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UNIVERSITY OF JAMMU

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SELF LEARNING MATERIAL

MA ECONOMICS SEM-I
Session 2025-26

Subject: Macroeconomics **No. of Credits: 6** **Unit : I**
Course No: ECO-107 **Lesson No. : 1-24**

Dr. Neelam Choudhary
Course coordinator

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MACROECONOMICS

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M.A Economics under Non-CBCS (CDOE)
Semester-1
Syllabus for the examination to be held in December 2025, 2026 & 2027
Course Code: ECO-107 Title – Macroeconomics
Credits:6 Max. Marks: 100
Internal Assessment: 30 Time: 3 Hours Semester Exam: 70

Course Outcomes

- To understand macroeconomic theoretical structure for the proper comprehension of different issues and policies
- To learn various approaches to National Income and Accounts
- To familiarise the students with the theory of consumption function and investment function
- To study various theories of Business Cycles and Macro Economic Policy
- To study and compare the Keynesian and Neo-classical perspectives on macroeconomic issues

Unit-I Macro Economic Policy & National Income Accounts

Macroeoconomic seven schools of thought; Circular Flow of income in two, three and four sector economy; different forms of national income accounting- social accounting, flow of funds accounting, and balance of payments accounting, New classical critique of Micro Foundations of Macroeconomics, New classical theoretical conclusions, Rational expectations, Empirical validity of Rational expectation hypothesis & Policy implication of New classical approach.

Unit-II National Income Determination: The IS-LM Model

Demand-side Equilibrium- Equilibrium Income and Interest Rate in the Product Market- derivation of the IS curve, Equilibrium Income and Interest Rate in the Money Market- Derivation of the LM curve, Equilibrium in the Product and Money Markets- the combined 1S- LM model, Fiscal Policy Effects on Demand, Monetary Policy effects on Demand, Interaction of Fiscal and Monetary Policies, Crowding out effect and crowding in effect..

Unit-III Sectoral Demand Functions: Consumption and lnvestment

Background of the Consumption Function, Duesenberry's Relative Income Hypothesis,

Friedman's Permanent Income Hypothesis, Ando-Modigliani's Life Cycle Hypothesis. The Modern Approach-Consumption under Uncertainty, Marginal Efficiency of Capital and Investment, The Neo-classical theory of investment, The Stock Demand for capital and the flow of lnvestment , Investment Subsectors-Business Fixed, Residential and inventory: Investment and Aggregate Supply.

Unit-IV Business Cycle and Macro-Economic Policy

Theories of Kaldor, Samuelson, JR Hicks and Goodwin's model of business cycle, Control of Business Cycles, Macroeconomic Policy: Objectives and instruments: Developments in Macroeoconomics to the 2009 Crisis; New Classical Economics and Real Business Cycle Theory ,New Keynesian Economics, New Growth Theory, Toward an Integration.

Note for Paper Setting

The term end examination shall be of 70 marks. There shall be two types of questions in each unit, two short answer type (each of 250words) and two medium answer type (each of 600 words). The candidate will have to attempt one short answer type question and one medium answer type question fromeach unit. Each short answer type question shall carry 4.5 marks and each medium answer type question shall carry 13 marks.

Basic Reading List

- Ackley, G, Macroeconomics Theory and Policy. Macmillan. New York.
- Blackhouse,R and A. Salansi (Eds.) (2000), Macroeconomics and the Real World (2 Vol.) Oxford University Press London.
- Branson, W.A. (1989), Macroeconomic. Theory and Policy. (3rd Edition). Harper and Row, New York.
- Dornbusch, R and F. Stanley (1997), Macroeconomics, McGraw Hill, Inc. New York
- Edmund Phelps (1990), Seven School of Macroeconomics Thought. Oxford University Press.
- Hall, RE and JB Taylor (1986), Macroeconomics, WW Norton, New York.
- Heijdra, BJ and VP Fredrick (2001) Foundations of Modern Macroeconomics, Oxford University Press, New Delhi.

- Jha,R.(1991) Contemporary Macroeconomics Theory and Policy, Wiley Eastern Lid. New Delhi.Romer, D.L. (1996), Advanced Macroeconomics, McGraw Hill Company Ltd., New York.
- Foryen, Richard T. Macroeconomics Theories and Policies, Pearson Education Inc., New York.
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- Scafe BL (1977), Cycles, Growth and inflation, McGraw Hill, New York .
- Shapiro, E. (1996), Macroeconomic Analysis, Galgotia Publications, New Delhi.
- Surrey, MJC (Ed.1976), Macroeconomic Themes, Oxford University Press, Oxford.

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	19. Goodwin's Model of Business Cycle: Analysis and Application	Prof. Jasbir Singh
	20. Control of Business Cycles: Policy Approaches and Instruments	Dr. Apoorva Jamwal
	21. New Classical and Real Business Cycle Theory: Overview and Implications	Prof. Jasbir Singh
	22. New Keynesian Economics: Post-2009 Crisis Developments	Dr. Apoorva Jamwal
	23. New Growth Theory: Implications for Macroeconomic Policy	Dr. Apoorva Jamwal
	24. Toward Integration: A Unified View of Business Cycles and Macroeconomic Policy	Dr. Apoorva Jamwal

M.A. ECONOMICS		**LESSON NO. 1**
COURSE NO: ECO-107	**SEMESTER IST**	**UNIT–I**

INTRODUCTION TO MACROECONOMIC SCHOOLS OF THOUGHT

STRUCTURE:

1.0 Objectives

By the end of this chapter, the reader will be able to:

- Describe the key assumptions and implications of the Classical School of Economics, including Say's Law and the concept of money neutrality.
- Explain the emergence of the Keynesian School, focusing on aggregate demand, wage-price rigidity, and the role of government intervention.
- Analyse the Monetarist, Neo-Classical, New Classical, and New Keynesian schools' contributions to modern macroeconomic theory, including rational expectations and price stickiness.
- Understand the integration of different schools into the New Neoclassical Synthesis and its role in contemporary macroeconomic research and policy-making.

1.1 Lesson Outcomes

After completing this chapter, students will be able to:

- Differentiate between the **Classical**, **Keynesian**, and **Monetarist** views on how the economy reaches equilibrium.
- Interpret and compare graphical representations of aggregate supply and demand across different schools of thought.

- Evaluate the policy recommendations of different macroeconomic schools and their relevance in addressing modern economic challenges.

1.2 Introduction

Dear learner, after going through this chapter, you would be able to critically engage with the concept of macroeconomics. Macroeconomics, the branch of economics concerned with the behavior and performance of an economy as a whole, has been shaped by a rich history of theoretical debates and schools of thought. One of the fundamental challenges in macroeconomics is understanding how an economy adjusts to equilibrium levels of output, employment, and prices, and what causes fluctuations around this equilibrium. Throughout the evolution of the discipline, economists have developed different frameworks to explain these phenomena, each with unique assumptions about market behavior, price and wage flexibility, expectations, and the role of government and monetary policy. This chapter introduces the major schools of thought in macroeconomics, tracing their historical development and highlighting their core principles and policy implications.

1.3 The Classical School of Economics

The Classical school of economics laid the groundwork for macroeconomic theory and is associated with early economists such as Adam Smith, David Ricardo, Thomas Malthus, and John Stuart Mill. The defining feature of classical economics is the belief in the self-regulating nature of markets. Central to this approach is **Say's Law**, which posits that supply inherently generates its own demand. In other words, production of goods and services creates enough income to purchase those goods, implying that general gluts or prolonged unemployment cannot occur.

Key Assumptions:

- **Price, wage, and interest rate flexibility:** The classical economists argued that prices and wages adjust quickly to clear markets. For example, if unemployment arises, wages will fall, encouraging firms to hire more workers until full employment is restored.
- **Market clearing:** Because prices and wages are flexible, supply equals demand in all markets, including labor and goods markets.
- **Money neutrality:** Money is viewed as a veil that only affects nominal variables (like the price level) but does not influence real output or employment. Thus, changes in money supply affect prices but not real economic activity.
- **Role of government:** The government's role is limited to protecting property rights, enforcing contracts, and providing defense and public order. Economic management through fiscal or monetary policy is unnecessary as markets naturally find equilibrium.

Implications:

- The aggregate supply (AS) curve is vertical, reflecting that output is determined solely by supply-side factors such as technology, labor, and capital.
- Fluctuations in aggregate demand affect only the price level and not output or employment.
- Economic growth depends on supply-side improvements, such as capital accumulation, labor force growth, and technological innovation.

Graphical Representation:

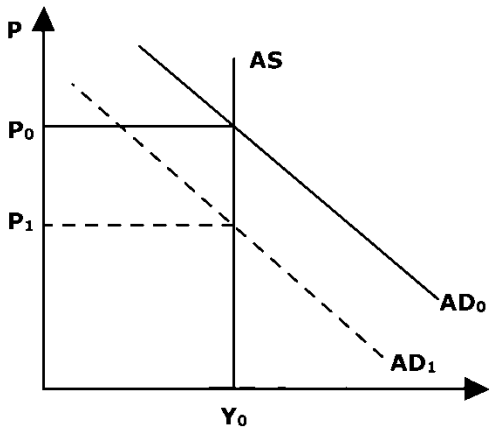

Figure 1: Vertical Aggregate Supply curve by classical economists. Any change in aggregate demand changes the price level, without changing the output and income in the economy.

If aggregate demand shifts from AD_0 to AD_1, prices adjust (fall in this case) but output remains at the full employment level, Y_0.

1.4 The Keynesian School of Economics

The Keynesian school emerged as a reaction to the Great Depression of the 1930s, a period when classical economics failed to explain prolonged high unemployment and economic stagnation. John Maynard Keynes, in his landmark work *The General Theory of Employment, Interest, and Money* (1936), introduced a new paradigm focusing on the role of aggregate demand in determining output and employment.

Core Ideas:

- **Demand creates its own supply:** Contrary to Say's Law, Keynes argued that insufficient aggregate demand could lead to underemployment equilibrium where resources, including labor, remain unused.
- **Sticky wages and prices:** Keynes emphasized that wages and prices do not adjust instantly or flexibly downward. Contracts, labor unions, regulations, and social norms cause wage and price rigidity.
- **Importance of expectations and uncertainty:** Businesses and consumers base their spending decisions on uncertain future conditions, which can depress investment and consumption.
- **Role of government intervention:** Because markets may not clear, the government must actively intervene to boost aggregate demand through fiscal policy (increasing government spending or cutting taxes) and monetary policy (lowering interest rates).

Implications:

- The short-run aggregate supply curve is horizontal or flat, indicating that output can change significantly without changes in the price level.
- A decline in aggregate demand reduces output and employment, leading to recessions or depressions.
- Stabilization policies are necessary to smooth out business cycles and return the economy to full employment.

Graphical Representation:

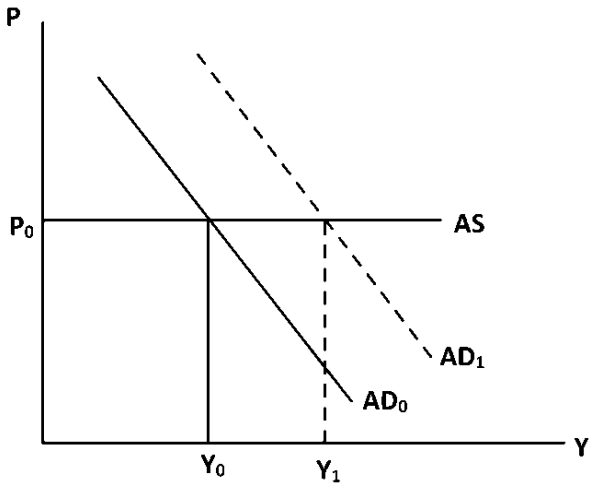

Figure 2: Aggregate supply curve in Keynesian economics in the short-run. An increase in demand increases output, without any change in the price level, due to wage-price rigidity.

In Keynesian theory, a fall in aggregate demand shifts the AD curve leftward, causing output to fall below full employment and leading to unemployment while prices remain relatively stable due to rigidity.

1.5 The Monetarist School

Developed primarily by Milton Friedman, the Monetarist school revisited the importance of monetary factors in macroeconomic analysis, particularly in response to perceived shortcomings in Keynesian economics.

Key Points:

- **Money supply's role:** Monetarists argue that changes in the money supply are the primary drivers of fluctuations in output and prices.
- **Long-run neutrality of money:** While money can affect output in the short run, in the long run, monetary policy only influences the price level.

- **Critique of fiscal policy:** Monetarists are skeptical of active fiscal policy, warning it can lead to inflation without boosting output sustainably.
- **Monetary policy rules:** They advocate for predictable, rule-based monetary policies rather than discretionary interventions.

1.6 Check your progress

Q- What are the key assumptions of Classical school of Economics?

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Q – How is the Monetarists school of Economics different from the Keynsian school?

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1.7 The Neo-Classical School

The Neo-Classical school emerged as an effort to reconcile the insights of Keynesian and Classical economics. Economists such as John Hicks, Paul Samuelson, and Robert Solow played central roles in this synthesis.

Contributions:

- **IS-LM Model:** Developed by John Hicks, this model integrates the goods market (IS curve) with the money market (LM curve), showing how interest rates and output adjust to equilibrate these markets.
- **Solow Growth Model:** Robert Solow's model provides a framework for understanding long-run economic growth based on capital accumulation, labor growth, and technological progress.
- The Neo-Classical school accepts that prices and wages may be sticky in the short run (Keynesian insight) but flexible in the long run (Classical insight).

1.8 The New Classical School

The New Classical economists built on Neo-Classical ideas and introduced the concept of **rational expectations**. Economists like Robert Lucas, Thomas Sargent, and Robert Barro argued that economic agents form expectations based on all available information and that markets clear continuously.

Key Features:

- **Rational expectations:** Agents anticipate the effects of economic policies, making systematic policy interventions largely ineffective.
- **Market clearing:** Wages and prices adjust flexibly to clear markets.
- **Real Business Cycle (RBC) theory:** Business cycles are caused by real (technology or productivity) shocks, not monetary or demand shocks.
- **Policy implications:** Only unexpected policy changes can affect output; attempts at short-term stabilization are ineffective or destabilizing.

1.9 The New Keynesian School

Emerging as a response to New Classical ideas, the New Keynesian school introduces microeconomic foundations to explain why wages and prices are sticky despite rational expectations.

