v), along with the replacement investment (R). To determine net investment (In)t, the replacement investment (R) must be subtracted from both sides of the equation, yielding:

Im = v (Yt-Yt-1)

= v ΔYt

When the national output in the current period (Yt) exceeds that of the previous period (Yt-1), net investment during period t is positive. Conversely, if Yt is lower than Yt-1, net investment becomes negative, indicating disinvestment in period t.

2.3 OPERATION OF THE ACCELERATION PRINCIPLE

The working of the acceleration principle is explained in Table I.

Table I: Operation of the Acceleration Principle : $v = 4$

Period in Years	*Total Output (Y)*	*Required Capital*	*Replacement Investment (R)*		*Net Investment (I_n)*		*Gross Investment (I_g)*
(1)	*(2)*	*(3)*	(4)	+	(5)	=	(6)
t	100	400	40		0		40
t+1	100	400	40		0		40
t+2	105	420	40		20		60
t+3	115	460	40		40		80
t+4	130	520	40		60		100
t+5	140	560	40		40		80
t+6	145	580	40		20		60
t+7	140	560	40		—20		20
t+8	130	520	40		—40		0
t+9	125	600	40		—20		20

The table traces changes in total output, capital stock, net investment and gross investment over ten time periods. If the acceleration value (**v**) is set at 4, the necessary capital stock for each period will be four times the respective output of that period, as illustrated in column (3).

It is assumed that replacement investment amounts to 10% of the capital stock in period **t**, represented as 40 in each time period. The net

investment, shown in column (5), is calculated by multiplying v with the change in output from one period to the previous one. For instance, in period t+3, net investment is calculated as v(Yt+3 - Yt+2), which results in 40 = 4(115 - 105). This indicates that with an accelerator value of 4, a rise of 10 in the demand for final output leads to an increase of 40 in the demand for capital goods (machinery).

As a result, the total demand for capital goods reaches 80, consisting of 40 for replacement and 40 for net investment. The table illustrates that net investment is determined by the change in total output, given the accelerator value. As long as the demand for final goods continues to grow, net investment remains positive.

However, when there is a decline in output, net investment becomes negative, indicating a reduction in capital stock. In the table, total output (column 2) increases at an increasing rate from period to t+4 and so does net investment (column 5). Then it increases at a diminishing rate from period t+5 to t+6 and net investment declines from period t+7 to t+9, total output falls, and net investment becomes negative.

The acceleration principle is illustrated diagrammatically in Fig. 1 where in the upper portion, total output curve Y increases at an increasing rate up to t+4 period, then at a decreasing rate up to period t+6. After this, it starts diminishing.

The curve in the lower part of Fig.1 shows that the rising output leads to increased net investment up to the t+4 period because output is increasing at an increasing rate. But when output increases at a decreasing rate between t+4 and t+6 periods, net investment declines.

As output begins to decrease in period t+7, net investment turns negative. The curve Ig illustrates the economy's gross investment, following a pattern similar to the net investment curve. However, unlike net investment, gross investment does not become negative. Instead, when it reaches zero in period t+8, the Ig curve starts increasing again. This is because, despite net investment being negative, the replacement investment is taking place at a uniform rate.

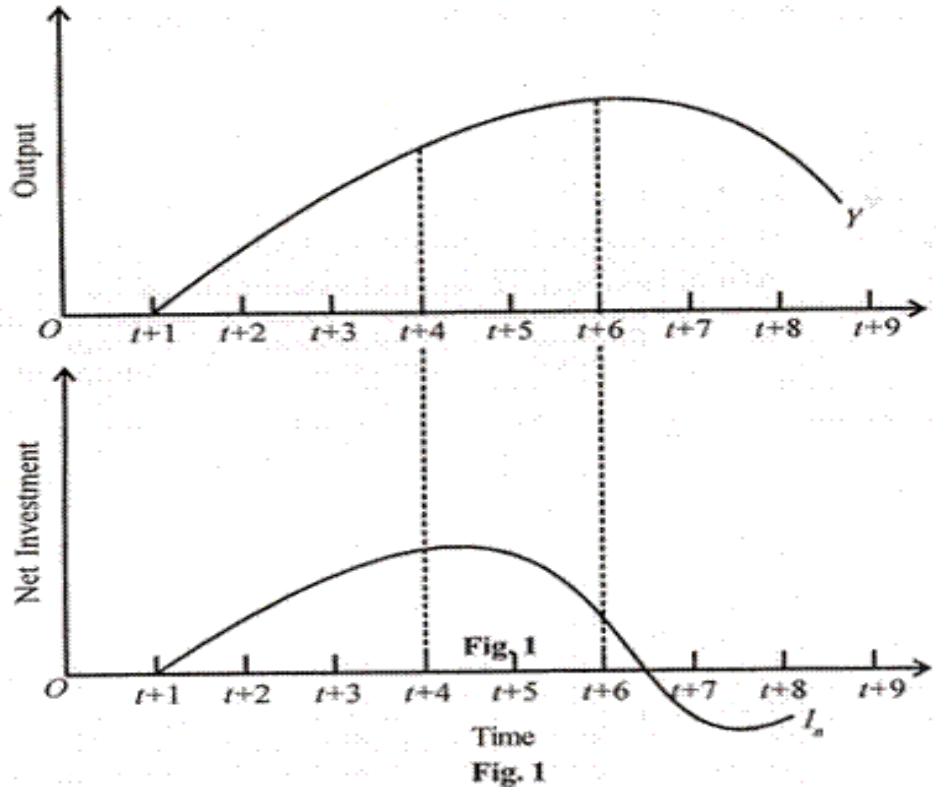


Fig. 1

Self-Check Exercise-3

Q1. Describe the operation of the principle of acceleration.

2.6 Criticisms

The acceleration principle has been subject to criticism due to its rigid assumptions, which limit its practical applicability. Some of its key limitations include:

1. **Capital-Output Ratio is Not Fixed:** The principle is built on the assumption of a constant capital-output ratio. However, in a dynamic economy, this ratio fluctuates due to technological advancements and improvements in production techniques, which enhance output per unit of capital. Additionally, factors such as changing business expectations regarding prices, wages, and interest rates influence future demand, leading to variations in the capital-output ratio. Consequently, this ratio is not stable and changes across different phases of the business cycle.

2. **Limited Availability of Resources:** The principle assumes that resources are sufficiently flexible to be redirected toward capital goods industries for expansion. This holds true in conditions of unemployment. However, when the economy attains full employment, the inability to access additional resources restricts the expansion of capital goods industries, thereby limiting the effectiveness of the acceleration principle. Similarly, this principle does not hold in periods of recession when excess capacity exists.
3. **Existence of Idle Capacity:** The acceleration principle presumes that all capital equipment is fully utilized. However, if factories operate below full capacity or have unused machinery, an increase in consumer goods demand may not necessarily result in higher investment in new capital goods. In such cases, firms may first utilize their existing capacity before making additional investments, thereby weakening the acceleration effect.
4. Difference between required and Real Capital Stock: It assumes no difference between required and real capital stock. Even if it exists, it ends in one period. But if industries are already producing capital goods at full capacity, it is not possible to end the difference in one period.
5. The acceleration principle assumes that when production reaches full capacity, any rise in demand for output directly triggers induced investment. However, it does not account for the timing of such investments. While it can estimate the volume of investment, it fails to address the delays that may occur before new investments are initiated. In reality, there is often a time lag between increased demand and actual investment. For example, if the lag period is four years, the impact of new investment will not be visible immediately but only after four years.
6. Does not consider Availability and Cost of Capital Goods: The timing of the acquisition of capital goods depends on their availability and cost, and the availability and cost of financing them. The theory does not consider these factors.
7. Acceleration Effect Zero for Installed Equipment: It is assumed that no increase in demand for consumer goods has been foreseen and provided for in previous capital investment. If capital equipment has already been installed in anticipation of future demand, there will be no need for additional investment, resulting in no acceleration effect.

8. Does not Work for Temporary Demand: The acceleration theory operates under the assumption that increased demand is long-term. However, if consumer demand is only temporary, producers may avoid investing in additional capital goods. Instead, they might utilize existing equipment more efficiently to meet the short-term increase in demand. As a result, the acceleration effect may not take place.

9. Supply of Credit not Elastic: The theory presumes that credit supply is flexible, allowing easy access to affordable loans when investment is triggered by rising consumption. However, if credit is scarce or expensive due to high interest rates, investment in capital goods may be significantly reduced. Consequently, the acceleration effect may not function as expected.

10. Neglects Profits as a Source of Internal Funds: This assumption further implies that firms resort to external sources of finance for investment purposes. However empirical evidence has shown that firms prefer internal sources of finance to external sources. The acceleration principle is weak in that it neglects profits as a source of internal finance. As a matter of fact, the level of profits is a major determinant of investment.

11. Neglects the Role of Expectations: The acceleration principle primarily focuses on demand-driven investment and overlooks the influence of expectations in entrepreneurial decision-making. Factors such as stock market fluctuations, political events, global developments, and overall economic conditions also play a crucial role in shaping investment decisions.

12. Neglects the Role of Technological Factors: A key limitation of the acceleration principle is its inadequate emphasis on technological advancements in investment decisions. Changes in technology can either enhance capital efficiency or alter labor requirements, thereby affecting investment levels. Additionally, as Professor Knox highlighted, capital equipment is often introduced in large, integrated units rather than single machines, making investment decisions more complex and less responsive to minor demand fluctuations.

13. Fails to Explain Lower Turning Point: As noted by Professor Knox, the acceleration principle has limitations in explaining the factors that contribute to the lower turning point in economic cycles.

It does not adequately address the conditions that lead to a recovery after a downturn.

14. Not Precise and Satisfactory: Again, Knox points out that the acceleration principle is not precise and is unsatisfactory. It is, therefore, inadequate as a theory of investment.

Self-Check Exercise-4

Q1. Critically examine the principle of acceleration.

2.7 SUMMARY

Despite its shortcomings, the acceleration principle provides a clearer and more practical understanding of income propagation compared to the multiplier theory. While the multiplier focuses on how investment influences income through consumption, the acceleration principle highlights how changes in consumption or output affect investment and income. This principle effectively explains fluctuations in income and employment, particularly in capital goods industries, though it is more suited to analyzing upper turning points than lower ones.

2.8 GLOSSARY

- **Accelerator Principle:** A concept stating that variations in consumer demand lead to proportionally larger changes in the demand for capital goods. As a result, businesses expand production when demand rises and scale back when it declines, intensifying economic booms and downturns.
- **Capital-Output Ratio:** The amount of capital required to generate a specific level of output. A higher capital-output ratio signifies a greater capital requirement for production.
- **Net Investment:** The total increase in capital stock after accounting for depreciation. It is derived by subtracting capital consumption from gross investment.
- **Investment:** A shift in investment levels driven by changes in income or output.

2.9 ANSWERS TO SELF CHECK EXERCISE

Self-Check Exercise-1

Answer to Q1. Refer to Section 2.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 2.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 2.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 2.6.

2.10 References/Suggested Readings

1. Diulio, A. E. (1974). Macroeconomic theory (Schaum's Outline series). Tata McGraw Hill.
2. Frogmen, R. T. (2013). Macroeconomics. Pearson Education.
3. Mankiw, G. (2006). Macroeconomics (6th ed.).
4. Tata McGraw Hill. Shapiro, E. (1982). Macroeconomic analysis. Oxford University Press.

2.11 Terminal Questions

Q1. Explain the acceleration principle. What is its main criticism?

Q2. What is the acceleration principle?

Q3. What are the main assumptions of the acceleration principle?

UNIT 3
THE HICKS' THEORY OF ACCELERATOR

STRUCTURE

3.1 INTRODUCTION

In the previous unit, we explored the concept of the acceleration principle. Now, we will examine various theories related to accelerators. This unit focuses on Hicks' theory of the accelerator, while the upcoming unit will cover Samuelson's theory.

3.2 Learning Objectives

After going through this unit, you will be able to

- List the important assumptions of accelerator theory
- Explain the Hick's theory of accelerator
- Offer the main criticism of the theory

3.3 THE HICKS' THEORY OF ACCELERATOR

Hicks developed a comprehensive theory of business cycles by examining the interplay between the multiplier and accelerator. He selected specific values for the marginal propensity to consume (c) and the capital-output ratio (v), which he believed accurately represent real-world economic conditions. According to his analysis, these values typically fall within either region C or D, as illustrated in Fig. 3.1. In case values of these parameters lie in region C, they produce cyclical movements (i.e., oscillations) whose amplitude increases over time and if they fall in region D they produce an explosive upward movement of income or output without oscillations.

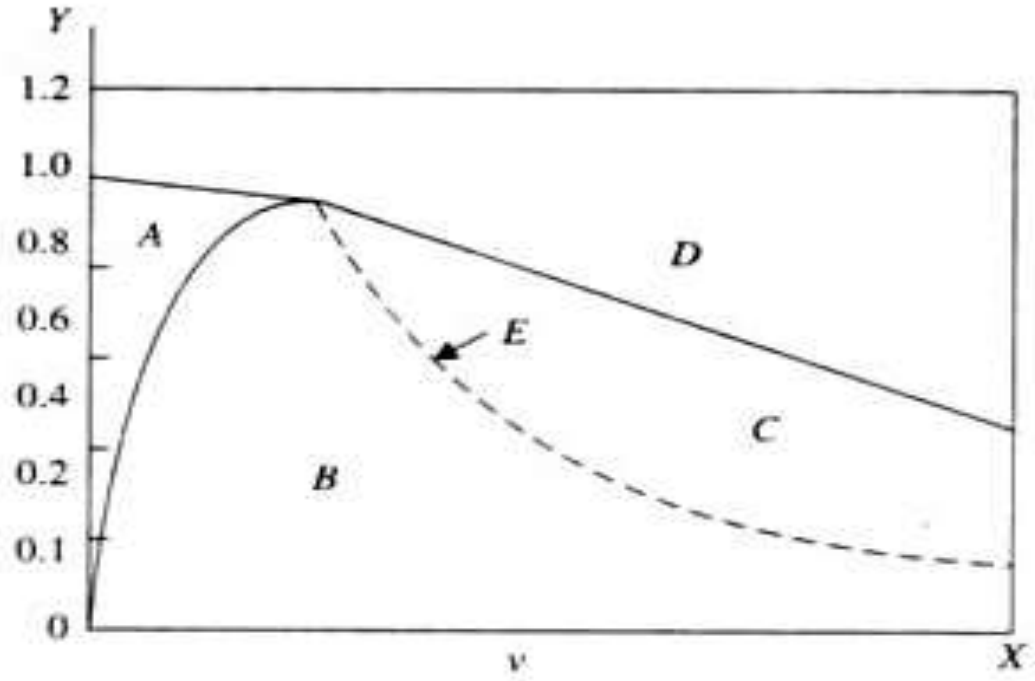


Fig. 3.1

To explain business cycles of the real world which do not tend to explode, Hicks has incorporated in his analysis the role of buffers. On the one hand, he introduces an output ceiling when all the given resources are fully em-ployed and prevents income and output to go beyond it, and, on the other hand, he visualizes a floor or the lower limit below which income and output cannot go because some autonomous investment is always taking place.

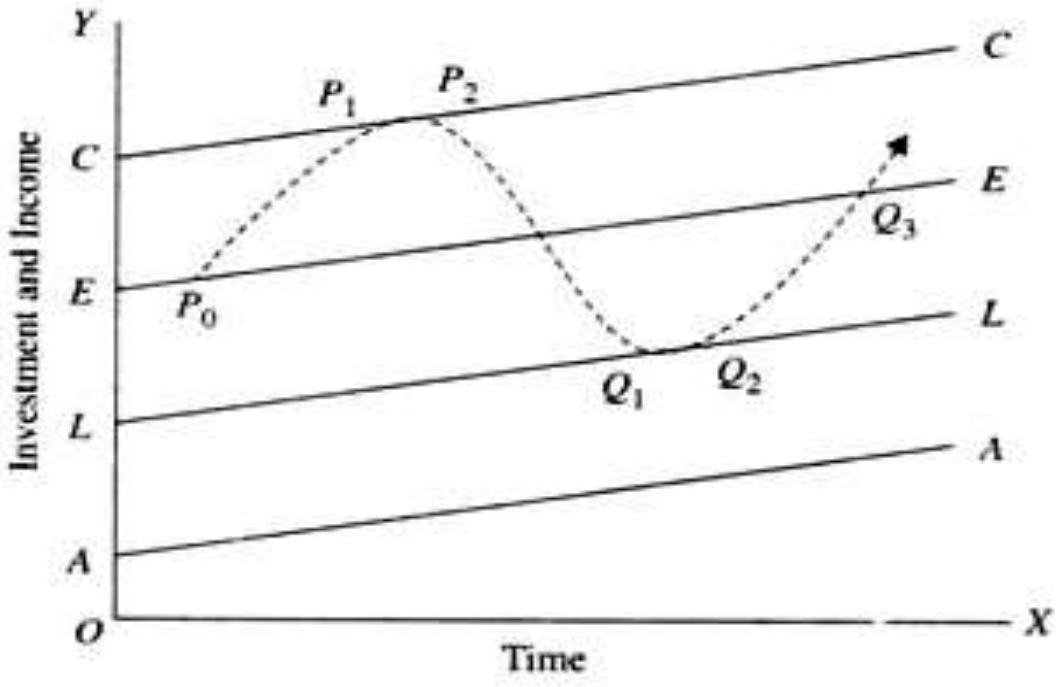


Fig. 3.2

Another important feature of Hicks' theory is that business cycles in the economy occur in the background of economic growth (i.e., the rising trend of real income of output over time). In simple terms, the real output of goods and services experiences cyclical variations, moving above and below the upward trend of income and output growth. Thus, in his theory, he explains business cycles along with an equilibrium rate of growth.

Self-Check Exercise-1

Q1. Define Hick's theory of accelerator.

3.4 ASSUMPTIONS

The followings are the assumptions of Hick's theory of accelerator

1. He proposed that the long-term equilibrium growth is influenced by the rate at which autonomous investment increases over time. Consequently, the equilibrium growth of income in the long run is shaped by autonomous investment along with the values of the multiplier and accelerator.
2. Hicks assumed that autonomous investment, depending as it is on technological progress, innovations and population growth, grows at a constant rate.
3. With further assumptions of stable multiplier and accelerator, equilibrium income will grow at the same rate as autonomous

investment. It follows therefore that the failure of actual output to increase along the equilibrium growth path, sometimes to move above it and sometimes to move below it determines the business cycles.

Self-Check Exercise-2

Q1. What are the assumptions of Hick's theory of accelerator?

3.5 EXPLANATION OF THE THEORY

Hicks' theory of business cycles is illustrated in Figure 3.2. In this figure, the AA line represents autonomous investment, which refers to investment not influenced by income changes. Instead, it is driven by factors such as technological advancements, innovations, or population growth. Hicks assumed that autonomous investment increases at a constant annual rate, represented by the slope of the AA line. Given the marginal propensity to consume, the simple multiplier is determined, and the combination of the multiplier and autonomous investment establishes the equilibrium path of income, shown by the LL line. This LL line, referred to by Hicks as the "floor line," sets the minimum limit below which income cannot fall due to the continuous growth of autonomous investment and the fixed size of the multiplier. However, this analysis does not yet account for induced investment. When national income increases from one year to the next along the LL line, some amount of induced investment occurs through the accelerator effect. The EE line represents the equilibrium growth path of national income, determined by autonomous investment and the combined influence of the multiplier and accelerator. The FF line, on the other hand, represents the full employment ceiling, indicating the maximum output level attainable when all resources are fully utilized.

With a steady increase in autonomous investment, the economy follows the EE growth path, influenced by both the multiplier and accelerator effects. If an external shock occurs—such as a surge in investment due to technological innovation or increased government spending—the economy moves above the equilibrium path after a certain point, labeled as P_0. This sudden rise in autonomous investment causes national income to grow at a faster rate than indicated by the slope of EE. The resulting increase in income further stimulates induced investment through the acceleration effect, leading to rapid economic expansion from P_0 to P_1.

The shift from P_0 to P_1 represents the expansion phase of the business cycle. However, this growth halts at P_1, as it reaches the full employment ceiling. Due to resource limitations, the economy cannot sustain output beyond this point, as indicated by the ceiling line CC. Hicks assumed that

the full employment ceiling increases at the same rate as autonomous investment, making the CC line slope gently compared to the steep growth seen between P_0 and P_1. Once the economy reaches P_1, it must return to growing at the usual rate dictated by autonomous investment.

For a brief period, the economy may follow the full employment ceiling line CC. However, as the rapid increase in national income ceases, induced investment through the accelerator declines to a level consistent with the stable growth rate of autonomous investment.

But the economy cannot crawl along its full employment ceiling for a long time. The sharp decline in growth of income and consumption when the economy strikes the ceiling causes a sharp decline in induced investment. Thus, with the sharp decline in induced investment when national income and hence consumption ceases to increase rapidly, the contraction in the level of the income and business actually must begin. Once the downswing starts, the accelerator works in the reverse direction.

That is, since the change in income is now negative the inducement to invest must begin to decrease. Thus, there is slackening off at point P2 and national income starts moving toward equilibrium growth path EE. This movement from P2 downward therefore represents the downswing or contraction phase of the business cycle.

In this downswing, investment falls off rapidly and therefore multiplier works in the reverse direction. The fall in national income and output resulting from the sharp fall in induced investment will not stop on touching the level EE but will go further down. The economy must consequently move all the way down from point P2 to point Q1. But at point Q1 the floor has been reached. Whereas, the upswing was limited by the output ceiling set by the full employment of available resources, in the downswing the national income cannot fall below the level of output represented by the floor. This is because the floor level is determined by simple multiplier and autonomous investment growing at a constant rate, while during the downswing after a point accelerator ceases to operate.

It may be noted that during downswing the limit to negative investment (disinvestment) and therefore the limit to the contraction of output is set by the depreciation of capital stock. There is no way for businessmen to make disinvestment at a desired rate higher than the depreciation. When during a downswing such conditions arise, the accel-erator becomes inoperative. After hitting the floor the economy may for some time crawl along the floor through the path Q1 to Q2. In doing so, there is some growth in the level of national income.

This rate of growth as before induces investment and both the multiplier and accelerator come into operation and the economy will move towards Q3 and the full employment ceiling CC. This is how the upswing of cyclical movement again starts.

Self-Check Exercise-3

Q2. Examine the Hick's theory of accelerator with the help of diagram.

3.6 Critical Appraisal

Hicks' theory of trade cycles is not without critics. A major weakness of Hicks' theory, according to Kaldor, is that it is based on the principle of acceleration in its rigid form. If the rigid form of the acceleration principle is not valid, then the interaction of the multiplier and accelerator which is the crucial concept of the Hicksian theory of trade cycles is not valid. Thus, Duesenberry writes, "the basic concept of multiplier-accelerator interaction is important one but we cannot really accept to explain observed cycles by a mechanical application of that con-cept" and, according to him, Hicks in his business cycle theory actually tries to do so.

It may be noted that Kaldor puts forward a theory of business cycles which does not make use of the rigid or strict form of the acceleration principle. In his trade cycle theory, Kaldor provides for investment being directly related to the level of income and inversely related to the stock of capital. Thus, Kaldor's approach which is also supported by Goodwin abandons the rigid and inflexible relation of investment to changes in income (output) as implied by the rigid acceleration principle [i.e., It = Ia + v (Y t – 1 – Y t – 2)] and instead has used the following form of the investment function

$It = Ia + gkt – 1 – jK_1$

Where It stands for investment in period t, Ia for autonomous investment, Y t – 1, for income in the previous period, Kt for the stock of capital, and g and j are constants. A look at the above investment function used by Kaldor will reveal that investment is directly related to income and inversely related to the stock of capital. Thus, in the Kaldor- Goodwin investment function, the increase in income, the capital stock remaining constant, will cause an increase in investment which will enlarge the stock of capital.

On the other hand, according to this new investment function, if capital stock increases, output or income remaining constant, the investment will fall due to its being negatively related to capital stock. Thus Kaldor-Goodwin's approach to investment gives up the rigid acceleration principle

but still retains the basic idea of investment related to income because in this approach investment will cause the capital stock to expand towards the stock of capital as desired for the production of output of the preceding year.

Self-Check Exercise-4

Q1. Critically examine Hick's theory of accelerator.

3.7 SUMMARY

In this unit, we discussed Hicks' theory of accelerator. However, despite the shortcomings of Hicks' theory of business cycles, this is a valuable contribution to the theory of business cycles. Even its critics such as Kaldor though indicating some of its weaknesses acknowledge its merit. Thus, Kaldor writes that Hicks's theory of trade cycles provides us with many brilliant and original pieces of analysis". Duesenberry considers it an "ingenious piece of work".

3.8 GLOSSARY

- **Accelerator-multiplier model:** An economic model which incorporates both the accelerator and multiplier effect: if government investment expenditure increases this will lead to an increase in consumer demand which itself leads to an increase in output which in turn will lead to a further increase in investment. It is also called the multiplier-accelerator model.
- **Multiplier:** a number which multiplies another or a factor which tends to multiply something, as when the effect of new inputs such as investment is to produce a proportionately higher increase in national income.
- **Marginal Propensity to Consume (MPC):** the proportion of the last unit of income which is spent. It is the amount that consumption changes in response to a change in disposable income.
- **Autonomous Investment:** investment which is not related to increases or decreases in national income or in output, but which may be due to factors such as changes in government policy or the response to new inventions

3.9 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 3.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 3.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 3.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 3.6.

3.10 References/Suggested Readings

5. Diulio, A. E. (1974). Macroeconomic theory (Schaum's Outline series). Tata McGraw Hill.
6. Frogmen, R. T. (2013). Macroeconomics. Pearson Education.
7. Mankiw, G. (2006). Macroeconomics (6th ed.).
8. Tata McGraw Hill. Shapiro, E. (1982). Macroeconomic analysis. Oxford University Press.

3.11 Terminal Questions

Q1. Critically examines the Hicks' Theory of Accelerator?

Q2. What are the basic assumptions on which the Hicks theory of Accelerator is based?

UNIT 4
SAMUELSON'S THEORY OF ACCELERATOR: INTERACTION BETWEEN MULTIPLIER AND ACCELERATOR

STRUCTURE

4.1 Introduction

Samuelson's Theory of Accelerator emphasizes the dynamic interaction between the multiplier and accelerator effects in economic growth. This theory highlights how changes in investment lead to amplified fluctuations in output and employment. By combining these concepts, Samuelson explains cyclical economic patterns, making it a valuable study for distance learners in understanding economic cycles.

4.2 Learning Objectives

After going through this unit, you will be able to

- Explain the meaning of accelerator
- Make out the difference between accelerator and multiplier
- Elucidate the interaction between the multiplier and accelerator
- Give the mathematical representation of Samuelson's Theory of Accelerator

4.3 Samuelson's Theory of Accelerator

Keynes significantly contributed to the understanding of economic fluctuations by highlighting that variations in investment demand,

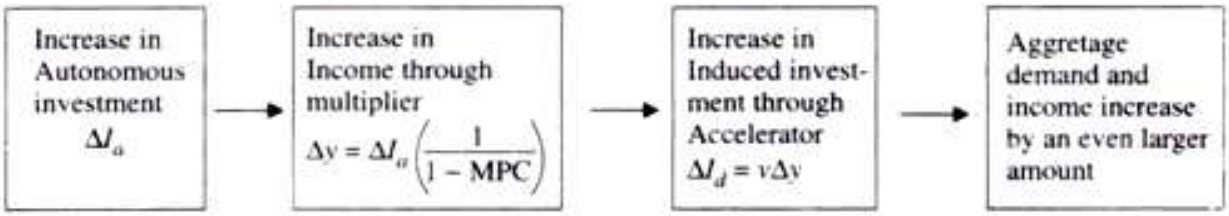
influenced by entrepreneurs' profit expectations, drive changes in aggregate demand. These fluctuations, in turn, impact income, output, and employment levels. Moreover, Keynes introduced the concept of the multiplier, which demonstrates how changes in investment can amplify their effects on output and employment during economic upswings and downswings.

However, Keynes did not fully explain the repetitive and cumulative nature of business cycles, as he did not emphasize the role of the accelerator. In contrast, Samuelson, in his influential work, demonstrated that the interplay between the multiplier and the accelerator leads to cyclical fluctuations in economic activity. The multiplier alone does not adequately explain the cyclical and repetitive nature of economic changes.

An independent increase in investment leads to a proportionally larger rise in income, determined by the multiplier effect. This rise in income subsequently stimulates additional investment due to the acceleration principle. As income grows, aggregate demand for goods and services also rises, prompting firms to expand production. Increased production necessitates further investment in capital goods, leading to a continuous interaction between investment and income. This dynamic relationship causes fluctuations in income and employment in a cyclical pattern.

The following section will illustrate how the combination of the accelerator and the Keynesian multiplier results in a greater increase in income and output:

Where ∆Ia = Increase in Autonomous Investment.



∆Y = Increase in Income.

1/ 1 – MPC = Size of Multiplier where MPC = Marginal Propensity to Consume.

ΔI_d = Increase in Induced Investment

v = Size of accelerator.

Fluctuations in investment play a key role in causing instability in a market-driven economy. This instability is further amplified by the interaction between the multiplier and accelerator. Any change in a component of aggregate demand triggers a multiplier effect, the strength of which is determined by the marginal propensity to consume.

As consumption, income, and output rise due to the multiplier effect, they, in turn, lead to further variations in investment. The scale of this induced investment in capital goods industries depends on the capital-output ratio. The interaction between the multiplier and the accelerator, even in the absence of external disturbances, can generate business cycles. The specific pattern of these cycles is influenced by factors such as the marginal propensity to consume and the capital-output ratio.

Self-Check Exercise-1

Q1. Examine the Samuelson's theory of accelerator.

4.4 Mathematical Representation of the Samuelson Model

The mathematical representation of the interaction between the multiplier and accelerator can be expressed as follows:

$Y_t = C_t + I_t$ ...(i)

$C_t = C_a + c\ (Y_{t-1})$ ...(ii)

$I_t = I_a + v\ (Y_{t-1} - Y_{t-2})$....(iii)

The mathematical representation of income, consumption, and investment over a given period ttt can be defined as follows:

Where Y_t C_t I_t represent income, consumption, and investment, respectively, for period t. C_a denotes autonomous consumption, I_a represents autonomous investment, ccc refers to the marginal propensity to consume, and v signifies the capital-output ratio or accelerator.

From these equations, it is clear that consumption in a given period ttt depends on the income of the preceding period Y_{t-1}. This implies that there is a one-period lag in the effect of income on consumption. On the other hand, induced investment in period ttt is influenced by the change in income from the previous period.

This suggests that a two-period gap exists between changes in income and their impact on induced investment. In equation (iii), induced investment is given by $v(Y_{t-1}-Y_{t-2})$ or $v(\Delta Y_{t-1})$. By substituting equations (ii) and (iii) into equation (i), we derive an income equation that highlights how income variations are influenced by the marginal propensity to

consume (c) and the capital-output ratio (v), also known as the accelerator.

$Y_t = C_a + c\ (Y_t - _1) + I_a + v\ (Y_{t-1} - Y_{t-2})$ ...(iv)

In static equilibrium, the level of income determined will be:

$Y = C_a$ f cY + I

It's because of the fact that in static equilibrium, given the data of the determining factors-, the equilibrium level of income remains unchanged, that is, in this case, $Y_t = Y_{t-1} = Y_{t-2} = Y_{t-n}$, so that period lags, have no influence at all and accelerator is reduced to zero.

Thus, in a dynamic state when autonomous investment changes, equation (iv) describes the path which a disequilibrium system follows to reach either a final equilibrium state or move away from it. The direction in which the economy moves—either toward a new equilibrium or away from it—depends on the values of the marginal propensity to consume (ccc) and the capital-output ratio (vvv), also known as the accelerator.

By considering different combinations of these values, Samuelson identified various potential trajectories for economic movement. The specific interactions between the marginal propensity to consume and the capital-output ratio, which influence the magnitude of both the multiplier and the accelerator, are illustrated in Figure 4.1.

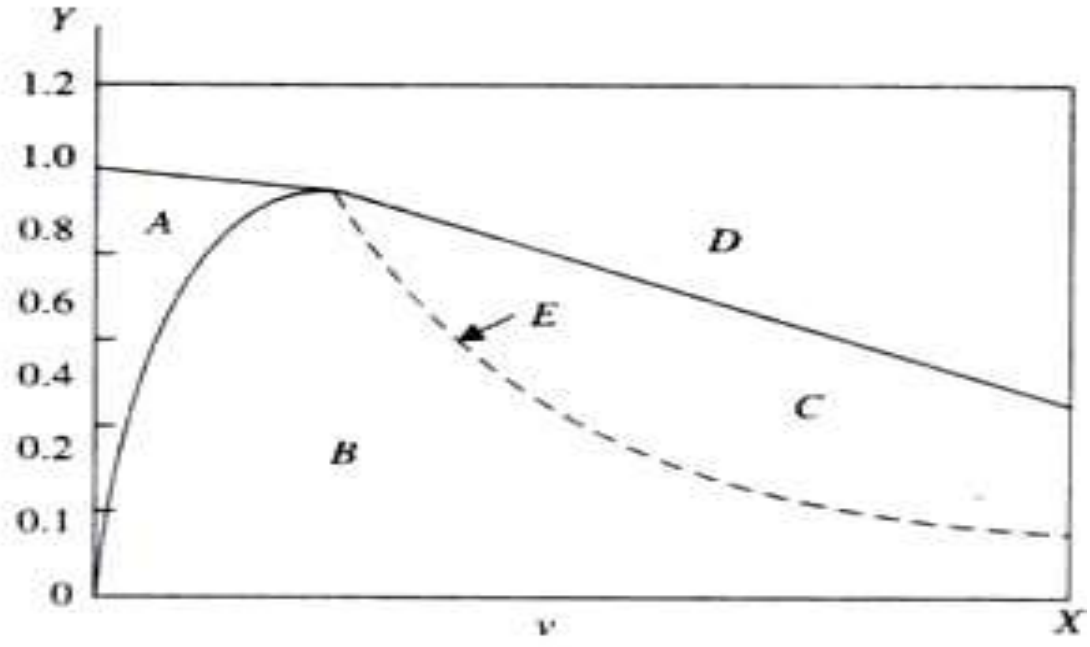


Fig. 4.1

Figure 4.2 illustrates four possible trajectories of economic activity, measured by gross national product or income, based on different combinations of the marginal propensity to consume (ccc) and the capital-output ratio (vvv).