Explanations for Sticky Prices/Wages:

- Menu costs: Changing prices is costly for firms, so they adjust prices infrequently.
- Coordination failures: Firms and workers are reluctant to change prices and wages because they depend on what others do.
- Aggregate demand externalities: One firm's price cut can increase demand for other firms' products, creating reluctance to reduce prices.

Policy stance:

- Some government intervention is justified to address market imperfections and stabilize the economy.

1.10 New Growth Theories

Starting in the 1980s, economists began focusing on **endogenous growth models** to explain persistent differences in economic growth rates across countries.

Focus Areas:

- The role of technological innovation, human capital development, and knowledge spillovers.
- Emphasizes that growth arises internally within the economy through investments in research, education, and innovation.
- Rejects the notion that growth is exogenously determined.

1.11 The New Neoclassical Synthesis

In the 1990s, economists sought to integrate the best elements of New Classical and New Keynesian schools, resulting in the New Neoclassical Synthesis.

Features:

- Combines **rational expectations** and **real business cycle theory** with **price stickiness** and market imperfections.
- Uses **Dynamic Stochastic General Equilibrium (DSGE)** models to analyze the behavior of households and firms under uncertainty and shocks.
- These models serve as the basis for much of modern macroeconomic research and policy analysis.

1.12 Let us sum up

The development of macroeconomic theory reflects an ongoing effort to understand the complex dynamics of economies. From the classical belief in self-correcting markets to Keynesian advocacy for government intervention, and further to sophisticated modern syntheses, each school contributes important insights. Recognizing these schools' differences and complementarities is essential for comprehending contemporary macroeconomic debates and policy decisions. The evolution of macroeconomic thought reflects the dynamic nature of real-world economic challenges and theoretical debates. From the Classical School's emphasis on self-correcting markets to Keynesian concerns about aggregate demand, to Monetarist, Neo-Classical, and New Keynesian refinements, each school has added valuable insights to our understanding of the economy. The modern New Neoclassical Synthesis highlights the importance of integrating microeconomic foundations, rational expectations, and market imperfections to develop comprehensive macroeconomic models. This chapter has provided a foundational understanding of these diverse schools of thought, setting the stage for deeper exploration of macroeconomic theory and policy in subsequent studies.

1.13 Keywords

- Say's Law: An economic principle asserting that supply creates its own demand, implying that general gluts (excess supply) cannot persist in an economy.
- Aggregate Demand (AD): The total demand for goods and services in an economy at a given overall price level and time period.
- Rational Expectations: The assumption that economic agents use all available information efficiently when forming expectations about future economic variables.
- DSGE Models: Dynamic Stochastic General Equilibrium models that combine microeconomic foundations with macroeconomic analysis to study the behaviour of an economy under uncertainty and policy shocks.

1.13 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

1.14 Hints to check your progress

Q1- See section 1.3

Q2- See section 1.4 and 1.5

1.15 Examination oriented questions

- Explain Say’s Law and critically assess its validity in the context of the Great Depression.
- Describe the Keynesian perspective on wage-price rigidity and its implications for unemployment.
- Compare and contrast the Monetarist and Keynesian views on the effectiveness of fiscal and monetary policy.
- Discuss the role of rational expectations in the New Classical School and its policy implications.
- How does the New Neoclassical Synthesis integrate elements of both Classical and Keynesian thought?

M.A. ECONOMICS		**LESSON NO. 2**
COURSE NO. :ECO-107	**SEMESTER IST**	**UNIT–I**

CIRCULAR FLOW OF INCOME IN A TWO SECTOR ECONOMY

STRUCTURE

2.0 Objectives

By the end of this chapter, the reader will be able to:

(i) How are national income and employment levels determined at a particular point of time and why do the economies pass through the phases of boom and depression during a specific period of time?

(ii) What are the laws of economic development?

(iii) Managers of modern corporate enterprises know that these issues are very much relevant to their growth and prosperity.

(iv) In an attempt to understand the basics of macroeconomics let us discuss the circular flow of income in an economy.

2.1 Learning Outcomes:

After completing this chapter, the reader will be able to:

(i) How are national income and employment levels determined at a particular point of time and why do the economies pass through the phases of boom and depression during a specific period of time?

(ii) What are the laws of economic development?

2.2Introduction

Dear Learner, after going through this chapter, you would be able to understand how, until the publication of John Maynard Keynes' *The General Theory of Employment, Interest and Money* in 1936, economists made little attempt to analyse the functioning of the economic system as a whole. You will learn how the Great Depression of the 1930s exposed the weaknesses of classical economic theory, which had assumed that markets functioned rationally and automatically achieved full employment. The economic collapse of that period not only caused immense social distress but also led to a deep intellectual crisis among economists, as aptly noted by Robert L. Heilbroner. This chapter will help you

appreciate how Keynes' revolutionary ideas challenged existing beliefs and laid the foundation of modern macroeconomics.

You will be able to recognize how Keynes introduced an alternative framework to explain the determination of employment and output, showing that market forces alone could not guarantee full employment. This transformation in economic thinking is often referred to as the "Keynesian Revolution." The chapter will also familiarize you with how, since then, economists have shifted their attention to the behaviour of the economy as a whole. As described by Rudiger Dornbusch and Stanley Fischer, modern macroeconomics now deals with issues such as economic growth, inflation, unemployment, balance of payments, and exchange rates. By the end of this chapter, you will gain a clear understanding of why Keynes' work is considered the genesis of macroeconomics and how it continues to shape economic thinking and policy-making today.

2.3 Circular Flow And Economic Activity

It means continual circular movement of money and goods in the economy. The concept of the circular flow of income is a simplification which attempts to illustrate the flow of money and goods from households to business enterprise and back to household. We know that the economic activities and money have a circular flow. Circular flow of money means that the money spent must not be hoarded and should continue to flow to maintain a certain level of economic activity and income. In order to obtain a clear idea of the relation between the numerous economic units in a country, it is best to reduce them to homogeneous groups. For example, all households may be taken as one whole, because their activities are more or less of the same type. Enterprises and government agencies too can be grouped also. Through economic activity (production, consumption, capital formation etc.), these groups are linked up not only with each other but also with other economic problems of the world--- by flow of goods and money. All those currents make up the circular flow of economic activity.

We see the GNP, GNY and GNE are all identical in values and when depreciation is deducted, they become net-i,e., NNP □ NNY □ NNE, (the symbol □ denotes identity). But the income, output and expenditure approach would not assume such a great importance if they were merely identical to each other; the fact of the matter is that income, output and employment are equal to each other functionally also. Keynes was the first to note the fact of the circular flow of economic activity. Consumers spend their incomes on goods and services produced by business and production units. The business sector pay them (to factors) in the form of wages, rent, interest and profits.

This forms the income of the factors which is again spent. Thus, the functioning of the economy consists in the production of goods and the services by the factors of production and production units. What are 'costs' to business are 'incomes' to the factors such as the workers and the resource-owners. Consumer's expenditure is income to business. It is expenditure by the consumers that determines the income of the producers. More expenditure means more income and greater production. It will increase the earnings of the factors and their spending and so on. Once we understand this, we understand the circular flow of economic activity. Keynesian approach of income also tells us the most important condition which must be fulfilled before the economy is said to be in equilibrium, i,e., the important condition of saving being equal to investment. We know that in a closed economy with no government activity the income(y) is divided between consumption expenditure (c) and investment expenditure (i). We also know that whatever part of income is not consumed is saved(Y=C+S). Since income (y)= Expenditure (E), therefore, C +S = C+I, therefore, S=I. Here in lies the greatest importance of Keynesian approach. In the fundamental Keynesian equation Y= C + I, C depends on Y, therefore, it is essential to understand clearly what Y stands for and what different concepts are that have come to lie associated with it. The definition of income presented good deal of difficulty to Keynes. Today, it has been refined and operationally made more significant.

Thus, one of the important conditions for the economy to be in equilibrium is

that its circular flow of economic activities among the different sectors of the economy must be maintained, i,e., whatever is earned in the form of income (y) by the factors of production must be spent by them either Y= C+I this is the income-expenditure approach, in which the balance between the two sides is maintained-when this is done, it is said that the circular flow of economic activity has been maintained and the economy is in a state of macro equilibrium.

This circular flow of economic activity is maintained not only in two sector closed simple economy but also in three sector economy and four sector open economy in which we take into consideration the foreign trade sector transactions. In order to attain the circular flow of economic activity necessary adjustments of transactions in the various sectors of the economy are made. Circular flow model highlights the circular flow of spending and income between business and household sectors of the economy built on the concept that spending creates income.

CHECK YOUR PROGRESS I

Q1. How does circular flow of income affect economic activity?

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2.4 Two Sector Model

In a two-sector model of a simple economy we consider Household sector and Business sector called Firms etc. Households own all economic resource or factors of production. These resources are either labour force (human resources) or capital stock (non-human resources) or both. Households are not only families, they may be single

people and communal groups as well. Households are basically consumer units and their ultimate aim is to satisfy the wants of their members. They are also the controllers of the factors of production. On the other hand, business sector employs the factors of production or resources (inputs) and produces the final output for sale. Business or firms take economic resources from households and in turn provide them with goods and services. These basic exchanges are known as real flows. By themselves these real flows would mean barter-but this being very inconvenient-we make use of money-the medium of exchange. Business sector gives money for the purchase of scarce economic resources from the resource markets and also receives money in return for the sale of goods and services produced and supplied through the product market. Business sector pays for factor services and incur---what are called 'factor costs' and receives income in return. Thus, flows of goods and services in one direction are always matched by the flows of money in the opposite direction. The model given below shows how circular flow in two sectors in a simple closed economy is maintained.

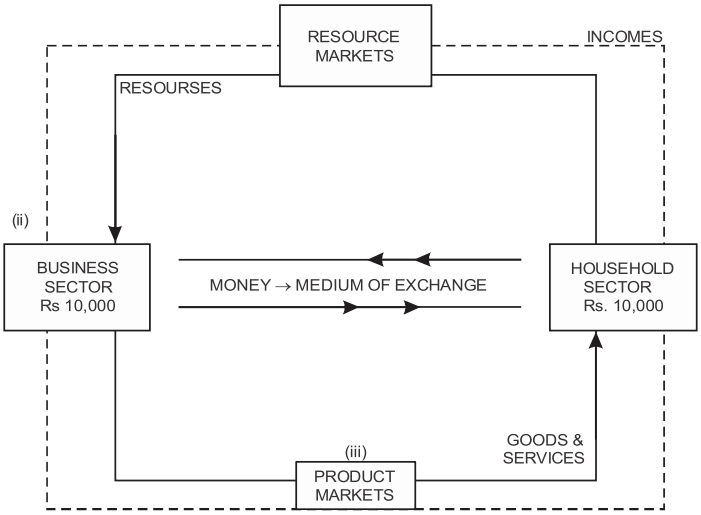


Figure 2.1

In this model we see that business and household sectors are the principals in the circular flow of real items and money---that takes place in the resource and product markets. In other words, business sector do not buy all the economic resources directly from the households; nor do the households buy goods and services directly from business sector. Both types of transactions are carried through the markets (the resource market and the product market). In resources market household sector supplies economic resources to satisfy the demand of business sector. Business sector makes use of these resources (inputs) in the production and in the process supplies final goods and services through product market to households for the satisfaction of their wants---through money, being the chief medium of exchange. The size of these flows depends on the amount demanded by the household sector and supplied by the business sector and on the prices of the final output. However, on account of the scarcity of resources and limitation of supplies these flows are finite in nature.

The model depicts circular flow in two-sector simple economy ,where household sector earns Rs. 10,000 from the sale of 'factor services' to business sector and this business sector makes use of these inputs to produce an output in the economy exactly equal to Rs.10,000. The basic assumption being that income payments to business sector for factor services return to business sector in the form of purchase of output of final goods and services--- the circular of income and product not only maintains itself but tends to perpetuate itself, production equals sales---output equals demand--- and there will be a tendency to continue operating at the same level---the whole process being described as macroeconomic short period static equilibrium.

Accordingly, the economic agents in the business sector are called 'producers' and economic agents in the household sector are called 'consumers'. As such there are mainly two broad types of transactions that take place between 'producers' and 'consumers'. From the viewpoint of producers these transactions take the form of, (i) purchase of the factor services from the household sector, (ii) sale of final output to

household sector. From the 'consumers' viewpoint, these transactions take the form of, (i) sale of factor services to business sector, (ii) purchase of final output from business sector. The circular flow of economic activity in the two sector simple economy is, however, based on the following assumptions:

Assumptions

(a) The economy is a closed economy (no foreign trade sector),

(d) Production takes place only in business sector,

(c) Producers sell all that they produce. In other words, there is no inventory accumulation in the business sector,

(d) Consumers spend all their income on consumption. In other words, there is no saving in the household sector,

(e) There are no transactions involved like government expenditure on goods and services or taxes etc.

Given the above assumptions, it follows that production should equal sales and income should equal expenditure, then the circular flow is complete. In the real world, it is not possible to uphold these assumptions and at times these have to be dropped. In such circumstances the maintenance of circular flow in the economy becomes a bit more complicated. While basic circular flow of spending and income prevails, the real working of the economy adds complications in our simple two sector theoretical structure or model of the economy described above. These complications are caused by injections and leakages. Injections are factors which increase spending flow; while leakages are factors which tend to reduce spending. The basic mechanism of circular flow remains the same though some adjustments in transactions will have to be made.

Even in two sectors model based on simple assumption mentioned above there may be leakages from the income stream in the form of savings by the household sector. They may save a fraction of income say, Rs. 1,000 out of Rs. 10,000 (in the above example) and decide not to spend---as a result consumption expenditure will fall to Rs.

9,000---so production levels will have to be cut back in the second round, reducing, in turn, the flow of income to household sector. It shows that leakages in any form would reduce the production and income level and would also interfere with the smooth flow of circular activity. However, should the business sector decide to buy the leftover output worth Rs. 1,000 for any reason (because it wishes to add to its stock of inventories) total expenditure can still remain equal to output despite the saving leakage. Thus, if intended or desired business investment equals saving---equilibrium, flow can still be maintained at the original level of income and output. This is shown in the model given below:

The model shows that the household sector saves Rs. 1,000 and spends Rs. 9,000 on consumption--- business sector purchases goods and services worth Rs 1,000 for its

own use, thereby helping the economy to maintain the circular flow. But the model shows that there is a capital market also between S and I flows. Just as factor services or resources flow through resources market and the final output through product markets, S and I flow through capital market. According to classical, capital market is always acted in a manner that will make saving equal to investments automatically through the mechanism of the rate of interest. But modern economists believe that there is no automatic capital market mechanism making S = I. This outside action, force or mechanism is monetary policy, which can stimulate or retard investment spending. The model shows that monetary policy helps the capital market to bring savings (Rs. 1,000) equal to investments (Rs. 1,000).

INCOME
PAYMENT
S (Rs
10,000)

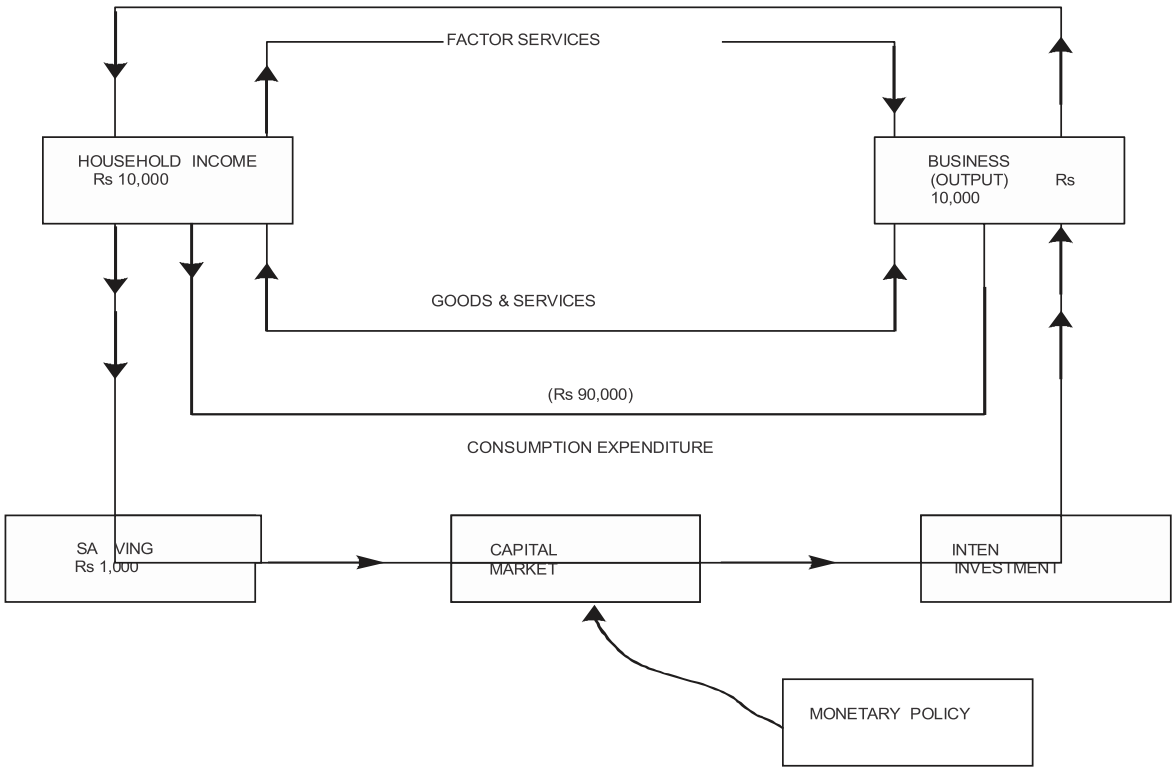


Figure 2.2

2.5 LET US SUM UP

1. Circular flow implies a continuous movement of money and goods in the economy.
2. One of the most important conditions of macroeconomic equilibrium is that its circular flow must be maintained.
3. The circular flow is first of all maintained in two sector simple and closed

economy.

4. Two sector model comprises of the Household sector and the Business sector.
5. The circular flow in two sectors is attained when production equals sale and output equals demand.

2.6 Keywords

Circular flow: It means continual circular movement of money and goods in the economy

Economic activity : Economic activity includes all actions encompassing production, distribution, and consumption of goods and services that uses different factors of production.

2.7 SUGGESTED READINGS

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

2.8 HINTS TO CYP

Q1. See section 2.3.

2.9 EXAMINATION ORIENTED QUESTIONS

1. What is circular flow of income?
2. Explain the effect of injections and withdrawals in the circular flow of income.
3. Discuss the circular flow of income in four sector system.
4. Explain circular flow in two sector with product and capital market.

M.A. ECONOMICS		**LESSON NO. 3**
COURSE NO: ECO-107	**SEMESTER IST**	**UNIT–I**

CIRCULAR FLOW OF INCOME IN A THREE SECTOR ECONOMY

STRUCTURE:

3.0 OBJECTIVES

By the end of this chapter, the reader will be able to:

i) How are national income and employment levels determined in the presence of a government and foreign sector.

ii) What are the laws of economic development?

Managers of modern corporate enterprises know that these issues are very much relevant to their growth and prosperity.

In an attempt to understand the basics of macroeconomics let us discuss the circular flow of income in a three and four sector economy.

3.1 LEARNING OUTCOMES

After the completion of the chapter the student will be able to know

i). How are national income and employment levels determined in a three and four sector economy

ii). What are the laws of economic development?

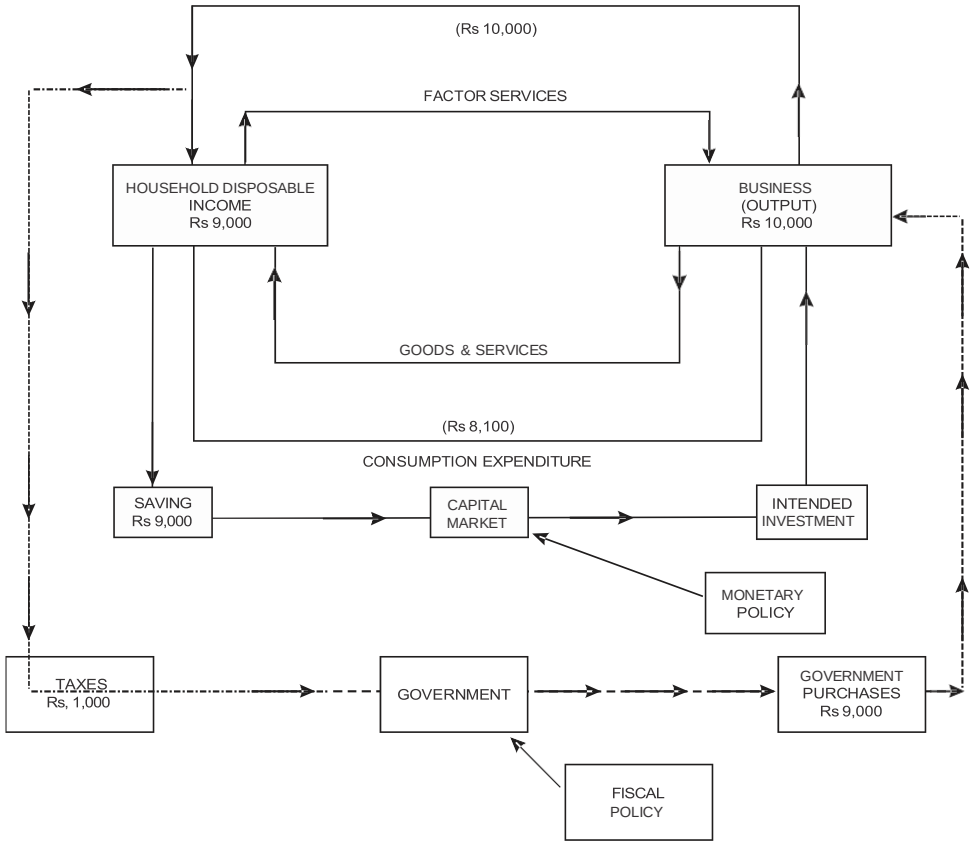
3.2 INTRODUCTION

Dear learner, after going through this chapter, you would be able to understand how the field of macroeconomics evolved, particularly how, until the publication of Keynes' *The General Theory of Employment, Interest and Money* in 1936, there was little effort made to analyse the functioning of the economy as a whole. As noted by Robert L. Heilbroner, economists of that era suffered from a kind of myopia, and the Great Depression not only caused immense social distress but also delivered a profound intellectual shock by exposing the failure of classical economic theory to address real-world crises. You will appreciate how Keynes offered an alternative theory that emphasized the role of aggregate demand in determining employment and output, marking a departure from the belief that market forces always ensure full employment.

This shift in thinking, known as the Keynesian Revolution, gave birth to modern macroeconomic theory. You will also become familiar with the current scope of macroeconomics as described by economists like Rudiger Dornbusch and Stanley Fischer—covering topics such as economic booms and recessions, inflation, unemployment, national output, the balance of payments, and exchange rates—thereby enabling a more comprehensive understanding of the economy as a whole.

3.3 THREE SECTOR MODEL

The three sector model of a simple economy shows the circular flow of economic activity involving government transactions. Government incurs expenditure on goods and services and gets receipts in the form of taxes. Taxes which are levied by the government constitute an important source of leakage apart from savings; whereas government expenditure on the purchase of goods and services constitutes an important source of injection. When we give money to government (Central, State & Local) in the form of taxes, our ability to spend is reduced but the government can offset the effect of this leakage through taxes by spending more on the purchase of goods and services called injection. This act on the part of the government to levy taxes and to spend more is called fiscal action. The working of the three sector model involving government transactions, taxes and expenditure is shown in the model given in figure given below :



INCOME PAYMENTS

Figure-3.1

The model shows that the government collects Rs. 1,000 of the household income in the form of taxes. This will reduce the household consumption as well as saving, which in turn, will reduce business sales. But if there is a new source of injection in the form of government purchase and expenditure on goods and services, it will offset the effects of the tax leakage. If the government purchases (expenditure) from the business sector are equal to the amount by which the taxes reduce consumption, total business sales will again equal production and the circular flow of the economy involving three sectors will be maintained. In the model the total output is worth Rs. 10,000 before taxes. The government levies taxes worth Rs. 1,000 reducing the disposable income of the household sector to

Rs. 9,000. This causes the households to reduce consumption by Rs. 900 and saving by Rs.100, as such the new level of saving is Rs. 900 and the level of consumption expenditure is Rs. 8,100. If intended investment remains as before (Rs. 1,000) total expenditure on C and I will be Rs. 9,100. Therefore, the government must purchase and spend on goods and services Rs. 900 to make the total demand equal to the total value of the output, i.e., Rs 10,000. What is important is that total expenditure must equal total output---which is equivalent to saying that total leakages must equal total injections. We see in the model that government expenditure is not equal to taxes and savings are no longer equal to intended investments but the macroeconomic equilibrium or the circular flow of the economy obtains nevertheless because total expenditure is equal to the value of total output. In the model taxes and savings (leakages) have reduced consumption to Rs. 8,100--- what is therefore, required is some source of demand(injections) worth Rs. 1,900.If I < S. then government should compensate the economy by spending more than it taxes. All this involves once again an action or a mechanism which in this case is in the form of fiscal policy on the part of government. It is, therefore, clear that the monetary policy and the fiscal policy are necessary instruments of maintain circular flows in the economy---in case it is temporarily disrupted by leakages in the form of savings in two sector model or taxes in the three sector model or imports in the four sector model.

3.4FOUR SECTOR MODEL

The two sector or three sector models given above of a simple closed economy can be extended to four sector open economy by waiving the assumption of closed

economy. The four sector model includes foreign trade and transactions taking place in foreign trade sector. When the household sector purchases goods from abroad and imports them into the economy---the expenditure represents a leakage from the circular flow. This leakage (import expenditure) has to be offset--- offsetting this are the expenditure incurred by foreigners on domestic goods and services(exports) and give rise to injections (export expenditure) into the domestic circular flow. When these flows are added in our four sector model we treat imports as leakages and exports as injections. These flows

pass through a sector called 'balance of payments' sector---which is influenced by various types of foreign trade policies (say, like free trade or protection). The equilibrium condition for maintain the circular flow would still be that total leakage must equal total injections. However, in the four sectors open economy model, leakage would consist of imports besides savings and taxes and injections would consist of exports besides investment and government expenditure.

In the symbolic form the four sector model of circular flow can be shown as follows:

Let us put NNP = y, consumption expenditure including imports = C, intended investment = I, government purchase of goods and services = G, exports = X, and imports = Z. The supply of output available to an economy consists of its domestic production NNP or Y plus the level of imports (Z). In macroeconomic equilibrium condition when circular flow is maintained this supply must exactly equal the sum of demands of the household, business, government and foreign trade sectors for exports (denoted by X). As such we may rewrite the condition:

$$Z + Y = C + I + G + X$$

or

$$Y = C + I + G + (X-Z)$$

Where X-Z represents the net trade balance (the difference between exports and imports). Denoting saving by S and taxes by T and net disposable income of households by Yd-we rewrite the above equation as follows:

Y = Yd + T (But Yd can be either spent on C or saved, we get)

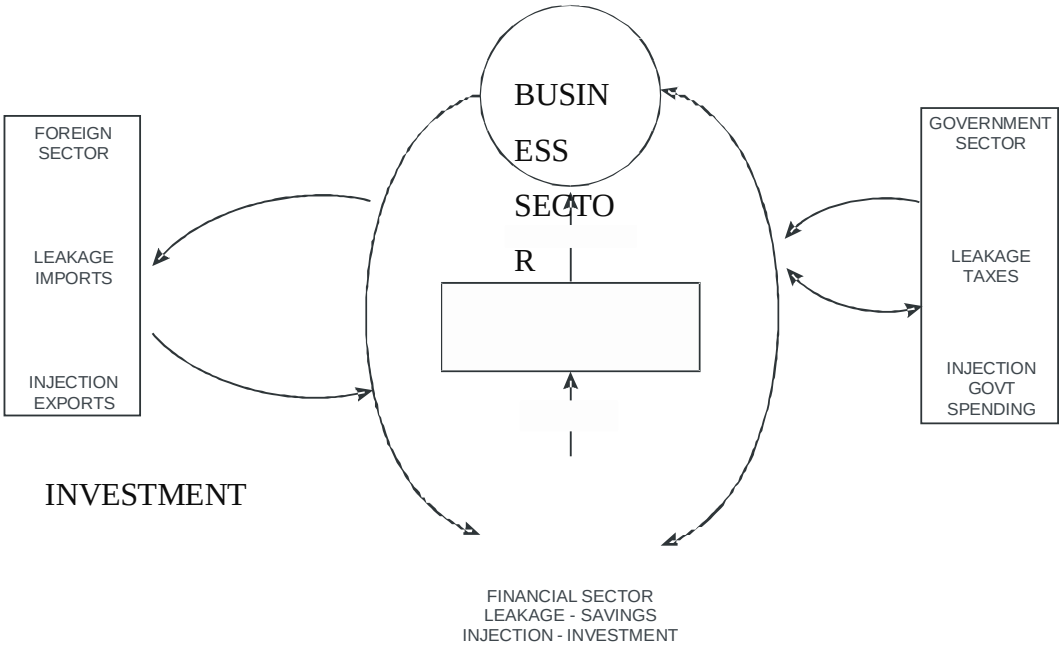
$$Y = C + S + T \qquad (\_ Yd = C + S)$$

Therefore, $C + S + T = C + I + G + X- Z$

or $S + T + Z = I + G + X$

It shows that injections must equal leakages to maintain the circular flow of economic activities in the four sector open economy. As we move from two sector

simple model of a closed economy to three sectors or four sectors model of an open economy the adjustments becomes necessary. The mechanism of the circular flow for the maintains of macroeconomic equilibrium remains the same-only the nature of transactions and their adjustment undergo a change as is shown by a generalized picture of a model is given below.