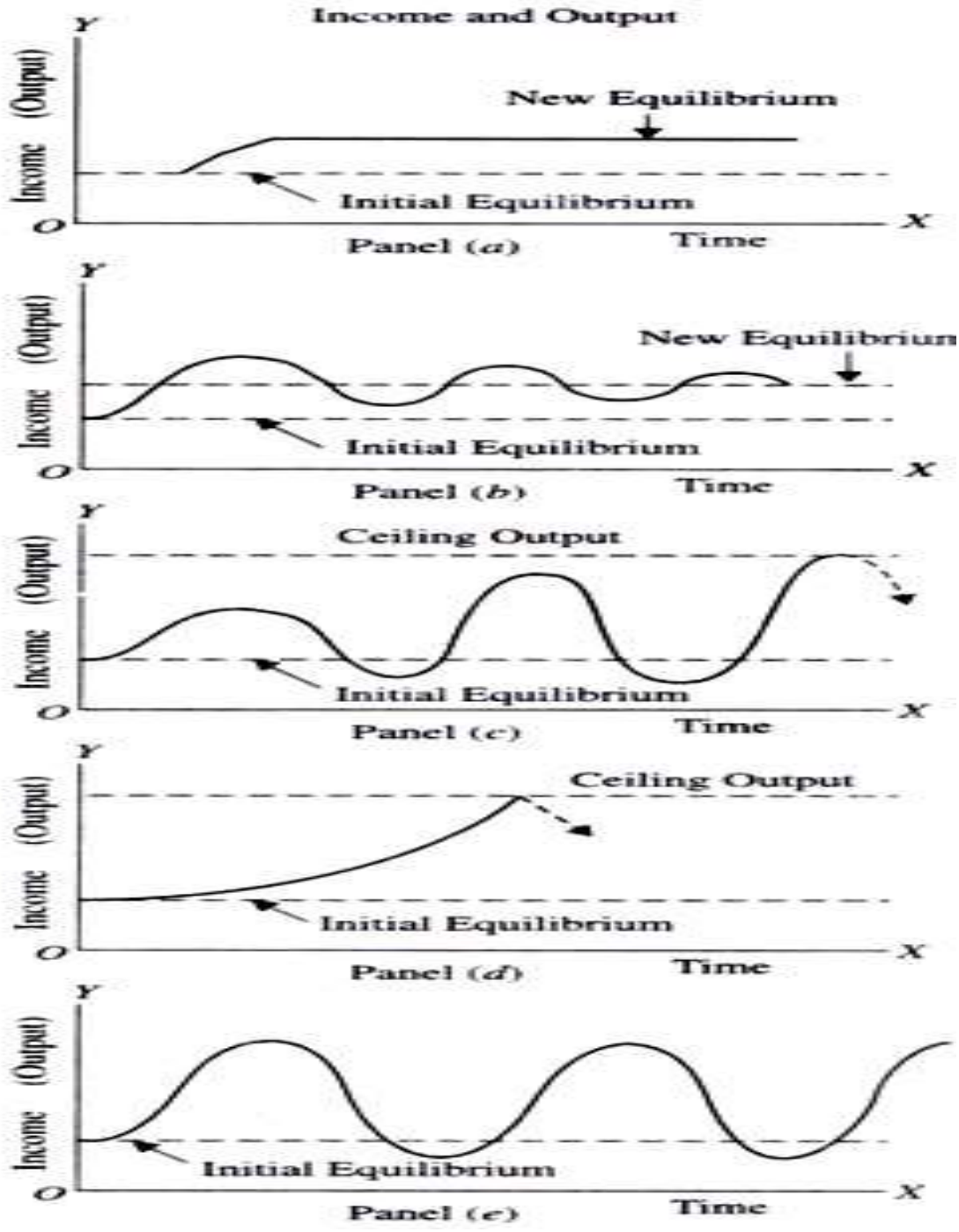


Fig. 4.2

When the combinations of the value of marginal propensity to consume (c) and capital-output ratio (v) lie within the region marked A, with a change in autonomous investment, the gross national product or income moves upward or downward at a decreasing rate and finally reaches a new equilibrium as is shown in panel a) of Fig. 4.2.

If the values of c and v are such that they lie within region B, the change in autonomous investment or autonomous consumption will generate fluctuations in income which follow the pattern of a series of damped cycles whose amplitudes go on declining until the cycles disappear as is shown in panel (b) of Fig. 4.2.

The region C in Fig. 4.2 represents the combinations of c and v which are relatively high as compared to region B and determine such values of multiplier and accelerator that bring about explosive cycles, that is, the fluctuations of income with successively greater and greater amplitude.

The situation is depicted in panel (c) of Fig. 4.2 which shows that the system tends to explode and diverges greatly from the equilibrium level. The region D provides the combinations of c and v which cause income to move upward or downward at an increasing rate which has somehow to be restrained if the cyclical movements are to occur.

This is depicted in panel (d) of Fig 4.2. Like the values of the multiplier and accelerator of region C, their values in region D cause the system to explode and diverge from the equilibrium state by an increasing amount.

In a specific scenario where the values of ccc and vvv (which determine the magnitudes of the multiplier and accelerator) fall within region E, they lead to income fluctuations with a constant amplitude, as illustrated in panel (e) of Figure 4.2.

From this, it can be observed that regions A and B exhibit similar characteristics. Following a disturbance—such as a change in autonomous investment or consumption—the system eventually stabilizes, reaching equilibrium. In contrast, regions C and D also share similarities in their values of ccc and vvv, but they result in significant instability. In these cases, deviations from equilibrium continue to grow, causing the system to become increasingly unstable and diverge further from its initial state. The case of region E lies in between the two as the combinations of values of c and v in it are such that cause cyclical movements of income which neither move toward nor away from the equilibrium.

It is worth noting that all the above five cases do not give rise to cyclical fluctuations or business cycles. It is only combinations of c and v lying in regions B, C and E that produce business cycles. The values of

accelerator and multiplier in region A are such that with a disturbance caused by a change in autonomous investment or autonomous consumption, Economic activity, measured by income levels or Gross National Product, transitions steadily from its initial equilibrium to a new equilibrium without experiencing any cyclical fluctuations or oscillations.

On the other hand, the values of c and v (and therefore of multiplier and accelerator) of region B produce cyclical fluctuations which are of the type of damped oscillations that tend to disappear over time, that is, the amplitude of the cycles shrinks to zero over a period of time. However, this contradicts the historical experience which reveals that there is no tendency for the cyclical movements to disappear or die out over time.

It is important to highlight that Case B illustrates how a single disruption influences income and employment. For instance, if there is a one-time rise in autonomous investment, its effect gradually diminishes over time, provided no additional disturbances occur.

But, in reality, further disturbances such as technological advances, innovations, natural disasters and man-made disasters such as security scams in India in 1991-92 do take place quite frequently and at random intervals and in a way they provide shocks to the system.

Thus, the values of c and v of region B can generate cyclical fluctuations over time without dying out if the above-mentioned disturbances occur frequently at random. This results in business cycles whose duration and amplitude are quite irregular and not uniform.

As a matter of fact, the business cycles in the real world also reveal such irregular patterns. To sum up, “what otherwise shows up as a tendency for the cycle to disappear in case B may be converted into an unending sequence of cycles by the addition of randomly disturbed erratic shock system.”

In case of the values of multiplier and accelerator falling within the region C, though they generate continued oscillations, the cycles produced by them tend to become ‘explosive’ (i.e. their amplitude tends to increase greatly). However, they are not consistent with the real-world situation where oscillations do not become explosive.

However, the values of multiplier and accelerator falling within region C can be made consistent with the actual world situation by incorporating the analysis of the so-called buffers. Buffers are the factors which impose an upper limit or ceiling on the expansion of income and output on the one hand or impose a lower limit or floor on the contraction of output and income on the other.

With the inclusion of these buffers the otherwise explosive upward and downward fluctuations arising out of values of multiplier (or MPC) and accelerator (or capital-output ratio) of the region C can become limited cyclical fluctuations, characteristic of the real world situation.

What has been said about case C above also applies to region D where the values of multiplier and accelerator are such that give rise to directly explosive upward or downward movement which can be restrained by the factors determining the ceiling and floor.

A comprehensive explanation of business cycles in this scenario must also address the factors that cause the system to reverse direction after reaching a peak. Hicks, in his well-known theory of business cycles, identifies the reasons behind this reversal, whether the system hits an upper limit or a lower bound. His theory will be discussed in detail below.

Finally, Case E describes a situation where business cycles persist with a constant amplitude, neither fading out nor escalating. However, this contradicts real-world observations, as business cycles typically vary significantly in both amplitude and duration.

Self-Check Exercise-2

Q1. Critically examine Samuelson's theory of interaction between the multiplier and the accelerator.

4.5 Summary

The interaction between the multiplier and accelerator has been analyzed for different values of the marginal propensity to consume (c) and the capital-output ratio (v). Based on this interaction, business cycle theories can be classified into two main categories. One category includes theories that assume values of the multiplier and accelerator leading to explosive cycles. For instance, Hicks' theory of business cycles falls into this group, as discussed in the previous unit. Conversely, Hansen developed a business cycle theory in which the multiplier interacts with a weak accelerator, resulting in only damped oscillations. As mentioned earlier, these interaction-based theories have been refined by incorporating random shocks or disturbances. Some models also introduce mechanisms that limit economic fluctuations, such as ceilings that restrict excessive expansion and floors that prevent deep contractions in output.

4.6 Glossary

- **Accelerator-Multiplier Model:** This economic framework integrates the accelerator and multiplier effects. When government investment spending rises, it stimulates consumer demand, increasing output,

further driving additional investment. This model is also known as the multiplier-accelerator model.

- **Multiplier:** a number that multiplies another or a factor that tends to multiply something, such as when the effect of new inputs such as investment is to produce a proportionately higher increase in national income.

- **Marginal Propensity to Consume (MPC):** The fraction of additional income spent on consumption rather than saved. It reflects how much consumer spending changes in response to variations in disposable income.
- **Autonomous Investment:** Investment that occurs independently of national income or output changes. It may result from factors such as government policy shifts or technological advancements.

4.7 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 4.3.

Self-Check Exercise-2

Answer to Q2. Refer to Section 4.4.

4.8 Suggested Readings

1. Diulio, A. E. (1974). *Macroeconomic Theory* (Schaum's Outline series). Tata McGraw Hill.
2. Frogmen, R. T. (2013). *Macroeconomics*. Pearson Education.
3. Mankiw, G. (2006). *Macroeconomics* (6th ed.). Tata McGraw Hill.
4. Shapiro, E. (1982). *Macroeconomic Analysis*. Oxford University Press.

4.9 Terminal Questions

Q1. Explain Samuelson’s Theory of Accelerator.

Q2. Explain the meaning of interaction of multiplier and accelerator.

UNIT-5
BUSINESS CYCLES

STRUCTURE

5.1 Introduction

This unit will discuss the business cycle, its types, and the different phases. The four primary business cycle phases—prosperity, recession, depression, and recovery—will be analyzed in detail. Each phase has distinct characteristics that impact economic growth, employment, investment, and overall business activity. Furthermore, this unit will explore various measures and policy interventions that can be used to regulate and stabilize business cycles, ensuring economic stability and sustained growth.**5.2 Learning Objectives**

After going through this unit, you will be able to

- Define business cycles
- Types of business cycles

- Phases of business cycles
- Methods to control business cycles

5.3 Meaning of Business Cycles

Business cycles, also referred to as economic cycles or trade cycles, describe the periodic fluctuations in economic activity, as measured by Gross Domestic Product (GDP), around its long-term growth trend. These cycles consist of alternating periods of economic expansion and contraction. The duration of a business cycle encompasses one complete sequence of growth (boom) followed by a decline (recession). During expansionary phases, the economy experiences rising output, income, and employment, whereas contractionary phases are marked by stagnation or decline in these key indicators. Although the long-term trajectory of Gross National Product (GNP) has generally shown an upward trend, short-term variations in economic activity persist. These fluctuations impact key economic variables such as production, income, employment levels, and price stability. Periods of high economic growth, known as expansion, upswing, or prosperity, contrast with periods of economic slowdown, often referred to as contraction, recession, downswing, or depression. The continuous alternation between these phases characterizes the business cycle, which plays a fundamental role in shaping economic trends and policies.

Self-Check Exercise-1

Q1. What do you mean by business cycle?

5.4 Definition

J.M. Keynes writes, “A trade cycle is composed of periods of good trade characterised by rising prices and low unemployment percentages with periods of bad trade characterised by falling prices and high unemployment percentages.”

Prof. Haberler has said – “The business cycle in the general sense may be defined as an alternation of a period of prosperity and depression of good and bad trade.”

In the words of Frederic Benham “A trade cycle may be defined, rather badly as a period of prosperity followed by a period of depression. It is not surprising that economic process should be irregular trade being good at some time and bad at others.”

Anatol Murad “Business cycles are alternations of prosperity and depression.’’

In summary, a business cycle, also known as a trade cycle, represents the recurring pattern of economic expansions and contractions. It is characterized by periodic surges and downturns in overall economic activity, including fluctuations in employment levels, income, production, and price movements.

Self-Check Exercise-2

Q1. Define the business cycle.

5.5 Types of Business Cycles

The length of a business cycle is not fixed and can range between two years and up to ten or twelve years. Based on their duration, business cycles are classified into five different types, which are as follows:

1. The Minor Cycle

This is also known as the Short Kitchin Cycle. This gained popularity after the name of the British economist Joseph Kitchin in the year 1923. He did research and came to the conclusion that a cycle takes place within a duration of approximately 30 to 40 months.

2. The Major Cycle

This has been emphasised as the fluctuation of business activity between successive crises. This is also known as “The Long Jugler Cycle.” A French economist Clement Jugler showed that the periods of prosperity, crisis and liquidation followed each other always within a span of an average of nine and half years.

3. The Very Long Period Cycle

Often referred to as the Kondratieff Cycle, this concept was introduced by Russian economist N.D. Kondratieff in 1925. He suggested that economic cycles extend over a period exceeding fifty years, characterized by long-term fluctuations in economic growth and decline.

4. Kuznets Cycle:

This cycle was introduced by American economist Simon Kuznets, who observed that structural changes in an economy typically occur over a period ranging from 7 to 11 years. These fluctuations are often linked to demographic shifts and infrastructure development.

5. Building Cycles:

The concept of building cycles was explored by American economists Warren and Pearson, as documented in their 1937 work *World Prices and the Building Industry*. They proposed that economic fluctuations, particularly in construction and industrial development, occur in cycles lasting approximately 18 years.

Self-Check Exercise-3

Q1. What are the types of business cycles?

5.6 Phases of Business Cycles

Business cycles exhibit distinct phases, and understanding these phases helps in analyzing the factors influencing economic fluctuations. Different economists have

referred to these phases using various terminologies. A business cycle can be described as fluctuations in overall national output, income, and employment levels. These cycles typically range in duration from two to ten years and involve periods of economic growth and decline across multiple sectors.

The business cycle primarily consists of two key phases: expansion and recession. Additionally, turning points in the cycle are marked by peaks, representing the highest point before a downturn, and troughs, indicating the lowest point before recovery begins. The successive stages of the business cycle are illustrated in Fig. 5.1.

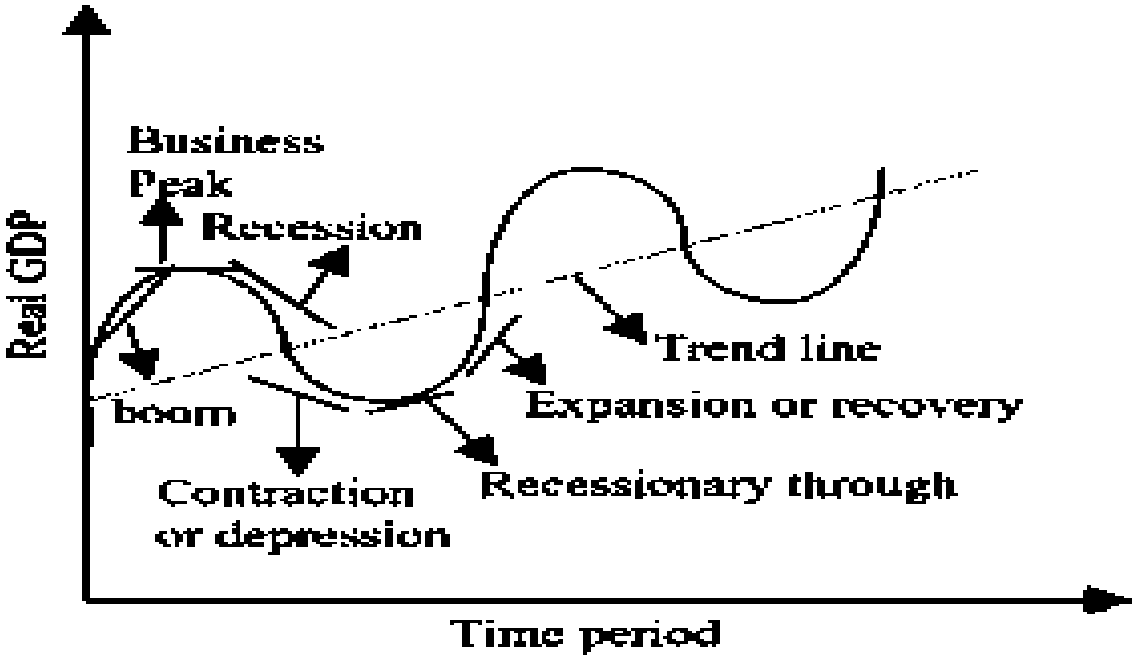


Fig. 5.1: The Business Cycle

The pattern of business cycles is unpredictable, with no two cycles being identical. The duration and timing of these cycles are challenging to forecast. A recessionary phase is marked by several key characteristics, including:

- A reduction in consumer spending, leading to an accumulation of unsold goods. As inventories increase, businesses scale down production, resulting in a decline in real GDP. Additionally, investments in capital assets such as plant and machinery experience a significant drop.
- A decrease in demand for labor, leading to workforce reductions and rising unemployment levels.
- A slowdown in economic activity causes inflation to decline. The reduced demand for raw materials leads to falling prices, although wages and service costs may remain stable or increase at a slower pace.

- A sharp decline in corporate profits. In anticipation of economic contraction, stock market prices tend to drop. Additionally, as the demand for credit weakens, interest rates also decrease.

Joseph Schumpeter identified four distinct phases within a business cycle: prosperity, recession, depression, and recovery. (See Fig. 5.2).

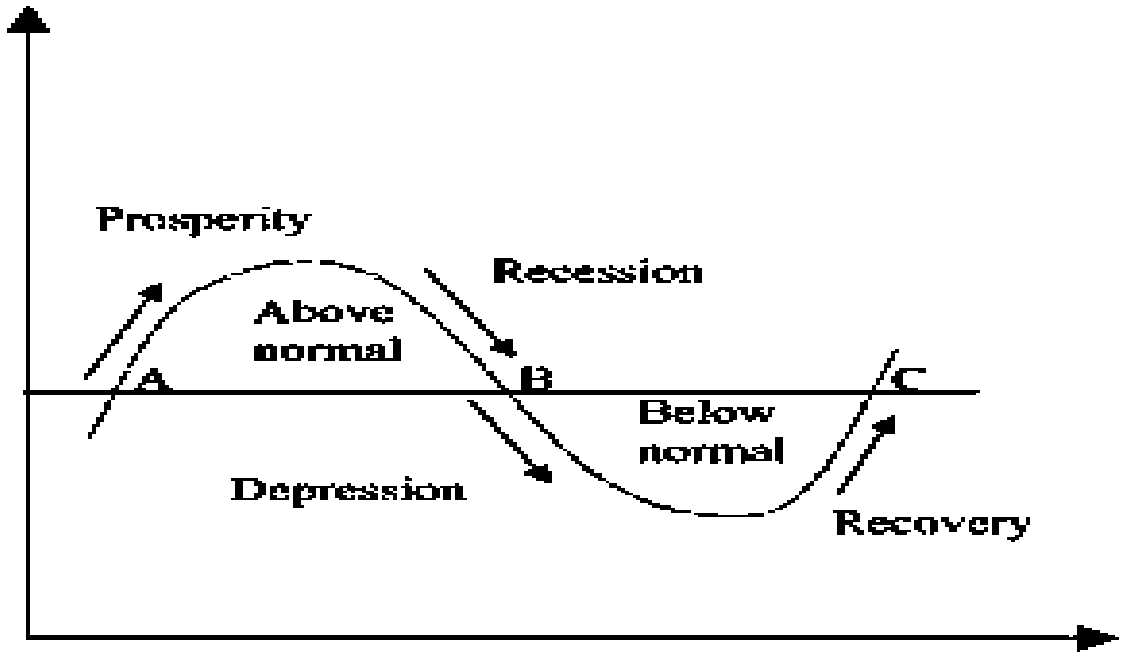


Fig. 5.2: Phases of Business Cycle

1. Prosperity Phase

The prosperity phase, also known as expansion, is characterized by rising levels of income, output, employment, prices, and profits. This period leads to an overall improvement in the standard of living.

Key features of prosperity include:

1. Increased production and trade activities.
2. Strong consumer demand.
3. High levels of income and employment.
4. Rising interest rates.
5. Inflationary pressures.
6. Significant expansion of bank credit.

7. A positive business environment with optimism.
8. High Marginal Efficiency of Capital (MEC) and increased investment.

During this phase, the economy operates at full capacity, maximizing production and leading to growth in Gross National Product (GNP). The heightened economic activity results in increased prices and profitability. This stage marks the peak of the economic cycle and is often referred to as the boom period.

2. Recession Phase

A recession marks the transition from prosperity to economic downturn. During this period, economic activities begin to slow down.

Key characteristics of a recession include:

- A decline in demand, leading to reduced production.
- Businesses abandon expansion and investment plans.
- A drop in output, income, employment, prices, and profits.
- Loss of business confidence and a shift toward pessimism.
- Reduced investment and tightened credit conditions.
- Stock market declines and job losses.
- Rising unemployment, leading to a decrease in aggregate demand.

A recession is typically short-lived but can cause disruptions in economic stability.

3. Depression Phase

When a recession deepens, it leads to a depression, a prolonged period of economic decline marked by a severe contraction in output, income, employment, and overall economic activity.

Key features of depression include:

1. A sharp decline in production and trade.
2. Rising unemployment and falling income levels.
3. Reduced consumer demand and lower spending.
4. Declining interest rates.
5. Deflationary pressures.
6. Contraction in bank credit availability.
7. Widespread business pessimism.

8. A significant drop in Marginal Efficiency of Capital (MEC) and investment.

During a depression, economic resources remain underutilized, causing Gross National Product (GNP) to fall. The economy continues its downward trajectory until it reaches the lowest point, known as the trough, marking the end of the depression phase.

4. Recovery Phase

The transition from economic downturn to growth is referred to as the Recovery or Revival Phase. During this period, economic activities begin to expand once again.

Key characteristics of this phase include:

- A resurgence in demand, prompting increased production.
- Growth in investment as businesses regain confidence.
- A gradual rise in output, income, employment, prices, and profits.
- Renewed optimism among entrepreneurs, leading to further investments.
- Expansion of bank credit, encouraging business activities.
- Stock markets become more active.
- Aggregate demand strengthens, fueling overall economic growth.

As the economy continues its upward trajectory, the recovery phase eventually transitions into prosperity, completing the cycle.

In summary, inflation tends to dominate the prosperity phase, while deflation is more prevalent during periods of economic contraction or depression. The fluctuations in various macroeconomic indicators across the four stages of the business cycle are systematically outlined in Table 5.1.

Table 5.1 Changes in macroeconomic variables during different phases of the business cycle

Macroeconomic variables	Recovery	Prosperity	Recession	Depression
Industrial Production	↑ Gradually	↑ Rapidly	↓ Gradually	↓ Rapidly
Employment	-do-	-do-	-do-	-do-
Cost of production	-do-	-do-	Starts falling	Falls rapidly
Profit	Satisfactory	High	↓ Gradually	Falls rapidly

Investment	Replacement of existing capital	High	Falls slowly	Falls rapidly
Wages	↑	↑ Rapidly	Starts falling	Falls rapidly
Inventory stocks	Gradual decline	Very little	Starts piling up	High level
Business Expectations	Optimism with caution	Highly optimistic	Cautious pessimism	Highly pessimistic

Self-Check Exercise-4

Q1. Define the following phases of a business cycle

1) Prosperity Phase
2) Recovery Phase

Q2. What are the phases of the business cycle?

5.7 Measures to Control Business Cycles or Stabilization Policies:

Various strategies have been implemented over time to manage economic fluctuations and stabilize economic activity. These measures are designed to mitigate the adverse effects of both economic booms and downturns. The three primary approaches include monetary policy, fiscal policy, and direct intervention.

5.7.1 Monetary Policy

The central bank of a country implements monetary policy as a tool to regulate business cycle fluctuations. By managing the supply and cost of credit, the central bank influences aggregate demand and economic activity.

According to D. C. Aston, "Monetary policy involves the influence on the level and composition of aggregate demand by the manipulation of interest rates and the availability of credit."

5.7.1.1 Dear monetary policy

To curb excessive money supply and inflation during an economic boom, the central bank:

- Increases the bank rate.
- Sells government securities in the open market.
- Raises the cash reserve ratio.

- Implements selective credit controls, such as increasing margin requirements and regulating consumer credit.

These measures make borrowing more expensive and restrict excessive credit expansion, helping to prevent overheating in the economy.

5.7.1.2 Cheap monetary policy

To counter a recession or depression, the central bank adopts an easy monetary policy, which includes:

- Reducing the bank rate and other interest rates.
- Purchasing government securities in the open market.
- Lowering reserve requirements for commercial banks.
- Encouraging banks to extend more credit to businesses and consumers.

By increasing liquidity in the economy, these measures stimulate spending and investment, thereby aiding economic recovery.

Limitations of Monetary Policy:

Despite its role in managing economic fluctuations, monetary policy has certain limitations:

- It is less effective in controlling inflation caused by cost-push factors.
- During severe recessions, such as the Great Depression of the 1930s, pessimism among businesses and consumers can reduce the effectiveness of monetary policies.
- Even with low interest rates, businesses may hesitate to invest, and consumers facing income losses may cut down on spending, limiting the policy's impact on aggregate demand.

Due to these constraints, monetary policy alone may not always be sufficient to stabilize the economy, requiring the support of fiscal and other economic policies.

5.7.2 Fiscal Policy

Monetary policy alone may not be sufficient to regulate business cycles, making fiscal policy a crucial complementary tool. Fiscal policy involves government decisions regarding taxation and public expenditures to stabilize the economy. During inflationary periods, the government can increase taxes and reduce public spending to create a budget surplus, helping control excessive demand. Conversely, in times of recession, tax reductions and increased government spending on infrastructure and welfare programs can stimulate economic activity by boosting demand.

According to Prof. G. K. Shaw, “Fiscal policy refers to government policies concerning revenue, expenditure, and debt management to achieve specific economic objectives.”

5.7.2.1 Policy during Boom:

During periods of economic expansion, the government implements measures to prevent overheating and inflation. These include:

- **Reducing Non-Essential Expenditures:** The government limits spending on non-developmental activities to curb excess demand for goods and services. However, distinguishing between essential and non-essential expenditures can be challenging.
- **Increasing Taxes:** To control personal and corporate spending, the government raises tax rates on income, businesses, and commodities, thereby reducing disposable income and aggregate demand.
- **Maintaining a Budget Surplus:** By ensuring that government revenues exceed expenditures, the government helps slow down economic activity. This is achieved through a combination of tax hikes and spending cuts, leading to lower income and demand through the multiplier effect.
- **Public Borrowing:** The government may increase borrowing from the public, thereby reducing the money supply available for private spending. Additionally, it may delay repayment of public debt until the economy stabilizes.

These fiscal strategies help moderate inflationary pressures and maintain economic stability during periods of rapid growth.

5.7.2.2 Policy during Depression:

In times of economic downturn, the government takes measures to stimulate economic activity by increasing public expenditure, lowering taxes, and implementing a budget deficit strategy. These actions aim to boost aggregate demand, production, income, employment, and prices.

- **Increased Public Spending:** The government invests in infrastructure projects such as roads, canals, dams, parks, schools, and hospitals. These projects generate employment and create demand for materials from private industries, contributing to economic recovery.
- **Social Welfare Measures:** Expenditures on unemployment benefits and social security programs help sustain consumer spending, thereby supporting industries that produce essential goods and services.
- **Deficit Financing:** To fund increased spending, the government borrows from banks and financial institutions. This ensures that idle funds are put to productive use, stimulating investment and economic growth.

Many modern economists consider fiscal policy a crucial tool for managing economic fluctuations. However, its effectiveness depends on strategic implementation aligned with the specific needs of the economy.

Direct Controls:

This approach focuses on the efficient allocation of resources to maintain price stability. It includes measures such as rationing, regulating prices and wages, imposing export duties, managing foreign exchange, and controlling monopolies. They are more effective in overcoming shortages arising from inflationary pressures. Their point of success mainly depends upon the existence of an efficient and honest administration. They are mostly used in emergencies like war, crop failures and hyperinflation.

In the end, it can be said that of the various instruments of stabilization policy, no single method is sufficient to control cyclical fluctuations. Therefore, all methods should be used simultaneously. This is because monetary policy is easy to apply but less effective while fiscal measures and direct controls are difficult to operate but are more effective.

Since cyclical fluctuations are inherent in the capitalist system, they cannot be eliminated. Some fluctuations may be beneficial for economic growth and others may be undesirable. Stabilisation policy should, therefore, control undesirable fluctuations.

We conclude with Keynes, “The right remedy for the trade cycles is not to be found in abolishing booms and thus keeping us permanently in a semi-slump; but in abolishing slumps and thus keeping us permanently in a quasi-boom.”

Self-Check Exercise-5

Q1. Define

1) Monetary Policy
2) Fiscal Policy

Q2. Discuss the measures to control the business cycle.

5.8 Summary

This unit explored the concept of business cycles, which involve fluctuations between periods of economic growth and downturns. It covered the different types of business cycles and examined their four key phases: prosperity, recession, depression, and recovery. Additionally, the unit outlined various government strategies for managing economic fluctuations, including monetary policy, fiscal policy, and direct controls.

5.9 Glossary

- **Business cycles:** Business Cycle or trade Cycle refers to the phenomenon of cyclical booms and depressions. In a business cycle, there are wave-like fluctuations in aggregate employment, income, output and price level.

- **The Minor Cycle:** A cycle takes place within a duration of approximately 30 to 40 months.
- **The Major Cycle:** The periods of prosperity, crisis and liquidation followed each other always within a span of the average of nine and half years.
- The Very Long Period Cycle: there are longer waves of cycles of more than fifty years duration.

- **Kuznets Cycle:** A medium-term economic cycle lasting approximately 7 to 11 years, influencing economic fluctuations within this period.
- **Building Cycles:** A business cycle averaging around 18 years, significantly impacting construction and industrial growth.
- **Prosperity Phase:** A period of economic expansion characterized by rising income, output, employment, prices, and profits, leading to an improved standard of living.
- **Recession Phase:** The transition from prosperity to downturn, marked by declining demand, reduced production, and a decrease in income, employment, and profits.
- **Depression Phase:** A prolonged economic downturn with sustained declines in output, income, employment, and living standards.
- **Recovery Phase:** The shift from depression to expansion, where increasing demand boosts production, investment, and overall economic activity.
- **Monetary Policy:** Measures implemented by a country's central bank to regulate credit supply, interest rates, and liquidity to stabilize economic fluctuations.
- **Fiscal Policy:** Government strategies involving taxation and public spending to manage economic stability and growth.
- **Direct Controls:** Regulatory measures such as price controls, rationing, export duties, and wage regulations aimed at stabilizing the economy and ensuring resource allocation efficiency.

5.10 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 5.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 5.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 5.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 5.6.

Answer to Q2. Refer to Section 5.6.

Self-Check Exercise-5

Answer to Q1. Refer to Sections 5.7.1 and 5.7.2.

Answer to Q1. Refer to Section 5.7.

5.11 References/Suggested Readings

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5.12 Terminal Questions

Q.1 What do you understand by business cycles? What are the types of business cycles?

Q.2 Explain the phases of business cycles and how to control the business cycles.

UNIT 6
Fisher's Quantity Theory of Money

STRUCTURE

6.1 Introduction

The word 'money' is derived from the Latin word 'Moneta' which was the surname of the Roman Goddess of Juno in whose temple at Rome, money was coined. The origin of money is lost in antiquity. Even the primitive man had some sort of money. The type of money in every age depended on the nature of its livelihood. In a hunting society, the skins of wild animals were used as money. The pastoral society used livestock, whereas the agricultural society used grains and foodstuffs as money. The Greeks used coins as money.

6.2 Learning Objectives

By the end of this unit, you will be able to

- Explain the cash balance Approach
- Elucidates the cash transaction Approach

6.3 The Quantity Theory of Money - Fisher’s Equation of Exchange

The Quantity Theory of Money explains the key factors influencing a nation's general price level. According to this theory, the price level is primarily determined by the money supply. The theory suggests that variations in the money supply have a direct impact on economic conditions. Essentially, it states that the value of money is dependent on the quantity of money circulating in the economy. As the money supply increases, the value of money declines, leading to a rise in the price level. Since inflation refers to a sustained increase in the price level, this theory asserts that an expanding money supply is a fundamental driver of inflation.

6.3.1 Value of Money

There is an inverse relationship between the price level and the value of money: as prices rise, the value of money declines. The term "value of money" refers to the purchasing power of a currency, while the "price level" represents the average cost of goods and services in the economy. Although the face value of a currency unit remains unchanged, its real worth is determined by what it can buy. Over time, purchasing power is affected by supply and demand, generally diminishing as the price level rises.

6.3.2 Price Level

Unlike the value of money, which is measured in terms of purchasing power, the price level is an aggregate measure. Since averaging the prices of all goods and services is challenging, economists often assess the price level using a representative basket of goods and services. Inflation causes the price level to increase over time, though in stable economies, this increase tends to be gradual.

6.3.3 Relationship Between Price Level and Value of Money

As the price level rises, the value of money declines. In most economies, this occurs gradually due to inflation and changes in supply and demand. The money market plays a crucial role in this process. The money supply is regulated by the Central Bank, which can adjust it by increasing or decreasing liquidity. Meanwhile, the demand for money originates from consumers, who require money for transactions. Several factors influence money demand, including access to banking services and payment methods such as credit cards.

A crucial determinant of money demand is the average price level. When the price level is high, consumers require more money to purchase goods and services. Conversely, when the price level is low, the demand for money decreases. The value of money is determined by the interaction between money supply, managed by the Central Bank, and money demand, driven by consumer needs. Any change in money supply or demand affects the value of money and the price level. These changes are proportional but occur in opposite directions—when the money supply expands, the value of money falls, and the price level rises.

6.3.4 Velocity

An important factor that influences the impact of changes in the money supply is the velocity of money. This refers to the frequency with which money is exchanged within the economy. When velocity is high, money circulates rapidly, allowing a smaller money supply to support a larger volume of transactions. Conversely, when velocity is low, money circulates slowly, requiring a greater money supply to sustain the same level of economic activity.