HOUSE
HOLD
SECTO
R

Figure -3.2

The model shows the various kinds of transactions which originate and take place in different sectors of the economy and cause complications but once the necessary adjustments between leakages and injections like saving and investment in two sector model--- taxes and government expenditure in three sector model and imports and exports in four sector model are made--- the circular flow of economic activity of the macroeconomic; static equilibrium is obtained irrespective of the fact whether these minor constituents (activities) are equal to each other or not what is required at the macro level is that the circular flow of activities must be so adjusted that the aggregate income generated must equal the aggregate value of the final output.

3.5 IMPORTANCE OF CIRCULAR FLOW

The concept of the circular flow gives a clear-cut picture of the economy. We can know whether the economy is working efficiently or whether there is any disturbance in its smooth functioning. As such, the circular flow is of immense significant for studying the functioning of the economy and for helping the government in formulating policy measures.

1. **Study of Problem of Disequilibrium.** It is with the help of circular flow that the problems of disequilibrium and the restoration of equilibrium can be studied.

2. **Effects of Leakages and Inflows.** The role of leakages enables us to study their effects on the national economy. For example, imports are a leakage out of the circular flow of income because they are payments made to a foreign country. To stop this leakage, government should adopt appropriate measures so as to increase exports and decrease imports.

3. **Link between Producers and consumers.** The circular flow establishes a link between producers and consumers. It is through income that producers buy the services of the factors of production with which the latter, in turn, purchase goods from the producers.

4. **Creates a Network of Markets.** As a corollary to the above point, the linking of producers and consumers through the circular flow of income and expenditure has created a network of markets for different goods and services where problems relating to their sale and purchase are automatically solved.

5. **Inflationary and Deflationary Tendencies.** Leakages or injections in the circular flow disturb the smooth functioning of the economy. For example, saving is a leakage out of the expenditure stream. If saving increases, this depresses the circular flow of income. This tends to reduce employment, income and prices, thereby leading to a deflationary process in the economy. On the other hand, consumption tends to increase employment, income, output and prices that lead to inflationary tendencies.

6. **Basis of the Multiplier .** Again, if leakages exceed injections in the circular flow, the total income becomes less than the total output. This leads to a cumulative decline in employment, income, output, and prices over time. On the other hand, if injections into the circular flow exceed leakages, the income is increased in the economy. This leads to a cumulative rise in employment, income, output, and prices over a period of time. Infact, the basis of the Keynesian multiplier is the cumulative movements in the circular flow of income.

7. **Importance of the Monetary Policy.** The study of circular flow also highlights the importance of monetary policy to bring about the equality of saving and investment in the economy. The equality between saving and investment comes about through the credit or capital markets. The credit market itself is controlled by the government through monetary policy. When saving exceeds investment or investment exceeds saving, money and credit policies help to stimulate or retard investment spending. This is how a fall or rise in prices is also controlled.

8. **Importance of Fiscal Policy.** The circular flow of income and expenditure points toward the importance of fiscal policy. For national income to be in equilibrium desired saving plus taxes (S + T) must equal desired investment plus

government spending (I + G). S + T represent leakages from the spending stream which must be offset by injections of I + G into the income stream. If S +T exceed I + G, government should adopt such fiscal measures as reduction in taxes and spending more itself. On the contrary, if I + G exceed S + T, the government should adjust its revenue and expenditure by encouraging saving and tax revenue. Thus the circular flow of income and expenditure tells us about the importance of compensatory fiscal policy.

9. **Importance of trade Policies.** Similarly, imports are leakages in the circular flow of money because they are payments made to a foreign country. To stop it, the government adopts such measures as to increase exports and decrease imports. Thus the circular flow points toward the importance of adopting export promotion and import control policies.

10. **Basis of Flow of Funds Accounts.** The circular flow helps in calculating national income on the basis of the flow of funds accounts. The flow of funds accounts are concerned with all transactions in the economy that are accomplished by money transfers. They show the financial transactions among different sectors of the economy, and the link between saving and investment, and lending and borrowing by them.

To conclude, the circular flow of income possesses much theoretical and practical significance in an economy.

CHECK YOUR PROGRESS I

Q1. Why is circular flow of income important for economic activity?

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3.6 LET US SUM UP

1. Circular flow implies a continuous movement of money and goods in the economy.
2. One of the most important conditions of macroeconomic equilibrium is that its circular flow must be maintained.
3. When government sector involving government transactions are involved it is called three sector model and for circular flow certain adjustments in the transactions are made.
4. When the transactions involving foreign trade are taken into account like imports and exports---it is called four sector model of an open economy and the necessary adjustment amongst leakages (imports) and injections (exports) are made before the circular flow is maintained in such an economy.

3.7 Keywords

Government sector : The government sector, or the public sector, is that sector of the economy owned and controlled by the government. It includes all purchases and sales made by the government. The government affects the economy b y levying taxes and granting subsidies.

Foreign sector : The sector that comprises of all the exchanges taking place between the residents of a country with the rest of the world is the foreign sector. It basically includes the imports and exports of the country.

3.8 SUGGESTED READINGS

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.

- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

3.9 HINTS TO CHECK YOUR PROGRESS

Q1. See section 3.5

3.10 EXAMINATION ORIENTED QUESTIONS

1. What is circular flow of income?
2. Explain the effect of injections and withdrawals in the circular flow of income.
3. Discuss the circular flow of income in four sector system.
4. Explain circular flow in three sector with product and capital markets.

M.A. ECONOMICS **LESSON NO. 4**

COURSE NO.: ECO-107 **SEMESTER IST** **UNIT–I**

NATIONAL INCOME ACCOUNTING: SOCIAL ACCOUNTING AND FLOW OF FUNDS ACCOUNTING

STRUCTURE

4.0 Objectives

By the end of this chapter, the reader will be able to:

- The performance of an economy is a crucial concern for all stakeholders associated with it.
- The key challenge lies in determining how to estimate this performance accurately.
- Trends in National Income serve as important indicators of a country's economic progress.
- This chapter focuses on the analysis of National Income and its various measures.
- These measures help reveal the growth trends and structural changes within an economy.

4.1 Learning outcomes

After the completion of this chapter the student will know

- How national income is calculated
- What are the different methods of calculating national income

4.2 Introduction

Dear learner, after going through this chapter, you would be able to understand the concept and significance of national income in macroeconomic analysis. You will gain insight into how national income and national product serve as key indicators to measure the economic performance of a country. This chapter will help you differentiate between national product, which refers to the flow of goods and services over a period, and national income, which represents the flow of factor earnings within the same timeframe. You will

also learn the importance of national income in studying production, distribution, economic stability, and unemployment levels. Furthermore, you will become familiar with various definitions and interpretations of national income given by eminent economists like Marshall, Pigou, Fisher, Richard Stone, Simon Kuznets, J.R. Hicks, and institutions like the National Income Committee and the UN Department of Economic Affairs. These perspectives will help you comprehend both the theoretical and practical dimensions of national income accounting, including the distinction between gross and net income, the role of depreciation, and the challenges in evaluating services and durable goods. Finally, you will be able to identify national income as a money measure of the economy over a year, free of duplication, encompassing both public and private sectors, international net gains, and output from both consumption and capital goods sectors after accounting for depreciation.

4.3 Significance of the Study of National Income

Every sector of economy uses human, natural as well as material resources to contribute in aggregate flow of commodities as well as services in a specified time interval normally is a years' time. According to Simon Kuznets, national income is net output of goods and services flowing in a year from nation's production to the actual consumers or net addition to nation's capital goods. While comparison is made with growth rate of net national income with the growth rate of relevant population—which states whether the status of economy is stagnant, developing or declining.

4.4 Concepts of National Income

Study of concepts of national income follows from that of definition. Generally countries have been compiling national income estimates for several years and they incorporated into them and following concepts which are as follows:

1. Gross National Product (GNP)

GNP is basic measure of nation's output stated in terms of money and represents total value of a nation's annual output. It is evaluated in market prices and includes all economic productions in an economy.

Gross national product may be defined as money value of national production for any specific period of time. But it is to be remembered that money value of final goods and services produced in the economy should be taken into consideration. Intermediate products are excluded from GNP.

Secondly, while calculating for GNP, money value of exclusively currently produced goods and services are taken into account to estimate economy's productivity during a particular year.

Thirdly, word '' gross'' has sufficiently significant is the term GNP. Depreciation or replacement of the fixed assets is not to be deducted. Depreciation is treated as loss to the economy and thus it will not to be deducted from GNP manufactured in the economy.

The term GNP often used in national income concept calculation of GNP for several years and comparing them will indicate whether there has been a long run growth or decline in the economy.

Symbolically,

$$GNP = C + IG + G \times (X - M) + NFIA$$

Where, C = Private Final Consumption expenditure.

IG = Gross Investment

G = Government Expenditure.

(X M) = Net Exports i,e Export minus Imports.

NFIA = Net Factor Income from Abroad.

2. Gross Domestic Product (GDP)

Gross domestic product is money value of all goods and services produced in the domestic territory of a country is in year's time. Various sectors of a country engaged in the production activities produce normally a certain amount of goods and services like fertilizers, cement, steel, rice, services of doctors, teachers and advocates etc. Money value of all these good and services taken together provides in the value of GDP.

Symbolically,

GDP = P (Q) +(S)

Where, = GDP + GROSS DOMESTIC PRODUCT.

P = Per unit.

Q = Gross output.

S = Services.

3. Net National Product (NNP)

Net national product at factor cost (NNP) is volume of goods and services turned out during an accounting year, counted without duplication. It can also be defined as net value added at factor cost in an economy during an accounting year. In terms of income earned by factors of production, net national product at factor cost or national income is defined as sum of domestic income and net factor income from abroad.

Symbolically,

NNP (National income) = DFI + NFIA

Where DFI = Domestic factor income.

NFIA + NET factor income from abroad.

Alternatively,

NNP may also calculate as gross national product minus depreciation during that year.

Symbolically,

NNP = GNP –Depreciation.

NNP is also called national income at market prices.

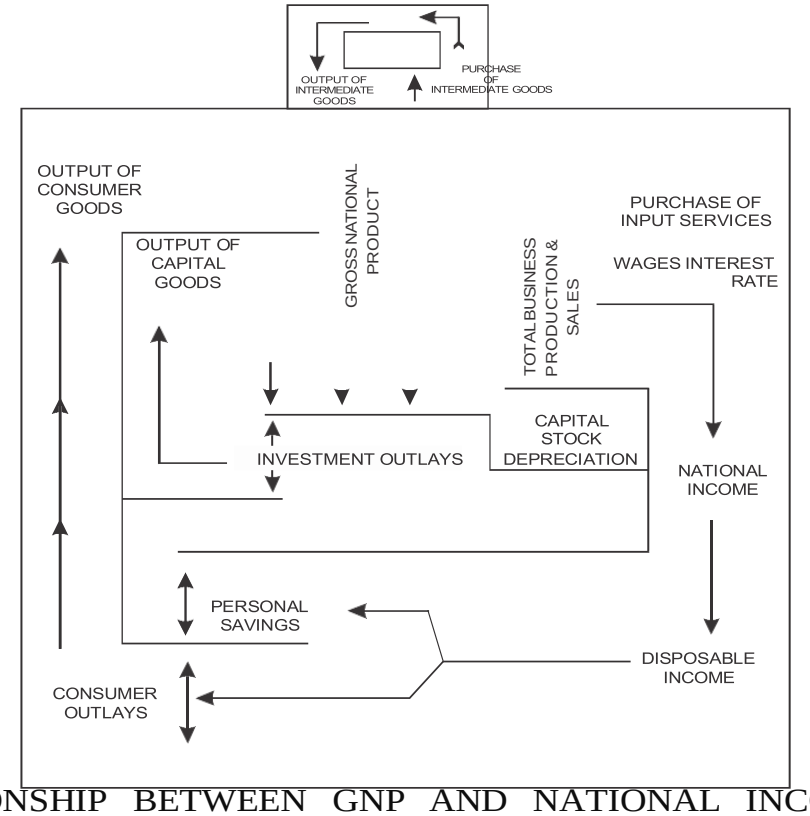
Net national product is a better and highly useful concept in the study of growth of economics because, it takes into account of net increase in total production of that country. But this concept has complex problem of fixing appropriate rates of depreciation for plants buildings, equipment etc. in an economy.

4. National Income at factor Cost

National Income at factor cost is marginally separate concept from GNP and NNP. It is total of entire incomes earned by owner of factors of production for their contributions. So, in measuring national income at factor cost¯those payments which are not made for any productive service is not to be included. Therefore an individual may take value of gifts he receives, transfer payment from firms and governments to estimate his income, but he has not done any service to get that income. Thus, they are not to be entered in computation of national income at factor cost.

Thus, we say that national income is aggregate of factors earnings. It does not consider government allowance; capital consumption, individual as well as business transfer payments and also indirect taxes. Likewise, if government pays any subsidy to any sector that will be included.

FLOW CHART 2.1



RELATIONSHIP BETWEEN GNP AND NATIONAL INCOME AT FACTOR COST

Symbolically, N.I at (factor cost) = NNP indirect taxes + subsidies.

In flow chart (1.a) relationship between NI and GNP can be studied with the help of a hypothetical economy. Let us assume that in our hypothetical economy is a market economy without any government. So, there will be no government outlays, no taxes, subsidies and social insurance contribution also. Apart from above, we also consider that simple economy is a closed economy.

As per above situation, production process occurs in business sector, output of intermediates goods is positioned at top in the form of a small box. Total product originates in business sector. After making capital depreciation it goes into national income flow by way of interest, rent profits and wages from business sector to factory

owners which is presented on R .H.S. Out of the national income, individual segregates it into consumption and savings which is presented at bottom side on R.H.S- which is return flow to business sector by way of demand for consumption and capital goods and in this way circular flow becomes complete.

But in actual world economy, situation differs from this simple economy. In simple closed economy-absence of government, NI, NNP and disposable income are same. But in reality international relations and government sector are important and therefore, social accountings are more complex in comparison to single national income accounts.

5. Private Income

Private income refers to income which accrues to individuals from any source; within domestic territory of a country and from abroad in an accounting year. It is obtained after adding to income from domestic product accruing to private sector the sum of net factor income from abroad, current transfer from rest-of-the world and interest on national debt.

Private Income: Income from domestic product accruing to private sector + Net factor income from abroad + Current transfer from the government + Net current transfer from rest of the world + Interest on national debt.

6. Personal Income (P.I)

Personal income aggregate money payment actually received by the individuals or household within domestic territory of a country from all sources in an accounting year. It means aggregate money payments received by people by way of wage interests, profits as well as rents. It is spendable income at current prices available to individuals. This aggregate amount will be different from national income at factor cost. National Income at factor cost is what is earned and personal income is what is received. This undistributed corporate profits is not available for individuals. Corporate income taxes and payment towards social security measures will also not be available for individuals. Therefore, all sorts of these amounts is to be deducted from what is actually earned.

On the other hand, there are certain sources of income which are not currently earned but paid to individuals. For instance, payments like old age pensions or widow pensions unemployment allowance, payments of scholarship or other welfare measures accrued to individuals-which is known as transfer payments by government. All these types of income are to be add up to get the amount of personal Income. Thus, **Personal Income:** National Income-Corporate Taxes-Undistributed corporate savings or profits-Social security contributions + Transfer payments.

7. Personal Disposable Income

Personal disposable income refers to that part of the personal income which is actually available to individual for consumption and saving purposes. Entire personal income received by individual cannot be spent by them at their desires. They have to pay personal direct taxes viz., income-tax, education tax etc. Thus,

Personal Disposable Income: Personal income – (Direct Taxes + fines, Fees etc, – social security contributions).

8. Net National Disposable Income (NNDI)

Concept of net national disposable income is different from personal disposable income. Net national disposable income is computed by adding to net direct taxes and other current transfer from rest of the world i,e net capital transfers to national income. Thus,

Net National Disposable Income:

National Income + Net indirect Taxes + Net capital Transfers from Rest-of-the World (ROW)

CHECK YOUR PROGRESS I

Q1. Define GNP and NNP

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Q2. Differentiate between Personal Income and Personal Disposable Income.

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National Income Accounting and National Income Accounts

Every country of the world today wants to step up its rate of economic growth. Because a high rate of economic growth would improve the standard of living of the people. The rate of economic growth is expressed in terms of growth of National income and per capita income over a period of time. Thus, national income is a measure of economic growth. The sum total of the market value of goods and services produced in an economy during a period of time say one year is called national product or national income. Statements of data relating to a national income of a country are called National Income Accounts. The method relating to the preparation or compilation of these statements is called National Income Accounting.

a Meaning of National Income Accounts: Every country prepares and maintains statistics on National Income. These are called National Income Accounts or national income. In India we call them National Accounts Statistics. National income Accounts contain a number of statistical statements showing the value of goods and services produced in different sectors of the economy such as agriculture, industry, transport and communication, trade, banking, public administration, etc. for a number of years. They also contain statements showing the details of the distribution of national income among different factor groups (such as land, labour, capital & enterprise) and final expenditure on goods and services for the economy as a whole. In fine National Income Accounts are the data or statistics regarding statements of the production, distribution and consumption of National Income.

b. Some definitions of National Income Accounts : According to Edey, Peacock & Cooper, "National Income Accounts imply an organized arrangement of figures relating to the economic activity of a region."

In Charles Schultz's words, "National Income Accounts provide a quantified

framework of output, spending and income.''

According to Dornbush & Fisher, "National Income Accounts provide us Statistical framework for describing relationship among output, income and spending.''

c. Meaning of National Income Accounting: The method relating to the preparation or compilation of national income accounts is called National Income Accounting. National Income Accounting prepares and organizes the national income data in such a way that accounting relationship is established as well as inter-relationships among the various sectors are easily understood from structure of the accounts. National Income Accounting tries to summarize the performance of a country's economy by measuring its total income and production of goods and services in a particular year.

d. Some Definitions of National Income Accounting:

1. According to Ruggles & Ruggles, "National Income Accounting can be defined as a system of classification that is necessary to provide a description & functional account of what has happened in the country".
2. According to M.Yanovsky, "National Income Accounting attempts primarily to measure national income, final product, consumption and accumulation of capital.''
3. In France Zahn's words, "National Income Accounting is the means of identifying and measuring aggregate economic activities."
4. In Paul Stustki's words, "National Income analysis serves as a tool for determining the nature, size and inter-relationships of the economy's complex financial transactions."

Importance of National Income Accounting

Importance of National Income Accounting We come to know a number of things from the national income accounting. This Knowledge is of great importance from the practical and theoretical points of view. It is of great importance in the case of planning and economic development.

1. **Broad Picture of the Economy.** National income accounting gives us a correct picture of the structure of the economy as well as the distribution of income according to regions, industrial origin, functional services and persons. We come to know about the nature of an economy from the national income accounts.

2. **Knowledge of Economic Conditions.** National Income accounting enables us to have a correct idea about the economic conditions prevailing in the economy. They enable us to know the relative importance of the various sectors of the economy and their contribution towards national income. From these studies, we learn how income is produced and how it is distributed, how much of it is spent, saved, invested or taxed.

3. **Knowledge about Economic Activities of People.** We come to know about the economic activities of the people from the national income accounting. We come to know about the occupational distribution, for example, how many people are working in agriculture, how many are working in industries and how many are working in business, transport and banks etc.

4. **Indicator of Economic performance.** National income accounting is an indicator of the economic development of an economy. The increase or decrease in national income figures shows the rate of economic development and whether the national income is equally distributed in the factor of production or not.

5. **Possibility of comparison**. By comparing the national income accounts of different countries we come to know about their rates of economic development.

6. **Indicator of Economic welfare.** National income accounts are very often used as an index of economic welfare. A country with higher per capita income is presumed to afford a higher standard of living for its masses. Similarly, an improvement in per capita income of a country is taken as proof of a better standard of living and increasing in economic welfare.

7. **Helpful in the Formulation of Fiscal Policy.** The government takes into account the national income accounts while formulating fiscal policy. The main aim of

the budgetary policy is to save the country from inflation and unemployment and to move towards economic development.

8. **Helpful in Formulation of Public Policies.** On the basis of national income accounting, the public policies are formulated and implemented. If we do not have the required figures then public policy will depend on assumptions and aim will not be fulfilled.

9. **Formulation of Economic Plans.** National income accounts are very important for planning. No country has ever gone along with the programme of economic planning without possessing a prior knowledge of the trends in national income measurements.

10. **Knowledge about Structural Changes.** National income accounts also tell about the structural changes which are taking place in an economy.

In brief, we can say that at present national income accounting is very important from the economic development point of view and this is the indicator of the economic development of an economy.

11. National Income Accounts can be used to measure Standard of Living

To measure how much output, spending and income has been generated in a given time period, we use national income accounts.

A term used in economic to refer to the bookkeeping system that a national government uses to measure the level of the country's economic activity in a given time period. National income accounting records the level of activity in accounts such as total revenues earned by domestic corporations, wages paid to foreign and domestic workers, and the amount spent on sales and income taxes by corporations and individuals residing in the country.

National income accounting provides economists and statisticians with detailed information that can be used to track the health of an economy and to forecast future growth and development. Although national income accounting is not an exact science,

it provides useful insight into how well an economy is functioning, and where money is being generated and spent.

12. Measure of Standard of Living

The estimates of national income and per capita income (derived by dividing the total national income by the population) give us an average income and standard of living of the people. Economic welfare depends to a considerable degree on the level of national income and its distribution.

Therefore, to know about the level of economic welfare it is essential to have estimates of national and per capita income.

However, there are certain problems in taking per capita income as the only measure of standard of living or that of development of the economy. The per capita income may be high even when only a few people are very rich and vast majorities of people are poor. The process of economic development is a complex phenomenon and is influenced by many factors. If the income of the vast majority of people are low but free health and educational services are provided, the standard of the people will be better than if no free services are provided. In addition, the well-being of the people depends on the composition of the output. If luxuries are being produced in relatively greater quantities than necessaries there will be shortage of goods for the poor people.

Nowadays in addition to national income, a number of development indicators are being suggested for evaluating standard of living or development. Growth in national income is possible without development, but for development growth is essential.

13. Comparison across Time and Space

By comparing national income over a period of time we can know whether the economy is growing or not. If national income increases over years, it means the

economy is growing and if national income is falling, it indicates that the economy is declining.

For having meaningful comparison of national income over time, the effect of change in prices has to be removed. If the monetary values of national income of an economy is increasing by 2 percent every year and if the prices are also increasing by 2 percent, then there is no real growth in the economy and it is stagnant. The comparison of the estimate of national income over time can be done only in real terms, i,e., If the estimates are prepared at constant prices. Because of this reason, the CSO is preparing the estimates of national income both at current and constant prices.

The incomes of different regions can be compared to study the regional disparities in incomes. Some of the regions may be more developed while some others may be less developed, e.g. Punjab is more developed than Assam. The per capita income, along with certain other indicators, gives us an idea of regional disparity. These estimates of different states are a guide in deciding the allocation of central funds to various states.

a) Sectoral Distribution of Income

The estimates of national income show contributions of different sectors of the economy, such as agriculture, manufacturing, transport, electricity services, etc. From the sectoral breakdowns of national income, one could study the broad sectoral shifts in an economy over time. For example, based on the sectoral estimates, it can be said that agriculture is overwhelmingly important for the Indian economy. The contribution of gross value added from agriculture decreased from 35.8 percent in 1980-81 to 22.2 percent in 2000-2001 (at 1993-94 prices). The contribution from manufacturing industries increased from 13.8 percent to 17.2 percent during the same period. The contribution from other sectors also showed an increase over this period. This shows that over period of time ,there is a shift from agriculture (in 1950-51, the contribution from agriculture was 50.2 percent) to manufacturing and other sectors.

b) Income Distribution by Factors of Production

National Income estimates throw light on the distribution among different categories of income such as wages, profits, rent and interest. The distribution of income into wage and non-wage income is of special importance, since the inequality in the personal distribution of income depends to a great extent on the share of working class (wages) and the share of property owners. From the size distribution of income, one can have an idea about the number of people who are poor.

c) International Comparison of National Income

National accounts are used for reporting to International agencies like UN Statistical Office. UN year Book on National Accounts gives national and per capita incomes of more than 120 countries. The national accounts statistics should confirm to standard, internationally accepted concepts, definition and classifications. The resulting data are widely used for international comparisons of the volumes of major aggregates such as GDP or GDP per head, and also for comparisons of structural statistics, such as ratios of investment, taxes, or government expenditures to GDP. Such comparisons are used by economists, journalists and other analysts to evaluate the performance of one economy against that of other similar economies. They can influence popular and political judgments about the relative successes of economic programmes in the same way as developments over time within a single economy. Databases consisting of a set of national accounts for groups of countries can also be used for econometric analysis

CHECK YOUR PROGRESS II

Q1. What are the different methods of calculating national income?

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4.8 Let us Sum Up

Statistics regarding the national income data is highly essentially for the successful operation of planning of an economy. National income accounting shows the gross income, output, saving and consumption, etc. Without being aware of these variables developmental planning becomes futile. Thus, the future economic policy for development depends a lot on the correct estimate of all these factors. It shapes the budgetary policy of the government and makes the borrowing and tax policy in order to neutralize the fluctuations of income and employment. Government takes to deficit or surplus budget to arrest depression or inflation in an economy.

Economic policy in the short run is formulated on the basis of an assessment of the recent behavior and the current state of the economy and a view of a better forecast, about likely future developments. Short-term forecasts are made by using econometric models. Over the medium or long term, economic policy has to be formulated in the context of a broad economic strategy which may need to be quantified in terms of a plan. Most of the elements which make up a medium or long-term economic plan consist of national account flows and it may be impossible to draw up such a plan without them. A good macroeconomic model which accurately reflects the past performance of the economy may be indispensable for planning and forecasting.

4.9 Keywords

GNP: Gross national product may be defined as money value of national production for any specific period of time

- **NNP:** It can also be defined as net value added at factor cost in an economy during an accounting year. In terms of income earned by factors of production, net national product at factor cost or national income is defined as sum of domestic

income and net factor income from abroad

- **National Income at factor cost**: It is marginally separate concept from GNP and NNP. It is total of entire incomes earned by owner of factors of production for their contributions.
- **Personal income:** It is the aggregate money payment actually received by the individuals or household within domestic territory of a country from all sources in an accounting year.
- **Personal disposable income:** It refers to that part of the personal income which is actually available to individual for consumption and saving purposes.

4.10 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

4.11 Hints to Check your progress

CYP I

Q1.See section 4.4

Q2. See section 4.4

CYP II

Q1. See section 4.5

4.12 Examinations oriented question

1. Explain the importance of National Income Statistics.
2. What are the problems of international comparisons of national income?