The velocity of money is not a fixed value; it fluctuates based on consumer behavior, changes in the price level, and shifts in the value of money. When the value of money declines, prices rise, leading to a need for more currency in transactions. If the money supply remains unchanged, the velocity of money must increase to accommodate the higher price level. Additionally, policy decisions by the Central Bank, which influence the money supply, can also impact velocity. In some cases, adjustments in velocity help stabilize the price level and the value of money.

6.3.5 The relationship between velocity, the money supply, the price level, and output

The connection between these variables is expressed through the equation:

$$M \times V = P \times Y$$

where:

- M represents the money supply
- V denotes velocity
- P stands for the price level, and
- Y signifies the total output of goods and services.

The term P×Y represents nominal GDP. This equation can also be rewritten as:

$$V=\text{Nominal GDP}/M$$

This equation illustrates that if nominal GDP remains unchanged, a lower money supply necessitates a higher velocity to support economic transactions. By transforming this formula into a percentage change equation, economists can analyze how changes in one variable influence the others. In the long run, this equation helps explain the effects of monetary policy. Over time, velocity remains relatively stable since consumer spending patterns do not change abruptly. Likewise, total output is primarily determined by production capacity rather than monetary policy. As a result, the percentage change in the money supply directly corresponds to the percentage change in the price level. This relationship highlights how an increase in the money supply by the Central Bank leads to inflation.

The velocity of money equation forms the core of the Quantity Theory of Money. By understanding how velocity influences inflation in both the short and long term, we gain deeper insights into the value of money. There are two main approaches to the Quantity Theory of Money:

1. **The Transaction Approach**
2. **The Cash Balance Approach**

In the following section, we will examine the Transaction Approach in greater detail, while the Cash Balance Approach will be covered in the next unit.

Self-Check Exercise-1

Q1. Define

1) Price Level
2) Value of Money
3) Velocity of Money

Q2. Discuss the Fisher's Transaction Approach.

6.4 Fisher's Equation of Exchange or the Transaction Approach

The American economist Irving Fisher introduced the **Cash Transaction Approach** to explain the quantity theory of money. In his book *The Purchasing Power of Money* (1911), he emphasized that the value of money within an economy depends on the amount of money in circulation. According to Fisher, the general price level is determined by the quantity

of money, and any change in the money supply leads to a proportional change in prices and an inverse change in the value of money.

Fisher stated that, assuming other factors remain unchanged, an increase in the money supply results in a corresponding rise in the price level, while the value of money declines. Conversely, a reduction in the money supply leads to a fall in the price level and an increase in the value of money. For instance, if the quantity of money doubles while other factors remain constant, the general price level also doubles, and the value of money is reduced by half. Similarly, if the money supply is reduced by half, the price level also falls by half, and the value of money doubles. According to Fisher's Cash Transactions Approach, the price level in an economy is determined by the interaction between the supply of and demand for money.

6.4.1 Supply of Money

The total supply of money includes both the quantity of money in circulation (MMM) and the speed at which it circulates (V), known as the velocity of money. The total volume of money supply over a given period is expressed as MV. For example, suppose the total money supply in an economy is Rs. 5,000 billion and each unit of money circulates 10 times in a given period. In that case, the effective money supply becomes Rs. 5,000 × 10 = Rs. 50,000 billion.

6.4.2 Demand for Money

Money is not demanded for its own sake but for its role as a medium of exchange. People require money to conduct transactions and facilitate the exchange of goods and services in the economy.

6.4.3 Assumptions of the theory

Fisher's theory is based on the following key assumptions:

1. **Full Employment:** The theory assumes that the economy operates at full employment, meaning all available resources are being utilized efficiently.
2. **Fixed Volume of Trade and Velocity of Money:** In the short run, the total volume of trade (T) remains stable, and the velocity of money (V) does not change significantly.
3. **Stable Relationship Between Currency and Credit Money:** Fisher assumes a constant relationship between the supply of currency (M) and credit money (M1).

4. **Price Level as a Passive Factor:** The price level (PPP) is considered a dependent variable that is influenced by other factors in the equation, such as M, M1, V, and T, rather than actively influencing them.

6.4.4 Equation of Exchange:

Irving Fisher formulated the **Cash Transaction Approach** to the quantity theory of money in the form of an equation. His approach can be expressed using the following equation of exchange:

$$MV=PT$$

Where:

- M represents the total money supply
- V denotes the velocity of money circulation
- P stands for the general price level
- T refers to the total number of transactions involving physical goods

This equation is considered an identity, meaning it holds true by definition. It signifies that the total monetary expenditure in an economy (MV) over a given period must be equal to the total value of goods sold during that period (PT).

Fisher made two key assumptions:

1. Under conditions of full employment, the total volume of transactions (T) remains constant.
2. The velocity of money (V) does not change significantly in the short run, as it primarily depends on people's spending habits.

Based on these assumptions, the Equation of Exchange transforms into the Quantity Theory of Money, which establishes a direct and proportional relationship between money supply and the general price level. Simply put, an increase in the money supply leads to a proportionate rise in price levels. For instance, if the money supply doubles, the price level also doubles. It is important to note that Fisher’s original equation only considered primary or currency money. However, modern economies rely heavily on demand deposits and credit money. Recognizing the increasing role of credit money, Fisher later modified his equation of exchange to incorporate this aspect. The revised equation includes both currency and credit money, making it more applicable to contemporary economic systems.

$P = MV + M1\ V1/T$ or $PT= MV+ M1V1$

Here,

In this context:

- P represents the price level
- M denotes the total money supply
- V is the velocity of money circulation
- M signifies the volume of credit money
- V1 refers to the velocity of credit money circulation
- T indicates the total volume of goods and trade

The relationship between money supply (M) and the price level (P) can be illustrated graphically. Figure 6.1 demonstrates the proportional relationship between these two variables. As the money supply rises from M0 to M1, the price level increases from P0 to P1. Likewise, when the money supply expands further from M1 to M2, the price level also moves from P1 to P2, indicating that changes in money supply correspond directly to changes in price levels.

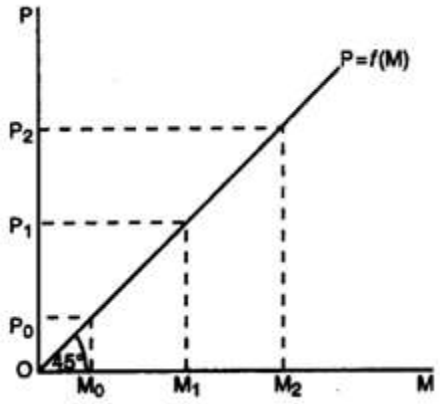

Fig. 6.1 Relationship between Quantity of Money and Price Level

Fisher's Transaction Approach helps in understanding the causes of hyperinflation, especially during wartime or emergencies. It also provides insights into long-term price trends. However, it does not effectively explain regular inflation during peacetime. This limitation has been addressed by the Cambridge Cash-Balance Approach.

Self-Check Exercise-2

Q1. Define

1) Supply of Money
2) Demand for Money

Q2. Discuss Fisher's Equation of Exchange.

Q3. What is the relationship quantity of money and price level according to Fisher's Transaction Approach?

6.5 Criticism of The Quantity Theory of Money

The Quantity Theory of Money has been criticized on several grounds, as outlined below:

1. **Unrealistic Assumptions**: The theory relies on several assumptions that do not hold in real economic conditions. It assumes that the price level (P) is passive, trade volume (T) is independent, and factors such as credit money (M1) and velocity (V, V1) remain constant in the short run. However, in reality, these variables are interdependent and subject to change.
2. **Interdependence of Variables**: The theory assumes that the variables in the transaction equation operate independently, but this is not the case. For instance, an increase in the money supply (M) often leads to a rise in the velocity of money (V). Similarly, while Fisher treats the price level (P) as a passive factor, in practice, rising prices can enhance business profits and stimulate trade (T).
3. **Unrealistic Full Employment Assumption**: J.M. Keynes argued that the theory's assumption of full employment is unrealistic since economies rarely operate at full employment. This makes the theory less applicable to real-world scenarios.
4. **Exclusion of Interest Rates**: The theory does not consider the impact of interest rates on the money supply and price levels. In reality, changes in the money supply significantly influence interest rates. An increase in money supply tends to lower interest rates, while a decrease raises them.
5. **Inability to Explain Business Cycles**: The theory does not account for economic fluctuations such as recessions and booms. For example, during a recession, an increase in money supply may not significantly affect price levels, while in a boom, tightening the money supply may not effectively control inflation. As G. Crowther observed, the quantity theory provides an incomplete explanation of business cycles.
6. **Neglect of Other Price Level Determinants**: The theory focuses only on money supply (M), velocity (V), and trade volume (T), ignoring other crucial factors like income, savings, investment,

consumption, and population. These elements play a significant role in determining price levels but are not considered in the theory.

Self-Check Exercise-3

Q1. Critically examine the Quantity Theory of Money.

6.6 Summary

This unit explored the Quantity Theory of Money, focusing on the classical perspective and Fisher's transaction approach. According to Fisher, money is primarily demanded for transaction purposes. He expressed this concept using the equation MV = PT, which can be rearranged as Md = PT/V. This implies that the demand for money is determined by the total volume of transactions (T) over a given period, multiplied by the average price level (P), and divided by the velocity of money (V). Fisher assumed that in the short run, both velocity (V) and trade volume (T) remain constant, making the demand for money directly dependent on changes in the price level (P).

6.7 Glossary

- **Money:** Anything widely accepted as a medium of exchange, which also serves as a unit of account and a store of value.
- **Quantity Theory of Money:** A theory stating that the money supply is the primary factor influencing the price level, with changes in money supply causing proportional changes in prices.
- **Value of Money:** The purchasing power of a unit of currency, indicating what goods and services it can buy.
- **Price Level:** The average price of all goods and services in an economy at a given time.
- **Face Value:** The nominal worth printed on a currency note or coin.
- **Velocity of Money:** The frequency at which money circulates within the economy over a specific period.

6.8 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Sections 6.3.2, 6.3.1 & 6.3.4

Self-Check Exercise-2

Answer to Q1. Refer to Sections 6.4.1 & 6.4.2.

Answer to Q2. Refer to Section 6.4.

Answer to Q3. Refer to Section 6.4.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 6.5.

6.9 References/Suggested Readings

1. Shapiro, E. (1982). *Macroeconomic Analysis*. Oxford University Press.
2. Mankiw, G. (2006). *Macroeconomics* (6th ed.). Tata McGraw Hill.
3. Frogmen, R. T. (2013). *Macroeconomics*. Pearson Education.
4. Diulio, A. E. (1974). *Macroeconomic Theory* (Schaum's Outline series). Tata McGraw Hill.
5. Gupta, R. D., & Rana, A. S. (1997). *Keynes post-Keynesian Economics*. Kalyani Publishers.
6. Singh, R. (2012). *Indian Economy for Civil Services Examinations*. Tata McGraw Hill.

6.10 Terminal Questions

Q1. How does the Transaction Approach differ from the Cash Balance Approach in explaining the demand for money?

Q2. Explain the neo-classical or the cash balances approach to the demand for money.

Q3. Explain the cash balance approach.

Unit-7

Cambridge Cash Balance Approach

STRUCTURE

7.1 Introduction

Fisher's perspective is largely deterministic, asserting that the amount of money people need to hold is dictated by the total volume of transactions at full employment and the efficiency of the payment system. In contrast, economists from the Cambridge School, including Alfred Marshall, A.C. Pigou, D.H. Robertson, and J.M. Keynes, introduced an alternative approach known as the Cash Balance equation. While both perspectives acknowledge that money primarily facilitates transactions, the Cambridge approach shifts the focus to the amount of money individuals willingly choose to hold. This approach essentially develops a theory of money demand, suggesting that when the money supply increases, individuals adjust their holdings rather than immediately spending the surplus.

7.2 Learning Objectives

By the end of this unit, you will be able to

- Define the Cambridge Cash Balance Approach
- Learn Marshal Equation
- Distinguish between Transaction and Cash Balance Approach

7.3 The Cash Balance Approach (Cambridge Approach)

The Cambridge approach highlights that individuals have alternatives to holding money, such as investing in shares and bonds, which offer returns. These returns represent the opportunity cost of holding money. As interest rates rise, people tend to minimize their cash holdings, and when interest rates fall, they hold more money. Another key factor influencing money holdings is the anticipated rate of inflation. When inflation is expected to be high, the purchasing power of money declines, encouraging individuals to invest in assets like securities or commodities to protect their wealth.

Cambridge economists viewed the value of money as being determined by its supply and demand. While the banking system determines the supply of money externally, the demand for money plays a crucial role in its valuation. Unlike Fisher's transaction approach, the Cambridge approach does not consider the velocity of money circulation. Instead, it emphasizes money demand, particularly for transactions and precautionary purposes. According to this perspective, money is not just a medium of exchange but also a store of value. The Cambridge equations suggest that at any given time, the value of money is influenced by the demand for cash balances. When individuals increase their money holdings, spending on goods and services decreases, leading to a decline in price levels and an increase in the value of money. Conversely, a lower demand for money results in higher price levels and a decrease in its value.

Self-Check Exercise-1

Q1. Explain the Cash Balance Approach.

7.4 Marshall’s Equation

Marshall's concept can be represented mathematically as:

$M = kPY$

Here, M represents the total money supply, which is determined externally. The term k signifies the portion of real income (PY) that individuals prefer to keep in the form of cash and demand deposits. P denotes

$P = \frac{M}{kY}$ or the value of money (the reciprocal or price level) is $\frac{1}{P} = \frac{kY}{M}$

9.4.3 Pigou's Equation

Pigou was the pioneering economist from the Cambridge school to formulate the cash balance approach mathematically. His equation is represented as: $P = \frac{kR}{M}$ in this equation, PPP represents the purchasing power of money, which is the inverse of the price level. The variable kkk denotes the fraction of total real income (RRR) that individuals prefer to hold in the form of cash or legal tender. MMM signifies the total quantity of money in circulation.

According to Pigou, the demand for money encompasses not just physical currency but also banknotes and bank balances. To account for these additional components, Pigou revised his equation as follows:

$$P = \frac{kR}{M} \{c + h(1 - c)\}$$

In this equation:

- ccc represents the fraction of total real income that individuals hold in legal tender, including token coins.
- (1−c) denotes the portion kept in banknotes and bank balances.
- h signifies the share of actual legal tender that banks retain as reserves against customer deposits and balances.

Pigou's equation helps explain the factors influencing the value of money and why individuals choose to hold varying portions of their income in cash. During inflation, when the value of money declines, people tend to reduce their cash holdings. Conversely, during economic downturns, as the value of money increases, individuals prefer to hold a larger proportion of their income in cash.

Self-Check Exercise-2

Q1. Discuss the Marshal's Equation of Cash Balance Approach.

7.5 Criticisms of Cash Balance Approach

The cash balance approach has several limitations:

1. **Overemphasis on Purchasing Power for Consumption Goods** – The Cambridge economists primarily focus on money's purchasing power concerning consumer goods, neglecting the speculative demand for money.
2. **Neglect of Interest Rate Role** – This theory does not account for the impact of interest rates on price levels, which plays a crucial role in money demand.
3. **Assumption of Unitary Elasticity of Demand** – The approach assumes that the demand for money has unitary elasticity, which does not hold true in a dynamic economic environment.
4. **Real Income as the Sole Determinant of Cash Holdings** – The Cambridge equation suggests that real income alone determines cash holdings (K), ignoring other influencing factors such as price levels, banking habits, business practices, and political conditions.
5. **Lack of Causal Explanation** – Similar to Fisher's equation, the Cambridge approach establishes a proportional link between money supply and price levels (M = KPY) but does not explain how or why this relationship forms.
6. **Assumption of Constant K and T** – Like Fisher, Cambridge economists assume that K (cash holdings) and T (transactions) remain constant, which is only feasible in a static economy and not in a dynamic one.
7. **No Insight into Business Cycles** – The Cambridge approach fails to provide an explanation for economic fluctuations or business cycles.

Self-Check Exercise-3

Q1. Critically examine the Cambridge Cash Balance Approach.

7.6 Comparison between Transaction and Cash Balance Approach

Both the Transactions and Cash Balance approaches share certain similarities while also exhibiting key differences in their perspectives on the quantity theory of money.

7.6.1 Similarities

1. **Relationship Between Money Supply and Price Level** – Both approaches conclude that the price level (P) is influenced by the quantity of money (M).
2. **Mathematical Similarities** – The equations used in both approaches are structurally similar.
3. **Role of Money** – Both theories acknowledge money's role as a medium of exchange within the economic system.

7.6.2 Dissimilarities

1. **Primary Function of Money** – Fisher's approach focuses on money as a medium of exchange, whereas the Cambridge approach highlights its role as a store of value.
2. **Flow vs. Stock Concept** – Fisher treats money as a flow variable, emphasizing circulation, while the Cambridge approach considers money as a stock, focusing on the amount held by individuals.
3. **Interpretation of V and k** – In Fisher's equation, **V** represents the velocity of money, indicating the frequency of transactions, whereas in the Cambridge equation, **k** denotes the proportion of income people prefer to hold as cash.
4. **Definition of Price Level (P)** – Fisher's equation considers the price level (P) as the average price of all goods and services, while the Cambridge equation focuses on the price level of consumer goods.
5. **Definition of T (Transactions or Trade Volume)** – In Fisher's model, **T** represents the total volume of goods and services exchanged for money. In contrast, the Cambridge model defines **T** as the quantity of final consumer goods traded for money.

7.6.3 Superiority of Cash Balance Approach over Transactions Approach

The Cash Balance approach is considered superior to the Transactions approach for several reasons:

1. **Comprehensive View of Money's Role** – The Transactions approach focuses primarily on money as a medium of exchange, whereas the Cash Balance approach also emphasizes its function as a store of value. This makes it more aligned with broader definitions of money, including demand deposits.

2. **Behavioral Perspective** – Unlike the Transactions approach, which views money circulation as a mechanical process, the Cash Balance approach takes a behavioral perspective by considering the demand for money as a key factor. This makes it more realistic in analyzing economic decisions.
3. **Integration with Demand-Supply Analysis** – The Cash Balance approach fits naturally into the standard demand-supply framework used in monetary economics, making it analytically more flexible than the Transactions approach.
4. **Incorporation of Income Level** – The Cash Balance approach recognizes income levels as an important factor influencing the price level, whereas the Transactions approach does not account for this relationship.
5. **Flexibility in Explaining Price Level Changes** – In the Transactions approach, changes in the price level (P) are solely attributed to changes in the money supply (M). However, the Cash Balance approach allows for price fluctuations even when M remains constant, as changes in **k** (the proportion of income people hold as cash) can influence P.
6. **Better Explanation of Business Cycles** – The variable **k** in the Cash Balance approach provides a more effective tool for understanding economic fluctuations and trade cycles than the velocity of money (**V**) used in Fisher's equation.

Self-Check Exercise-4

Q1. Distinguish between Fisher's Transaction Approach and Cambridge's Cash Balance Approach.

7.7 Summary

This unit explored the Cambridge Cash Balance Approach, which emphasizes the store of value function of money. According to the Cambridge economists, the demand for money represents the amount individuals wish to hold rather than spend. It is expressed by the equation Md = KPY, where K is the fraction of real income people prefer to keep as cash. Any change in the price level or real national income leads to a proportional adjustment in the demand for money.

7.8 Glossary

- **Money Supply (M):** The total quantity of money available in an economy, including both physical cash and bank deposits.

- **Money:** A widely accepted medium of exchange that also functions as a unit of account and a store of value.
- **Price Level:** The average price of goods and services within an economy at a given time.
- **Velocity of Money:** The frequency at which money is exchanged within an economy over a specific period.
- **Cash Balances:** The number of money people choose to keep readily available, either as cash or in bank accounts, rather than investing it or spending it immediately.
- **Cambridge Constant (k):** A number that represents the proportion of their income that people prefer to keep as cash or in their bank accounts. It reflects people's habits and preferences for holding money.

7.9 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 7.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 7.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 7.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 7.6.

7.10 References/Suggested Readings

1. Shapiro, E. (1982). *Macroeconomic Analysis*. Oxford University Press.
2. Mankiw, G. (2006). *Macroeconomics* (6th ed.). Tata McGraw Hill.
3. Frogmen, R. T. (2013). *Macroeconomics*. Pearson Education.
4. Diulio, A. E. (1974). *Macroeconomic Theory* (Schaum's Outline series). Tata McGraw Hill.
5. Gupta, R. D., & Rana, A. S. (1997). *Keynes post-Keynesian Economics*. Kalyani Publishers.
6. Singh, R. (2012). *Indian Economy for Civil Services Examinations*. Tata McGraw Hill.

7.11 Terminal Questions

Q1. Explain the Cambridge cash balance approach to money supply, including the formula $M=k \cdot PYM$. Discuss how the factors P (price level), Y (real output), and k(Cambridge constant) interact to determine the money supply in an economy.

Q2. Critically examine the Cambridge Cash Balance approach.

Unit-8

Keynesian Theory of Money and Price

STRUCTURE

8.1 Introduction

In the earlier unit, we explored Fisher's equation and Cambridge's approach to the demand for money. This unit focuses on John Maynard Keynes' perspective on money and prices. The Keynesian theory highlights the connection between money supply, interest rates, and overall economic demand. It posits that changes in money supply influence interest rates, which in turn affect investment and consumption, ultimately determining overall economic activity and price levels. This theory is fundamental for understanding macroeconomic policy.

8.2 Learning Objectives

After going through this unit, you will be able to

- Explain the meaning of liquidity preference
- List the different motives to demand money
- Bring out the shortcomings of the theory proposed by Keynes

8.3 Keynes' Theory of Money and Prices

The classical quantity theory of money suggests a direct and proportional link between the money supply and price levels. According to

this view, if the money supply doubles, prices also double, reducing the value of money by half, and vice versa. However, in his General Theory (1936), John Maynard Keynes challenged this idea. He argued that there is no straightforward or predictable relationship between the quantity of money and its value or price level. Instead, Keynes explained how changes in the money supply influence price levels.

Keynes introduced the concept of Liquidity Preference to explain the demand for money. He suggested that an individual's decision on how much income or wealth to hold as cash or non-interest-bearing deposits depends on their liquidity preference. This refers to the public's desire to keep money liquid rather than investing or lending it.

8.3.1 Motives for Liquidity Preference

An individual's preference for liquidity is influenced by several factors. The key question is why people choose to keep their resources in liquid form rather than investing or lending them for interest. Keynes identified three primary reasons for holding money:

1. **Transaction Motive**
2. **Precautionary Motive**
3. **Speculative Motive**

8.3.2 The transaction motive

This refers to the demand for money as a medium of exchange to facilitate everyday transactions. Since income is received periodically while expenditures occur continuously, people need to hold money for transaction purposes. Keynes further divided this into:

(a) Income Motive

Individuals hold cash to cover expenses between pay periods. Since salaries and wages are usually received at fixed intervals (e.g., weekly or monthly), part of the income must be kept in liquid form to meet daily expenses. The amount of money held depends on factors such as:

- **Income Level**: Higher incomes lead to greater demand for transaction money.
- **Time Interval**: The longer the gap between income receipts, the more cash individuals need to hold.
- **Standard of Living**: Higher living standards require holding more money for transactions.

(b) Business Motive

Businesses and firms also maintain cash balances to cover the time gap between incurring expenses (such as wages and raw material costs) and receiving revenue from sales. The volume of transactions and turnover determines the cash requirements of a business. The total demand for money for transaction purposes is the sum of individual and business demands, which depends on factors such as national income, employment levels, and price stability.

Since transaction demand for money is closely linked to income, it can be expressed mathematically as:

$L_t=f(Y)$

where L_t represents the transaction demand for money, and Y denotes national income. The figure below illustrates this relationship.

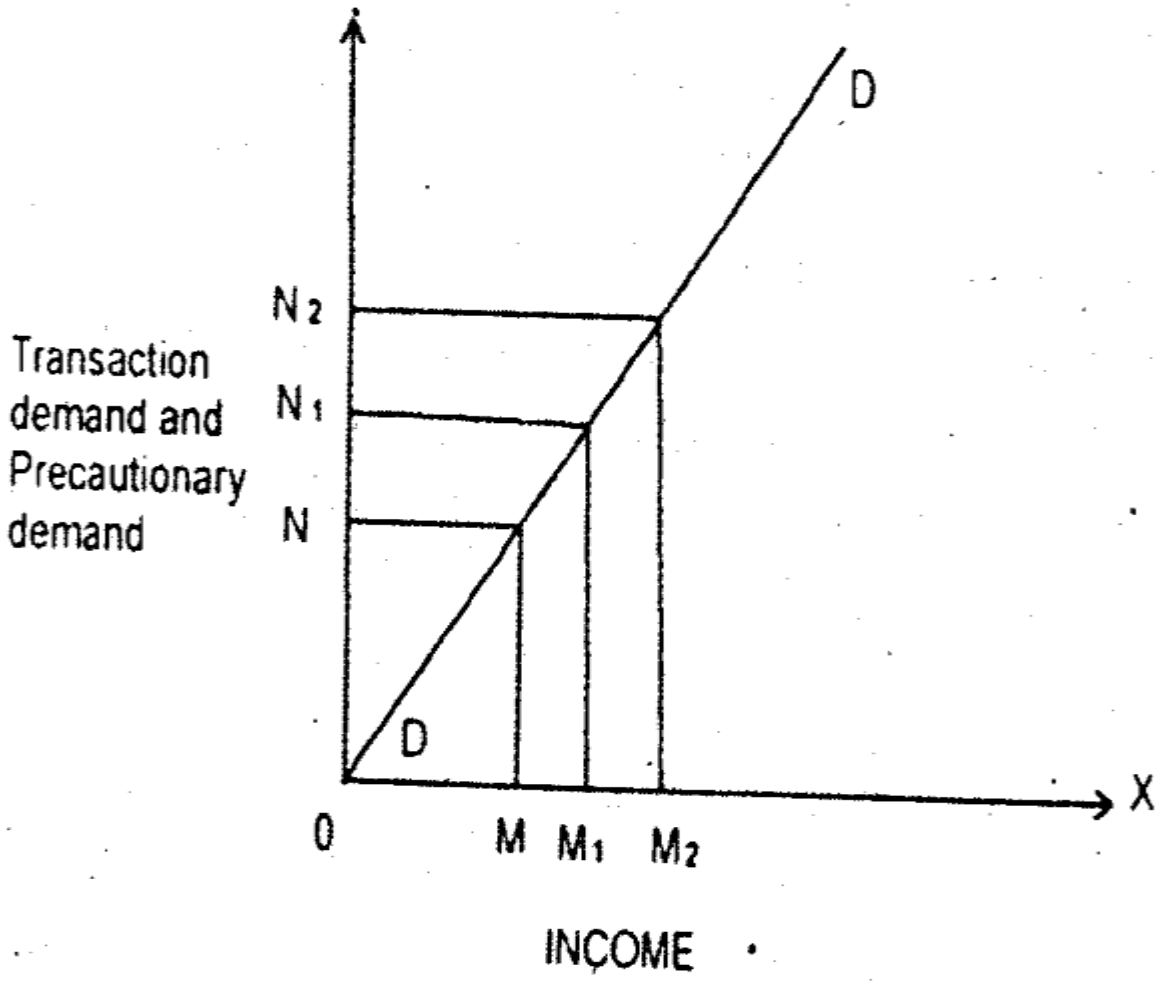

Fig. 8.1

In Figure 8.1, the upward-sloping curve dddddd suggests that as national income increases, the demand for money for transaction purposes also grows.

8.3.3 The Precautionary Motive

Apart from money held for transactions, individuals and businesses also keep additional funds to cover unforeseen circumstances, emergencies, or unexpected financial needs. This is known as the precautionary motive. The ease of accessing credit markets influences the amount of money set aside for this purpose. If borrowing is straightforward or assets can be quickly converted into cash, the precautionary demand for money will be lower, and vice versa. Uncertainty about the future encourages individuals and firms to maintain liquid reserves. The precautionary demand for money is positively related to income, represented as Lp=f(y), where Lp denotes money held for precautionary purposes and y represents income level.

8.3.4 Speculative Demand for Money

The speculative motive refers to the tendency of individuals to retain liquid assets to capitalize on expected changes in interest rates and bond prices. Keynes introduced this idea as a key aspect of monetary theory. Money held for speculative purposes functions as a store of value, similar to precautionary balances.

People use speculative cash reserves to invest in bonds when they anticipate price fluctuations. If bond prices are expected to rise—indicating a decline in interest rates—investors purchase bonds to sell them later at a profit. Conversely, if bond prices are predicted to fall—implying an increase in interest rates—they may sell bonds to prevent potential losses.

The amount of money held for speculative purposes is influenced by expectations regarding interest rates. When interest rates are high, individuals tend to hold fewer liquid assets, preferring to invest in bonds. However, as interest rates decline, the preference for holding cash increases. This results in an inverse relationship between speculative demand for money and the prevailing interest rate, as illustrated in the following figure.

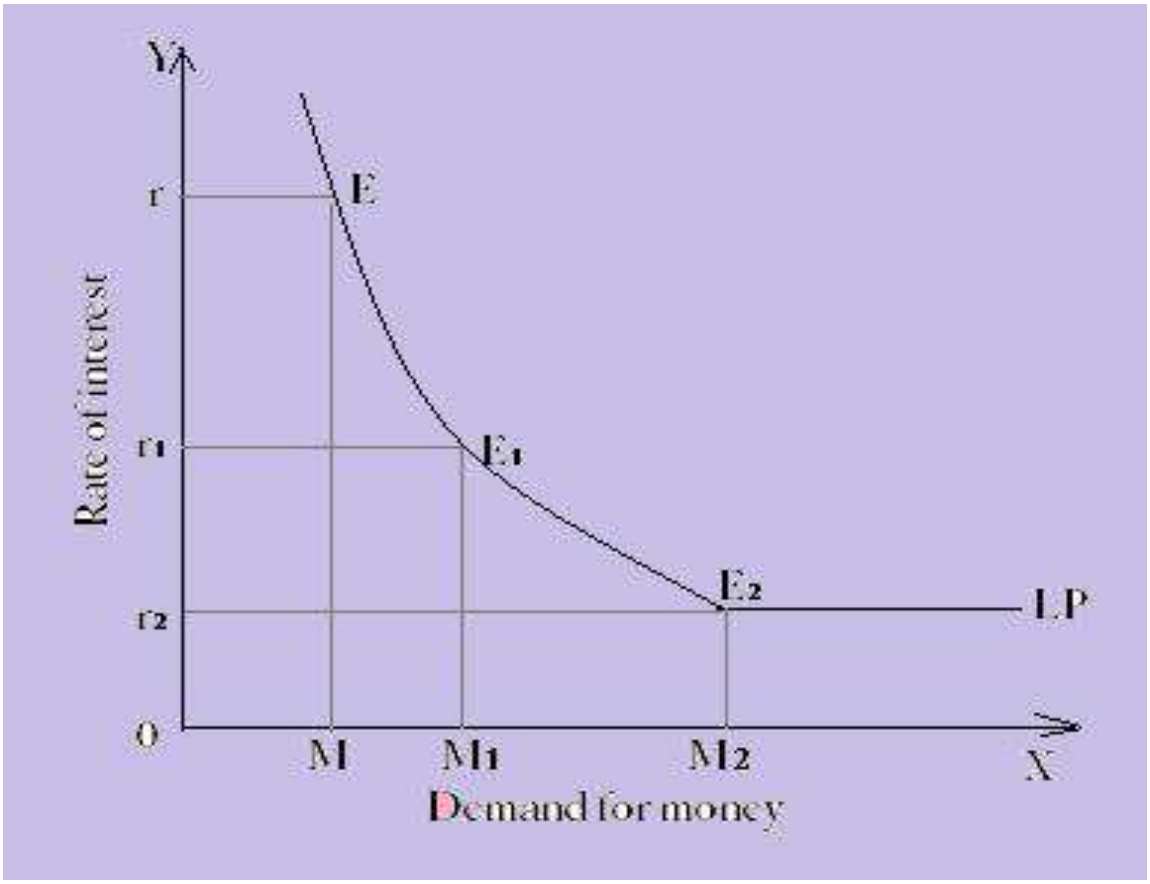

Fig. 8.2

In Fig. 8.2, the X-axis represents the speculative demand for money, while the Y-axis indicates the interest rate. The liquidity preference curve (LP) slopes downward to the right, illustrating an inverse relationship between the interest rate and the demand for money for speculative purposes.

When the interest rate is high (0r), individuals and businesses prefer to invest in bonds or lend money rather than hold cash, resulting in a lower speculative demand for money (0M). As the interest rate declines to 0r1, more money is retained for speculative purposes (0M1). A further decrease in the interest rate to 0r2 leads to an even higher amount (0M2) being held under the speculative motive. This trend highlights that as interest rates drop, people prefer to hold more liquid assets in anticipation of future investment opportunities.

Self-Check Exercise-1

Q1. Define

a) Transaction Motive
b) Precautionary Motive
c) Speculative Motive

Q2. Define the Keynesian theory of money and price.

8.4 The Liquidity Trap

When the interest rate falls below a certain threshold, individuals prefer to hold onto cash rather than invest or lend it. This situation is known as a liquidity trap, where any further decline in interest rates fails to stimulate an increase in investment or spending. In technical terms, the liquidity trap occurs at points on the liquidity preference curve where the responsiveness of money demand to changes in interest rates becomes extremely high. In other words, at very low interest rates, the demand for money becomes perfectly elastic, meaning people are unwilling to exchange their cash for interest-bearing assets. The following figure illustrates this scenario.

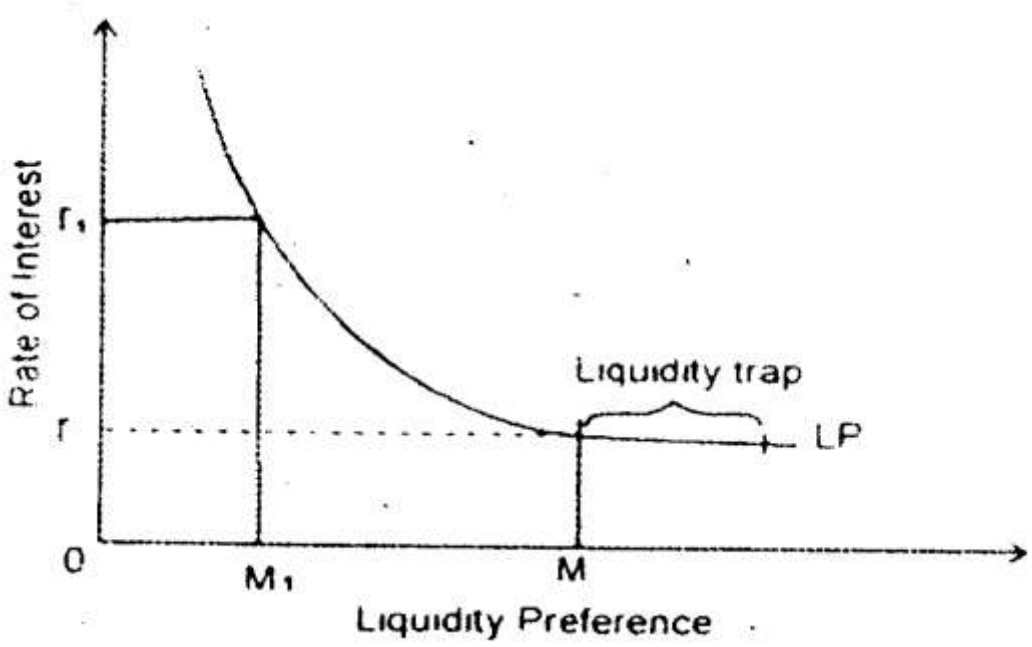

Fig.8.3

This suggests that even with an increase in the money supply, the interest rate remains unchanged and does not drop below a certain level (Or).

The Total Demand for Money: The overall demand for money in an economy is represented as:

$$L = L1 + L2$$

where:

- **L** represents the total demand for money,

- **L1** accounts for the demand arising from transaction and precautionary motives, and
- **L2** represents the demand driven by speculative motives.

Self-Check Exercise-2

Q1. Define Liquidity Trap.

8.5 Summary

This unit explored Keynes' theory of money demand, which identifies three primary motives: transaction, precautionary, and speculative. The demand for money due to transaction and precautionary motives is influenced by income levels, while the speculative motive depends on the rate of interest. The speculative demand for money has an inverse relationship with the interest rate. When bond prices are low and interest rates are high, individuals prefer holding bonds over cash. Conversely, as bond prices increase, people shift towards holding more liquid assets.

At extremely low interest rates, individuals tend to hold cash rather than invest in bonds, leading to a situation known as the "Liquidity Trap." Keynes expressed the total demand for money as: $L = L(y) + L(r)$ where $L(y)$ represents money held for transaction and precautionary motives, and $L(r)$ accounts for speculative demand.

8.6 Glossary

- **Speculative Motive:** The tendency to hold money with the aim of making financial gains, particularly influenced by changes in interest rates.
- **Liquidity Trap:** A scenario where the interest rate is extremely low, making the speculative demand for money highly elastic, meaning individuals prefer to hold cash rather than invest.
- **Precautionary Motive:** The need to hold money as a safeguard against unforeseen expenses. Individuals save for emergencies like illness or job loss, while firms retain cash reserves for unexpected financial obligations.
- **Transaction Motive:** The necessity of holding money for routine expenditures. Since individuals receive income periodically but spend regularly, they keep a portion of their earnings as readily available cash for daily transactions.

- **Liquidity Preference:** The inclination to hold wealth in liquid form (cash) rather than in fixed assets or investments, driven by factors such as uncertainty and interest rate expectations.

8.7 Answers to Self-Check Exercises

Self-Check Exercise-1

Answer to Q1. Refer to Sections 8.3.1, 8.3.2 and 8.3.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 8.4.

8.8 References/Suggested Readings

1. Diulio, A. E. (1974). *Macroeconomic theory* (Schaum's Outline series). Tata McGraw Hill.
2. D'Souza, E. (2008). *Macroeconomics*. Pearson Education.
3. Frogmen, R. T. (2013). *Macroeconomics*. Pearson Education.
4. Mankiw, G. (2006). *Macroeconomics* (6th ed.). Tata McGraw Hill.
5. Shapiro, E. (1982). *Macro-economic analysis*. Oxford University Press.

8.9 Terminal Questions

Q1. What are the motives for holding cash balances according to Keynes? Explain in detail.

Q2. Explain the meaning of liquidity preference.

Q3. Explain the transaction approach for the demand for money.

Q4. Explain the concept of Liquidity trap.

UNIT-9

Friedman's Restatement of Quantity Theory of Money

STRUCTURE

9.1 Introduction

The publication of Keynes's General Theory of Employment, Interest, and Money in 1936 led to a shift away from the traditional quantity theory of money. However, at the University of Chicago, economists continued to refine and discuss this theory throughout the 1930s and 1940s. Scholars such as Milton Friedman, Henry Simons, Lloyd Mints, Frank Knight, and Jacob Viner contributed to a more nuanced and applicable version of the quantity theory by integrating it with general price theory. Among them, Milton Friedman played a key role in advancing what became known as the "Monetarist Revolution." His 1956 essay, The Quantity Theory of Money – A Restatement, outlined a specific framework that redefined the quantity theory of money.

9.2 Learning Objectives

By the end of this unit, you will be able to

- List the Friedman's determinants of demand for money
- Explain Friedman's Restatement of the Quantity Theory of Money

9.3 Friedman's Restatement of the Quantity Theory of Money

Milton Friedman redefined the quantity theory of money by emphasizing that it is fundamentally a theory of the demand for money rather than a theory of output, income, or price levels. He compared the demand for money to the demand for a consumption good, highlighting that money provides services to its holders. In his view, money functions as an asset or capital good. The demand for money in real terms depends on several key factors:

1. **Total Wealth**: The demand for money is directly linked to an individual's total wealth, which sets an upper limit on how much money can be held. Friedman viewed income as a proxy for wealth. As wealth increases, both individuals and economies tend to demand more money for transactions and other purposes. He also distinguished between human wealth (productive capacity) and non-human wealth (assets), noting that the proportion of human wealth in total wealth influences liquidity needs. Since human wealth is less liquid, individuals with higher human wealth require more money to maintain liquidity. The ratio of wealth to income, which Friedman labeled as 'w,' plays a crucial role in determining money demand.

2. **Expected Rates of Return on Money and Other Assets**: These rates function similarly to the relative prices of goods in consumer demand theory. The nominal return on money can be zero (as with currency), negative (as with demand deposits subject to service charges), or positive (as with interest-bearing accounts). The return on other assets includes direct earnings, such as bond interest or stock dividends, and capital gains or losses due to price changes, which become significant during inflation or deflation.

3. **Other Influencing Factors**: Additional factors affecting money demand include individual preferences, liquidity needs, and market activities such as trading in capital goods. These elements influence how much money is held relative to other forms of wealth. Friedman represented these factors as 'u' in his analysis.

Total wealth encompasses all sources of income and consumable services, reflecting the expected returns over a lifetime. Wealth can be categorized into five distinct forms, each with unique characteristics and yields:

1. **Money**: This includes currency, demand deposits, and time deposits, which may generate interest. Beyond its monetary value, money also provides non-monetary benefits such as convenience and security, with its real return measured relative to the general price level (P).

2. **Bonds**: These represent financial instruments that guarantee a fixed stream of payments in nominal terms over time.
3. **Equities**: Unlike bonds, equities provide returns based on real values, meaning their payments fluctuate with economic conditions rather than being fixed in nominal terms.
4. **Physical Goods**: This category includes inventories of both producer and consumer durable goods, representing non-human assets.
5. **Human Capital**: Defined as the productive capabilities of individuals, human capital generates income through wages, salaries, and other earnings.

Each form of wealth yields returns either explicitly (through interest, dividends, wages, or salaries) or implicitly (through services such as liquidity and security). The total current value of wealth is determined by the present discounted value of the expected income flows from these five categories. Mathematically, it can be expressed as:

$W=Y/r$

where **W** represents the total wealth, **Y** is the expected income from all sources, and **r** is the prevailing interest rate.

Self-Check Exercise-1

Q1. Discuss the Friedman's Restatement of Quantity Theory of Money.

9.4 Demand for Money and Friedman's Restatement of Quantity Theory of Money

In his later empirical work, Monetary Trends in the United States and the United Kingdom (1982), Friedman presents a revised demand function for money, modifying some notations from his earlier study conducted in 1956. This updated formulation refines his previous analysis while maintaining the core principles of his monetary theory.

$M/P = f(Y, w, Rm, Rb, Re, gp, u)$

In this formulation:

- **M** represents the total demand for money.
- **P** denotes the price level.
- **Y** signifies real income.
- **w** indicates the proportion of wealth held in non-human assets.

- **Rm** refers to the anticipated nominal return on money.
- **Rb** represents the expected return on bonds, including potential price fluctuations.
- **Re** denotes the projected nominal return on equities, factoring in expected price changes.
- **gp** = (1/P) (dP/dt) reflects the anticipated rate of change in the price of goods, serving as the expected nominal return on physical assets.
- **u** accounts for additional factors, apart from income, that influence the perceived utility of holding money.

Self-Check Exercise-2

Q1. Describe the demand function according to Friedman's approach.

9.5 Determination of National Income: Friedman's Approach

The overall demand for money is determined by summing up individual money demand functions, where **M** and **y** represent per capita money holdings and per capita real income, respectively, while **w** denotes the proportion of total wealth held in non-human assets.

According to Friedman, when expected returns on various assets increase, individuals tend to hold less money. Conversely, an increase in total wealth leads to a higher demand for money. Importantly, money balances (**M/P**) adjust in relation to the expected long-term income rather than the actual income received at any given moment. Empirical studies suggest that the income elasticity of demand for money exceeds unity, implying a decline in income velocity over the long term. This stability in the long-run demand for money function also suggests that its interest elasticity is relatively insignificant.

Friedman's restated quantity theory of money asserts that the supply of money operates independently of its demand. The supply side is subject to fluctuations due to monetary policy actions, whereas the demand for money remains stable. The amount of money individuals choose to hold is closely tied to their permanent income. If the central bank expands the money supply through security purchases, sellers of these securities will experience an increase in their money balances relative to their permanent income. Consequently, they will allocate their excess money between asset purchases and consumer spending, leading to a rise in national income.

Conversely, when the central bank reduces the money supply by selling securities, buyers experience a decline in their money balances relative to their permanent income. To restore their desired level of money holdings, they may sell assets or reduce spending on goods and services, thereby leading to a decline in national income. Despite these fluctuations, the demand for money remains stable. Friedman's theory further suggests that changes in the money supply result in proportional shifts in income, prices, or both. By analyzing the demand for money, it is possible to anticipate how variations in money supply will influence overall spending and income. In cases where the economy operates below full employment, an increase in the money supply stimulates output and employment, boosting total expenditure—although this effect is primarily short-term.

Friedman's quantity theory of money can be illustrated through the following diagram (Fig. 9.1).

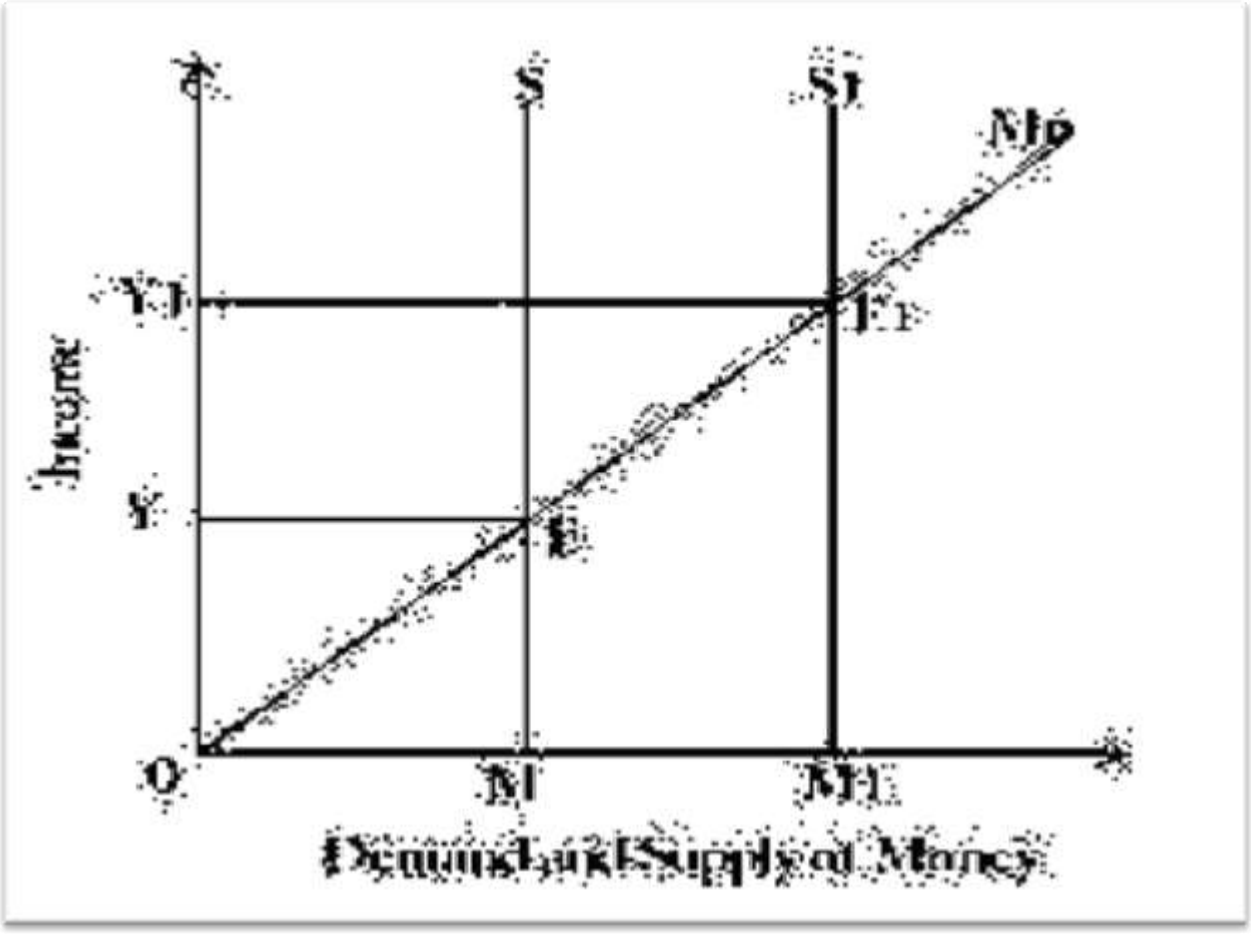

Fig. 9.1

In Fig. 9.1, income (Y) is represented on the vertical axis, while the demand and supply of money are plotted on the horizontal axis. The MD curve illustrates the demand for money, which fluctuates with changes in income. Meanwhile, the MS curve, representing the money supply, remains perfectly inelastic to income variations.

At point E, the demand and supply of money are in equilibrium, determining the income level OY. If the money supply increases, the MS curve shifts rightward to M_1S_1. This creates an excess supply of money, leading to increased total expenditure until a new equilibrium is reached at E_1, where income rises to OY_1.

Friedman conceptualizes the quantity theory of money as primarily a theory of money demand. He argues that the demand for money is influenced by asset prices, relative returns, and overall wealth or income. His approach demonstrates how a stable money demand function serves as a foundation for explaining price levels and output fluctuations.

Self-Check Exercise-3

Q1. With the help of a diagram examine the determination of national income under Friedman's approach.

9.6 Summary

This unit explored Friedman's Restatement of the Quantity Theory of Money. According to Friedman, the quantity theory primarily explains the demand for money, rather than output, income, or price levels. He likens the demand for money to the demand for consumption services, emphasizing that individuals hold real cash balances (M/P) because they provide utility.

9.7 Glossary

- **Money:** Broadly includes currency, demand deposits, and time deposits, which yield interest. Money also provides non-monetary benefits such as convenience and security.
- **Bonds:** Financial instruments representing fixed nominal payments over time.
- **Equity:** Represents ownership claims that yield returns adjusted for real value changes.
- **Human Capital:** The productive abilities of individuals, yielding returns in the form of wages, salaries, or services.
- **Aggregate Demand Function:** The total demand for money, derived by summing individual money demand functions. Here, M represents

per capita money holdings, y refers to per capita real income, and w denotes the share of wealth in non-human form.

9.8 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 9.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 9.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 9.5.

9.9 References/Suggested Readings

1. Shapiro, E. (1982). *Macroeconomic Analysis*. Oxford University Press.
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9.10 Terminal Questions

Q1. Write a note on Friedman's version of the demand for money.

Q2. What are Friedman’s determinants of demand for money?

UNIT-10
INFLATION-I

STRUCTURE

10.1 Introduction

Commodity prices fluctuate due to changes in demand and supply. A poor harvest or a surge in fashion trends can drive up prices, while an unexpected surplus can lead to price drops. However, inflation is different from these individual price changes. It refers to a sustained increase in the overall price level in an economy over time. Unlike temporary price variations, inflation represents a long-term trend that reduces the purchasing power of money. Price stability, in economic terms, does not imply absolute price fixity but suggests that modest price increases (around 2–3% annually) can be acceptable for economic growth. When inflation exceeds a tolerable level (such as reaching double digits), it becomes a major concern, especially when wages do not rise proportionally. The acceptable level of inflation varies by economic conditions. The S. Chakravarty Committee suggested that inflation should not exceed 4%, while Rangarajan considered 6% as an upper limit. The Tarapore Committee recommended a 3% inflation rate. Based on these views, India's ideal inflation rate typically falls within the 3–7% range.

10.2 Learning Objectives

By the end of this unit, you will be able to

- Define inflation
- State the features of inflation
- List the different types of inflation
- Explain the causes of inflation

10.3 Meaning and Definition of Inflation

10.3.1 Meaning of Inflation

Economists have long debated the precise definition of inflation, as it is a complex and evolving concept. Traditionally, Neo-classical economists viewed inflation as a purely monetary phenomenon. In simple terms, inflation refers to a persistent rise in the general price level over time, leading to a decline in the real value of money and a reduction in purchasing power. As prices increase, each unit of currency can buy fewer goods and services. Different economists have provided various interpretations of inflation, reflecting its multifaceted nature.

Self-Check Exercise-1

Q1. What do you mean by Inflation?

10.3.2 Definition of Inflation

According to Coulbourn, "Inflation is too much of money chasing too few goods."

According to Keynes, ‘Inflation is the form of taxation which the public finds hardest to evade.’

According to Samuelson, ‘Inflation denotes a rise in general level of prices’.

According to Milton Friedman, “Inflation is always and everywhere a monetary phenomenon”.

According to Brooman, “Inflation is a continuing increase in the general price level.”

According to Johnson, “Inflation is a sustained rise in prices”.

According to Shapiro, “Inflation is a persistent and appreciable rise in the general level of prices.”

According to Crowther, "Inflation is a state in which the value of money is falling i.e. the prices is rising."

According to Ackley, “Inflation as a persistent and appreciable rise in the general level or average of prices.”

According to Pigou, inflation occurs "when money income is expanding relatively to the output of work done by the productive agents for which it is the payment". In another place, he says that "inflation exists when money income is expanding more than in proportion to income-earning activity."

R. C. Hawtrey associates inflation with "the issue of too much currency".

T. T. Gregory calls it a state of "abnormal increase in the quantity of purchasing power." Inflation is typically described as a continuous increase in the overall price level, primarily driven by a rapid expansion in the total money supply.

Self-Check Exercise-2

Q1. Define Inflation.

10.4 Features of inflation

The key characteristics of inflation include:

a) Inflation is marked by a continuous rise in the general price level.
b) It is primarily an economic phenomenon, arising from the interaction of various economic forces.

c) Inflation is a long-term process that unfolds over an extended period.
d) It should not be mistaken for cyclical price fluctuations.
e) Inflation is closely linked to monetary factors and is often triggered by an excessive money supply.

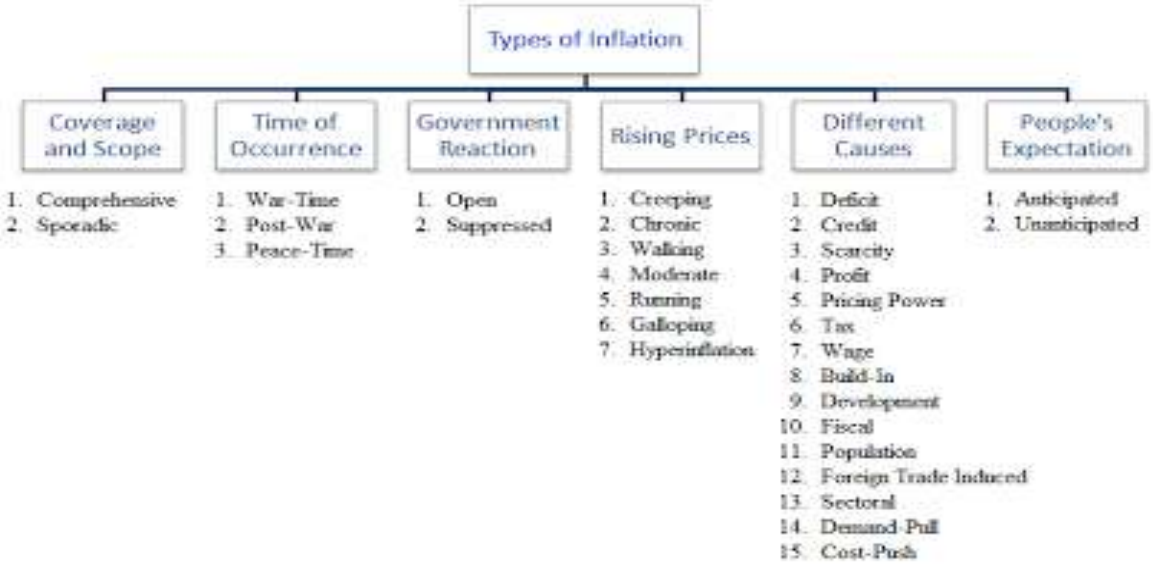
f) True inflation generally emerges once full employment is reached.

Self-Check Exercise-3

Q1. What are the features of Inflation?

10.5 Types of Inflation

The following diagram lists different types of inflation



10.5.1 Types of Inflation on Coverage

Inflation can be categorized based on its scope and extent:

a) **Comprehensive Inflation:** This occurs when the prices of all goods and services increase across the entire economy. It is also referred to as economy-wide inflation.

b) **Sporadic Inflation:** This type of inflation affects only specific commodities in certain regions. It is localized and does not impact the entire economy. For example, food prices may rise in some areas due to poor monsoon conditions.

10.5.2 Types of Inflation on Time of Occurrence

Inflation can also be classified based on the period in which it occurs:

a) **War-Time Inflation:** Inflation that takes place during the period of a war-like situation is known as War-Time inflation. During a war, scarce productive resources are all diverted and prioritized to produce military goods and equipment. This overall results in very limited supply or extreme shortage (low availability) of resources (raw materials) to produce essential commodities. Production and supply of basic goods slow down and can no longer meet the soaring demand from people. Consequently, prices of essential goods keep on rising in the market resulting in wartime inflation.This occurs during periods of war or conflict when resources are

redirected toward military production. As a result, the supply of essential goods decreases, leading to a sharp increase in prices.

b) **Post-War Inflation:** This type of inflation emerges after a war when government regulations are eased. Prices tend to rise more rapidly in the post-war period than during the war itself.
c) **Peace-Time Inflation**: Inflation that occurs in a stable, non-war period is known as peace-time inflation. It is often driven by high government spending on long-term infrastructure and development projects.

10.5.3 Types of Inflation on Government Reaction

Inflation can be classified based on the extent of government control:

a) **Open Inflation:** This occurs when the government takes no measures to curb rising prices. In a free-market system, prices fluctuate based on supply and demand, leading to open inflation.
b) **Suppressed Inflation:** This happens when the government intervenes to control price increases through mechanisms such as price regulations and rationing. Also known as Repressed Inflation, it temporarily holds back inflation, but once controls are lifted, prices may rise rapidly. Suppressed inflation can lead to issues such as black markets, corruption, and artificial shortages.

10.5.4 Types of Inflation on Rising Prices

Inflation can be classified based on how rapidly prices rise:

a) **Creeping Inflation:** This refers to a slow and steady increase in prices. It is the least severe form of inflation and is sometimes called mild or low inflation. According to economist R.P. Kent, when prices rise by up to 3% annually, it falls under this category.
b) **Chronic Inflation:** If creeping inflation continues over an extended period, it is known as chronic or secular inflation. It can either be continuous, where prices keep increasing without decline, or intermittent, occurring in cycles. Persistent inflation of this kind may eventually lead to hyperinflation.
c) **Walking Inflation:** When prices increase at a rate higher than creeping inflation but remain below 10% annually, it is referred to as walking inflation. Many economists consider this a warning sign, as unchecked walking inflation can escalate into more severe inflationary trends.

d) **Moderate Inflation:** This category combines creeping and walking inflation, as suggested by economist Paul Samuelson. Moderate inflation refers to a steady price increase of less than 10% per year, which is generally considered manageable and not a major economic concern.
e) **Running Inflation:** A rapid surge in prices, typically between 10% and 20% per year, is known as running inflation. While there is no fixed benchmark, it is often associated with economic instability and requires government intervention to prevent further escalation.
f) **Galloping Inflation:** If inflation reaches extremely high levels, between 20% and 1000% per year, it is termed galloping inflation. This form of inflation can severely disrupt economic stability and is also known as jumping inflation. In India, signs of galloping inflation were observed during the second Five-Year Plan period.
g) Hyperinflation: This occurs when prices rise at an extremely rapid and uncontrollable pace, exceeding 1000% per year. In such cases, the value of money diminishes drastically, often leading people to trade using alternative means like gold, silver, or even barter systems. Some of the worst instances of hyperinflation in history include Hungary in 1946 and Zimbabwe between 2004 and 2009.

10.5.5 Types of Inflation on Causes

Inflation can be categorized based on the underlying reasons that drive price increases:

a) **Deficit Inflation:** This occurs when inflation results from excessive government spending beyond its revenue, leading to deficit financing.
b) **Credit Inflation:** An oversupply of money in the economy, often due to excessive bank credit, contributes to inflationary pressures.
c) **Scarcity Inflation:** This form of inflation arises when goods become artificially scarce due to hoarding. Traders and black marketers stockpile essential commodities such as food grains and fuel to manipulate supply and drive up prices.
d) **Profit Inflation:** Businesses sometimes raise prices to maximize profits, leading to inflation that is not necessarily linked to demand or supply conditions.
e) **Pricing Power Inflation:** Also known as **Administered Price Inflation**, this happens when firms, especially in oligopolistic markets, increase prices deliberately to enhance profit margins. This type of inflation is less common during economic downturns.

f) **Tax Inflation:** An increase in indirect taxes (e.g., sales tax, VAT, excise duty) leads to higher costs for producers, which are then passed on to consumers, causing inflation.
g) **Wage Inflation:** If wage increases are not matched by productivity growth, businesses compensate for higher labor costs by raising the prices of goods and services.
h) **Build-In Inflation:** A self-perpetuating cycle occurs when workers demand higher wages in anticipation of inflation, prompting businesses to raise prices, which in turn fuels further wage demands.
i) **Development Inflation:** As an economy grows, higher incomes lead to increased consumer demand, which can push prices upward.
j) **Fiscal Inflation:** This type of inflation arises when excessive government spending, particularly during budget deficits, increases the money supply and stimulates inflation.
k) **Population Inflation:** A rapid increase in population heightens demand for goods and services, leading to price increases due to supply constraints.
l) **Foreign Trade Induced Inflation:** Inflation can result from changes in international trade dynamics. This includes:
    - **Export-Boom Inflation:** A surge in exports can reduce the domestic availability of goods, causing prices to rise within the exporting country.
    - **Import Price-Hike Inflation:** If the cost of imported goods rises due to inflation in exporting countries, domestic prices for those goods and related products also increase. For instance, if global oil prices surge, the cost of fuel-dependent industries like manufacturing and transportation rises, leading to widespread inflation.
m) **Demand-Pull Inflation:** This occurs when aggregate demand in an economy exceeds aggregate supply, often driven by rising income levels, population growth, or expansionary monetary policies.
n) **Sectoral Inflation:** When inflation affects specific industries or sectors, it can cause a ripple effect on related sectors. For example, an increase in crude oil prices directly impacts transportation costs, aviation, and other fuel-dependent industries.
o) **Cost-Push Inflation:** Inflation caused by rising production costs, such as higher wages or increased prices for raw materials, leading businesses to pass on these costs to consumers.

10.5.6 Types of Inflation on Expectation

a) **Anticipated Inflation:** This occurs when inflation aligns with what most individuals, businesses, and policymakers predict. Since it is expected, people can plan accordingly, reducing its disruptive impact on the economy.

b) Unanticipated Inflation: This refers to inflation that deviates from public expectations. When price increases occur unexpectedly, it can lead to economic instability, affecting savings, wages, and investment decisions.

Self-Check Exercise-4

Q1. Define

1. Hyperinflation
2. Creeping Inflation
3. Demand-Pull Inflation
4. Cost-Push Inflation

Q2. What are the different types of inflation?

10.6 Inflationary Gap

An **inflationary gap** occurs when total spending in an economy surpasses the value of output at the full employment level. In simple terms, it represents the excess of aggregate demand over aggregate supply when an economy is operating at full capacity. If total expenditure exceeds the full employment national income in a given period, this surplus demand leads to inflationary pressures.

Graphical illustration

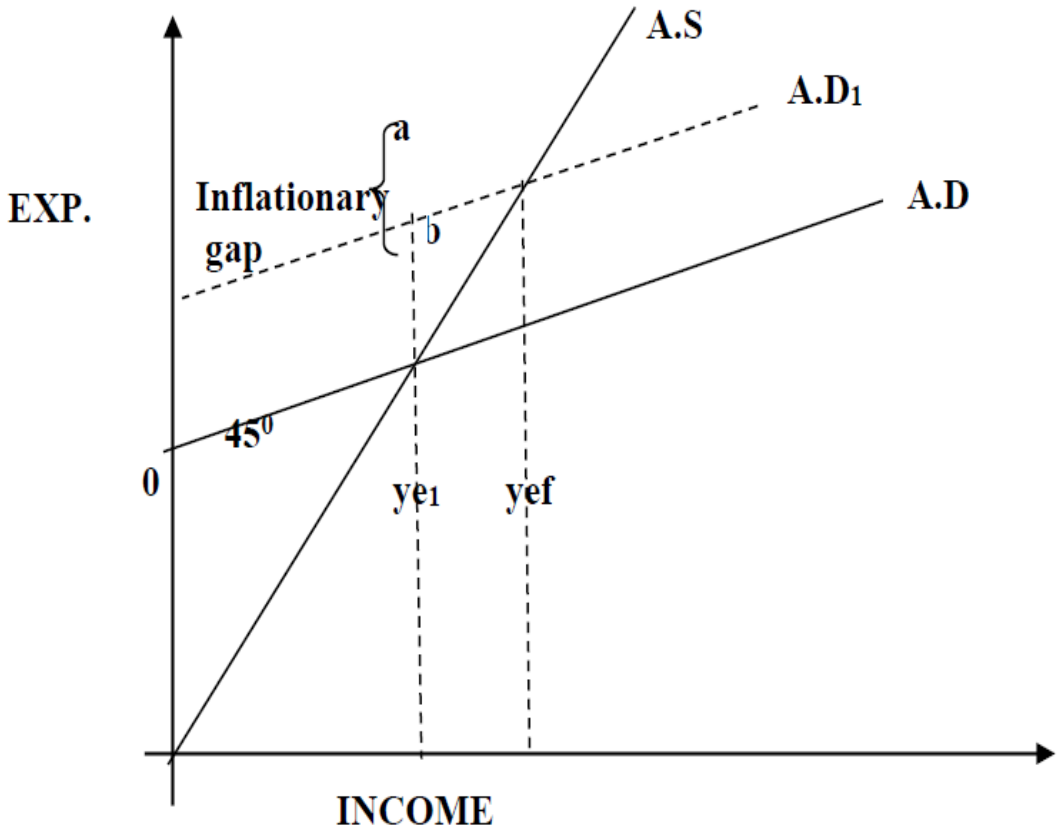


Fig. 10.1

In the above diagram, it represents the equilibrium level of national income at full employment. At this level, aggregate demand is equal to aggregate supply hence national income is in equilibrium. Suppose now that there is a rise in aggregate demand from AD to AD1 caused by a rise in effective demand, disequilibrium in national income takes place. Buyers will want more than what is available and suppliers will desire to hire more.

Self-Check Exercise-5

Q1. Define the Inflationary gap.

10.7 Summary

This unit explored the concept of inflation, which refers to a general increase in the price level of goods and services. Inflation can be categorized based on various factors such as its extent, timing, government response, rate of price rise, underlying causes, and expectations.

10.8 Glossary

- **Creeping Inflation:** A slow and steady increase in prices, also called mild or low inflation.
- **Chronic Inflation:** A prolonged period of creeping inflation, also known as secular inflation.
- **Walking Inflation:** A moderate rise in prices, typically between 3% and 10% annually.
- **Moderate Inflation:** Inflation that remains below 10% per year, generally considered stable.
- **Running Inflation:** A sharp increase in price levels, occurring at a faster pace.
- **Galloping Inflation:** A situation where inflation escalates significantly, reaching double or triple-digit percentages annually.
- **Hyperinflation:** An extreme and rapid rise in prices, making it difficult to measure inflation accurately.
- **Anticipated Inflation:** Inflation that aligns with public expectations or forecasts.
- **Unanticipated Inflation:** Inflation that occurs unexpectedly, differing from public predictions.

10.9 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 10.3.1.

Self-Check Exercise-2

Answer to Q1. Refer to Section 10.3.2.

Self-Check Exercise-3

Answer to Q1. Refer to Section 10.4.

Self-Check Exercise-4

Answer to Q1. Refer to Section 10.5.

Answer to Q2. Refer to Section 10.5.

Self-Check Exercise-5

Answer to Q1. Refer to Section 10.6.

10.10 References/Suggested Readings

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10.11 TERMINAL QUESTIONS

Q1. What do you understand by inflation? What are the different types of inflation?

Q2. Write a short note on the inflationary gap.

UNIT 11
INFLATION-II

STRUCTURE

11.1 Introduction

In the previous unit, we explored the concept of inflation, including its definition and various types. Building on that foundation, this unit will focus on understanding the causes of inflation and its impact on the economy.

11.2 Learning Objectives

After studying this unit, you will be able to

- State the different causes of inflation
- Explain how inflation affects the economy

11.3 Causes of Inflation

Inflation occurs when the overall demand for goods and services surpasses their available supply. The factors contributing to rising demand and supply shortages can be analyzed as follows.

11.3.1 Factors Affecting Demand

Both Keynesian and monetarist economists argue that inflation results from an increase in overall demand. Several factors contribute to this rise:

I. **Increase in Money Supply.** An increase in money circulation leads to higher demand, pushing up prices. Modern quantity theorists argue that inflation can occur even before an economy reaches full employment, as seen in many advanced economies.
II. **Increase in Disposable Income:** When people have more money to spend—either due to rising national income, lower taxes, or reduced savings—they demand more goods and services, contributing to inflation.
III. **Increase in public Expenditure**: Governments worldwide are increasing their spending on public utilities, social services, and nationalized industries, leading to a surge in demand.
IV. **Increase in Consumer Spending:** Greater consumer expenditure, driven by lifestyle choices or easy credit options such as hire-purchase and installment plans, can further push up demand.
V. **Cheap Monetary** Policy: A policy of increased credit availability leads to higher money supply, raising consumer purchasing power and contributing to inflation. This is often called credit-induced inflation.
VI. **Deficit Financing:** When governments borrow or print additional money to cover rising expenditures, demand grows faster than supply, leading to inflationary pressures.
VII. **Expansion of the Private Sector:** Large-scale investments in private enterprises create jobs and boost income, raising demand for goods and services before supply can catch up.
VIII. **Black Money:** The presence of unaccounted wealth due to corruption and tax evasion fuels excessive spending, increasing demand and driving up prices.
IX. **Repayment of Public Debt:** When the government repays past domestic loans, it increases the money supply, leading to a surge in demand for goods and services.
X. **Increase in Exports:** A higher international demand for locally produced goods boosts industrial earnings, which can, in turn, increase domestic demand and contribute to inflation.