   How can inter-temporal comparisons related to national income be made

M.A. ECONOMICS **LESSON NO. 5**

COURSE NO. : ECO-107 **SEMESTER IST** **UNIT–I**

BALANCE OF PAYMENTS ACCOUNTING: CONCEPTS AND APPLICATIONS

STRUCTURE

5.0 Objectives

- To understand the concept of Balance of payment
- To understand different concepts of Balance of payment
- To understand the Concept of flow of funds

5.1 Learning Outcomes:

After studying this chapter, the learners will be able to

- Understand the concept of Balance of Payments
- Understand the Concept of flow of funds

5.2 Introduction

Dear learner, after going through this chapter, you would be able to understand the significance of national income accounting as a systematic and official process of measuring a nation's economic performance. You will learn how national income statistics reflect changes in the economic health of a country, revealing fluctuations in output, income, investment, and overall activity. The chapter will introduce you to the evolution of social accounting concepts, which gained prominence after Keynes, and their vital role in understanding macroeconomic theory through identities like $Y = C + I + G$. You will comprehend the distinction between private accounting (for individuals) and social accounting (for the economy as a whole), and how social accounting helps classify economic activities to study the structure and functioning of the economy.You will gain insight into how social accounting not only covers national income accounting but also provides a detailed record of real and financial transactions—both domestic and international—occurring across sectors and sub-sectors of the economy. This enables the derivation of key aggregates such as income, consumption, savings, investment, exports, imports, taxation, and government expenditure. You will also learn how historical events

like the Great Depression (1929–32), World War II, and the 1962 Chinese invasion of India highlighted the need for comprehensive social accounts to frame effective fiscal and monetary policies. The chapter emphasizes how social accounts help resolve resource allocation debates—such as between defense and development—by offering a factual and structured basis for planning. Despite still being in the experimental stage in many countries, you will appreciate why social accounting is a more accurate and informed method than guesswork or mere observation for analyzing and managing economic systems.

5.3 Meaning & Components of Social Accounting

The term 'social accounting' was first introduced into economics by J.R. Hicks in 1942. In his words, it means 'nothing else but the accounting of the whole community or nation, just as private accounting is the accounting of the individual firm'. Social accounting, also known as national income accounting, is a method to present statistically the interrelationships between the different sectors of the economy for thorough understanding of the economic conditions of the economy. It is a method of studying the structure of the body economic. It is a technique of presenting information about the nature of the economy with a view not merely to get an idea of its prosperity, past or present, but also to get guidelines for state policy to influence or regulate the economy. In the words of Edey, Peacock and Cooper: "Social accounting is concerned with the statistical classification of the activities of human beings and human institutions in ways which help us to understand the operation of the economy as a whole. The field of studies summed up by the words 'social accounting' embraces, however, not only the classification of economic activity, but also the application of the information thus assembled to the investigation of the operation of the economic system.'' In other words, social accounting describes statistically the economic activities of the different sectors of the entire economy, which indicates their mutual relationships and provides a framework for analysis.

Components of Social Accounting

The principal forms of economic activity are production, consumption, capital accumulation, government transactions and transactions with the rest of the world. These are the components of social accounting. If the incomings and outgoings of a country relating to these five activities are shown in the form of accounts, they show a closed network of flows representing the basic structure of the economy. These flows are always expressed in money terms. We classify these flows as follows:

(1) **Production Account.** The production account relates to the business sector of the economy. It includes all forms of productive activity, i,e., manufacturing, trading, etc. It covers public and private companies, property firms and partnerships, and state-owned business undertakings. Since all productive activity takes place within this sector, all payments flows it to the other sectors. The production account of the business sector is shown in table 1.

Table 5.1: Production account (Rs Crores)

Payments		Receipts	
1. Payments to sectors, i,e., wages, etc. (2-5)	279	5. Consumption expenditures (2-1)	219
2. Payments to government (3-5)	12	6. Government Purchases (3-1)	30
3. Business saving (4-3)	9	7. Gross private domestic Investment (4-1)	36
4. Imports of goods and services(5-2)	9	8. Exports of goods and Services (5-1)	24
Gross national income	309	Gross national expenditure	309

Note: Figures in brackets relate to corresponding Table and item number.

Payments to personal sector include rent, interest, dividend, wages, salaries, employees compensation and proprietors' income. The item 'payments to government' includes producers' net payment to government in the form of taxes and social security payments. Business saving refers to producers' retained income or corporate saving. The last item relates to payments made to the foreign sector for imports of goods and services. These figures make up gross national income. The receipt side of the production account shows the incomings to the business sector from sales of goods and services to the household or personal sector. Government purchases refer to goods and services sold by the business sector to the government. Gross private domestic investment comprises the gross flow of capital goods (fixed capital formation) and the net change in inventories.Net exports refer to the income earned by the business sector by selling goods and services to the rest of the world. The total of all these items gives GNP by expenditure.

2. Consumption Account. The consumption account refers to the income and expenditure account of the household or personal sector. The household sector includes all consumers and non-profit making institutions such as clubs and associations. The consumption account is shown in table 2.

Table 5.2: Consumption Account (Rs. Crores)

Payments		**Receipts**	
1.Consumption Expenditure(1-5)	219	5.Receipts from business,	
2.Payments to government(3-6)	45	Wages and salaries, etc.(1-1)	279
3.Personal Saving(4-4)	15	6.Receipts from government	
4.Transfers to foreigners (5-3)	6	(3-2)	6
Personal outlay and saving	285	Personal income	285

Note: Figures in brackets relate to corresponding table and item no.

The major item in the left side of the consumption account is the expenditure of household consumers in buying goods and services from the business sector to satisfy their wants. Payments to government include taxes and special insurances contributions. The next item refers to personal saving used for investment by the household sector. The item transfers to foreigners might be taken to relate to investment in foreign securities or expenses by the residents on education or travel abroad. The right hand side of the account shows income of business and household consumers as the major item which comes in the form of wages and salaries, profit, interest, dividend, rent and receipts from current transfers, etc. Receipts from government include transfer payments and net interest payments on public debt.

Government Account. The government account relates to the outflows and inflows of the government sector. The government sector included all public authorities- centre, states and local authorities in a country. The government account is shown in table 3.

Table 5.3: Government account (RS. Crores)

Payments		**Receipts**	
1.Payments to Business (1-6)	30	5.Receipts from business(1-2)	12
2.Payments to persons (2-6)	6	6.receipts from persons(2-2)	45
3.Government surplus (4-5)	15	Government Receipts	57
4.Payment to foreigners (5-4)	6		
Government outlay and surplus	57		

All items in the preceding Table have already been explained in the two accounts contained in Tables 2 and 3, except item 3. This refers to investment made by the government out of its surplus or saving. However, the important point to be noted is that

state-owned business enterprises are excluded from the government sector as they have been included in the business sector because like private enterprises public undertakings produce goods and services for sale.

3. **Capital Account.** The capital account shows that saving equals domestic and foreign investment. Saving is invested in fixed capital and inventories within the country and /or in international assets. The capital account is shown in Table 4. The gross private investment includes the gross flow of capital goods and net change in inventories. Net foreign investment is the net foreign surplus on current account. On the right side, gross saving includes business and personal savings and government surplus.

Table-5.4 Capital Account

Payments		**Receipts**	
1.Gross private domestic		3.Business saving (1-3)	9
Investment (1-7)	36	4.Personal saving (2-3)	15
2.Net foreign investment(5-5)	3	5.Government surplus(3-3)	15
Gross investment	39	Gross saving	39

Note: Figures in brackets relate to corresponding Table and item number.

(5) Foreign Account. Foreign account shows the transactions of the country with the rest of the world. This account covers international movements of goods and services and transfer payments and corresponds to the current account of the international balance of payments. The foreign account or the rest of the world account is shown in table 5. For simplicity, such services as freight and insurance have not been shown separately. All items have been already explained in the proceeding accounts. It should be noted that in the foreign account 'exports' have been shown under payments (on the left side) and 'imports' under receipts (on the right side). This is because the amount received by the nationals of the country for exports is paid to foreign countries in exchange for imports and transfer payments. Here payments and receipts relate to the

rest of the world and not to the country itself.

The five-account system detailed above relates to flows of the economy in terms of production, consumption, government transactions,

Table 5.5: Foreign Account

Payments		**Receipts**	
1.Exports of goods and Services (1-8)	24	2. Imports of goods and services (1-4)	9
		3.Transfer payments to foreigners by Persons (2-4)	6
Net receipts from foreigners	24	4.Transfer payments to foreigners by Government (3-4)	6
		5.Net foreign investment (2-4)	3
		Net payments to foreigners	24

Capital accumulation and transactions with the rest of the world. The accounts based on them are known as functional accounts, as they are based on a classification of transactions according to their functions.

CHECK YOUR PROGRESS I

Q1. What are the different types of Balance of payment accounts.

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Importance of Social Accounting

Social accounting helps in understanding the structure of an economy and relative importance of the different sectors and flows. It is a key to the evaluation and formulation of government policies both in the present and future.

The uses of social accounting are as follows.

In Classifying Transactions. Economic activity in a country involves innumerable transactions relating to buying and selling, paying and receiving income, exporting and importing, paying taxes, etc. The great merit of social accounting lies in classifying and summarizing these different kinds of transactions properly, and deriving from these such aggregates as national income, national expenditure, saving, investment, consumption expenditure, production, government spending, foreign payments and receipts, etc.

In Understanding Economic Structure. Social accounting helps us to understand the structure of the body economic. It tells us not only about the national income but also about the size of production and consumption, the level of taxation and saving and the dependence of the economy upon foreign trade.

In Understanding different Sectors and Flows. Social accounts throw light on the relative importance of the different sectors and flows in the economy. They tell us whether the contribution of the production sector, the consumption sector, the investment sector or the rest of the world sector is greater than the other sectors in the national accounts.

In Clarifying Relations Between concepts. Social accounts help in clarifying the relationships between such related concepts as net national product at factor cost and gross national product at market prices.

In guiding the investigator. Social accounts are a guide for the economic investigator by indicating the type of data which might be collected for analyzing the behavior of the economy. Such data might relate to gross national product, government

expenditure on goods and services, private consumption expenditure, gross private investment, etc.

In Explaining Trends in Income Distribution. Variations in the components of social accounts are a guide to the trends in income distribution within the economy.

In Explaining Movements In GNP. Movements in Gross national products valued at constant prices and expressed per head of population indicate changes in the standard of living. Similarly, changes in the level of productivity can be measured by relating gross national product valued at constant prices to working population per head.

Provide a picture of the working of Economy. Social accounts provide an

ex past picture of the working of the economy. " They can also be used as a framework for drawing up an ex ante forecast of the likely outcome of the economy in the future. Thus, social accounts ensure consistency of forecasts, both internally and in relation to other Known facts.''

In Explaining Interdependence of Different Sectors of the Economy. Social accounts also provide an insight into the interdependence of the different sectors of the economy. This can be known from a study of the matrix of social accounts.

In Estimating Effects of Government policies. The importance of social accounts lies in estimating the effects of government policies on different sectors of the economy and in formulating new policies in keeping with changes in economic conditions, as revealed by national income accounts. Their main function is to help the government judge, guide or control economic conditions and to formulate economic policies which aim at maximization of national income and wealth, preventing undue rise in prices, conserving foreign exchange, etc.

Helpful in Big Business Organization. Social accounts are also used by big business houses for assessing their performance and to improve their prospects on the basis of the statistical information about the various sectors of the economy.

Useful for International Purposes. Social accounting is also useful for international purposes. A comparative study of the social accounts of different countries of the world helps in the categorization of the countries into the underdeveloped, less developed and developed. It is on the basis of social accounts that the various agencies of the united nations make provisions for aid to the poor countries of the world.

Basis of Economic Models. Social accounts form the basis for economic models for the purposes of analyzing the bahaviour of the economy as a whole, of the economic forecasting and of illuminating problems of economic policy.

Difficulties of Social Accounting

Preparation of social accounts presents the following difficulties:

1. **Imputations.** In preparing social accounts, all incomes and payments are measured in money. But there are many goods and services which are difficult to impute in terms of money. They are services of the housewife in her home, painting as hobby by an individual, a teacher teaching his children at home etc. Similarly there are a number of non-traded or non - market products and services. They are vegetables produced in the kitchen garden and consumed by the family itself, rental value of house occupied by the owner himself, a portion of farm produce retained by the farmer for personal consumption, etc. All such non-market transactions which cannot be assessed in money terms present problems in preparing social accounts accurately.

2. **Double Counting.** The greatest difficulty in preparing social accounts is of double counting. It arises from the failure to distinguish between final and intermediate products. For instance, flour used by a bakery is an intermediate product and that by a household the final product. Similarly,' 'the purchase of a newly constructed building by the government is taken under consumption output of the economy. On the other hand, the purchase

of the same building by a private firm becomes gross investment for the year.' Thus the same product is shown as consumption and investment in social accounts. Such problems lead to difficulties in preparing social accounts.

3. **Public Service.** Another problem is of estimating a number of public services in social accounts. They are police, military, health, education, etc. Similarly, the contribution made by multipurpose river valley projects cannot be fitted into the social accounts because of the difficulty of assessing their numerous benefits in monetary terms.

4. **Inventory Adjustment.** All inventory changes whether negative or positive are adjusted in the production accounts by inventory valuation adjustment. But the difficulty is that firms record inventories at their original costs and not at their replacement costs. When price rise, there are gains in the book value of inventories. But when prices fall there are losses in the value of inventoriess, so for correct calculation of inventories in business accounts under social accounting, inventory valuation adjustment is required which is very difficult thing.

5. **Depression.** Another problem in business accounts under social accounting is of estimating is of estimating depreciation. For instance, it is very difficult to estimate the current depreciation rate of a capital asset whose expected life is very long, say fifty years. The difficulty increases further when prices of assets change every year. Unlike inventories, it is very difficult to have depreciation valuation adjustment in social accounts.

CHECK YOUR PROGRESS II

Q1. Write down the importance of Social Accounting.

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Q2. What are the limitations of Social Accounting?

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Presentation of social Accounts

Social accounts are presented on the double-entry basis like private accounts. Prevailing consensus is to present social accounts in the form of a social accounting table as recommended by the United Nations. A social accounting table is called a social accounts matrix. A transaction matrix is used for social accounts in which each row contains payments to other sectors and each column contains receipts from other sectors. Every single entry is both in a particular row and in a particular column. For balancing social accounts a row-total must equal its corresponding column-total. A matrix of social accounts is shown in table 6 which presents the relationship between the flows of payments and receipts in accounts given in table 1 to 5..

Table 5.6 Flow Matrix of Social Accounts

	Accounts					
Receipts from Payments to	1 Production	2 Consumption	3 Government	4 Capital	5 Foreign	6 Total
1. Production	—	279	12	9	9	309

2.Consumption	219	—	45	15	9	285
3.Government	30	6	—	15	6	57
4.Capital	36	—	—	—	3	39
5.Foreign	24	—	—	—	—	24
Total	309	285	57	39	24	714

In table 6, each account has one row which shows the payments, and one column which shows the receipts, as explained below:

Row 1 shows payments made by the business sector to the tune of Rs. 279 crores to the consumption sector as wages, salaries, etc., Rs 12 crores to the government as taxes, Rs 9 crores as corporate saving to the capital account of firms and Rs 9 crores for importing goods and services from abroad.