11.3.2 Factors Affecting Supply

Several factors contribute to a decline in the overall supply of goods and services, leading to inflationary pressures. These factors include:

I. **Shortage of Factors of Production**: Limited availability of essential resources like labor, raw materials, energy, and capital restricts industrial output, leading to reduced supply.
II. **Industrial Disputes:** In economies where labor unions hold significant influence, frequent strikes and extended labor disputes can disrupt production. If wage

increases outpace productivity growth, production costs rise, further limiting supply.

III. **Natural Calamities:** Events such as droughts and floods negatively affect agricultural output, creating shortages in food and raw materials, thereby intensifying inflation.

IV. **Artificial Scarcities:** Hoarding and speculative activities in black markets deliberately restrict the availability of goods, driving prices upward.

V. **Increase in Exports:** A focus on exports over domestic supply reduces the availability of goods in local markets, contributing to price increases.

VI. **Lop-sided Production:** When an economy prioritizes luxury or capital goods over essential consumer goods, shortages arise, escalating inflation.

VII. **Law of Diminishing Returns:** Outdated machinery and inefficient production methods lead to higher costs per unit, increasing prices due to the law of diminishing returns.

VIII. **International Factors:** Inflation in major economies often has ripple effects on other countries through trade links. For instance, a surge in global fuel prices leads to increased costs across multiple industries, further impacting domestic price levels.

Self-Check Exercise-1

Q1. What are the demand side causes of inflation?

Q2. What are the supply-side causes of inflation?

11.4 Effects of Inflation

Inflation impacts different sections of society in varying ways due to changes in the purchasing power of money. As prices increase, some individuals benefit, while others face financial losses. Broadly, society can be categorized into two groups: those with fixed incomes and those with flexible incomes. Individuals with fixed earnings often experience a decline in real income, whereas those with variable incomes may gain if their earnings rise faster than prices.

Since price increases are not uniform across all goods, services, and assets, inflation affects different sectors differently. Some prices rise sharply, while others increase gradually or remain unchanged. The consequences of inflation can be analyzed in terms of income and wealth redistribution, economic production, and broader social implications. This phenomenon is also referred to as the impact of changes in the purchasing power of money.

11.4.1 Effects on Redistribution of Income and Wealth

Inflation influences the distribution of income and wealth in society in two primary ways. First, it alters the real value of factor incomes such as wages, salaries, rent, interest, dividends, and profits. Second, it affects income distribution over time, often leading to a widening gap between different economic classes. Those with rigid incomes tend to lose, while individuals with flexible earnings generally benefit.

Individuals with fixed wages and salaries, especially in the lower and middle-income brackets, experience a decline in purchasing power due to rising costs. In contrast, business owners, industrialists, and real estate investors often see an increase in their earnings as prices rise. This creates an uneven distribution of wealth, where the affluent accumulate more resources while lower-income groups struggle financially.

The extent to which inflation benefits or harms an individual depends on their ability to anticipate it. Those who can predict inflation can adjust their financial decisions accordingly, mitigating potential losses. However, since inflation is difficult to predict accurately, some people gain while others bear the economic burden. The specific effects on different groups are as follows:

(1) Debtors and Creditors: Borrowers benefit from inflation because they repay loans in currency that has lost value, reducing the real burden of debt. Lenders, on the other hand, receive payments that are worth less in real terms than when the loans were issued.

(2) Salaried Persons: Workers with fixed salaries, such as clerks and teachers, often experience financial strain since their earnings do not keep pace with rising living costs.

(3) Wage Earners: The impact on wage earners depends on the responsiveness of their wages to inflation. Strong labor unions may negotiate wage adjustments linked to inflation, but there is often a delay in implementation, causing temporary financial hardship.

(4) Fixed Income Group: Pensioners, individuals receiving social security benefits, and those living on fixed interest incomes face a decline in their purchasing power as inflation erodes the value of their earnings. Those who depend on fixed-income securities also suffer financial losses.

(5) Equity Holders or Investors: Individuals holding shares in companies often benefit from inflation, as rising prices boost corporate earnings and, consequently, dividends. However, those investing in fixed-return securities such as bonds and debentures lose out due to declining real interest income.

(6) Businessman: Entrepreneurs, traders, and real estate investors gain from inflation. Producers benefit from rising prices, which increase the value of their inventory and widen profit margins. Traders can take advantage of short-term price fluctuations, while real estate holders see a rapid appreciation in property values.

(7) Agriculturists: The impact of inflation on agricultural communities varies. Large landowners may suffer due to fixed rental agreements, but land-owning farmers often gain as agricultural product prices increase more rapidly than production costs. However, landless agricultural laborers, lacking strong bargaining power, typically struggle as their wages remain stagnant while the cost of living rises.

(8) Government: Inflation often benefits governments as they repay debt in depreciated currency, reducing the real value of their obligations. Additionally, inflation can lead to increased tax revenues, particularly from indirect taxes. However, the overall impact on the government depends on its role as a debtor or creditor in the economy.

11.4.2 Effects on Production

Inflation typically stimulates production initially, as rising prices encourage producers to invest in anticipation of higher profits. This leads to increased employment, output, and income. However, this positive effect is only sustainable up to the full employment level. Beyond that point, further investment can intensify inflationary pressures, as prices rise faster than production due to resource constraints. The negative impacts of inflation on production are outlined below:

(1) **Resource Misallocation:** Inflation often leads to inefficient resource allocation, as producers may shift focus from essential to non-essential goods that offer higher profits.

(2) **Changes in the System of Transactions:** Rising prices change how businesses handle transactions. Instead of maintaining cash reserves for emergencies, firms may convert their money into inventory or other assets, diverting attention away from productive activities.

(3) **Reduction, in Production:** Uncertainty caused by rising costs and fluctuating prices discourages long-term investment, leading to reduced production levels.

(4) **Fall in Quality:** A persistent rise in prices creates a seller’s market, where producers may lower product quality or resort to adulteration to maximize profits.

(5) **Hoarding and Black marketing:** Anticipating further price hikes, producers may hoard goods, leading to artificial shortages. These withheld stocks are then sold in black markets, exacerbating inflation.

(6) **Reduction in Saving:** As prices escalate, people allocate more of their income toward daily expenses, reducing their ability to save. Lower savings negatively impact investment and capital formation, hindering long-term production growth.

(7) **Hinders Foreign Capital:** Inflation hinders the inflow of foreign capital because the rising costs of materials and other inputs make foreign investment less profitable.

(8) **Encourages Speculation:** Price instability creates uncertainty, prompting businesses to engage in speculation rather than focusing on productive ventures. This shift can disrupt the supply of raw materials and essential inputs.

11.4.3 Other Effects

Inflation has several additional consequences, which are discussed below:

(1) **Government:** Inflation influences government finances in multiple ways. It facilitates revenue generation as higher money incomes lead to increased tax collections from incomes and goods. Additionally, inflation reduces the real burden of public debt as the value of money declines. However, government expenditures also rise due to increased costs of public projects, enterprises, and administrative expenses. Overall, while inflation may create an illusion of economic prosperity through rising wages and profits, it also imposes higher financial demands on the government.

(2) **Balance of Payments:** Inflation can negatively affect a country's balance of payments by undermining the benefits of international trade and specialization. When domestic prices increase at a faster rate than those in foreign markets, local goods become more expensive compared to imported alternatives. This results in higher imports and lower exports, leading to an unfavorable balance of payments—especially under a fixed exchange rate system. However, if a flexible exchange rate is in place, the impact on trade balance is mitigated.

(3) **Exchange Rate:** A rapid increase in domestic prices relative to foreign countries leads to a depreciation in the national currency, reducing its value in exchange for foreign currencies.

(4) **Collapse of the Monetary System:** Prolonged or extreme inflation, particularly hyperinflation, can erode the value of money to the point

where it loses public confidence. If inflation spirals out of control, the monetary system may collapse, as historically seen in post-World War Germany.

(5) **Social Consequences:** Inflation exacerbates income inequality, widening the gap between the wealthy and the poor. Rising living costs lead to dissatisfaction among workers, often triggering strikes and disruptions in production. Profit-seeking behaviors such as hoarding, black marketing, adulteration, and speculation become more prevalent. Additionally, corruption spreads across various sectors, ultimately reducing economic efficiency.

(6) **Political Instability:** Inflation can fuel public discontent, providing opposition parties with a platform to mobilize protests against the government. If inflation continues unchecked, it may lead to widespread unrest, forcing governments out of power. History has witnessed many regimes falling due to inflation-driven economic crises.

Self-Check Exercise-2

Q1. What are the effects of inflation on

1. Redistribution of income and wealth
2. Effects on production

11.5 SUMMARY

This unit explored the causes of inflation and its impact on various aspects of the economy. We examined how inflation influences production, resource allocation, employment, and investment. Additionally, we discussed its broader effects on wealth distribution, social stability, political dynamics, and economic efficiency. Inflation can disrupt trade, depreciate currency value, and create financial instability if left unchecked. It also affects government revenue and expenditure, contributing to both opportunities and challenges. Understanding these impacts helps in formulating effective economic policies.

11.6 GLOSSARY

- **Inflation:** A situation where the overall price levels rise due to an imbalance between money supply and available goods.
- **Demand-Pull Inflation:** Occurs when excessive demand surpasses supply, leading to rising prices.
- **Cost-Push Inflation:** An increase in prices driven by higher costs of production, such as wages and raw materials.

- **Purchasing Power:** The ability of money to acquire goods and services, which declines when inflation rises.

11.7 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 11.3.1.

Answer to Q2. Refer to Section 11.3.2.

Self-Check Exercise-2

Answer to Q1. Refer to Section 11.4.1 & 11.4.2

11.8 References/Suggested Readings

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11.9 Terminal Questions

Q1. What are the effects of inflation? Discuss in detail.

Q2. What are the main causes of inflation, explain.

Q3. What are the Factors that lead to a shortage of supply leading to inflation?

Q4. What is the effect of inflation on the Redistribution of Income and Wealth?

UNIT 12
INFLATION-III

STRUCTURE

12.1 Introduction

In the last unit, we explored the causes and consequences of inflation. This unit focuses on the various types of inflation, including demand-pull and cost-push inflation. Additionally, we will examine the different strategies used to control inflation.

12.2 Learning Objectives

By the end of this unit, you will be able to

- Explain demand-pull inflation
- Elucidate cost-push inflation
- Explicate the measure to control inflation

12.3 Demand-Pull Inflation

Demand-pull inflation occurs when total monetary demand consistently surpasses the supply of goods and services at existing prices, causing prices to rise. According to demand-pull theorists, inflation can result from an increase in the money supply, particularly when the economy is at full employment. A higher money supply lowers interest rates, encouraging investment, which, in turn, raises incomes and consumption. This surge in demand, when production is already at full capacity, leads to price increases and inflationary pressures. The relationship between aggregate demand and supply can be illustrated using a graphical representation.

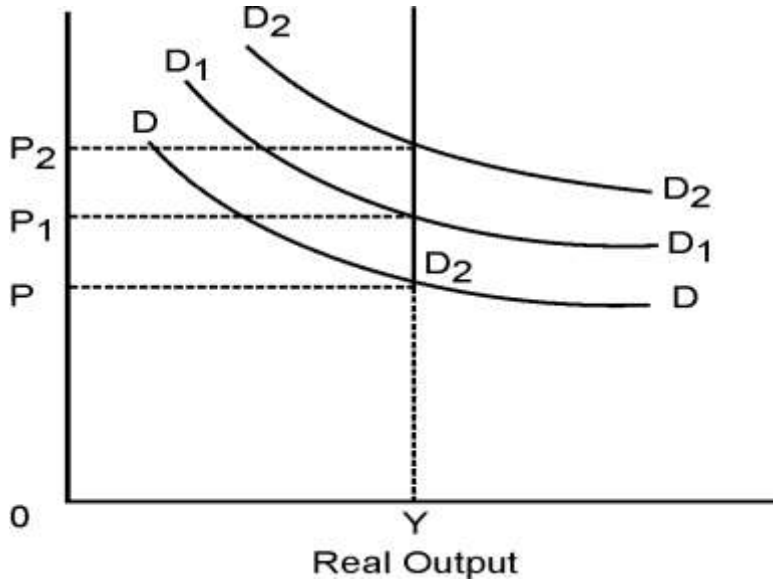

Fig. 13.1 Demand-pull inflation

In the figure, the X-axis represents real output, while the Y-axis indicates the price level. The aggregate demand curves are D, D1, and D2, while the aggregate supply curve (S) slopes upward and becomes vertical at point F, signifying full employment. At this stage, real output remains unchanged. The D curve intersects the S curve at F, establishing the price level at OP. As aggregate demand rises from D to D1 and D2, output remains constant, but prices increase from OP to OP1 and OP2. This inflationary cycle follows a pattern: rising demand → higher prices → increased costs → higher income → further demand → continued price increases.

12.3.1 Causes of Demand-pull Inflation

I. **Rise in Government Spending** – When public expenditure (G) exceeds public revenue, it can lead to inflation. This often occurs

through borrowing from banks or deficit financing, increasing the money supply.

II. **Growth in Investment** – If autonomous investment (I) exceeds current savings, total expenditure rises, creating excess monetary demand and pushing prices higher.

III. **Increase in Marginal Propensity to Consume (MPC)** – Higher MPC leads to greater demand, influenced by social factors like the demonstration effect.

IV. **Rising Exports and Trade Surplus** – In an open economy, higher export demand increases domestic money income. If not counterbalanced by savings or taxation, domestic spending exceeds output, driving inflation.

V. **Resource Diversion** – Shifting resources from consumer goods to capital or military sectors reduces the availability of goods, leading to price increases due to long production periods. The high opportunity cost of war-related goods further intensifies inflationary pressures.

Self-Check Exercise-1

Q1. Define Demand-Pull Inflation.

Q2. What are the causes of demand-pull inflation?

12.4 Cost-Push Inflation

Cost-push inflation is sometimes referred to as **wage inflation** since wages account for nearly 70% of production costs. When wages increase, production costs rise, leading to higher prices.

In the figure 13.2, D represents aggregate demand, while SS is the aggregate supply curve. At full employment, income is OY, where aggregate demand and supply intersect at F. If aggregate supply shifts upward to S1, the economy reaches equilibrium at A, with reduced output (OY1) and a higher price level (P1). Further shifts to S2 raise prices (P2) and lower income (OY2), causing unemployment.

Cost-push inflation may result from wage-push (due to powerful labor unions) or profit-push (where monopolies raise prices to increase profits).

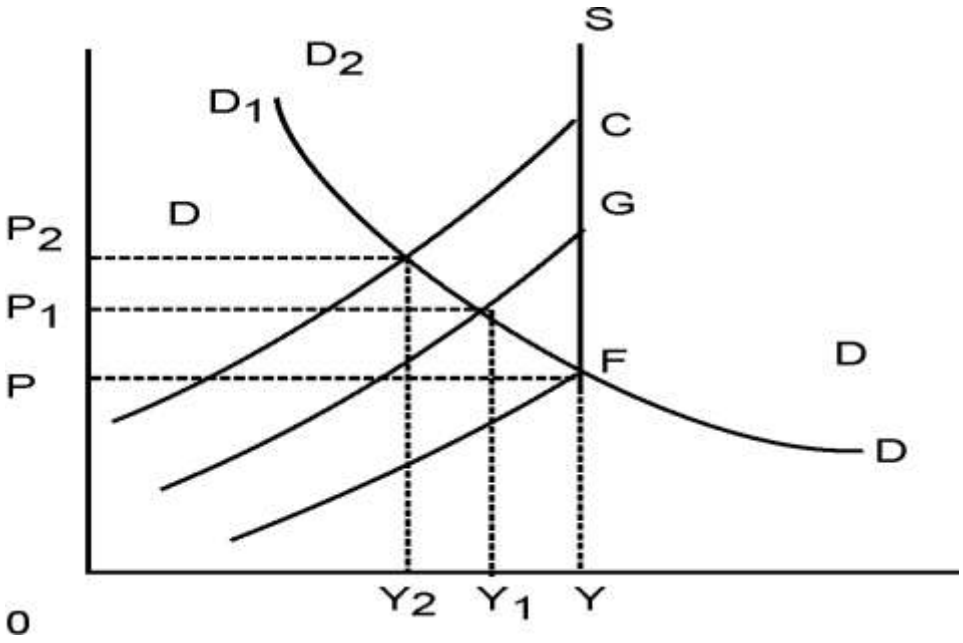

Fig. 13.2. Cost-push Inflation

Self-Check Exercise-2

Q2. Define Cost-Push Inflation.

12.5 Demand-Pull Versus Cost-Push Inflation

Economists have long debated whether inflation is driven by demand-pull or cost-push factors. F. Machlup argues that this distinction is often impractical or irrelevant. The debate largely stems from differences in policy responses. Demand-pull inflation is typically addressed through monetary and fiscal measures, which may increase unemployment. In contrast, cost-push inflation is tackled using administrative controls on prices and wages to curb inflation without causing job losses. Machlup also highlights the blame aspect of inflation. If demand-pull inflation is responsible, governments and central banks are criticized for excessive spending and easy credit. If cost-push inflation is the cause, trade unions, industries, and large firms are blamed for wage hikes and price increases.

However, trade unions reject the wage-push theory because they would not like to be blamed for inflation. They also reject the demand-pull view because that would prevent the use of monetary and fiscal measures to Increase employment. Thus, they hold only big firms responsible for the inflationary rise in prices through administered prices. However, there is no conclusive proof that the profit margins and profit rates of firms have been increasing year after year.

Machlup further points out that there is a group of economists who hold that cost-push is no cause of inflation, "because, without an increase in purchasing power and demand, cost increases would lead to unemployment." On the other hand, there is another group of function economists who believe that demand-pull is no cause of inflation; it takes a cost-push to produce it.

Thus, it is difficult to distinguish demand-pull from cost-push inflation in practice and it is easy to say that inflation has been caused by cost-push when, the fact, demand-pull may be the cause. As pointed out, by Samuelson and Solow, "The trouble is that we have no normal initial standard from which to measure, 110 price levels which has always existed to which everyone has adjusted." It is also suggested that the identification of demand-pull or cost-push inflation can be made with reference to timing. If prices increase first, it is a demand-pull Inflation, and if wages increase, it is cost-push inflation.

Like Machlup, Johnson regards the issue of demand-pull versus cost-push as "largely a spurious one." He assigns three reasons for this. First, the proponents of the two theories fail to investigate the monetary assumptions on which the theories are based; neither the demand-pull nor the cost-push theory can generate sustained inflation unless monetary policy followed by the monetary theory is taken into consideration under varying circumstances. "The two theories are, therefore, not independent and self-contained but rather theories concerning the mechanism of inflation in a monetary environment that permits it." Another distinction between the two theories lies in their interpretation of full employment. If full employment is defined as the point where demand for goods prevents price fluctuations, inflation results from excess demand, leading to demand-pull inflation. In this case, full employment equates to overfull employment, where demand exceeds supply. Alternatively, if full employment is seen as the level where job seekers match available jobs, inflation may arise from factors other than demand, causing cost-push inflation. Additionally, identifying whether inflation is demand-pull or cost-push is challenging, as there is no definitive test to distinguish between the two types.

Self-Check Exercise-3

Q1. Distinguish between demand-pull and cost-push inflation.

12.6 Measures to Control Inflation

Inflation occurs when aggregate supply fails to match rising aggregate demand. It can be managed by increasing supply and reducing money incomes to control demand. The key methods fall into three categories: monetary measures, fiscal measures, and other measures.

12.6.1 Monetary Measures

(a) Credit Control:

The central bank regulates credit by raising interest rates, selling securities, adjusting reserve ratios, and implementing selective credit controls. This approach is effective for demand-pull inflation but less effective for cost-push inflation. Monetary policy may not be effective in controlling inflation if inflation is due to cost-push factors. Monetary policy can only be helpful in controlling inflation due to demand-pull factors.

(b) Demonetizations of Currency:

High-denomination currency is removed from circulation, particularly to curb black money.

(c) Issue of New Currency:

During hyperinflation, replacing old currency with new notes stabilizes the economy but affects small depositors the most.

12.6.2 Fiscal Measures

Monetary policy alone is not enough to control inflation; it must be complemented by fiscal measures. These measures help regulate government spending, private and public investment, and consumption expenditure. The key fiscal strategies include:

(a) **Reduction in Unnecessary Expenditure:** The government should limit spending on non-essential activities to manage inflation. Since private spending is often linked to government demand, reducing public expenditure can have a broader impact. However, distinguishing between necessary and unnecessary spending is difficult, so taxation should complement this approach.

(b**) Increase in Taxes:** Higher personal, corporate, and commodity taxes can help curb excessive spending. However, tax rates should not discourage savings, investment, and production. The government should also enforce stricter penalties on tax evasion and adjust import and export duties to balance supply.

(c) **Increase in Savings:** Promoting savings reduces disposable income, which in turn lowers consumption expenditure. However, with rising living costs, voluntary savings may be low. To address this, compulsory savings schemes such as provident funds, high-interest public loans, and lottery-based savings plans can be introduced.

(d) **Surplus Budgets:** To combat inflation, the government should shift from deficit financing to surplus budgeting, meaning it should collect more revenue than it spends.

(e) **Public Debt:** Instead of repaying public debt immediately, the government can defer payments until inflation is under control. Additionally, borrowing more from the public can reduce the money supply, helping to stabilize prices. Fiscal measures alone are not sufficient to curb inflation. They must be combined with monetary policies and other regulatory actions to achieve stability.

12.6.3 Other Measures

Apart from monetary and fiscal policies, other strategies focus on boosting aggregate supply and directly controlling aggregate demand. These measures include:

(a) **To Increase Production:** To curb inflation, it is crucial to increase the supply of essential consumer goods such as food, clothing, and fuel. If necessary, raw materials should be imported on a priority basis to support production.Industrial stability can encourage productivity improvements by ensuring that agreements with trade unions prevent disruptions like strikes. In the long run, adopting modern production techniques and promoting industrial efficiency can sustain increased output. Providing industries with technological support, financial aid, raw materials, and subsidies can further enhance production levels.

(b) **Rational Wage Policy:** A well-structured wage and income policy helps control inflation. In cases of hyperinflation, unchecked wage hikes can trigger a wage-price spiral. A temporary wage freeze may be considered, though it could face resistance from workers and businesses. A more effective approach is to align wage increases with productivity growth, ensuring a balanced rise in income and output.

(c) **Price Control:** Price controls set legal maximum prices for essential goods, preventing excessive inflation. However, enforcing price regulations can be challenging and may lead to unintended consequences such as shortages and black-market activities.

(d) **Rationing:** Rationing is a method to distribute scarce resources fairly and prevent price surges. It is often applied to necessities like grains, fuel, and sugar to ensure affordability for all. However, it can create long queues, artificial shortages, and corruption. Economist John Maynard Keynes criticized rationing, stating that it wastes resources and reduces employment opportunities. While these measures can help stabilize the economy, they must be carefully implemented alongside monetary and fiscal policies for long-term effectiveness.

Self-Check Exercise-4

Q1. Discuss various measures to control inflation.

Q1. Discuss monetary measures to control inflation.

12.7 Summary

To effectively control inflation, a combination of monetary, fiscal, and other policy measures should be implemented together. Inflation is a complex economic issue that requires a comprehensive approach. Governments must utilize all available tools, such as controlling credit, managing public expenditure, and increasing production, to stabilize prices. Demand-pull inflation occurs when overall demand surpasses supply, leading to rising prices. In contrast, cost-push inflation results from higher production costs, particularly due to wage increases, which push prices upward. Addressing inflation requires coordinated efforts to balance demand and supply while ensuring economic stability and sustainable growth.

12.8 Glossary

- **Demand-Pull Inflation:** A condition where aggregate demand consistently exceeds aggregate supply, leading to an upward movement in prices due to increased consumer spending and investment.
- **Cost-Push Inflation:** A type of inflation primarily driven by rising production costs, particularly wage increases. As wages make up a significant portion of production expenses, an increase in wages leads to higher costs for businesses, which are then passed on to consumers in the form of higher prices.

12.9 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 12.3.

Answer to Q2. Refer to Section 12.3.1.

Self-Check Exercise-2

Answer to Q1. Refer to Section 12.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 12.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 12.6.

Answer to Q2. Refer to Section 12.6.1.

12.10 References/Suggested Readings

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10. Srinivasan, T. N. (2008). Price indices and inflation rates. *Economic and Political Weekly, 43*(26), 217-223.

12.11 Terminal Questions

Q1. What do you understand by cost-push inflation?

Q2. What are the different measures to control inflation?

Q3. Define demand-pull inflation. What are the causes of demand-pull inflation?

Q4. What are the fiscal measures to control the inflation?

UNIT-13
Unemployment and Phillips Curve

STRUCTURE

13.1 Introduction

Unemployment as defined by the International Labour Organization occurs when people are without jobs and have actively looked for work within the past four weeks. Unemployment is the situation of actively looking for employment but not being currently employed. The unemployment rate indicates the proportion of unemployed individuals within the labour force, expressed as a percentage. It is calculated by dividing the number of unemployed persons by the total labour force. During economic downturns, unemployment tends to rise significantly. In 2012, an International Labour Organization

report estimated that over 200 million people, or 6% of the global workforce, were unemployed. The workforce includes individuals actively seeking employment but excludes retirees, those with disabilities, and individuals not currently looking for work due to personal commitments such as education or caregiving responsibilities.

13.2 Learning Objectives

By the end of this unit, you will be able to

- Define unemployment
- Explain types and measurements of unemployment
- Explain the causes and effects of unemployment
- Define the Philips curve
- Explain short-run and long-run Phillips curve
- Explain the relationship between expectations and inflation

13.3 Types of Unemployment

Unemployment can be classified into different types based on its causes and characteristics:

1. **Frictional Unemployment:** This is a temporary form of unemployment that occurs when individuals are between jobs. It arises as people transition from one job to another, taking time to find a suitable position. In developed economies, frictional unemployment tends to be lower due to better job-matching services and employment insurance.

2. **Structural Unemployment:** This occurs when shifts in the economy lead to a mismatch between workers' skills and job requirements. Causes include geographical immobility (difficulty relocating for work), occupational immobility (challenges in acquiring new skills), and technological advancements that reduce labour demand. The extent of structural unemployment depends on an economy’s growth rate and industrial structure.

3. **Classical Unemployment:** Also known as real wage or disequilibrium unemployment, this happens when wages are set above market equilibrium due to factors such as trade union negotiations, leading to reduced labour demand.

4. **Cyclical Unemployment:** This type of unemployment is linked to economic downturns. When demand for goods and services declines, businesses cut back on production, leading to job losses, especially for unskilled and surplus workers.

5. **Seasonal Unemployment:** This occurs in industries where job availability fluctuates based on the time of year. Sectors such as tourism, hospitality, agriculture, and catering often experience seasonal employment patterns.

6. **Voluntary Unemployment:** Unlike other forms, this happens when individuals choose not to work, either due to personal preferences or because they cannot find a job that meets their expectations. It is sometimes considered a subset of frictional unemployment.
7. **Institutional Unemployment:** This results from structural barriers within the labour market, such as government regulations, wage controls, labour union activities, and taxation policies, which can limit job opportunities.

Self-Check Exercise-1

Q1. Define

1. Frictional Unemployment
2. Structural Unemployment

Q2. What are the various types of unemployment?

13.4 Measurement of Unemployment

Economists primarily assess unemployment using the unemployment rate rather than just the number of jobless individuals. This approach accounts for changes in population and workforce participation over time. The unemployment rate is represented as a percentage and is calculated using the formula:

$$Unemployment\ Rate = \frac{Unemployed\ Workers}{Total\ Labour\ Force}$$

According to the International Labour Organization (ILO), unemployed individuals are those who are not currently employed but are willing and able to work, available for employment, and actively seeking job opportunities.

Self-Check Exercise-2

Q1. What is the unemployment rate?

13.5 Causes of Unemployment

The causes of unemployment are the following:

i. Rapid changes in technology

ii. Recessions

iii. Inflation

iv. Disability

v. Undulating business cycles

vi. Changes in tastes as well as alterations in the climatic conditions. This may in turn lead to a decline in demand for certain services as well as products.

vii. Attitude towards employers

viii. Willingness to work

ix. Perception of employees

x. Employee values

xi. Discriminating factors in the place of work (may include discrimination on the basis

of age, class, ethnicity, colour and race).

xii. Ability to look for employment

Self-Check Exercise-3

Q1. What are the causes of unemployment?

13.6 Effect of Unemployment

Unemployment has significant financial and social consequences. Individuals without jobs struggle to meet financial commitments, which may lead to eviction or foreclosure. The effects include:

i. Increased vulnerability to malnutrition, health issues, mental stress, and low self-esteem, often resulting in depression.

ii. Historical examples, such as the Great Depression, highlight the severe impact of unemployment.

iii. Many unemployed individuals accept jobs that do not match their skills due to financial constraints and social responsibilities.

iv. Unemployment may lead to underemployment, while job insecurity can cause psychological distress.

Self-Check Exercise-4

Q1. Discuss the effects of unemployment in an economy.

13.7 The Philips Curve: Relation between Unemployment and Inflation

The Phillips Curve illustrates the inverse relationship between inflation and unemployment. This concept, introduced by economist A.W. Phillips in 1958, is widely used in macroeconomic analysis. Phillips initially examined wage inflation and unemployment in the UK from 1861 to 1957, plotting the data on a scatter diagram. The findings indicated a stable, inverse relationship. Later, economists replaced wage inflation with price inflation, confirming the theory across major economies.

13.7.1 Short-Run Phillips Curve

The relationship between inflation and unemployment can be understood through the Phillips Curve. When aggregate demand declines, the overall price level in the economy falls, leading to a decrease in inflation. Consequently, higher unemployment is associated with lower inflation, illustrating an inverse relationship. However, this connection is not strictly linear.

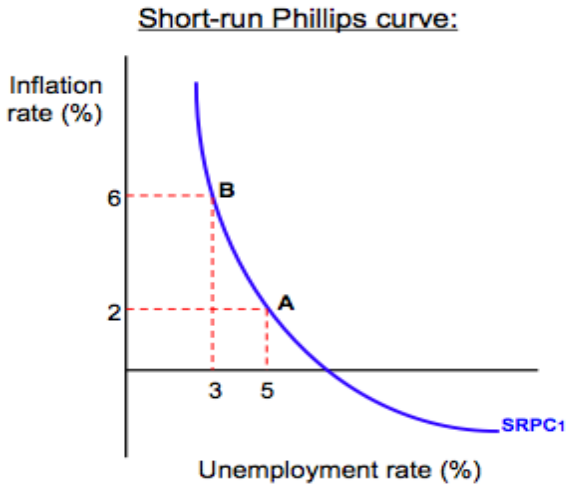

Fig. 13.1 Short Run Phillips Curve

Graphically, the short-run Phillips Curve forms an L-shape, with unemployment on the x-axis and inflation on the y-axis. The curve suggests a trade-off—lower unemployment tends to result in higher inflation, and vice versa. For instance, an economy may face 3% unemployment with 6% inflation or 5% unemployment with 2% inflation.

13.7.2 The Long-Run Phillips Curve

In the long run, inflation and unemployment are not directly related, as represented by a vertical Phillips curve at the natural rate of unemployment. While a short-term trade-off exists, economists argue that in the long run, attempts to reduce unemployment through expansionary policies only result in higher inflation without affecting unemployment.

13.7.2.1 Natural Rate Hypothesis

Milton Friedman and Edmund Phelps introduced the concept of the non-accelerating inflation rate of unemployment (NAIRU). According to this theory, when unemployment is below the natural rate, inflation accelerates, and when it is above, inflation slows. At the natural rate, inflation remains stable.

Example: If an economy starts at equilibrium and the government implements expansionary policies, inflation rises while unemployment initially declines. However, as inflation expectations adjust, unemployment returns to its natural level, leading to persistently higher inflation.

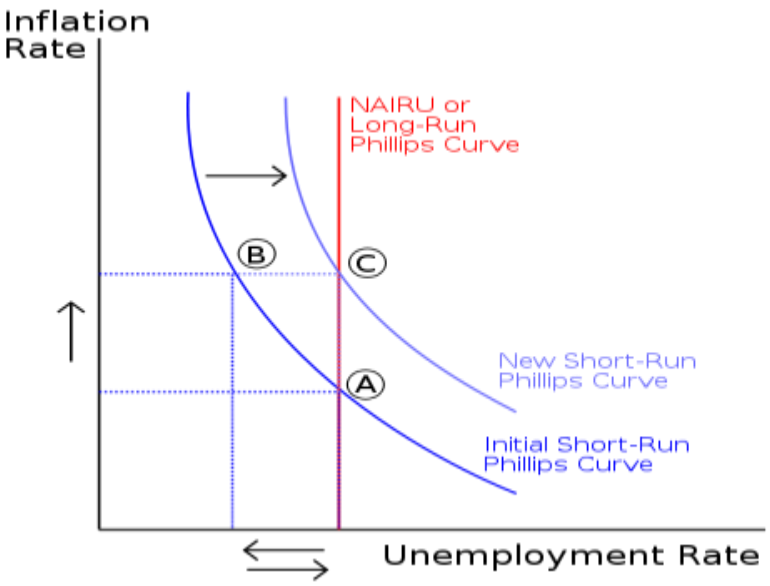

Fig. 13.2 Long Run Philips Curve

Initially, the economy may experience low inflation at point A. However, any attempt to reduce unemployment below the natural rate (NAIRU) results in rising inflation, leading to point C. In the long run, unemployment cannot fall below NAIRU without triggering higher inflation.

The short-run Phillips curve shifts due to changing inflation expectations. Workers, being aware of inflationary trends, recognize that their real wages decline when inflation rises faster than nominal wages (movement from A to B). To maintain their purchasing power, they negotiate higher wages, increasing production costs for firms. As costs rise, businesses reduce output and cut jobs, shifting the economy from B to C. As a result, efforts to lower unemployment only lead to persistently high inflation without a long-term reduction in unemployment.

NAIRU theory helps explain the stagflation of the 1970s when both inflation and unemployment remained high. This occurred because changing inflation expectations caused the short-run Phillips curve to shift, leading to sustained inflation without reducing unemployment.

Self-Check Exercise-5

Q1. Define

1. Phillips Curve
2. NAIRU

Q2. What is the Phillips curve? Examine the relationship between unemployment and inflation with the help of the short-run Phillips curve.