Row 2 shows payments made to the business sector by the household sector amounting to Rs. 219 crores for buying goods and services from it, Rs 45 crores to the government in paying taxes, and insurances contributions, Rs. 15 crores to the investment (Capital) sector in the form of saving by household consumers and Rs. 6 crores as investment in foreign securities, expenses on education, travel etc. in foreign countries.

Row 3 relates to the outflows of the government sector. The government pays Rs. 30 crores to the business sector for purchasing goods and services from it, Rs. 6 crores to the household sector as net interest payment on public debt and as transfer

payments in the form of pension, gratuity, etc., Rs. 15 crores of government surplus is spent for investment purposes, and Rs. 6 crores are paid to foreign countries for goods and services received from them. The last item also includes expenditure on the maintenance of embassies abroad, and on delegations to foreign countries.

Row4 relates to the capital account of the economy out of which payment of Rs. 36 crores is made to business sector for capital goods and net change in inventories,

and Rs. 3 crores are net foreign investments.

Row 5 relates to the rest of the world account or foreign account to which payments of Rs. 24 crores are made by selling or exports of goods and services to foreigners.

Similarly, the receipts of each sector can be explained column wise from table 6.

The social accounts matrix presented in table 6 further reveals three things. First, each sell (i,e., rectangular box) shows the equality of the payments to one sectoral account and the receipts from another sectoral account. For example, payment of Rs 279 crores by the production sector to the consumption sector, reading column-wise. Second, the total payments of each sect oral account equal the total receipts of that sector. For example, the total payments of the production sector reading row-wise amounting to Rs. 309 corers equal to the total receipts of the sector, reading column –wise. Third, the total payments of all sectors equal the total receipts of all sectors in the social accounting matrix. They are Rs 714 corers both row-wise and column-wise in the table.

5.4 Flow of Funds Accounts:

The national income accounts do not tell anything about monetary or financial transactions whereby one sector places its savings at the disposal of the other sectors of the economy by means of loans, capital transfers, etc. In fact, the national income accounts do not take into considerations the financial dimensions of economic activity and they describe product accounts as if they are operated through barter. The flow of funds accounts are meant to supplement national income and product accounts. The flow of funds accounts was developed by Professor Morris Copeland in 1952 to overcome the weaknesses of national accounting.

The flow of funds accounts list the sources of all funds received and the uses

to which they are put within the economy. They show the financial transactions among different sectors of the economy and the link between saving and investment aggregates with lending and borrowing by them. The account for each sector reveals all the sources of funds whether from income or borrowing and all the uses to which they are put whether for spending or lending. This way of looking at financial transactions in their entirety has come to be known as the flow of funds approach or of sources and uses of funds.

In the flow of funds accounts, all changes in assets are recorded as uses and all changes in liabilities are recorded as sources. Uses of funds are increases in assets if positive or decreases in assets if negative. They refer to capital expenditures or real investment spending which involve the purchase of real assets. Sources of funds are increases, in liabilities or net worth or saving if positive, and repayment of debt or dissaving if negative. Net worth is equal to a sector's total assets minus its total liabilities. Therefore a change in net worth equals any change in total assets less any change in total liabilities.

Limitations

The flow of funds accounts are beset with a number of problems which are discussed as under:

1. The flow of funds accounts are more complicated than the national income accounts because they involve the aggregation of a large number of sectors with their very detailed financial transactions.
2. There is the problem of valuation of assets. Many assets, claims and obligations have no fixed value. It, therefore, becomes difficult to have their correct valuation.
3. The problem of inclusion of non-reproducible real assets arises in the flow of funds accounts. Economists have not been able to decide as to the type of reproducible assets which may be included in flow of funds accounts.

4. Similarly, economists have failed to decide about the inclusion of human wealth in flow of funds accounts.

Despite these problems, the flow of funds accounts supplements the national income accounts and help in understanding social accounts of an economy.

5.5 Importance

The flow of funds accounts present a comprehensive and systematic analysis of the financial transactions of the economy. As such, they are useful in a number of ways.

1. The flow of funds accounts are superior to the national income accounts. Even though the latter are fairly comprehensive, yet they do not reveal the financial transactions of the economy which the ,flow of funds accounts do.
2. They provide a useful framework for studying the behavior of individual financial institutions of the economy.
3. According to professor Gold Smith, they bring ‘’the various financial activities of an economy in explicit statistical relationships with one another and with data on the non-financial activities that generate income and production’’.
4. They trace the financial flows that interact with and influence the real saving-investment process. They record the various financial transactions underlying saving and investment.
5. They are essential raw materials for any comprehensive analysis of capital market behavior. They help to identify the role of financial institutions in the generation of income, saving and expenditure, and the influence of economic activity on financial markets.
6. The flow of funds accounts show how the government finances its deficit and surplus budget and acquires financial assets.

7. They also show the results of transactions in government and corporate securities, net increase in deposits and foreign assets in the economy.
8. The flow of funds accounts help in analyzing the impact of monetary policies on the economy as to whether they bring stability or instability or economic fluctuations.

5.6 Difference between Flow of Funds Accounts and National Income Accounts

The flow of funds accounts differ from national income accounts in many ways.

First, the national income accounts are confined exclusively to nonfinancial transactions. They neglect the link between saving and investment aggregates with lending and borrowing by different sectors of the economy.

Second, the national income accounts confine all real investment to the business sector with the exception of building constructions. Consumers and governments are not allowed to invest in national income accounts. The flows of funds accounts treat consumer purchases of durable goods as real investment. Government enterprises are included in the producing sector of national income accounts but in the flow of funds accounts they are included in the government sector.

Thirdly, the number of sectors in flow of funds accounts are more with larger details than in the national income accounts. They are defined institutionally in flow of funds accounts whereas they are defined functionally in national income accounts.

Fourthly, there are fewer imputations in the flow of funds accounts than in national income accounts. For instance, taxes are carried on a cash basis is flow of funds accounts whereas some sectors are shown on an accrual basisi in national income accounts.

5.7 Balance of Payments Accounts

The balance of payments of a country is a systematic record of all its economic transactions with the outside world in a given year. It is a statistical record of the character and dimensions of the countries' economic relationships with the rest of the world. According to Bo-Sodersten, ''The balance of payments is merely a way of listing receipts and payments in international transactions for a country''. B.J Cohen says, "It shows the country's trading position, changes in its net position as foreign lender or borrower, and changes in its official reserve holdings."

Structure and classification

The balance of payments account of a country is constructed on the principle of double-entry book-keeping. Each transaction is entered on the credit and debit side of the balance sheet. But balance of payments accounting differs from business accounting in one respect. In business accounting, debits (−) are shown on the left side and credit (+) on the right side of the balance sheet. But in balance of payments accounting, the practice is to show credits on the left side and debits on the right side of the balance sheet. When a payment is received from a foreign country, it is credit transactions while payment to a foreign country is a debit transaction. The principal items shown on the credit side ((+) are exports of goods and services, unrequited (or-transfer) receipts in the form of gifts, grants etc. from foreigners, borrowings from abroad, investments by foreigners in the country and official sale of reserve assets including gold to foreign countries and international agencies. The principal items on the debt side (-) include imports of goods & services,transfer payment to foreign countries and official purchase of reserve assests or gold from foreign countries.

The credit and debit items are shown vertically in the balance of payments account of a country according to the principle of double-entry book-keeping. Horizontally, they are divided into three categories: the current account, the capital account and the official settlements accounts or the official reserve assets account.

The balance of payments account of a country is constructed in Table no-7

Table 1.3.7 Balance of payments account

Credit (+) (Receipts)	Debts (-) (Payments)
Export	Imports
1. Current Account	
(a) Goods (b) Services (c) Transfer Payments	(a) Goods (b) Services (c) Transfer Payments
2. Capital Account	
(a) Borrowing from Foreign Countries (b) Direct Investment By Foreign Countries	(a) Lending to Foreign Countries (b) Direct Investment in Foreign Countries
3. Official Settlement Account	
(a) Increase in Foreign Official Holdings	(a) Increase in Foreign Official Holdings
Errors & Omissions	

1. Current Account. The current account of a country consists of all transactions relating to trade in goods and services and unilateral (or unrequired) transfers. Service transactions include costs of travel and transportation, insurance, income and payments of foreign investments, etc. Transfer payments relate to gifts, foreign aid, pensions,

private remittances, charitable donations, etc. received from foreign individuals and governments to foreigners. In the current account, merchandise exports and imports are the most important items. Exports are shown as a positive item and are calculated f.o.b (free on board) which means that cost of transportation, insurance, etc. are excluded. On the other side, imports are shown as a negative item and are calculated c.i.f (costs, insurance and freight) are included. The difference between exports and imports of a country is its balance of visible trade or merchandise trade or simply balance of trade. If visible exports exceed visible imports, the balance of trade is favourable. In the opposite case when imports exceed exports, it is unfavourable.

It is, however, services and transfer payments or invisible items of the current account that reflect the true picture of the balance of payments account. The balance of exports and imports of services and transfer payments is called the balance of invisible trade. The invisible items along with the visible items determine the actual current account position. If exports of goods and services exceed imports of goods and services, the balance of payment is said to be favourable. In the opposite case, it is unfavourable.

In the current account, the exports of goods and services and the receipts of transfers payment (unrequired receipts) are entered as credits ($+$) because they represent receipts from foreigners. On the other hand, the imports of goods and services and grant of transfer payments to foreigners are entered as debit ($-$)because they represent payments to foreigners.The net value of these visible and invisible trade balances is the balance on current account.

1. **Capital Account** The capital account of a country consists of its transactions in financial assets in the form of short-term and long-term lending and borrowings and private and official investments. In other words, the capital account shows international flows of loans and investments, and represents a change in the country's foreign assets and liabilities. Long –term capital transactions relate to international capital movements

with maturity of one year or more and include direct investments like building of a foreign plant, portfolio investment like the purchase of foreign bonds and stocks and international loans. On the other hand, short-term international capital transactions are for a period ranging between three months and less than one year.

There are two types of transactions in the capital account—private and government. Private transactions include all types of investment: direct, portfolio and short term. Government transactions consist of loans to and from foreign official agencies.

In the capital account, borrowings from foreign countries and direct investment by foreign countries represents capital inflows. They are positive items or credits because these are receipts from foreigners. On the other hand, lending to foreign countries and direct investments in foreign countries represent capital outflows. They are negative items or debits because they are payments to foreigners. The net value of the balances

of short-term and long-term direct and portfolio investments is the balance on capital account. The sum of current account and capital account is known as the basic balance.

2. **The official Settlements Accounts.** The official settlements account or official reserve assets account is, in fact, a part of the capital account. But the U.K. and U.S. balance of payments accounts show it as a separate account. "The official settlements account measures the change in nations' liquidity and non-liquid liabilities to foreign official holders and the change in a nation's official reserve assets during the year. The official reserve assets of a country include its gold stock, holdings of its convertible foreign currencies and SDRs, and its net position in the IMF". It shows transactions in a country's net official reserve assets.

Errors and Omissions. Errors and omissions is a balancing item so that total credits and debits of the three accounts must equal in accordance with the principles of double entry-book-keeping so that the balance of payments of a country always balances in the accounting sense.

5.8 Let us sum up

The social accounting framework is useful for economizes as well as for policy makers, because it represents the major economic flows and statistical relationships among various sectors of the economic system. It is of particular interest and significance to the policy-makers because by studying the national income series, over a period of time, it becomes possible to forecast the trends of economy more accurately. In many countries, annual economic planning is in the form of national budgets which are, in fact, nothing but forecasts of social accounts for the following years.

5.9 Keywords

- **Balance of payment account**: The balance of payments of a country is a systematic record of all its economic transactions with the outside world in a given year.
- **Capital account:** The capital account of a country consists of its transactions in financial assets in the form of short-term and long-term lending and borrowings and private and official investments.
- **Current account:** The current account of a country consists of all transactions relating to trade in goods and services and unilateral (or unrequired) transfers. Service transactions include costs of travel and transportation, insurance, income and payments of foreign investments, etc. Transfer payments relate to gifts, foreign aid, pensions, private remittances, charitable donations, etc. received from foreign individuals and governments to foreigners.

5.10 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.

- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

5.11 Hints to Check Your Progress

CYP I

Q1. See section 5.2

Q2. See section 5.2

CYP II

Q1. See section 5.4

5.12 Examination oriented questions

1. What do you mean by social accounting? How are social accounts arrived? Discuss the Importance of social accounting in economic analysis.
2. Explain and illustrate social accounting and indicate its usefulness as a tool of economic policy.
3. Explain and illustrate flow of funds accounts. In what respect they are different from national income accounts?
4. Explain fully flow of funds accounts. Discuss their limitations and importance.
5. Show how balance of payments always balances and why does a deficit or surplus arises in the balance of payments of a country?

M.A. ECONOMICS LESSON NO. 6

COURSE NO. : ECO-107 SEMESTER-Ist UNIT-I

NEW CLASSICAL APPROACH: CRITIQUE AND RATIONAL EXPECTATIONS

STRUCTURE

6.0 Objectives

- **To explain the key principles underlying the New Classical Approach in macroeconomics.**
- **To describe the concept of rational expectations and its role in economic modeling.**
- **To evaluate the main criticisms of the New Classical model, including its assumptions and real-world applicability.**

6.1 Lesson Outcomes

By the end of this lesson, students should be able to:

- **Identify the microeconomic foundations that support the New Classical Approach.**
- **Discuss the significance of the rational expectations hypothesis in shaping economic forecasts.**
- **Critically assess the policy ineffectiveness proposition advocated by New Classical economists.**
- **Articulate the limitations and critiques of the approach, especially in the context of market frictions and behavioral economics.**

6.2 Introduction

The New Classical Approach emerged in the 1970s as a significant departure from Keynesian economic thought. It was driven by dissatisfaction with Keynesian

explanations for stagflation and focused on grounding macroeconomics in firm microeconomic principles. Central to this approach are the ideas of rational expectations, market-clearing mechanisms, and the representative agent model. While the New Classical school brought analytical rigor and challenged the effectiveness of anticipated policy interventions, it also sparked considerable debate due to its reliance on strong assumptions. This chapter explores the foundations, implications, and criticisms of the New Classical framework, as well as its impact on modern macroeconomic theory.