13.8 Relationship between Expectations and Inflation

There are two main theories—adaptive expectations and rational expectations—that explain how individuals anticipate inflation. The short-run Phillips curve shifts due to changes in inflation expectations, but how are these expectations formed? These theories help understand how people predict inflation based on past trends or forward-looking assessments.

13.8.1 Real versus Nominal Quantities

To understand expectations, it's important to distinguish between real and nominal values. A nominal value represents a stated figure, while a real value is adjusted for inflation. For example, if a savings account offers a 5% interest rate but inflation is 3%, the real interest rate is 2% (5% - 3%). This distinction applies not only to interest rates but also to GDP, wages, income, and exchange rates.

13.8.2 Adaptive Expectations

According to the adaptive expectations theory, people predict future inflation based on past trends. If inflation was consistently lower than expected, individuals will revise their expectations downward.

For instance, suppose an economy is at point A with a stable inflation rate of 2% and unemployment at its natural rate. Based on past experience, workers expect inflation to remain at 2% and negotiate wages accordingly. This ensures that their nominal wages rise in line with inflation, preserving their real wages over time.

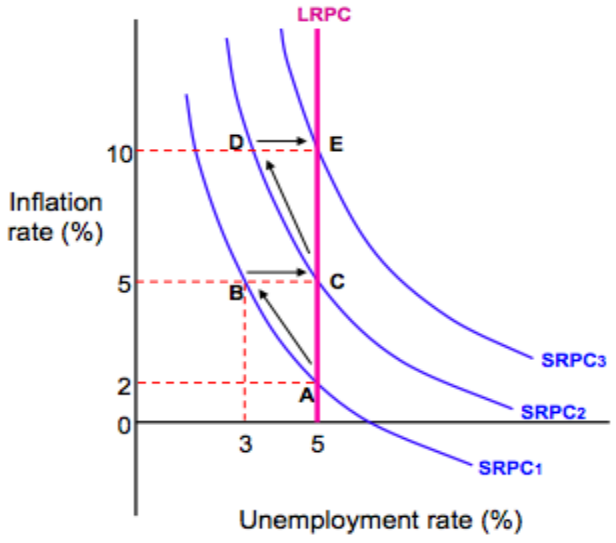

Fig. 13.3 Expectations and the Phillips Curve

The relationship between expectations and the Phillips curve can be understood through two key theories: adaptive expectations and rational expectations.

According to the adaptive expectations theory, efforts to reduce unemployment initially lower it temporarily at the cost of rising inflation (moving from point A to point B). However, in the long run, unemployment returns to its natural rate at point C, leaving behind only higher inflation. In contrast, the rational expectations theory suggests that workers anticipate inflation correctly and adjust their wage expectations accordingly. As a result, expansionary policies move the economy directly from point A to point C, bypassing point B altogether. Suppose the government implements expansionary policies to reduce unemployment. As aggregate demand rises, inflation increases, and workers' real wages decline. For instance, if a worker earns $100 with a 2% inflation adjustment, their nominal wage becomes $102, maintaining their real wage at $100. However, if inflation rises unexpectedly to 6%, their real wage effectively drops to about $96.23.

In the short run, lower real wages make hiring labour more affordable for firms, leading to job creation and increased output (moving from point A to point B). However, as workers recognize the decline in their purchasing power, they demand higher wages to compensate for inflation. Rising labour costs reduce business profits, leading to job cuts and restoring the unemployment rate to its natural level (moving from point B to point C). This scenario illustrates how adaptive expectations explain the absence of a long-term trade-off between inflation and unemployment. While unemployment can be temporarily reduced through inflationary policies, in the long run, expectations adjust, and the economy reverts to its natural state—only at a higher inflation level.

13.8.3 Rational Expectations

The rational expectations theory suggests that individuals use all available information to form accurate forecasts about future economic conditions. As a result, their predictions are generally aligned with market equilibrium. Unlike adaptive expectations, where predictions are based primarily on past trends, rational expectations incorporate both historical data and current economic indicators, such as inflation rates and policy changes. Consider an economy that starts at point A, where the inflation rate is 2% and unemployment is at its natural rate. Under rational expectations, workers are well-informed and anticipate economic changes accurately. If the government enacts expansionary policies to boost aggregate demand, workers foresee the inflationary effects and demand higher wages immediately. This eliminates any temporary reduction in real wages and prevents a period of lower unemployment. Since workers adjust their expectations in advance, the economy moves directly from point A to point C, bypassing any short-term dip in unemployment at point B. This means that policies aimed at reducing unemployment will not be effective in the long run, as workers' rational behavior neutralizes their impact. Instead, such policies result only in higher inflation, reinforcing the idea that there is no long-term trade-off between inflation and unemployment.

Self-Check Exercise-6

Q1. Define

1. Adoptive Expectations
2. Rationale Expectations

Q2. What is the relationship between expectations and inflation?

13.9 Summary

Unemployment refers to the condition where individuals are actively seeking jobs but are not currently employed. The unemployment rate represents the proportion of unemployed individuals within the labor force and is calculated as a percentage of the total workforce. There are several types of unemployment, including frictional, structural, classical, cyclical, seasonal, voluntary, and institutional unemployment. The Phillips curve illustrates the relationship between inflation and unemployment. In the short run, the curve slopes downward, indicating an inverse relationship—when unemployment declines, inflation rises, and vice versa. However, in the long run, the Phillips curve is a vertical line, showing that inflation and unemployment are not permanently linked, and any attempts to reduce unemployment below its natural rate will only lead to higher inflation over time.

13.10 Glossary

- **Unemployment**: A situation where individuals are actively seeking work but are not currently employed.
- **Frictional Unemployment**: Temporary unemployment that occurs when individuals transition between jobs or enter the labor market.
- **Structural Unemployment**: Unemployment caused by a mismatch between workers' skills and job requirements due to economic changes.
- **Cyclical Unemployment**: Unemployment that rises during economic downturns and falls during periods of economic growth.
- **Phillips Curve**: A graphical representation of the short-run inverse relationship between inflation and unemployment.
- **NAIRU (Non-Accelerating Inflation Rate of Unemployment)**: The level of unemployment at which inflation remains stable in the long run.

13.11 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 13.3.

Answer to Q2. Refer to Section 13.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 13.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 13.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 13.6.

Self-Check Exercise-5

Answer to Q1. Refer to Section 13.7.

Answer to Q2. Refer to Section 13.7.

Self-Check Exercise-6

Answer to Q1. Refer to Sections 13.8.2 & 13.8.3.

Answer to Q2. Refer to Section 13.8.

13.12 References/Suggested Readings

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13.13 Terminal Questions

Q.1 What is unemployment? What are the types of unemployment and how we can measure it?

Q.2 What are the causes and effects of unemployment?

Q.3 What is the Phillips curve?

UNIT-14
IS-LM Analysis-I

STRUCTURE

14.1 Introduction

The IS-LM model illustrates the interaction between the goods market (IS curve) and the money market (LM curve), providing a framework for analyzing interest rates, income, and output in an economy. Keynes' analysis of national income suggests that equilibrium is reached when aggregate demand for consumption and investment matches total output. He viewed investment as influenced by interest rates and the marginal efficiency of capital, rather than by national income levels.

Keynes proposed that interest rates are determined by the balance between money supply and demand. Changes in interest rates then impact investment, influencing national income and output. However, some economists argue that shifts in the goods market (such as investment and income levels) do not directly affect money market equilibrium. J.R. Hicks and other scholars challenged this view, demonstrating that income variations—driven by investment or consumption changes—affect the demand for money and, consequently, interest rates. Hicks, Hansen, Lerner, and Johnson expanded Keynes' model by integrating these interactions into a unified framework. The IS-LM model represents these relationships through two key curves: the IS curve (depicting goods market equilibrium) and the LM curve (representing money market equilibrium). This extension provides a more comprehensive understanding of how income levels and interest rates are interdependent in Keynesian economics.

14.2 Learning Objectives

After completing this unit, you will be able to

- Understand IS-LM Curve Model
- Examine Goods Market Equilibrium (IS Curve)
- Examine Money Market Equilibrium (LM Curve)

14.3 The Goods Market and Money Market

14.3.1 Goods Market

In the IS-LM model, the goods market is represented by the IS (Investment-Savings) curve, which illustrates the relationship between interest rates and output levels where the market is in equilibrium. This market includes the production and consumption of goods and services, with total spending—comprising consumption, investment, government expenditure, and net exports—determining equilibrium output. Investment and consumption are influenced by interest rate fluctuations; lower interest rates encourage borrowing, leading to higher investment and consumption, thus increasing aggregate demand. Conversely, higher interest rates reduce borrowing, leading to a

decline in investment and consumption, ultimately lowering aggregate demand and output.

14.3.2 Money Market

The money market in the IS-LM framework is represented by the LM (Liquidity Preference-Money Supply) curve, which shows the equilibrium relationship between interest rates and output levels. This equilibrium is achieved when the demand for money, which depends on income levels and interest rates, aligns with the money supply set by the central bank. As income rises, the demand for money increases, potentially pushing interest rates higher if the money supply remains unchanged. On the other hand, an increase in money supply can lower interest rates, encouraging investment and spending. The interaction between the IS and LM curves determines the overall equilibrium of interest rates and national income in an economy.

Self-Check Exercise-1

Q1. What do you mean by goods market?

Q2. Define the Money Market.

14.4 Goods Market Equilibrium; Derivation of IS Curve

The goods market reaches equilibrium when the level of investment matches the level of savings. Savings tend to increase as income rises, establishing a direct relationship between the two.

S=f(Y) .....(1)

Investment is inversely related to the rate of interest:

I=f(r).....(2)

In equation (1) and (2) S=I

The IS curve represents equilibrium in the goods market and illustrates the relationship between income and the interest rate. It is also referred to as the real sector equilibrium.

In the IS curve framework, the interest rate acts as the independent variable, while income serves as the dependent variable. The curve slopes downward, with interest rate (i) on the vertical axis and income (Y) on the horizontal axis. This downward slope reflects the inverse relationship between investment and the interest rate.

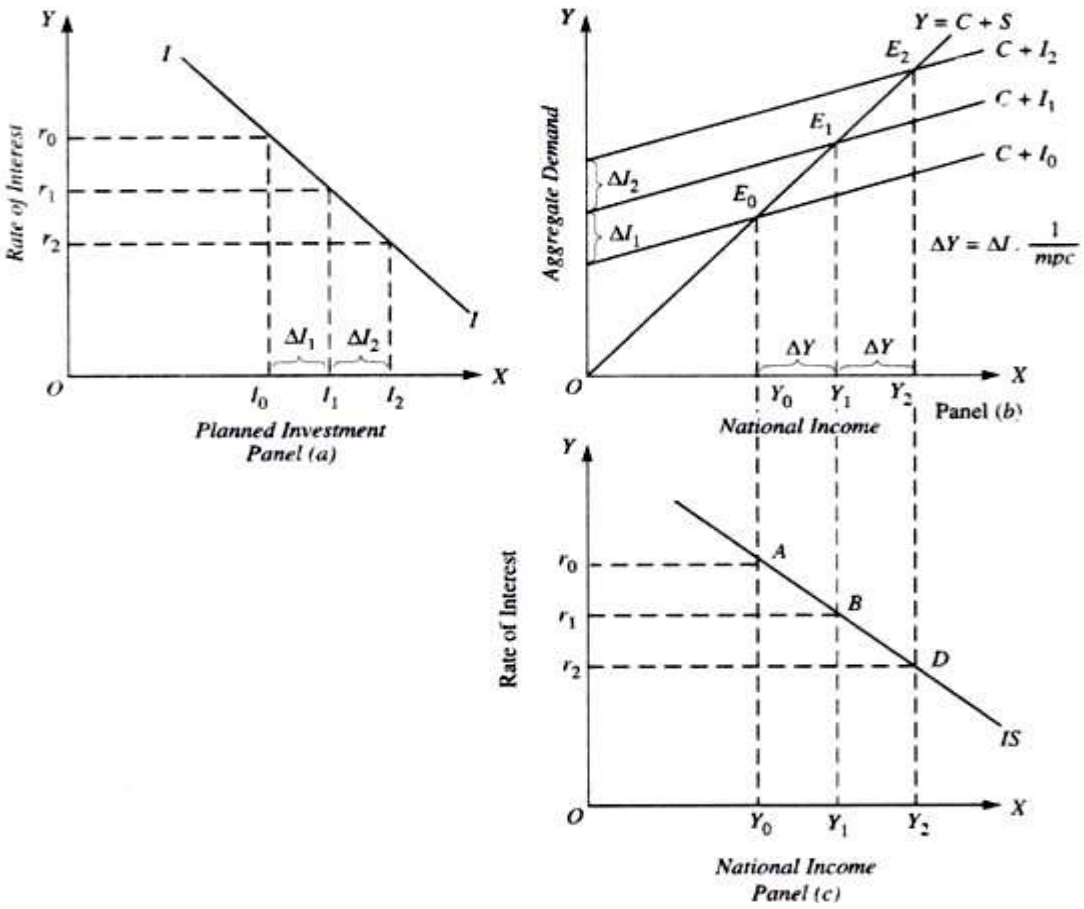

Fig. 14.1 Derivation of IS Curve: Linking Rate of Interest with national income through investment and aggregate demand

The IS curve represents combinations of interest rates and national income where the goods market remains in equilibrium. A lower interest rate leads to a higher equilibrium level of national income, forming the IS curve.

The derivation of the IS curve is illustrated in the figure. In panel (a), the relationship between interest rate and planned investment is shown by the investment demand curve. At an interest rate of Or_0, planned investment equals OI_0. Given this level of investment, the aggregate demand curve ($C + I_0$) determines equilibrium national income at OY_0 in panel (b).

When the interest rate decreases to Or_1, planned investment rises to OI_1, shifting the aggregate demand curve upward to $C + I_1$. The new equilibrium income level is OY_1. Similarly, when the interest rate further declines to Or_2, investment increases to OI_2, shifting the aggregate demand curve to $C + I_2$, with a corresponding increase in equilibrium income to OY_2.

Panel (c) plots these interest rate-income combinations. Connecting points A, B, and C—representing different equilibrium levels—forms the IS curve. The downward slope

of the IS curve indicates the inverse relationship between interest rates and national income: lower interest rates boost investment and income, while higher interest rates reduce them.

14.4.1 Slope of the IS Curve

The IS curve slopes downward because a reduction in the interest rate encourages greater investment spending, which increases aggregate demand and raises national income. This inverse relationship between interest rates and income results in a downward-sloping IS curve.

The degree of steepness of the IS curve is influenced by two factors:

1. **Elasticity of Investment Demand:** If investment demand is highly responsive to changes in interest rates, a small decrease in interest rates will significantly boost investment. This, in turn, shifts aggregate demand upwards, leading to a larger increase in national income. In this case, the IS curve is relatively flatter. Conversely, if investment demand is less responsive to interest rate changes, the IS curve will be steeper.
2. **Multiplier Effect:** The multiplier depends on the marginal propensity to consume (MPC). A higher MPC leads to a steeper aggregate demand curve and a larger multiplier, meaning that a given increase in investment results in a more significant rise in national income. This makes the IS curve flatter. On the other hand, if the multiplier is smaller due to a lower MPC, the increase in national income will be more limited, making the IS curve steeper.

Self-Check Exercise-2

Q1. What do you mean by goods market equilibrium/

Q2. What accounts for the downward-sloping nature of the IS curve?

14.5 Shift in IS Curve:

The position of the IS curve is influenced by factors affecting savings and investment. A reduction in the savings rate or an increase in investment shifts the IS curve to the right, indicating higher equilibrium income at a given interest rate. Conversely, an increase in the savings rate or a decline in investment shifts the IS curve to the left, reflecting lower income levels. The key determinant of the IS curve's position is the level of autonomous expenditure. Any change in autonomous expenditure, such as government spending or consumption independent of income, causes the IS curve to shift accordingly.

Self-Check Exercise-3

Q1. What factors cause a shift in the IS Curve?

14.6 Money Market Equilibrium: Derivation of LM Curve

The money market reaches equilibrium when the quantity of money demanded matches the money supply. Here, L represents the demand for money, while M denotes the money supply. Equilibrium occurs when L=M, ensuring stability in the financial system.

$L = L_T + L_S$ where L_T is transaction money which is directly related to the level of income, $L_T = f(Y)$. L_S show the speculation demand of money which is inversely related to the rate of interest, $L_S = f(r)$. So, the equilibrium in the money market is:

$M = L_T(Y) + L_S(r)$.....(3)

The LM curve represents the relationship between the interest rate and the level of income at which the money market is in equilibrium, meaning that the demand for money (L) equals the supply of money (M). It is derived from Keynesian monetary theory, which explains money demand based on transaction and speculative motives.

The demand for money for transaction purposes is directly linked to income, as individuals and businesses require money to finance their expenditures. A higher income level leads to an increased demand for money. Additionally, the demand for money is influenced by the interest rate, as holding money instead of investing it results in an opportunity cost in terms of forgone interest earnings.

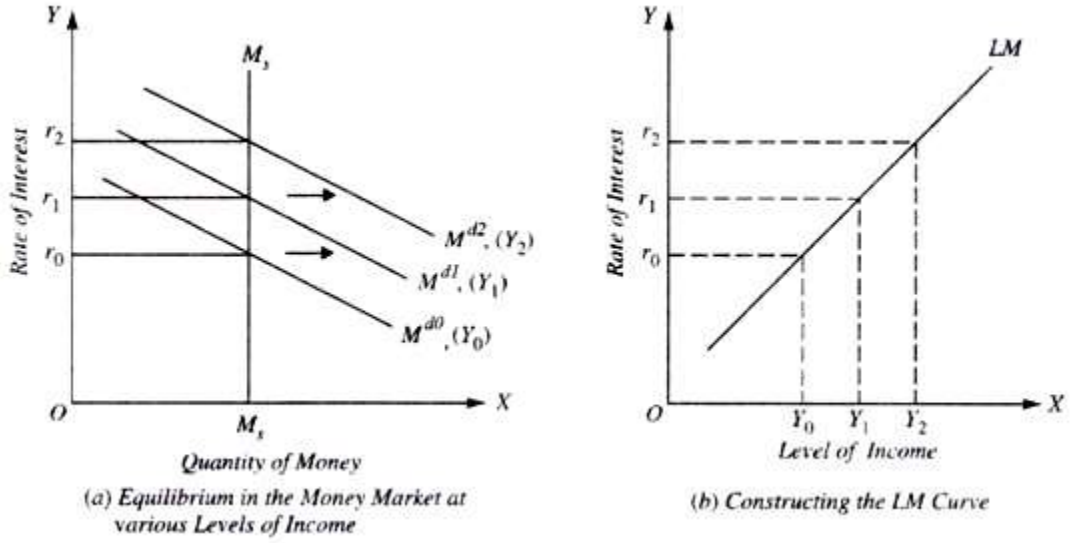

Fig. 14.2 Derivation of LM Curve

The LM curve derivation is illustrated using Keynesian liquidity preference theory. In the diagram, liquidity preference curves (M^{d0},M^{d1},M^{d2}) represent the demand for money, while the vertical money supply curve (M1M_1M1) reflects Keynes's assumption that money supply remains fixed. Equilibrium occurs where money demand equals money supply at different income levels. At income level Y0, equilibrium is achieved at interest rate r0, while at higher income levels (Y1 and Y2), the corresponding equilibrium interest rates are r1 and r2. When these points are connected, they form an upward-

sloping LM curve, indicating that higher income levels are associated with higher interest rates.

14.6.1 Slope of LM Curve

The LM curve illustrates how the interest rate is influenced by income levels within an economy, based on the equilibrium between money supply and demand. Since higher income levels lead to an increased demand for money, a higher interest rate is required to restore equilibrium in the money market, resulting in an upward-sloping LM curve.

The steepness of the LM curve is influenced by two key factors:

1. **Sensitivity of Money Demand to Income Changes**: As income rises from Y0 to Y1, the demand for money also increases due to greater transactional needs, shifting the money demand curve from M^{d0} to M^{d1}. This disrupts equilibrium in the money market, requiring an increase in the interest rate to restore balance. At the new equilibrium, more money is held for transactions, while the amount available for speculative purposes declines. The stronger the increase in money demand for transactions as income rises, the steeper the LM curve, since a larger adjustment in interest rates is needed to maintain equilibrium.
2. **Responsiveness of Money Demand to Interest Rate Changes** The second factor affecting the LM curve's slope is how sensitive speculative money demand is to changes in the interest rate. If the demand for money held for speculative purposes is less responsive to interest rate fluctuations, the LM curve will be steeper. Conversely, if speculative money demand is highly elastic, the LM curve will be flatter, as smaller changes in interest rates can restore equilibrium in the money market.

Self-Check Exercise-3

Q1. Define money market equilibrium. How the equilibrium is determined in the money market?

Q2. Discuss the factors determining the slope of the LM curve.

14.7 Shifts in the LM Curve

Understanding what causes shifts in the LM curve is essential in the IS-LM model. The position of the LM curve depends on factors such as the money supply and liquidity preference. Since the LM curve is plotted with a fixed money supply, any increase in the money supply, assuming no change in money demand, leads to a lower interest rate for a given level of income. This happens because, with a constant income level, the interest rate must decrease to encourage higher money demand for both transactions and speculation. As a result, the LM curve shifts to the right. Another factor influencing shifts in the LM curve is changes in liquidity preference (money demand) at a given income level. If money demand increases, keeping the money supply constant, interest rates will rise for the same level of income, shifting the LM curve to the left. Conversely,

if money demand declines, the interest rate at a given income level falls, causing the LM curve to shift to the right.

Self-Check Exercise-5

Q1. Discuss the factors that cause a shift in the LM curve.

14.8 Summary

In the IS-LM model, equilibrium in both the goods and money markets is essential for economic stability. The IS curve represents goods market equilibrium, where total output equals total spending, influenced by factors like consumption, investment, government spending, and net exports. Lower interest rates boost investment and consumption, shifting output. The LM curve represents money market equilibrium, where money demand matches supply. As income rises, money demand increases, affecting interest rates if supply remains constant. The IS curve slopes downward, showing the inverse relationship between interest rates and output, while the LM curve slopes upward, indicating a positive link between interest rates and income. These interactions help analyze economic fluctuations and policy impacts.

14.9 Glossary

- **IS-LM Model**: A macroeconomic framework that explains the interaction between the goods and money markets, showing how interest rates, income, and output influence each other.
- **Goods Market Equilibrium**: Occurs when total output matches total spending (consumption, investment, government spending, and net exports). Represented by the downward-sloping IS curve, which reflects the inverse relationship between interest rates and output.
- **Money Market Equilibrium**: Achieved when money demand equals money supply, as shown by the upward-sloping LM curve, indicating a positive relationship between interest rates and income.
- **IS Curve**: Represents equilibrium in the goods market, showing combinations of interest rates and output where spending equals production.
- **LM Curve**: Represents equilibrium in the money market, illustrating combinations of interest rates and income where money demand equals supply.

14.10 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 3.1.

Answer to Q2. Refer to Section 3.2.

Self-Check Exercise-2

Answer to Q1. Refer to Section 4.

Answer to Q2. Refer to Section 4.1.

Self-Check Exercise-3

Answer to Q1. Refer to Section 5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 6.

Answer to Q2. Refer to Section 6.1.

Self-Check Exercise-5

Answer to Q1. Refer to Section 7.

14.11 References/Suggested Readings

1. Evans, M. K. (2004). *Macroeconomics for managers*. Blackwell Publishing Ltd.
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14.12 Terminal Questions

Q1. Describe the goods market equilibrium within the IS-LM curve model and illustrate it with a diagram.

Q2. How do the IS and LM curves represent equilibrium in the goods and money markets, respectively, within the IS-LM curve model?

UNIT-15
IS-LM Analysis-II

STRUCTURE

15.1 Introduction

The IS-LM model integrates money, interest rates, and income within the framework of general equilibrium. The IS curve represents equilibrium in the goods market, where investment equals savings, while the LM curve depicts equilibrium in the money market, where money demand matches supply. Together, these curves illustrate the interaction between the goods and money markets, shaping overall economic equilibrium.

15.2 Learning Objectives

After completing this unit, you will be able to

- Understand the IS-LM curve model
- Understand Simultaneous Equilibrium in Product (Goods) and Money Market

15.3 Simultaneous Equilibrium of Product and Money Market (IS-LM)

The equilibrium level of income and interest rate is determined at the intersection of the IS and LM curves. At this point, savings equal investment, ensuring equilibrium in the goods market, while money demand matches the fixed money supply, achieving balance in the money market.

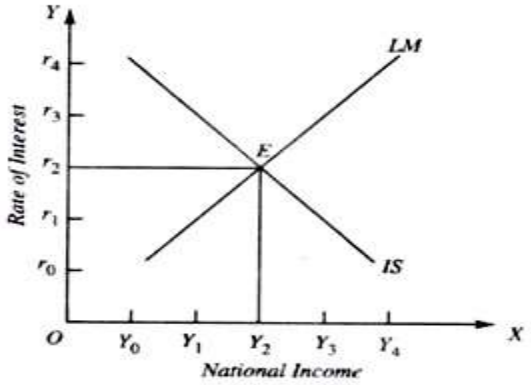

Fig. 15.1 The IS and LM Curves Combined Joint Determination of the Interest Rate and the National Income

The IS-LM model is built upon:

1. Investment-demand function
2. Saving function
3. Money demand function
4. Money supply

Both real factors (savings and investment) and monetary factors (money demand and supply) influence income and interest rate equilibrium. Any change in these elements shifts the IS or LM curve, altering the equilibrium.

Self-Check Exercise-1

Q1. Define

1) Product Market Equilibrium
2) Money Market Equilibrium

Q2. Define simultaneous equilibrium in the product and money market with the help of a diagram.

15.4 Changes in the General Equilibrium

15.4.1 Effect of Changes in Supply of Money on the Rate of Interest and Income Level

When the money supply increases, the LM curve shifts downward, while a decrease in money supply shifts it upward. If the central bank increases the money supply, more funds become available for speculative purposes at a given income level, leading to a lower interest rate and shifting the LM curve to the right.

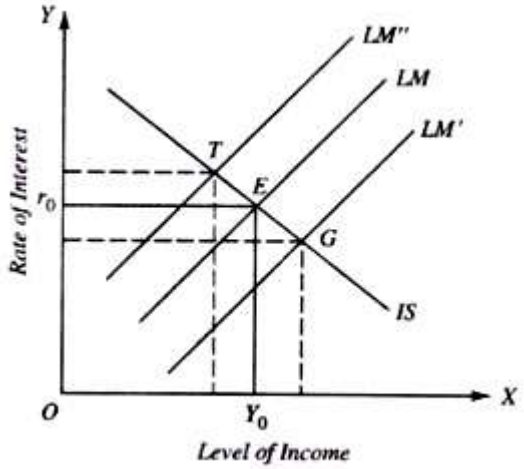

Fig. 15.2 Impact of Changes in Supply of Money

When the LM curve shifts right due to an increase in the money supply, the new equilibrium results in a lower interest rate and higher income level. This occurs as the IS curve remains unchanged. Conversely, if the central bank reduces the money supply, less money is available for speculative purposes, shifting the LM curve left. In this scenario, the interest rate rises, and income decreases.

15.4.2 Changes in the Desire to Save or Propensity to Consume

To understand the impact of changes in saving behavior on interest rates, we need to analyze shifts in consumption patterns. A reduction in the tendency to save, which translates to an increase in the propensity to consume, leads to a rise in aggregate demand. This, in turn, elevates the national income at every given interest rate.

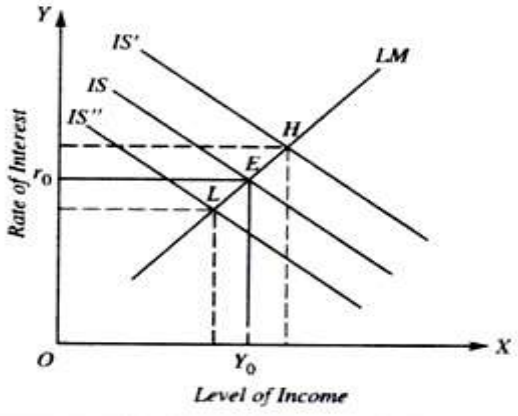

Fig. 15.3 Impact of Changes in Propensity to Save

As a consequence, the IS curve shifts to the right, representing a higher level of output and expenditure. For instance, in Fig. 15.3, a decline in savings (or an increase in consumption) moves the IS curve rightward to its new position, labeled IS'. Assuming the LM curve remains unchanged, a new equilibrium is established at point H. At this point, both the interest rate and the income level exceed their initial values at E.

Conversely, if individuals choose to save more and consume less, aggregate demand declines. This reduction in spending results in lower national income at each interest rate, shifting the IS curve to the left. If the LM curve remains constant, the economy reaches a new equilibrium to the left of E, at point L (as illustrated in Fig. 16.5). At this new equilibrium, both interest rates and national income are lower compared to their previous levels.

15.4.3 Changes in Autonomous Investment and Government Expenditure

Changes in autonomous investment and government spending significantly influence the IS curve. An increase in private investment or a rise in government expenditure boosts aggregate demand, leading to higher national income through the multiplier effect. As a result, the IS curve shifts to the right. Given a fixed LM curve, this shift causes both the interest rate and income level to increase.

Conversely, a decline in private investment or a reduction in government spending leads to lower aggregate demand. This results in a leftward shift of the IS curve. With the LM curve unchanged, the economy experiences a decrease in both the interest rate and national income.

15.4.4 Changes in Demand for Money or Liquidity Preference

Variations in liquidity preference impact the LM curve by altering the demand for money. When individuals' preference for liquidity increases, the demand for money rises, leading to a leftward shift in the LM curve. Given a fixed money supply, this shift results in higher interest rates at each level of national income. Consequently, the equilibrium interest rate increases while national income declines.

Conversely, if liquidity preference declines, the demand for money decreases, shifting the LM curve to the right. With a stable money supply, this shift results in lower interest rates at each income level. Consequently, the equilibrium interest rate falls while national income rises. Overall, shifts in the IS or LM curves occur due to changes in consumption patterns, saving behavior, autonomous investment, government spending, money supply, or money demand. These shifts influence both interest rates and national income levels. The IS-LM model demonstrates how the interplay between the goods market and money market allows government policies to influence economic activity. Through monetary policy adjustments, such as modifying the money supply, the government can shift the LM curve. Likewise, fiscal policy measures, including changes in government spending and taxation, can shift the IS curve. By utilizing both monetary and fiscal strategies, policymakers can regulate national income and economic stability effectively.

Self-Check Exercise-2

Q1. Discuss the effect of changes in the supply of money on the rate of interest and income level.

Q2. What is the effect of changes in the desire to save or propensity to consume on an equilibrium level?

15.5 Summary

This unit examined the IS-LM model, which illustrates the relationship between the goods and money markets. The IS curve represents equilibrium in the product market, where investment equals savings, while the LM curve reflects equilibrium in the money market, where money demand matches supply.

The IS curve slopes downward, indicating that higher interest rates reduce income. It shifts right with increased government spending, consumer confidence, or a rise in the marginal propensity to consume, and left when these factors decline. The LM curve, which slopes upward, shifts downward with an increase in money supply or a drop in prices, and upward with monetary contraction or inflation.

The Central Bank plays a key role in stabilizing the economy by adjusting the money supply to counteract inflationary pressures and maintain equilibrium in interest rates and income levels.

15.6 Glossary

- **IS Curve:** IS word is a form of equilibrium of investment and savings which shows the equilibrium of the product money market.
- **LM Curve:** LM is a form of equilibrium of demand and supply of money which shows the equilibrium of the money market.
- **Equilibrium of Product and Money Market:** equilibrium position where IS curve is equal to LM curve.

15.7 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 15.1.

Answer to Q2. Refer to Section 15.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 15.4.1.

Answer to Q2. Refer to Section 15.4.2.

15.8 References/Suggested Readings

1. Evans, M. K. (2004). *Macroeconomics for managers*. Blackwell Publishing Ltd.
2. Investopedia. (n.d.). IS-LM model. In *Investopedia*. Retrieved from http://www.investopedia.com/terms/i/islmmodel.asp
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6. Web.mit.edu. (n.d.). *Three somewhat unrelated essays*. Retrieved from http://web.mit.edu/krugman/www/trioshrt.html

15.9 Terminal Question

Q.1 How to derive an IS-LM curve? In which condition IS and LM curve can shift?

Q.2 How you get a general equilibrium in the product market and money market?

UNIT-16
Classical and Keynesian Dichotomy

STRUCTURE

16.1 Introduction

In this unit, we will explore the foundational ideas of both Classical and Keynesian economics, highlighting how they approach issues like employment, inflation, and government intervention. The Keynesian and classical dichotomy represent two contrasting economic theories. Keynesian economics emphasizes government intervention to manage economic fluctuations, while classical economics advocates for minimal intervention, believing free markets naturally achieve balance. This divide highlights differing views on how to address issues like unemployment and economic growth.

16.2 Learning Objectives

By the end of this unit, you will

- Understand the core principles of Classical and Keynesian economics.
- Identify the key differences between these two economic theories.
- Analyse how each theory addresses issues like unemployment and inflation.

- Apply these concepts to contemporary economic situations and discussions.

16.3 Neutrality of Money and Classical Dichotomy

The classical theory of output and employment suggests that changes in the money supply influence only nominal variables such as money wages, nominal interest rates, and nominal GNP, while real variables like real GNP, employment, and real wages remain unaffected. In the classical full employment model, adjustments in prices and wages offset changes in the money supply, keeping real economic factors unchanged. According to classical economists, real variables are determined by factors like capital availability, technological progress, labor productivity, and household preferences regarding work and leisure, rather than fluctuations in the money supply. In the classical model, where prices and wages can adjust freely, changes in the money supply only influence the price level and nominal figures like money wages and nominal interest rates. Real variables such as employment, output, savings, investment, real wages, and real interest rates are not affected by these changes. Essentially, money is neutral and doesn't impact the real aspects of the economy. That is, money is neutral in its effect on the real variables of the economy. According to classical theory, real variables like output, employment, real wages, and the real interest rate depend on factors such as the stock of capital (K), the labour supply (N), and the level of technology (T). These variables are unaffected by changes in the money supply. In the classical theory, nominal variables and real variables are influenced by two distinct sets of factors. Real variables remain unaffected by changes in the money supply and nominal variables, a concept known as the classical dichotomy.

Self-Check Exercise-1

Q1. Define the Neutrality of Money.

Q2. What do you mean by classical dichotomy?

16.4 Neutrality of Money: Changes in Money Supply and Saving-Investment Equilibrium

In classical theory, money is simply a medium of exchange used for buying goods and services, so it's only held for transactions. This implies that the alternative to holding money is spending it on goods and services. Therefore, the demand and supply of money in the classical system do not influence the interest rate. If the money supply increases, the real interest rate stays the same, and the amount of output saved and invested (real savings and investment) remains unchanged, as illustrated in Fig. 16.1. This indicates that an increase in money supply does not disrupt the balance between savings and investment in the capital market, ensuring full employment equilibrium continues.

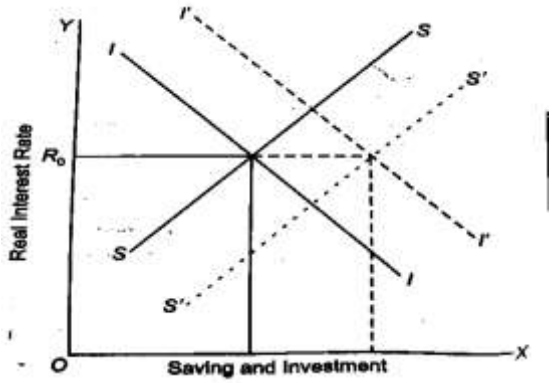

Fig. 16.1 Capital Market Equilibrium

However, it is important to note that higher commodity prices mean that the money spent on investments will increase proportionally to the price rise, even though the actual quantity of goods allocated for investment remains the same. This increase in investment spending is balanced by a corresponding increase in monetary savings due to the higher prices. Additionally, higher prices result in proportionately greater revenue from the sale of goods, leading savers to provide more savings at the same interest rate. Therefore, as the money supply increases, the supply curve for nominal savings and the investment curve both shift to the right, as shown by the dotted S'S' and I'I' curves. This shift occurs in the same proportion, ensuring that the real interest rate remains unchanged and the same amount of real savings and investment, in terms of goods, is maintained despite the higher price level.

A major limitation of the classical concept of money neutrality should be noted. As mentioned, the neutrality of money is a key outcome in the classical full employment model, which relies on flexible prices and wages. However, there are several limitations:

1. **Impact of Inflation**: If an increase in money supply and the resulting rise in prices had no real effect, inflation wouldn't be a concern. Yet, we know that inflation significantly lowers people's standard of living and hinders economic growth.
2. **Income Distribution**: Inflation affects the distribution of income within society, often hurting the poor the most. This unequal impact makes inflation a critical issue to address.
3. **Economic Stability**: Due to these adverse effects, efforts are continually made to control inflation and achieve price stability in the economy. This contradicts the classical view that changes in the money supply are neutral in their impact on real economic variables.

Self-Check Exercise-2

Q1. Define saving-investment equilibrium.

Q2. How do changes in money supply affect saving-investment equilibrium?

16.5 Keynes Critique of Classical Economics

The Keynesian critique of classical economics emerged during the Great Depression, challenging the notion that markets are always self-correcting and that full employment is the norm. Keynes argued that aggregate demand—total spending by households, businesses, and the government—drives economic activity and employment levels. He contended that insufficient demand could lead to prolonged periods of high unemployment and economic stagnation. Unlike classical economists, Keynes emphasized the role of government intervention through fiscal policy to boost demand and stabilize the economy. This marked a significant shift from the classical focus on supply-side factors and self-regulating markets. We explain below the various criticisms of classical theory made by Keynes.

1. **Keynes Challenged Say's Law:** Keynes criticized Say's Law, which claims that supply inherently creates its own demand, preventing overproduction and unemployment. While it's true that production generates income for factors of production, which is then spent on goods, this doesn't guarantee that all income will be spent. Some income is saved, and if entrepreneurs don't invest an amount equal to these savings, aggregate demand falls short of total output. Consequently, producers can't sell all their goods, leading to reduced profits and lower production levels, which in turn causes involuntary unemployment. This highlights the need for government intervention to maintain adequate demand and economic stability. Keynes argued that the balance between saving and investment can't be achieved solely through changes in interest rates, as savings are primarily influenced by income. It's the fluctuations in income that align saving with investment, not adjustments in interest rates. However, classical economists overlooked the impact of income changes because they assumed the economy always operated at full employment.
2. **Keynes Proved Pigou's View Fallacious:** Keynes also criticized Pigou's view that lowering wages and prices during a depression would eliminate unemployment and restore full employment if the market operated freely. Keynes argued that reducing wages wouldn't increase employment because it would lower aggregate demand for goods. Wages are not only production costs but also the primary income for workers, who make up the majority of the population. Lower wages mean reduced income for workers, leading to decreased aggregate

demand. This decline in demand would force businesses to cut production and employ fewer workers, increasing unemployment rather than reducing it. Thus, a general wage cut would deepen the depression by further reducing demand and employment.

3. **Sticky Wages and Unemployment**: Classical economists believed that in a free market economy, full employment is the norm, and any deviation would be quickly corrected by adjustments in prices and wages. During the Great Depression, when 25 per cent of the labour force in the USA was unemployed, A.C. Pigou stated, "With perfectly free competition, there will always be a strong tendency towards full employment. Any unemployment at any time is entirely due to the frictional resistance that prevents immediate wage and price adjustments." Contrarily, Keynes argued that unemployment during the depression was caused by a drop in aggregate demand, leading to reduced real output and employment, resulting in involuntary unemployment. According to classical economists, the aggregate supply curve is vertical at full employment output. On the other hand, according to Keynes, prices and wages are sticky and therefore Keynesian short-run supply is flat.

Self-Check Exercise-3

Q1. Write a short note on Keynes's critique of classical theory.

16.6 Summary

In this unit, we discussed the key differences between Classical and Keynesian economics. Classical economists believe in the self-correcting nature of markets, where full employment is the norm, and changes in money supply only affect nominal variables. Keynesians, on the other hand, argue that aggregate demand drives economic activity and employment levels. They highlight the need for government intervention to boost demand, especially during periods of economic downturn. This unit also covered the concepts of money neutrality and the classical dichotomy, as well as Keynes' critiques of classical views on wage adjustments and unemployment.

16.7 Glossary

- **Classical Economics:** An economic theory that emphasizes free markets, flexible prices, and the self-correcting nature of the economy, asserting that full employment is the natural state and changes in money supply only affect nominal variables.
- **Keynesian Economics:** An economic theory proposed by John Maynard Keynes, which argues that aggregate demand drives economic activity and employment, and that government intervention is necessary to manage demand and stabilize the economy, especially during recessions.
- **Aggregate Demand:** The total demand for goods and services within an economy, encompassing consumption, investment, government spending, and

net exports. Keynesians believe it is crucial for determining economic output and employment levels.

- **Money Neutrality:** A classical economic concept that changes in the money supply only impact nominal variables like prices and wages, without affecting real economic variables such as output, employment, and real interest rates.
- **Classical Dichotomy:** The division in classical economics between real variables (such as output and employment) and nominal variables (such as money supply and price level), asserting that real variables are unaffected by changes in nominal variables.

16.8 Answers to Self-Check Exercise

Self-Check Exercise-1

Answer to Q1. Refer to Section 16.3.

Answer to Q2. Refer to Section 16.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 16.4.

Answer to Q1. Refer to Section 16.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 16.5.

16.9 References/Suggested Readings

1. Cherunilam, F. (2017). *International economics*. McGraw Hill Education.
2. D'Souza, E. (2009). *Macroeconomics*. Pearson.
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16.10 Terminal Questions

Q1. What do you mean by the classical dichotomy? How does the money supply affect the saving-investment equilibrium?

Q2. Discuss the Keynesian critique of classical economic theory.

UNIT 17
Balance of Payments-I

STRUCTURE

17.1 Introduction

In the present unit, we will discuss the meaning of Balance of payments and balance of trade. We will discuss the two accounts of balance of payments i.e., the current account and capital account of Balance of Payments. Further, we will acquaint ourselves with the equilibrium and Disequilibrium in the balance of payments and explicate the methods of correcting the Balance of Payment disequilibrium.

17.2 Learning Objectives

After completing this unit, you will be able to

- Define Balance of Payment and Balance of Trade
- Distinguish between Balance of Payment and Balance of Trade
- Analyze the Components of the Balance of Payment

17.3 Balance of Payments

The balance of payments (BoP) is a comprehensive record of all economic transactions between a country's residents and the rest of the world over a specific period, usually a year. It includes transactions by individuals, businesses, and government entities, covering both visible and invisible exchanges such as trade in goods, services, capital flows, and financial transfers.

BoP accounts are maintained in the domestic currency and categorize inflows, like export earnings and foreign investments, as surpluses, while outflows, such as imports and overseas investments, are recorded as deficits. Ideally, when all BoP components are accounted for, they sum to zero. However, imbalances can occur in individual sections, such as the current or capital account, leading to wealth accumulation in surplus nations and rising debt in deficit countries.

A surplus in the balance of payments indicates that a country’s inflows exceed its outflows, resulting in a rise in foreign exchange reserves. Conversely, a deficit implies that outflows surpass inflows, requiring adjustments through borrowing or reserve depletion. Kindleberger defines the balance of payments as "a systematic record of all economic transactions between residents of the reporting country and residents of foreign countries."

Self-Check Exercise-1

Q1. Define Balance of Payment (BOP).

Q2. Define

1) Balance of Payment Deficit
2) Balance of Payment Surplus

17.4 Balance of Trade

The balance of trade (BOT) refers to the difference between a country's exports and imports of goods and services. It is calculated as:

BoT = Earnings from Exports - Payments for Imports

A favorable BOT occurs when exports exceed imports, indicating a trade surplus. Conversely, when imports surpass exports, the BOT is unfavorable, leading to a trade deficit.

The distinction between the balance of trade and the broader balance of payments (BoP) can be better understood through a comparative analysis.

Balance of Trade (BOT)	Balance of Payment (BOP)
The balance of trade (BOT) represents the difference between a nation's exports and imports of goods and services. It reflects whether a country has a trade surplus (when exports exceed imports) or a trade deficit (when imports surpass exports).	The Balance of Payments encompasses not just the import and export of goods and services but also includes financial and capital transfers.
BOT = Net Earning on Exports - Net payment made for imports	BOP = BOT + (Net Earning on Foreign investment i.e. payments made to foreign investors) + Cash Transfer + Capital Account +or - Balancing Item or BOP = Current Account + Capital Account + or - Balancing items (Errors and omissions
When exports exceed imports, the Balance of Trade (BOT) is considered favorable. Conversely, when imports surpass exports, the BOT becomes unfavorable.	The Balance of Payments (BOP) is favorable when a country maintains a surplus in the current account, enabling it to repay past loans in the capital account. Conversely, the BOP becomes unfavorable if the country experiences a current account deficit and relies on additional foreign loans. This leads to higher interest payments on extra borrowing, further worsening the BOP.
Need not be in balance always	Balance of payments to be in balance always
The key factors influencing the Balance of Trade (BOT) include: a) Production costs, b) Accessibility of raw materials, c) Fluctuations in exchange rates, d) Domestic manufacturing prices.	The primary factors influencing the Balance of Payments (BOP) include: a) Terms set by foreign lenders, b) Government economic policies, c) All determinants affecting the Balance of Trade (BOT).

Self-Check Exercise-2

Q1. Define Balance of Trade.

Q2. Distinguish between Balance of Payment and Balance of Trade.

17.5 Current Account and Capital Account

17.5.1 Current Account

The current account records all transactions related to the export and import of goods and services, along with unilateral transfers within a specific period. It includes payments and receipts from visible items, invisible items, and one-sided transfers.

I. Components of the Current Account:

1. **Export and Import of Goods (Merchandise Trade):** This involves transactions related to the trade of tangible goods. Payments for imports are recorded as debits, while receipts from exports are recorded as credits. The difference between these values is referred to as the balance of trade.
2. **Export and Import of Services (Invisible Trade):** This covers non-factor services like shipping, banking, and insurance, which are bought or sold internationally. Receipts are recorded as credits, while payments appear as debits.
3. **Unilateral Transfers (One-Way Transactions):** These include gifts, donations, and personal remittances, which involve receipts and payments without any direct exchange of services. Transfers received are credited, while those sent abroad are debited.
4. **Income Receipts and Payments:** This includes earnings from foreign investments such as interest, rent, and profits, reflecting payments received from or made to other countries.

II. Balance on Current Account

In the current account, earnings from exports of goods, services, and unilateral transfers are recorded as credit (positive) entries, while expenses on imports of goods, services, and unilateral transfers are recorded as debit (negative) entries. The difference between total credits and debits determines the balance on the current account.

1. A current account surplus occurs when credit entries exceed debit entries, signifying a net inflow of foreign exchange.
2. A current account deficit arises when debit entries surpass credit entries, indicating a net outflow of foreign exchange.

The current account captures all real transactions of goods and services that influence a nation's income, production, and employment. As a result, it reflects the net income generated from international economic activities.

Components of Current Account		
Credit Items	Debit Items	Net Credit (Credit – Debit
1. Visible Trade Exports of goods:	Imports of goods	Net Exports of goods (Balance of Trade)
2. Invisible Trade Exports of services:	Imports of services	Net Exports of services
3. Unilateral Transfers Transfer Receipts:	Transfer Payments	Net Transfer Receipts
4. Income Receipts & Payments Income Receipts:	Income Payments	Net Income Receipts
Current Receipts	Current Payments	Current Account Balance
(1+2+3+4)		

17.5.2 Capital Account

The capital account in the balance of payments (BOP) records financial transactions between a country's residents and the rest of the world, leading to changes in assets or liabilities. It includes financial claims and obligations of the government and private sector.

The capital account serves the following purposes: (i) Covers deficits in the current account. (ii) Manages surplus in the current account.

Since the capital account deals with financial transactions, it does not directly impact a country's income, output, or employment.

Components of the Capital Account

1. Borrowings and Lending with Other Countries

- Inflows: Foreign loans received by the government or private entities, as well as repayments made by foreign borrowers, are recorded as credit (positive) transactions.
- Outflows: Loans extended by residents to foreign entities and repayments of external borrowings are recorded as debit (negative) transactions.

2. Foreign Investments

- Inflows: Investments by foreign entities in domestic assets, such as company shares and real estate, bring foreign exchange into the country and are recorded as credit (positive) entries.
- Outflows: Investments made by domestic residents in foreign assets, such as shares or real estate abroad, lead to an outflow of foreign exchange and are recorded as debit (negative) transactions.

3. Changes in Foreign Exchange Reserves

    - Foreign exchange reserves, managed by the central bank, act as a balancing factor in the BOP.
    - Withdrawals from reserves appear as credit (positive) entries, while additions to reserves are recorded as debit (negative) entries.
    - The BOP records only changes in reserves, not the total reserve holdings.

Balance on the Capital Account

- Capital Account Surplus: Occurs when credit transactions exceed debit transactions, indicating a net capital inflow.
- Capital Account Deficit: Occurs when debit transactions surpass credit transactions, leading to a net capital outflow.

Apart from the current and capital accounts, the balance of payments also includes an adjustment item known as "Errors and Omissions." This accounts for discrepancies arising from unrecorded international transactions, ensuring the overall BOP remains balanced.

Components of Capital Account		
Credit Items	Debit Items	Net Credit (Credit – Debit
1. Borrowings and lending's to and from abroad Borrowings from abroad:	Landings to abroad	Net Borrowings from abroad
2. Investments from abroad Investments from abroad:	Investments to abroad	Net Investments from abroad
3. Change in Foreign Exchange Reserves.	Increases in foreign exchange reserves	Net change in foreign exchange reserves
Decreases in foreign exchange reserves:		
Capital Receipts	Capital Payments	Capital Account Balance
(1+2+3):		

Self-Check Exercise-3

Q1. Define

1) Current Account
2) Capital Account

Q2. What are the main components of the current account?

Q3. What are the main components of a capital account?

17.6 Summary

This unit covered key concepts related to the Balance of Payments (BoP) and Balance of Trade. The BoP is a comprehensive record of a country's financial dealings with other nations. It consists of two primary components: the current account and the capital account. The current account tracks trade in goods and services, income from investments, and unilateral transfers such as foreign aid. It indicates whether a country is a net lender or borrower in global transactions. The capital account documents cross-border investments, including acquisitions of physical assets like real estate and financial instruments such as stocks and bonds. Together, these accounts provide insight into a country's economic stability and its financial engagement with the global economy.

17.7 Glossary

- **Balance of Payments (BoP):** A detailed record of all financial exchanges between a country's residents and the rest of the world over a specific period, covering trade, investments, and monetary transfers.
- **Current Account:** A segment of the BoP that tracks transactions related to trade in goods and services, earnings from investments, and one-way transfers such as foreign aid, reflecting a nation's overall trade and income flows.
- **Capital Account:** A component of the BoP that monitors cross-border capital transactions, including investments in tangible assets like real estate and financial instruments such as stocks and bonds.
- **Trade Surplus:** A condition where a country's exports of goods and services exceed its imports, leading to a positive impact on the current account balance.
- **Trade Deficit:** A scenario in which a nation's imports of goods and services surpass its exports, resulting in a negative effect on the current account balance.

17.8 Answer to Self-Check Exercises

Self-Check Exercise-1

Answer to Q1. Refer to Section 17.3.

Answer to Q2. Refer to Section 17.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 17.4.

Answer to Q1. Refer to Section 17.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 17.5.

Answer to Q2. Refer to Section 17.5.1.

Answer to Q3. Refer to Section 17.5.2.

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1. Cherunilam, F. (2017). *International economics*. McGraw Hill Education.
2. D'Souza, E. (2008). *Macroeconomics*. Pearson Education.
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17.10 Terminal Questions

Q1. Define Balance of Payment (BOP). What are the main components of the current account in the Balance of Payments?

Q2. How does the capital account differ from the current account in the Balance of Payments?

UNIT-18
Balance of Payments-II

STRUCTURE

18.1 Introduction

The Balance of Payments (BoP) is a comprehensive record of a country's financial dealings with the rest of the world. It is categorized into two main sections: the current account, which tracks trade in goods and services, investment earnings, and transfers, and the capital account, which captures international investments. When both accounts are balanced, it signifies that the nation's financial inflows match its outflows, maintaining economic stability. Disequilibrium occurs when there's a surplus (more inflows) or deficit (more outflows). To correct imbalances, countries use adjustment mechanisms like changing exchange rates, implementing monetary policies, or adjusting trade policies. Understanding BoP helps in assessing a country's economic stability and financial health.

18.2 Learning Objectives

After going through this unit, you will be able to

- Understand the concept and significance of the Balance of Payments
- Analyse the causes of disequilibrium in the Balance of Payments
- Understand the methods to correct disequilibrium in the Balance of Payments
- Know the Balance of Payments and adjustment mechanism

18.3 Equilibrium and Disequilibrium in Balance of Payments

Achieving a perfect balance in the current account—where total exports of goods, services, and unilateral transfers match total imports and payments—is rare. Generally, a country's earnings from abroad may exceed or fall short of its expenditures, leading to either a surplus or a deficit in the current account. A deficit indicates that a nation is spending more overseas than it earns from foreign sources. This shortfall is compensated through transactions recorded in the capital account.

For example, trade statistics often reveal mismatches between current and capital account balances, requiring adjustments through an accounting entry known as "Errors and Omissions." This balancing entry accounts for discrepancies that may arise due to unrecorded transactions or statistical errors.

The balance of payments always technically balances because it follows the principles of double-entry bookkeeping, where every transaction is recorded as both a credit and a debit. Exports, which generate foreign earnings, are recorded as credit entries, while payments for imports appear as debits.

However, in real economic terms, imbalances do occur. A current account deficit must be offset by a corresponding capital account surplus, which can be achieved through various means, such as drawing from foreign exchange reserves, borrowing from international sources, or selling assets to foreign investors. In some cases, a country may secure short-term loans or attract capital inflows, creating a surplus in the capital account to counteract the current account deficit.

If foreign investment inflows or international aid increase significantly, they may naturally create a surplus in the capital account, even without deliberate intervention. Such capital transactions can be classified as either accommodating transfers, which are made to correct imbalances, or autonomous flows, which occur due to independent investment opportunities rather than a need to balance accounts.

Ultimately, a balance of payments deficit or surplus is determined by the relationship between autonomous and accommodating capital movements. If a country's autonomous earnings are lower than its autonomous expenditures, accommodating capital outflows must cover the gap. Conversely, a surplus in autonomous earnings results in an accommodating capital inflow of an equivalent amount.

Self-Check Exercise-1

Q1. What do you mean by equilibrium in the Balance of Payments?

Q2. Define disequilibrium in the Balance of Payments.

18.4 Causes for Disequilibrium in Balance of Payments

Even though balance of payments (BoP) accounts are recorded using double-entry bookkeeping, they do not always remain balanced. Often, a country's total payments exceed its total receipts, or vice versa, leading to an imbalance known as disequilibrium. A deficit occurs when a nation's foreign payments surpass its foreign earnings, creating an unfavourable balance due to higher demand for foreign currency than its supply. Conversely, a surplus emerges when a country's receipts exceed its payments, leading to a favourable balance due to lower demand for foreign exchange than its availability.

Several factors contribute to disequilibrium in the balance of payments:

1. **Trade Cycles**: Economic cycles, including expansions and recessions, affect international trade patterns. Differences in economic conditions across countries often lead to cyclical imbalances in the BoP.
2. **Large-Scale Development and Investment**: Developing nations experience chronic deficits due to their reliance on imports for industrialization. Since these economies focus on raw material production, their export capacity may not increase at the same rate as their import needs. Additionally, domestic industries may absorb primary commodities previously exported, causing structural imbalances.
3. **Shifting Export Demand**: Industrialized nations have reduced their reliance on agricultural exports from developing countries due to advancements in local food production and synthetic substitutes. This change in demand has resulted in export difficulties for developing nations. Similarly, wealthier countries may face declining exports as developing economies pursue self-sufficiency, making trade imbalances more persistent in less developed regions.
4. **Population Growth**: Rapid population expansion in low-income nations strains resources, increasing import dependency while reducing surplus production for exports. This demographic factor negatively impacts the BoP position.
5. **External Debt and Borrowing**: Countries that borrow heavily from international sources often face persistent deficits as debt repayment obligations exceed foreign earnings. Meanwhile, lending nations may experience BoP surpluses due to steady interest and principal repayments.

6. **Inflationary Pressures**: Rapid economic growth often triggers inflation, which affects BoP stability. Rising incomes in developing economies boost both domestic consumption and import demand, while inflation discourages exports. Additionally, heavy investments in capital-intensive industries delay output growth, leading to excess liquidity in the economy, rising prices, and a further deterioration in the BoP.
7. **Demonstration Effect**: Exposure to advanced economies influences consumer preferences in developing countries, increasing demand for imported luxury goods and Western lifestyles. This rise in imports, coupled with stagnant or declining export volumes, worsens the trade deficit.
8. **Variations in Reciprocal Demand**: Countries have different levels of demand for each other's goods, leading to disparities in terms of trade. Unequal trade relationships can cause persistent imbalances in the BoP.

Each of these factors influences a country's external financial position, making it essential to adopt policies that address and mitigate BoP disequilibrium.

Self-Check Exercise-2

Q1. Define

1) Trade Cycles
2) Inflation
3) Reciprocal Demand

Q2. What are the causes of disequilibrium in the Balance of Payments?

18.5 Methods of Correcting the Disequilibrium

A prolonged imbalance in the balance of payments, particularly a deficit, can have negative consequences. It not only weakens a nation's global economic standing but also hinders economic growth. Therefore, corrective measures are essential to restore stability. Several approaches can be employed to address this issue, some of which are outlined below:

1. Deflation: Deflation is a traditional approach to managing a deficit in the balance of payments. It involves reducing the money supply to lower overall price levels and decrease individuals' purchasing power. The central bank can implement deflationary policies by increasing interest rates, selling government securities in open market operations, or restricting credit availability. Lower domestic prices can boost exports, while reduced income levels curb import demand. Additionally, higher interest rates may attract foreign capital, which helps bridge the balance of payments gap.

However, deflation has significant drawbacks, particularly in developing economies:

- A decline in wages and income is often resisted by labor unions.
- It can lead to rising unemployment and economic distress for workers.
- Developing nations typically require expansionary monetary policies to support growth rather than contractionary deflationary measures.

2. Depreciation: Currency depreciation is another strategy to address balance of payments disequilibrium. It refers to a decline in the value of the domestic currency relative to foreign currencies. This happens when the supply of a country's currency in the foreign exchange market exceeds its demand. A depreciated currency makes imports more expensive and exports more competitive, thereby discouraging import consumption and increasing foreign demand for locally produced goods. This adjustment helps correct the balance of payments by narrowing trade deficits and improving export revenues. Each of these methods has distinct economic implications, and the choice of corrective measures depends on a country's economic conditions and policy priorities.

3. Exchange depreciation is automatic: Exchange depreciation occurs automatically in a flexible exchange rate system and can help address a moderate balance of payments deficit, provided that both import demand and export demand are sufficiently elastic. However, this approach has several limitations:

1. It is ineffective in economies that operate under a fixed exchange rate system.
2. The uncertainty it creates in international trade may reduce overall trade volume.
3. A depreciating currency worsens the terms of trade, as imported goods become more expensive, forcing the country to export more to afford the same level of imports.
4. Exchange depreciation can lead to inflationary pressures, as higher import costs drive up domestic prices and money supply.
5. The method's effectiveness relies on the actions of other countries; if multiple nations simultaneously devalue their currencies, the intended benefits may be neutralized.

3. Devaluation: Devaluation refers to a deliberate policy decision by the government to lower the external value of its currency. Unlike depreciation, which is a market-driven process, devaluation is a planned intervention to achieve similar outcomes—discouraging imports, boosting exports, and improving the balance of payments.

The success of devaluation depends on several factors:

- The demand for exports must be sufficiently elastic to increase foreign purchases.

- The demand for imports should also be elastic, ensuring a decline in import volumes.
- The country should focus on exporting non-traditional goods that are consistently sought after in international markets.
- Domestic prices should remain stable after devaluation to prevent inflationary effects.
- Other countries should refrain from retaliatory devaluations, which would undermine any competitive advantage gained.

Despite its potential benefits, devaluation has several drawbacks:

1. It signals economic instability, potentially reducing investor confidence.
2. Public trust in the national currency may weaken, leading to speculative capital flight.
3. Devaluation can contribute to inflation by increasing the cost of imported goods.
4. It raises the burden of foreign debt, as repayment obligations in foreign currencies become more expensive.
5. The positive effects take time to materialize, making it a slow-response mechanism.
6. It serves as a short-term solution rather than a permanent fix for persistent balance of payments issues.

Both depreciation and devaluation have advantages and limitations, and their effectiveness depends on the broader economic environment and policy measures in place.

4. **Exchange Control:** One of the most commonly adopted measures to address balance of payments imbalances is exchange regulation. This approach involves the central bank exercising control over foreign exchange transactions. Under this system, exporters are required to surrender their foreign currency earnings to the central bank, which then allocates foreign exchange based on priority needs, such as essential imports. By restricting the availability of foreign exchange, this method effectively limits non-essential imports. However, its primary limitation is that it addresses only the symptoms of the deficit rather than its underlying causes. In some cases, it can even worsen the fundamental economic imbalances, making it an ineffective long-term solution for persistent deficits.

5**. Tariffs:** Tariffs refer to taxes levied on imported goods. When a country imposes tariffs, the cost of imported products rises, discouraging their consumption and

encouraging domestic industries to produce alternatives. Higher import duties can significantly reduce the demand for non-essential foreign goods. By imposing steep tariffs, a government can effectively curb excessive imports and promote local production, thereby improving the trade balance.

Self-Check Exercise-3

Q1. Define

1) Deflation
2) Devaluation
3) Tariffs

Q2. Discuss the methods for correcting disequilibrium in the Balance of Payments.

18.6 Devaluation of Currency

In modern monetary policy, devaluation refers to a deliberate reduction in the value of a country's currency relative to other currencies, goods, and services. This adjustment is implemented within a fixed exchange rate system, where the monetary authority officially lowers the currency's value by setting a new exchange rate against a foreign benchmark currency. The primary outcome of devaluation is that the domestic currency becomes less valuable in comparison to others.

Devaluation has two main effects:

1. It makes the country's exports cheaper and more competitive in the global market, thereby boosting foreign demand.
2. It increases the cost of imported goods, discouraging excessive imports and potentially improving the trade balance by reducing the current account deficit.

Governments may also use devaluation as a policy tool to stimulate overall economic demand, especially as an alternative to unpopular fiscal policies aimed at addressing unemployment.

(i)Effects of Devaluation

While devaluation can support export growth and limit imports, it also carries certain risks:

- **Inflationary Pressure:** As import prices rise, domestic production costs may increase, leading to overall inflation. If inflation escalates, policymakers might resort to higher interest rates to stabilize prices, which could slow economic growth.

- **Investor Confidence:** A devalued currency can be perceived as a sign of economic instability, potentially reducing investor confidence and negatively affecting the country's ability to attract foreign capital.
- **Competitive Devaluations:** Other countries may respond to devaluation by lowering their own exchange rates to maintain trade competitiveness. This cycle of successive devaluations, known as "beggar-thy-neighbour" policies, can create uncertainty in international markets and further economic instability.

In contrast, under a floating exchange rate system, market forces determine currency values. When a currency loses value due to market fluctuations, it is termed depreciation, whereas an increase in value is referred to as appreciation.

Self-Check Exercise-4

Q1. Define Devaluation.

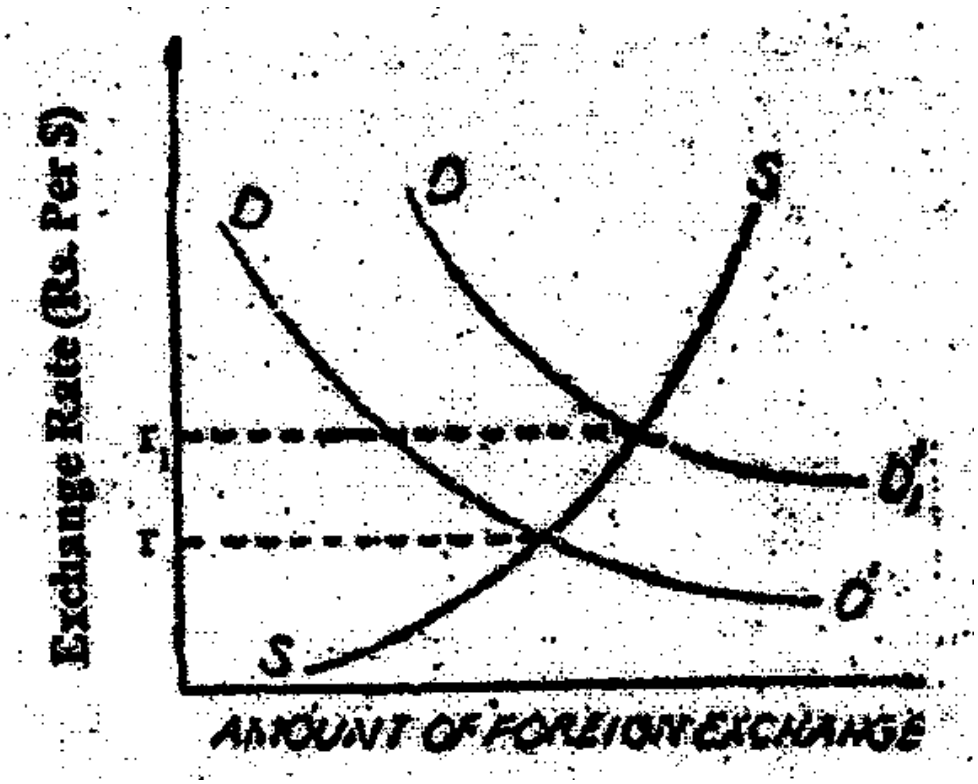
Q2. What are the effects of the devaluation of currency on the Balance of Payments?

18.7. Balance of Payment and Adjustment Mechanism

As previously noted, the current account plays a crucial role in the balance of payments for most nations. Neither a prolonged surplus nor a persistent deficit is beneficial for a country's economic stability. Ideally, over time, the inflows and outflows should balance out. This means that deficits in certain years should be offset by surpluses in others, ensuring long-term equilibrium in international transactions.

In an economy where foreign exchange markets operate freely and price levels remain flexible, there are natural economic forces that work to restore balance in the balance of payments. These mechanisms help correct imbalances without requiring direct government intervention. The following section provides a brief overview of how this adjustment process occurs.

Consider a simplified scenario where only two countries, India and the USA, engage in trade. Suppose India operates under a free foreign exchange market with a flexible price structure. In such a system, the demand for foreign exchange typically slopes downward, meaning that as the exchange rate increases, the demand for foreign currency decreases. Conversely, the supply of foreign exchange is upward-sloping, indicating that higher exchange rates encourage more foreign exchange inflows.



At the point where the demand and supply curves intersect, the foreign exchange market reaches equilibrium, ensuring balance in international transactions. However, fluctuations can occur. If India's demand for US dollars rises—perhaps due to economic expansion, shifts in consumer preferences, or increased investments—the demand curve shifts upward. As a result, the exchange rate depreciates, meaning more Indian rupees are required to purchase one US dollar. This depreciation influences trade patterns: imports become costlier, discouraging excessive imports, while Indian exports become more competitive in global markets, boosting foreign demand for domestic goods.

When a country experiences a trade deficit—where imports exceed exports or capital inflows decline—the demand for foreign exchange surpasses its supply, leading to further currency depreciation. Conversely, a trade surplus results in an excess supply of foreign exchange, causing the currency to appreciate. This self-regulating mechanism helps restore balance over time by adjusting the relative costs of imports and exports.

Beyond price-based adjustments, Keynesian economists argue that income fluctuations play a crucial role in correcting balance of payments imbalances. If a country faces a deficit due to declining exports, the resulting reduction in national income lowers overall spending, including on imports, thereby narrowing the deficit. Similarly, a surplus boosts national income, increasing import demand and reducing the trade surplus.

However, real-world economies often experience imperfections in these automatic adjustment mechanisms. As a result, governments frequently implement policy measures to address persistent disequilibria in the balance of payments, which will be explored in subsequent discussions.

Self-Check Exercise-5

Q1. Write a short note on the Balance of Payment and Adjustment Mechanism.

18.8 Summary

This unit covered the concepts of the Balance of Payments (BoP) and Balance of Trade (BoT). It explained the two key components of the BoP—the current account and the capital account—and discussed how economies maintain equilibrium or experience disequilibrium in their international transactions. Various methods to address BoP disequilibrium were also explored.

The Balance of Payments is a comprehensive record of all economic transactions between a country's residents and the rest of the world over a specific period, typically a quarter or a year. It consists of:

1. The Current Account, which tracks transactions related to the export and import of goods and services, along with unilateral transfers. This account includes receipts and payments for visible trade (goods), invisible trade (services), and unilateral transfers like remittances or foreign aid.
2. The Capital Account, which records financial transactions that affect a country's assets and liabilities. It includes investments, loans, and other financial flows between residents and foreign entities, reflecting changes in a nation's financial claims and obligations.

Understanding these components helps in analyzing a country's economic stability, trade performance, and financial health in the global economy.

18.9 Glossary

- **Balance of Payments (BoP):** A country's financial record of all economic transactions between its residents and the rest of the world over a specific period, typically a quarter or a year.
- **Balance of Trade (BoT):** The difference between a country's exports and imports of goods and services. A favorable BoT occurs when exports exceed imports, while an unfavorable BoT happens when imports surpass exports.
- **Current Account:** A section of the BoP that records transactions related to the exchange of goods, services, and unilateral transfers such as remittances and

foreign aid. It includes visible trade (goods), invisible trade (services), and transfers.

- **Capital Account:** This part of the BoP captures financial transactions that affect a country's assets and liabilities, such as foreign investments, loans, and capital transfers between residents and non-residents.
- **Tariff:** A tax imposed on imported goods and services to support domestic industries and generate government revenue.
- **Devaluation:** A government-led reduction in a currency's value relative to foreign currencies, making domestic goods cheaper for foreign buyers and potentially boosting exports.
- **Currency Depreciation:** A market-driven decline in the value of a currency compared to others, often influenced by inflation, interest rates, or economic policies.
- **Adjustment Mechanism in BoP:** Strategies used by governments to correct imbalances in international financial transactions. These can include currency adjustments, policy reforms, and trade regulations to stabilize the economy.

18.10 Answer to Self-Check Exercises

Self-Check Exercise-1

Answer to Q1. Refer to Section 18.3.

Answer to Q2. Refer to Section 18.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 18.4.

Answer to Q2. Refer to Section 18.4.

Self-Check Exercise-3

Answer to Q1. Refer to Section 18.5.

Answer to Q2. Refer to Section 18.5.

Self-Check Exercise-4

Answer to Q1. Refer to Section 18.6.

Answer to Q2. Refer to Section 18.6.

Self-Check Exercise-5

Answer to Q1. Refer to Section 18.7.

18.11 References/Suggested Readings

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18.12 Terminal Questions

Q1. What do you mean by equilibrium in the Balance of Payments? What are the main causes of disequilibrium in the Balance of Payments?

Q2. Discuss the Balance of Payments and adjustment mechanism with the help of a diagram.

UNIT 19
Foreign Exchange Rate-I

STRUCTURE

19.1 Introduction

The movement of financial capital between nations as well as the exchange of commodities and services were covered in the last unit's discussion of the balance of payments. The value of these transactions is based on how much other countries' currencies are worth. For instance, in India, the value of balance of payments transactions is expressed either in rupees or US dollars. The value of these transactions in dollars or rupees would rely on the rupee's exchange rate with the US dollar. Therefore, in this unit, we will discuss Foreign Exchange Rate. Further, we will discuss fixed exchange rates, flexible exchange rates and determination of exchange rates.

19.2 Learning Objectives

After completing this unit, you will be able to

- Understand the fundamental principles behind foreign exchange rates
- Explore the difference between fixed and flexible exchange rate systems
- Analyse the factors influencing the exchange rate determination

19.3 Foreign Exchange Rate

The foreign exchange rate represents the value of one currency in terms of another. It indicates the rate at which one currency can be exchanged for another in international transactions. Foreign exchange refers to the medium used for settling international financial obligations, such as paying for imports or repaying foreign loans.

Historically, gold was widely accepted as a medium for international payments. However, due to its limited availability, global currencies like the British Pound (GBP) and the US Dollar (USD) have played a significant role in foreign exchange.

Similar to commodities, foreign exchange operates within a market system, where it is bought and sold. This market can either function freely or be influenced by government intervention.

- In a freely fluctuating exchange rate system, the exchange rate is determined by the forces of demand and supply in the market.
- In a fixed exchange rate system, the government or monetary authority controls and sets the exchange rate instead of allowing market forces to determine it.

Thus, the exchange rate acts as the price of foreign currency, and its determination depends on the type of exchange rate system in place.

Self-Check Exercise-1

Q1. Define Foreign Exchange Rate.

19.4 Fixed Exchange Rate

The foreign exchange rate represents the value of one currency in terms of another. It indicates the rate at which one currency can be exchanged for another in international transactions. Foreign exchange refers to the medium used for settling international financial obligations, such as paying for imports or repaying foreign loans.

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- In a fixed exchange rate system, the government or monetary authority controls and sets the exchange rate instead of allowing market forces to determine it.

Thus, the exchange rate acts as the price of foreign currency, and its determination depends on the type of exchange rate system in place.

19.4.1 Merits of Fixed Exchange Rate

1. Avoid Currency Fluctuations. If the value of currencies fluctuates significantly this can cause problems for firms engaged in trade. For example, if a firm is exporting to the US, a rapid appreciation in sterling would make its exports uncompetitive and therefore may go out of business. If a firm relied on imported raw materials a devaluation would increase the costs of imports and would reduce profitability

2. Keep Inflation Low: Another important advantage of a fixed exchange rate system is that it prevents the Governments of the countries from adopting inflationary policies. Generally, Governments have often been tempted to pursue undue expansionary fiscal and monetary policies to lower unemployment and create boom conditions. However, inflation has several bad effects on the economy. It increases inequalities of income and

wealth and hurts the poor most. Further, inflation hampers economic growth in the long run. The fixed exchange rate system forces the Governments to achieve price stability by taking effective anti-inflationary measures. This is be-cause in the case of fixed exchange rates, inflation will cause balance of payments deficits and result in loss of international reserves. Therefore, this forces the Government to adopt measures to check inflationary pressures in the economy.

To quote B. Soderston, “Fixed exchange rates can serve as an anchor. Inflation will cause balance of payments deficits and losses in reserves. Hence the authorities will have to take countermeasures to stop inflation. Fixed exchange rates should therefore impose a discipline on governments and stop them from pursuing inflationary policies which are out of tune with the rest of the world.”

3. Promotes economic integration of the world: A fixed exchange rate system plays a crucial role in fostering economic unity among nations. Just as a common currency within a country facilitates trade, communication, and financial transactions across different regions, a stable exchange rate system between countries helps promote seamless economic interactions. By minimizing exchange rate fluctuations, it ensures fair competition among producers and consumers globally. This principle is evident in efforts like the European Union’s proposal for a single currency to strengthen regional economic integration.

4. Promotes growth of internal money and capital markets: A stable exchange rate system contributes to the growth of domestic money and capital markets. In contrast, fluctuating exchange rates create uncertainty, discouraging businesses and financial institutions from engaging in lending and borrowing activities. Historically, the Bretton Woods system (1944–1971) was established to maintain exchange rate stability, allowing adjustments only in cases of severe imbalances in the balance of payments.

5. Prevents Speculation in Foreign Exchange Market: One of the key benefits of a fixed exchange rate system is that it discourages speculative activities. A flexible exchange rate system often invites speculation, where traders exploit fluctuations for financial gain. Economist Ragnar Nurkse highlighted how speculative trading in the 1920s contributed to excessive currency volatility. By maintaining a fixed rate, governments

can minimize such destabilizing activities, ensuring a more predictable foreign exchange environment.

6. Promotes Capital Movements: A stable exchange rate system fosters confidence among investors, encouraging foreign direct investment (FDI). When exchange rates are predictable, businesses and private firms are more willing to invest, as they face minimal risk of capital loss due to currency fluctuations. Since foreign investment plays a vital role in economic development, a fixed exchange rate system can significantly contribute to the economic growth of developing nations.

7. Prevents Capital Outflow: Unstable exchange rates can trigger capital outflows, particularly during economic downturns. A historical example is Mexico, where currency instability led to massive capital flight, worsening the country's balance of payments crisis. In contrast, a stable exchange rate system reduces uncertainty, ensuring that capital remains within the economy and mitigating the risk of financial instability.

19.4.2 Demerits of Fixed Exchange Rates

The system of fixed exchange rates has been criticized on the following grounds:

The fixed exchange rate system has faced several criticisms, including the following:

1. An Outdated System

This system functioned effectively during the 19th century under the gold standard, primarily because:

- Countries allowed their balance of payments to influence domestic economic policies.
- There was coordination among trading nations in monetary policy decisions.
- Central banks focused on maintaining the external value of their currencies.
- Price levels were more flexible.

However, in the present economic environment, these conditions no longer exist, making it difficult for a fixed exchange rate system to operate smoothly.

2. Deterrent to Foreign Investment

Although a fixed exchange rate system aims to provide stability, it is not entirely rigid. Investors may perceive potential adjustments in exchange rates as a risk, discouraging long-term foreign investment.

3. Loss of Monetary Independence

A country that follows a fixed exchange rate system has limited control over its monetary policies. To maintain exchange rate stability, governments must adjust their monetary policies, often leading to either excessive expansion or contraction of the money supply, which may not always align with domestic economic needs.

4. **Cost-Price Relationship not reflected:** The fixed exchange rate system does not reflect the true cost-price relationship between the currencies of the countries. No two countries follow the same economic policies. Therefore, the cost-price relationship between them go on changing. If the exchange rate is to reflect the changing cost-price relationship between the countries, it must be flexible.

5. **Not a Genuinely Fixed System:** The fixed exchange rate system does not guarantee permanent stability, unlike the gold standard. At the same time, it lacks the flexibility of a freely fluctuating exchange rate, which allows for continuous adjustments based on market conditions.

6. **Difficulties of IMF System:** The fixed or pegged exchange rate system, as implemented by the International Monetary Fund (IMF), operates under controlled flexibility. This approach presents several challenges, including:

- Determining the appropriate timing for adjusting a currency's value.
- Establishing clear and acceptable criteria for devaluation.
- Assessing the extent of devaluation required to restore balance in international transactions.

Self-Check Exercise-2

Q1. Define a Fixed Exchange Rate system.

Q2. Discuss the merits and demerits of the Fixed Exchange Rate system.

19.5 Flexible Exchange Rate

A flexible exchange rate system is one where the value of a currency is determined by market forces, specifically the global supply and demand for that currency. Unlike fixed exchange rates, these rates fluctuate continuously without direct control from central banks.

There are two main types of flexible exchange rate systems:

- **Pure Floating Exchange Rate**: In this system, there is no government or central bank intervention in the foreign exchange market. The currency's value adjusts solely based on market dynamics.
- **Managed Floating Exchange Rate**: Also known as a "dirty float," this system allows some level of government or central bank intervention to stabilize or influence exchange rates when necessary.

Historically, most countries adhered to fixed exchange rate systems before the late 20th century. Before World War II, governments frequently intervened in currency markets to maintain stable exchange rates, often aligning with trade policies. While some countries experimented with flexible exchange rates in the 1920s, they largely returned to the gold standard. However, by the 1930s, a significant shift occurred, leading many nations to abandon the gold standard as economic conditions changed.

In 1944, with the war almost over, international policy coordination was starting to make sense in everybody's mind. Along with other international organisations created during those years, the Bretton Woods agreement was signed, putting in place a new pegging system: currencies were pegged to the dollar, which in turn was pegged to gold. It was not until 1973, when Bretton Woods completely collapsed, that countries started to implement flexible exchange rate regimes.

19.5.1 Merits of Flexible Exchange Rates

A system of flexible exchange rates offers several benefits:

1. **Autonomous Monetary Policy**: A country operating under a flexible exchange rate system can implement its own monetary policy without external constraints. Domestic economic policies are shaped independently, unaffected by the economic conditions of other nations.
2. **Stabilizing External Shocks**: When economic disturbances arise from foreign markets, a flexible exchange rate system helps absorb these shocks. By allowing the currency value to adjust naturally, the domestic economy is shielded from external volatility.

3. **Supports Economic Growth**: Flexible exchange rates can be adjusted according to national economic goals, aiding in economic expansion and full employment. This adaptability makes it easier to align currency values with development objectives.
4. **Automatic Balance of Payments Adjustment**: When a country faces a trade deficit, a depreciation in its currency makes exports more competitive and imports more expensive. This self-correcting mechanism helps restore balance in international transactions.
5. **Encourages Global Trade**: Unlike fixed exchange rate systems that require exchange controls, flexible exchange rates promote the unrestricted movement of capital and goods across borders, fostering global commerce.
6. **Improves International Liquidity**: Since flexible exchange rates eliminate the need for large foreign exchange reserves, countries do not have to maintain excessive stabilization funds. This helps in resolving liquidity shortages in the global financial system.
7. **Market-Driven Exchange Rates**: Currency values are determined by supply and demand in the foreign exchange market, ensuring an automatic balancing mechanism. This prevents persistent shortages or surpluses of any particular currency.
8. **Trade Stability through Forward Markets**: Unlike fixed exchange rates, which historically have not necessarily boosted global trade, flexible exchange rates allow businesses to anticipate currency movements through forward contracts. This reduces financial risks associated with exchange rate fluctuations and facilitates international trade.

19.5.2 Demerits of Flexible Exchange Rates

Despite their advantages, flexible exchange rates have several drawbacks:

1. Limited Impact of Exchange Rate Adjustments: In many cases, exchange rate fluctuations do not effectively correct trade imbalances. When the demand for imports and exports is relatively inelastic, currency depreciation may fail to improve the balance of payments and can even exacerbate deficits.
2. Economic Uncertainty: Frequent fluctuations in exchange rates create instability, discouraging international trade and foreign investment. Businesses and investors face higher risks, leading to reduced long-term investments.

3. Disruptions to Economic Stability: Constant changes in exchange rates influence the prices of imported and exported goods, causing volatility in domestic markets. This instability can hinder economic growth and disrupt long-term planning.
4. Speculative Capital Movements: A system of fluctuating exchange rates often encourages speculative financial activities, leading to unpredictable capital inflows and outflows. These rapid shifts in capital can destabilize economies.
5. Recessionary Impact of Speculation: High uncertainty in exchange rates can lead to increased liquidity preference, where individuals and businesses hoard money instead of investing. This results in rising interest rates, reduced investments, and potential increases in unemployment.
6. Risk of Inflation: Currency depreciation in a flexible exchange rate system can contribute to inflation. As the domestic currency weakens, imported goods become more expensive, pushing overall price levels higher and leading to further depreciation.
7. Barriers Due to Factor Immobility: The benefits of flexible exchange rates are limited when factors of production, such as labor and capital, do not move freely. Structural rigidities in the economy prevent smooth adjustments and reduce the effectiveness of monetary policies.
8. Historical Failures: Past experiences, particularly during the interwar period, have shown that flexible exchange rate systems have not always functioned effectively. Many economies struggled with instability, leading to economic crises.

Self-Check Exercise-3

Q1. Define the Flexible Exchange Rate system.

Q2. What are the merits and demerits of the Flexible Exchange Rate system?

19.6 Summary

In this unit, we explored fundamental concepts related to foreign exchange rates. These rates indicate the value of one currency in comparison to another. Fixed exchange rates, established by governments, provide stability by maintaining a constant value, but

they also restrict flexibility in currency adjustments. Flexible exchange rates fluctuate based on supply and demand, allowing currencies to adjust freely. Understanding these concepts is essential for grasping how currencies impact international trade and investment. Fixed rates provide predictability, while flexible rates offer responsiveness to market forces. Both systems have their pros and cons, shaping global economies in different ways.

19.7 Glossary

• **Foreign Exchange Rate:** The rate at which one currency is exchanged for another, reflecting its relative value.

• **Fixed Exchange Rate:** A system where a government establishes and maintains a stable value for its currency against another, typically through interventions in the foreign exchange market.

• **Flexible Exchange Rate:** A system where the value of a currency is determined by market forces, specifically supply and demand, allowing it to fluctuate.

19.8 Answer to Self-Check Exercises

Self-Check Exercise-1

Answer to Q1. Refer to Section 19.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 19.4.

Answer to Q2. Refer to Sections 19.4.1 & 19.4.2.

Self-Check Exercise-3

Answer to Q1. Refer to Section 19.5.

Answer to Q1. Refer to Sections 19.5.1 & 19.5.2.

19.9 References/Suggested Readings

1. Cherunilam, F. (2017). *International economics*. McGraw Hill Education.
2. D'Souza, E. (2008). *Macroeconomics*. Pearson Education.
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19.10 Terminal Questions

Q1. Define the Foreign Exchange Rate.

Q2. What are the merits and demerits of the Flexible Exchange Rate system?

Q3. Differentiate between Fixed Exchange Rate and Flexible Exchange Rate systems.

UNIT-20
Foreign Exchange Rate-II

STRUCTURE

20.1 Introduction

In the previous unit, we covered some fundamental concepts about foreign exchange rates, fixed exchange rates, and flexible exchange rates. In this unit, we will study how the exchange rates are determined through demand and supply factors. We will also talk about Purchasing Power Parity (PPP) and the Mint-Parity theory of exchange rates. The Mint Parity theory examines how government-set fixed currency rates affect global trade. In the meanwhile, the PPP theory clarifies how exchange rates need to represent the relative costs of commodities across countries.

20.2 Learning Objectives

By the end of this unit, you will be able to

- Understand the factors influencing the determination of foreign exchange rate
- Explore the Mint-Parity and Purchasing Power Parity theories of foreign exchange rate

20.3 Determination of Foreign Exchange Rate

In the previous unit, we discussed how exchange rates are determined, particularly focusing on the flexible exchange rate system, where market forces come into play. Unlike in a fixed exchange rate system, where the government sets the rate and controls it, in a flexible system, the exchange rate is determined by the dynamics of demand and supply in the foreign exchange market.

In a flexible exchange rate system, currencies are traded in the foreign exchange market, where the rate is determined by the interaction of buyers and sellers. This system allows the exchange rate to fluctuate freely based on the market forces.

20.3.1 Demand for Foreign Exchange

Assuming that the market operates without government interference, a country's demand for foreign exchange will be influenced by several factors, such as the need for foreign goods and services, investments abroad, payments for international grants, and loan repayments. The amount of foreign exchange required for these purposes is directly affected by the exchange rate: as the exchange rate increases, the demand for foreign currency generally decreases, and vice versa.

Among these factors, the most significant driver of demand is imports. Therefore, the elasticity of demand for foreign exchange largely depends on the demand elasticity for imports. This, in turn, is influenced by two key factors: (1) the ease with which domestic production can replace imports, and (2) whether the imports are necessities or luxuries. When domestic production can easily substitute imports and when imports are luxury items, the demand for foreign exchange tends to be more elastic.

The time frame also plays a critical role in determining elasticity. In the short term, the demand for foreign exchange is less responsive to price changes because it's more challenging to adjust production and consumption. However, in the long term, the demand becomes more elastic as domestic production can adjust to price changes over time.

20.3.2 Supply of Foreign Exchange

The supply of foreign exchange in the market primarily comes from the export of goods and services. When a country exports goods and services, the exporters receive foreign currencies, which they then exchange for the domestic currency in the foreign exchange market. Additionally, foreign government agencies or individuals may send unilateral transfers, such as grants, donations, or gifts, which also contribute foreign currencies to the market. These transfers typically enter the market as foreign exchange.

In general, the supply of foreign exchange in most cases is directly influenced by the exchange rate. Just like the demand for foreign exchange, the elasticity of supply depends on how responsive the country's exports are to changes in the exchange rate. If the country can easily increase exports in response to higher prices (a higher exchange rate), the supply of foreign exchange becomes more elastic.

Now, to understand how the equilibrium exchange rate is determined, we can consider the forces of demand and supply for foreign exchange. The equilibrium occurs where the demand and supply curves intersect. In a graphical representation, the vertical axis measures the exchange rate in terms of domestic currency per unit of foreign currency, and the horizontal axis measures the quantity of foreign exchange. The point where the demand curve (D'D') and supply curve (S) intersect determines the equilibrium exchange rate.

For example, if there is an increase in the demand for foreign currency, such as the demand for U.S. dollars in India, the demand curve will shift to the right (D1D1), resulting in a higher equilibrium exchange rate. This means the exchange rate will rise to Or1, and the quantity of foreign exchange supplied and demanded will increase to OQ1.

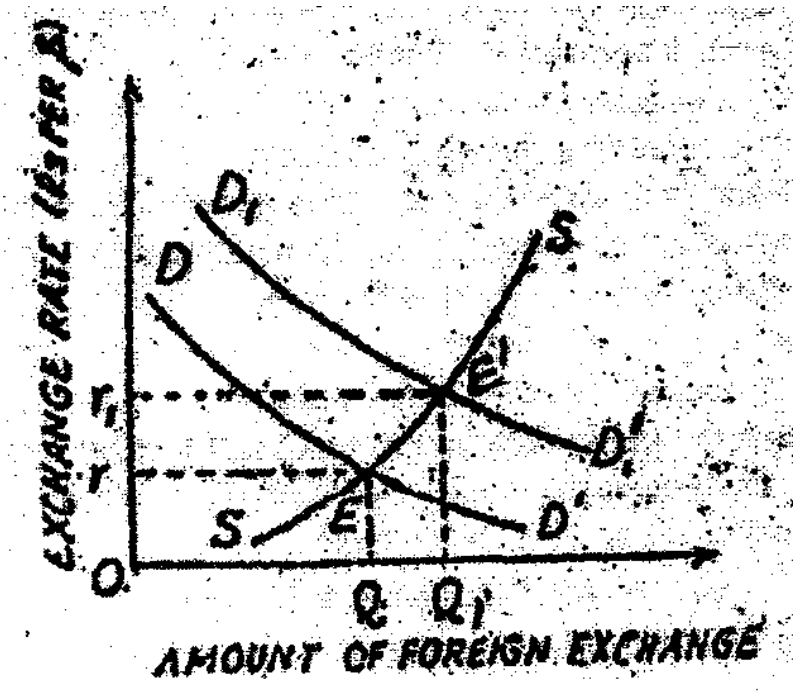

Fig. 20.1

The consequences of a flexible exchange rate system can be illustrated through the diagram. In such a system, fluctuations in the exchange rate (the price of foreign exchange) adjust automatically to align the supply and demand for foreign currency, thereby establishing an automatic adjustment mechanism that helps restore external balance or equilibrium in the economy.

As shown in the diagram, if the demand for foreign exchange increases in India for any reason, the demand curve shifts upward and to the right. This shift leads to a rise in the exchange rate, signifying the depreciation of the Indian currency. In this case, it takes more Indian rupees to obtain the same amount of foreign currency, such as the U.S. dollar. Conversely, if the demand curve shifts to the left or the supply curve shifts to the right, the exchange rate falls, resulting in currency appreciation. In this situation, fewer rupees are needed to exchange for the same amount of foreign currency.

In the case of a balance of payments deficit, the demand for foreign exchange exceeds its supply, which leads to depreciation. This depreciation makes imports more expensive and encourages exports, causing adjustments on both sides of the foreign exchange market. As a result, the rise in the exchange rate helps restore equilibrium in the balance of payments. In contrast, when there is a surplus in the balance of payments, the opposite occurs, leading to exchange appreciation. Therefore, fluctuations in the exchange rate (either appreciation or depreciation) help balance the country's payments automatically.

While this flexible exchange rate system offers a mechanism for automatic adjustment, historically, many countries have preferred the fixed exchange rate system. From the late 19th century until World War I, most countries adhered to the gold standard, a form of fixed exchange rate system. Some nations resumed this system after World War I, but it collapsed during the Great Depression. After World War II, the fixed exchange rate system was re-established under the IMF's par value system, though it ended in 1973. Since then, many countries have adopted a floating exchange rate system, where the exchange rate is determined by the forces of supply and demand within certain limits.

Self-Check Exercise-1

Q1. Define

1) Demand for foreign exchange
2) Supply of foreign exchange

Q2. What are the factors that influence the determination of foreign exchange rates?

20.4 Theories of Foreign Exchange Rate

Two key theories help in systematically determining exchange rates: the Mint Parity Theory and the Purchasing Power Parity Theory.

20.4.1 The Mint-Parity Theory

The Mint Parity Theory applies when the currencies of two nations are based on a metallic standard, such as gold or silver. According to this theory, the exchange rate between these countries is determined by the parity of the precious metals in their

respective currencies. This theory is specifically relevant when both countries are using the same type of metallic standard (for example, the gold coin standard).

Mint parity means that the exchange rate is calculated based on the weight of the metals (gold or silver) in the currencies of the two countries, with adjustments made for their metal content. The value of each coin depends on the amount of metal it contains, and as such, coins can freely circulate between the countries.

For example, before World War I, both England and the United States were on the gold standard. A British gold sovereign contained 113.0016 grains of gold, while the U.S. gold dollar had 23.2200 grains of gold. The mint parity exchange rate was calculated by the ratio of the gold content of the two currencies:

Exchange rate=113.0016/23.2200 =4.8665

This meant that one British pound would be equivalent to 4.8665 U.S. dollars based on the gold content.

Under the gold standard, the exchange rate typically stayed close to the ratio of gold values, or mint parity. However, it could fluctuate within certain limits known as "gold points." These points represent the range within which the market exchange rate could move, based on factors like the costs of insurance, transportation, and handling during the shipment of gold. When exchange rates reached these gold points, the supply and demand for gold would return the rate to its equilibrium.

The mint parity rate was a fixed rate and remained unchanged as long as the monetary laws of the countries stayed the same. However, the market exchange rate could fluctuate due to changes in the balance of payments. These fluctuations occurred within a defined range called the gold points, with the upper and lower limits of the range representing the maximum permissible deviations from the mint parity rate.

(i) Calculations of gold points.

But the actual rate of exchange could be very above and below the mint parity by the cost of shipping gold between the two countries The gold points are determined by the costs of transporting gold (such as shipping, packing, insurance charges, etc.) from one country to another. The upper gold point (upper specie point) is obtained by adding the cost of shipping gold to the mint parity rate of exchange. The lower gold point (lower specie point) is arrived at by deducting the cost of shipping gold from the mint parity rate of exchange. For example, the mint parity rate of exchange between England and America is £1=$4.866. The shipping cost of gold from America to England worth 4.866 dollars of gold is .02 cents. In that case the upper gold point = £1=$4.866 + .02=$4.886. The lower gold point = £1$4.866 .02= $4.846.

(ii)Gold export point and gold import point.

The upper gold point is also called the gold export point. It is the rate of exchange above which the gold will be exported. The lower gold point is also called the gold

import point. It is the rate of exchange below which gold will be imported. Under the gold standard, the exchange rate between the two currencies cannot vary above the upper gold point and below the lower gold point as illustrated in the Fig. 9.1.

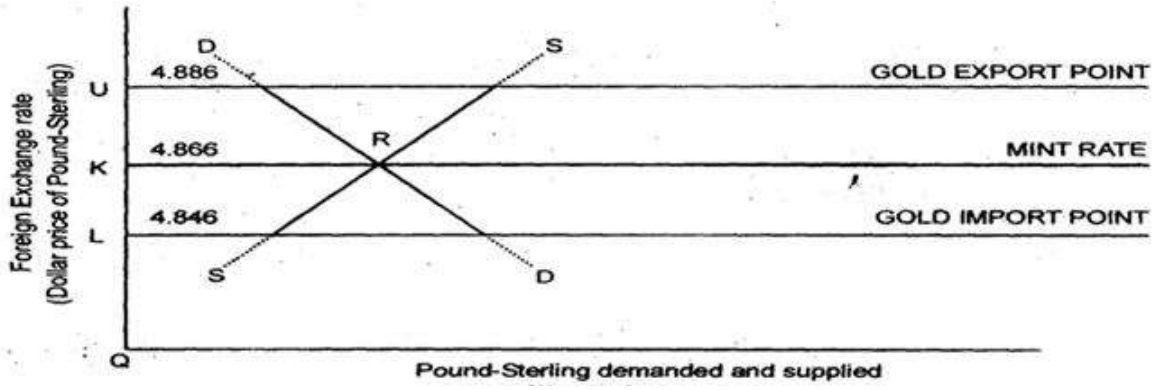

Fig. 20.2

In the Fig. 20.2 the demand curve DD' and supply curve DD' intersect each other at point R. OR is the exchange rate between the dollar and the pound. It may here be noted that the exchange rate need not be at the mint parity. It can be anywhere between the upper and lower gold points depending on the shape of demand and supply curves. An American importer would not pay more than $4.886 to obtain one pound of England. It is because he can purchase $4.866 worth of gold from the US Treasury and ship it to England at a cost of .02 cents per pound. The exchange rate, therefore, cannot rise beyond the gold export point OU. The supply curve of pounds becomes perfectly elastic at the US gold export point. Similarly, the rate of exchange cannot fall between $4846 to a pound. The exchange rate of $4846 to a pound is the US gold import point. In case of the lower rate, the Americans would prefer to use the pounds to import gold from England. The American demand curve for pounds becomes perfectly elastic at the gold import point OL. The mint parity theory has long been discarded ever since the gold standard broke down. Now no country is on the gold standard. So it has an academic curiosity only.

(iii)Drawbacks

The gold standard has only limited applicability in the present world. This will function only under the gold base standard. It fails to explain the determination of exchange rates in the present-day floating system.

20.4.2 The Purchasing Power Parity Theory

The Purchasing Power Parity (PPP) theory was first referenced by David Ricardo, but it gained significant attention and popularity when Gustav Cassel presented it in 1918. According to the PPP theory, in a scenario where exchange rates fluctuate, the long-term exchange rate between two currencies is determined by the relative purchasing power of those currencies within their respective countries.

Foreign currency is in demand because it possesses purchasing power in its own economy, while domestic currency has its own purchasing power, allowing it to purchase goods and services in the home country. Therefore, when domestic currency is exchanged for foreign currency, it is essentially the purchasing power of the domestic currency being traded for the purchasing power of the foreign currency. The exchange rate is established at a level where the purchasing power between the two currencies is balanced. In other words, the exchange rate reflects the relative purchasing power of the currencies involved.

For example, if a specific bundle of goods and services costs $10 in the U.S. and the same bundle costs Rs. 450 in India, the exchange rate between the U.S. Dollar and the Indian Rupee would be $1 = Rs. 45. This exchange rate ensures that the purchasing power of both currencies is aligned. A change in the purchasing power of any currency will cause a corresponding adjustment in the exchange rates. Thus, according to this theory, the value of a currency in international markets is determined by its purchasing power relative to another currency.

(i) Gustav Cassel has presented the PPP theory in two versions.

Absolute Version of the PPP Theory

The absolute version of the PPP theory posits that exchange rates between two currencies should reflect the relationship between their international purchasing powers. Simply put, the exchange rate is determined at the point where the purchasing power of the two currencies becomes equal.

For instance, if a basket of goods costs Rs. 1000 in India and $100 in the U.S., the exchange rate can be calculated as Rs. 10 = $1. This rate reflects the parity in purchasing power between the two currencies based on the price of the same set of goods.

The exchange rate can be determined with the following equation.

$$R = \frac{P_b \times Q_o}{P_a \times Q_o}$$

Where,

R = Exchange rate.

P_a = Prices in nation a.

P_b = Prices in nation b.

Q_o = Corresponding weights.

In this equation, 'P' represents the prices associated with the respective bundles of goods, where the weights assigned to the goods are the same in both countries. This

equation illustrates that the equilibrium exchange rate is determined by the ratio of the internal purchasing powers of the foreign and domestic currencies within their own economies. To summarize, the absolute version of the PPP theory asserts that the absolute purchasing power of currencies plays a crucial role in determining the equilibrium exchange rate.

Relative Version of the PPP Theory

The relative version of the PPP theory, introduced by Cassel, focuses on how changes in the equilibrium exchange rate occur. Any deviation from the equilibrium will result in disequilibrium, which can happen due to shifts in the internal purchasing power of a currency. These changes in purchasing power can be measured using domestic price indices within each country. To understand the percentage change in the exchange rate, it is necessary to assume a base exchange rate from a previous period.

By comparing the price indices from the base period with those of the current period, the new equilibrium exchange rate can be calculated. This relationship is simplified using the following equation.

$$R_n = R_{n-1} \times \left[\frac{P_{b1} / P_{b0}}{P_{a1} / P_{a0}} \right]$$

Where,

R_n = New equilibrium exchange rate.

R_{n-1} = Base period exchange rate.

P_{b0} = Price index of nation b in base Period.

P_{b1} = Price index of nation b in Current Period.

P_{a0} = Price index of nation a in base period

P_{a1} = Price index of nation a in Current period

According to the equation, when the price level in a country changes, it automatically affects the internal purchasing power of that country's currency, leading to a shift in the equilibrium exchange rate. In this context, Gustav Cassel linked the purchasing power of two currencies to determine the equilibrium exchange rate. However, this theory has faced several criticisms.

(ii)Criticism of Purchasing Power Parity (PPP) Theory

1. **Limitations of the Price Index**: In the relative version of the PPP theory, price indices are used to measure changes in the equilibrium exchange rate. However, price indices have several limitations, which affect the accuracy of the theory itself.

2. **Neglect of Demand/Supply Forces**: The theory does not account for the demand and supply of foreign exchange, which are fundamental factors in determining exchange rates. This omission makes the PPP theory less practical since, in reality, exchange rates are heavily influenced by market forces such as demand and supply for foreign currencies.
3. **Unrealistic Approach**: The use of price indices in the PPP theory is often criticized for being unrealistic. The reason is that the goods and services included in these indices may differ in quality from country to country, which makes comparisons without considering these differences impractical.
4. **Unrealistic Assumptions**: One of the major criticisms of the PPP theory is that it is based on unrealistic assumptions, such as the absence of transport costs and trade barriers. These assumptions do not align with real-world conditions, where transportation costs and trade restrictions are common.
5. **Neglect of International Capital Flows**: The PPP theory overlooks the role of international capital flows, which can significantly impact the foreign exchange market. Movements of capital across borders can lead to fluctuations in exchange rates, something the theory does not address.
6. **Rare Occurrence**: Critics argue that the PPP theory is rarely applicable in practice, as exchange rates based on domestic price ratios do not frequently occur in real-world markets.

Self-Check Exercise-2

Q1. Discuss the Mint-Parity theory of foreign exchange rate.

Q2. What do you mean by Purchasing Power Parity (PPP)?

20.5 Summary

This unit has explored the factors that determine foreign exchange rates, with an emphasis on how supply and demand influence currency values. We have examined two key theories: the Mint-Parity Theory and the Purchasing Power Parity (PPP) Theory. The Mint-Parity Theory revolves around fixed exchange rates, often based on the gold standard, which ensures currency stability through government intervention. On the other hand, the PPP Theory argues that exchange rates should adjust to equalize the price of a set of goods across different countries.

20.6 Glossary

- **Fixed Exchange Rate:** A system in which a government establishes and maintains the value of its currency relative to another currency, typically by buying or selling its currency in the foreign exchange market.

- **Flexible Exchange Rate:** A currency exchange system where the value of a currency is determined by market forces of supply and demand, allowing for fluctuations.
- **Purchasing Power Parity (PPP):** A theory that compares the relative values of currencies by measuring the cost of a standardized basket of goods and services in different countries.

20.7 Answer to Self-Check Exercises

Self-Check Exercise-1

Answer to Q1. Refer to Sections 20.3.1 & 20.3.2.

Answer to Q2. Refer to Section 20.3.

Self-Check Exercise-2

Answer to Q1. Refer to Section 20.4.1.

Answer to Q2. Refer to Section 20.4.2.

20.8 References/Suggested Readings

1. Cherunilam, F. (2017). *International economics*. McGraw Hill Education.
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20.9 Terminal Question

Q1. Discuss the factors influencing the determination of foreign exchange rates.

Q.4 Critically examine the Purchasing Power Parity theory of foreign exchange.