6.3 The New Classical Approach

The New Classical Macroeconomics emerged in the 1970s as a revolutionary school of thought, challenging Keynesian and monetarist views by reintroducing classical principles with modern twists. Central to this approach are the concepts of **rational expectations** and **market efficiency**, which fundamentally reshape how economists understand policy impacts and economic fluctuations.

Origins and Key Principles

Developed by Robert Lucas, Thomas Sargent, and Robert Barro, the New Classical approach rejects Keynesian demand-management policies and instead emphasizes:

a) **Market Continuity**: Prices and wages adjust instantaneously to clear markets, leaving no room for involuntary unemployment.
b) **Rational Expectations**: Individuals and firms use all available information to form unbiased forecasts, learning from past trends and policy patterns.
c) **Policy Ineffectiveness Proposition**: Systematic fiscal or monetary policies fail to influence real variables like output and employment, as rational agents anticipate their effects.

This framework builds on Walrasian general equilibrium models, assuming agents maximize utility or profits under constraints. For example, Lucas and Rapping's labor market analysis posits that unemployment reflects voluntary choices based on perceived real wages, not market failures.

Major Implications of the New Classical Approach

- **Limits of Policy Influence**

A major claim of this approach is that routine fiscal and monetary policies have little to no consistent impact on real variables like GDP or employment. This stems from:

- **Predictable Policy**: If a policy is expected, individuals will anticipate its effects and adjust in ways that neutralize it.
- **Unexpected Policy**: Only surprises can temporarily affect the real economy, and even those impacts are short-lived as expectations adjust.

- **No Long-Term Inflation-Unemployment Trade-Off**

New Classical theorists reject the idea of a lasting trade-off between inflation and unemployment. They argue:

- **Vertical Long-Run Phillips Curve**: In the long run, attempts to push unemployment below its natural level through stimulus will only result in higher inflation, not more jobs.

- **Focus on Supply Factors**

This school emphasizes supply-side dynamics, asserting that real shocks—such as technological changes or resource shifts—drive fluctuations, not changes in demand.

Major Criticisms of the New Classical Framework

- **Unrealistic Assumptions About Behavior**

- **Rationality Questioned**: Critics argue that people don't always act rationally. Insights from behavioral economics show that decision-making is often biased or based on rules of thumb.
- **Information Problems**: In practice, information is imperfect, costly, or unevenly distributed, which challenges the model's reliance on informed agents.

- **Doubts About Market Flexibility**

- **Sticky Wages and Prices**: Empirical data suggests that wages and prices do not adjust instantly, often due to contracts or norms. This contradicts the idea that markets always clear.
- **Involuntary Unemployment**: Many jobless individuals during downturns are willing to work at current wages but can't find employment, challenging the notion that all unemployment is voluntary.

- **Problems with the Representative Agent Model**

- **Lack of Diversity**: The simplification of using one representative agent overlooks real differences in behavior, preferences, and information among individuals and groups.

- **Policy Implications Disputed**

- **Overstated Ineffectiveness**: Critics say that even anticipated policies can influence real outcomes, particularly in the presence of market imperfections and rigidities.

- **Underappreciation of Government Role**: The framework tends to downplay how government interventions can stabilize the economy or address inequality.

➢ **Broader Societal Oversights**

- **Distribution and Externalities**: The model pays little attention to issues like income inequality or environmental degradation.
- **Neglect of Institutions and Culture**: It often ignores how social norms, institutions, and cultural factors shape economic outcomes.

Practical Relevance and Theoretical Evolution

➢ **Struggles with Real-World Application**

The New Classical model has had difficulty explaining prolonged unemployment during recessions or the sluggish adjustment of wages and prices.

Events like the 2008 financial crisis exposed the limitations of assuming perfect information and fully rational behavior in efficient markets.

➢ **Rise of the New Keynesian Response**

In response, New Keynesian economics emerged. This newer approach keeps rational expectations and microfoundations but also accounts for sticky prices, imperfect competition, and other frictions that better reflect observed economic dynamics.

Comparison Table: New Classical vs. Its Critics

Feature	New Classical Perspective	Criticisms/Alternative Views
Rationality	Fully rational agents	Real behavior often deviates due to cognitive limits and biases
Information	Nearly perfect information	Often incomplete or asymmetric
Market Mechanism	Markets clear via flexible prices and wages	Evidence supports rigidity and unemployment
Policy Effectiveness	Predictable policy is neutralized	Can be effective under real-world conditions
Social Considerations	Not a focus	Ignores inequality and social outcomes
Environmental Externalities	Rarely considered	Neglects vital long-term impacts
Agent Diversity	Uses a representative agent	Oversimplifies actual economic behavior
Response to Shocks	Immediate adjustment	Adjustment may be slow and uneven

6.4 Rational Expectations Hypothesis

Rational Expectations: Foundations and Implications

Rational expectations, a cornerstone of modern macroeconomics, revolutionized how economists model decision-making under uncertainty. Introduced by **John F. Muth** in 1961 and later expanded by **Robert Lucas** and **Thomas Sargent**, this hypothesis posits

that economic agents form forecasts using all available information and economic theory, avoiding systematic errors.

Definition and Mathematical Formulation

Rational expectations (RE) assume agents predict future variables by:

1. Incorporating **all publicly available data** (e.g., policy announcements, historical trends).
2. Applying **economic models** to avoid biased or persistent forecasting errors.

Muth formalized this as:

Et[Xt+1] = Xt+1+ϵt+1$Et[Xt+1] = Xt+1+\epsilon t+1$

where Et [Xt+1] $Et[Xt+1]$ is the expectation of future variable XX, and ϵϵ is a random error term with mean zero. This contrasts with **adaptive expectations**, where agents mechanically adjust forecasts based on past errors (e.g., assuming future inflation mirrors recent trends).

Example: If a central bank announces a 5% increase in the money supply, rational agents anticipate higher inflation and immediately demand wage hikes, neutralizing the policy's real economic impact.

Key Implications

1. **Policy Ineffectiveness Proposition**:
    - Anticipated monetary or fiscal policies fail to alter real variables like output or employment. Agents adjust behavior preemptively, rendering policies neutral.

- *Example*: Expansionary fiscal stimulus may boost demand temporarily, but rational consumers foresee future taxes and increase savings, offsetting the stimulus.

2. **Lucas Critique**:
    - Traditional econometric models (e.g., Phillips Curve) fail because they ignore how policy changes alter expectations. Structural parameters are not invariant to policy shifts.
    - *Application*: A historical inflation-unemployment trade-off collapses if central banks exploit it, as agents revise expectations.
3. **Market Efficiency**:
    - Asset prices reflect all available information, negating predictable profit opportunities (efficient markets hypothesis)

Criticisms and Limitations

1. **Unrealistic Assumptions**:
    - Agents are assumed to have **perfect information** and computational capacity, ignoring cognitive limits and information asymmetry.
    - *Counterexample*: During the 2008 crisis, even experts failed to predict housing market collapses, highlighting informational gaps.
2. **Behavioral Biases**:
    - Humans often rely on heuristics (e.g., overconfidence, herd behavior) rather than optimal decision-making.
    - *Case*: Stock market bubbles suggest speculative behavior driven by irrational exuberance, not rational forecasts.
3. **Empirical Challenges**:

- RBC models, which rely on RE, struggle to explain recessions without observable real shocks (e.g., the 2020 pandemic slump).
- Studies show households frequently misforecast inflation, contradicting RE's error randomness.

4. **Policy Relevance**:
    - While RE underscores the limits of discretionary policy, New Keynesians argue **sticky prices** justify short-term interventions to stabilize demand

6.5 Check your progress

Q1- What are the key principles of the New Classical Approach?

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Q2- What do you mean by Lucas critique?

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6.6 Let us sum up

The New Classical Approach revolutionized macroeconomic theory by reintroducing microeconomic foundations, rational expectations, and market-clearing mechanisms into the analysis of economic fluctuations. Its emphasis on fully rational agents and the policy ineffectiveness proposition challenged traditional Keynesian views and reshaped the

debate on the role of government interventions. However, despite its analytical rigor, the New Classical framework has faced criticism for its strong assumptions—particularly regarding rationality, perfect information, and instantaneous price adjustments. These limitations, along with empirical challenges, paved the way for alternative approaches like New Keynesian economics, which retain microfoundations while acknowledging market imperfections and behavioral nuances. Overall, understanding the New Classical approach and its critiques is essential for grasping the evolution of macroeconomic thought and policy debates in modern economics.

6.7 Keywords

- Rational Expectations
  An economic hypothesis asserting that individuals form forecasts using all available information and economic theory, resulting in unbiased and systematically correct predictions on average.
- Policy Ineffectiveness Proposition
  The argument that systematic fiscal or monetary policies have no consistent impact on real economic variables (like output and employment) because rational agents anticipate and neutralize their effects.
- Representative Agent
  A simplification in macroeconomic modeling where the behavior of the entire economy is captured by a single, typical decision-maker, ignoring heterogeneity among individuals and firms.
- Lucas Critique
  A criticism of traditional econometric models that fail to account for how policy changes affect agents' expectations, making historical relationships unreliable for policy evaluation.

6.8 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

6.9 Hints to check your progress

Q1- See section 6.3

Q2- See section 6.4

6.10 Examination oriented questions

- Explain the concept of **rational expectations** and discuss its significance in modern macroeconomics.
- Critically evaluate the policy ineffectiveness proposition advocated by the New Classical economists.
- Discuss the major criticisms of the New Classical approach, focusing on its assumptions of market-clearing mechanisms and rational behavior.

M.A. ECONOMICS		**LESSON NO. 7**
COURSE NO.: ECO-107	**SEMESTER IST**	**UNIT–II**

DEMAND SIDE EQUILIBRIUM: EQUILIBRIUM INCOME AND INTEREST RATE IN THE PRODUCT MARKET

STRUCTURE:

7.11 Examination oriented questions

7.0 Objectives

- To explain the concept of demand side equilibrium in the product market and its significance in macroeconomic analysis.
- To analyze how equilibrium income and the interest rate are determined in the product market using the IS curve framework.
- To illustrate, with diagrams, the process of achieving equilibrium in the goods market under varying interest rates.
- To evaluate the implications of changes in autonomous expenditures and interest rates for macroeconomic equilibrium.

7.1 Lesson Outcomes

By the end of this chapter, students will be able to:

- Describe the conditions for demand side equilibrium in the product market and the role of the interest rate.
- Derive and interpret the IS curve as the locus of equilibrium points for income and interest rates.
- Illustrate shifts in the IS curve and explain their impact on equilibrium income and interest rates.

Assess the policy relevance of the IS curve for fiscal and monetary interventions

7.2 Introduction

Dear learner, after going through this chapter, you would be able to understand the functioning of the product market, also known as the goods market, where the total output

of an economy is bought and sold. You will learn the importance of achieving equilibrium in this market for ensuring macroeconomic stability. The chapter will help you grasp the concept of demand-side equilibrium, which occurs when aggregate demand equals aggregate supply. You will become familiar with the IS curve, a key analytical tool in modern macroeconomics, which represents all combinations of income and interest rates at which the product market remains in equilibrium. Furthermore, you will understand the critical role of the interest rate in shaping investment decisions and, consequently, aggregate demand and equilibrium income. This knowledge is essential for evaluating how fiscal and monetary policies influence overall economic performance.

7.3 The Concept of Demand Side Equilibrium

Demand side equilibrium in the product market is achieved when the quantity of goods and services demanded equals the quantity supplied. In a simple closed economy, aggregate demand (AD) is given by:

AD=C+I+G$AD=C+I+G$

where:

- **C** = Consumption (a function of disposable income, Y−T$Y-T$)
- **I** = Investment (a function of the interest rate, rr)
- **G** = Government expenditure (exogenous, determined by policy)

Equilibrium occurs when:

Y=C(Y−T)+I(r)+G$Y=C(Y-T)+I(r)+G$

This condition ensures that all output produced is demanded, and there is no unintended inventory accumulation or depletion. If aggregate demand exceeds output, firms will increase production, raising income. If aggregate demand is less than output, firms will reduce production, lowering income.

2. The Role of the Interest Rate

The interest rate is a key determinant of investment. A higher interest rate increases the cost of borrowing, which reduces investment and, consequently, aggregate demand. Conversely, a lower interest rate stimulates investment and raises aggregate demand. This relationship is crucial for understanding how changes in monetary policy or financial market conditions affect the overall economy.

7.4 Derivation of the IS Curve

The **IS curve** represents all combinations of income (Y) and interest rate (r) where the product market is in equilibrium—that is, where aggregate demand equals aggregate supply, or equivalently, where saving equals investment.

Step-by-Step Derivation:

1. **Investment Function:**
   Investment (I*I*) is inversely related to the interest rate (r*r*):

I=I0−dr*I*=*I*0−*dr*

where I0*I*0 is autonomous investment and d*d* is the interest rate sensitivity of investment.

2. **Saving Function:**
   Saving (S*S*) is a function of income (Y*Y*) and taxes (T*T*):

S=−a+(1−b)(Y−T)*S*=−*a*+(1−*b*)(*Y*−*T*)

where a*a* is autonomous consumption, b*b* is the marginal propensity to consume, and (1−b)(1−*b*) is the marginal propensity to save.

3. **Equilibrium Condition:**
   In equilibrium, saving equals investment (S=I*S*=*I*):

−a+(1−b)(Y−T)=I0−dr−*a*+(1−*b*)(*Y*−*T*)=*I*0−*dr*

Rearranging for Y*Y*:

Y=a+I0+G−bT1−b−dr1−b*Y*=1−*ba*+*I*0+*G*−*bT*−1−*bdr*

This is the equation of the IS curve, showing income (Y*Y*) as a decreasing function of the interest rate (r*r*).

Graphical Illustration:

Interest Rate (r)

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| IS

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Income (Y)

The IS curve is downward sloping: as the interest rate falls, investment rises, leading to higher equilibrium income through the multiplier effect.

4. Shifts in the IS Curve

The IS curve shifts due to changes in autonomous expenditures (such as government spending, autonomous consumption, or autonomous investment):

- **Increase in government spending (*G*) or autonomous consumption/investment:** Shifts the IS curve to the right, increasing equilibrium income at every interest rate.
- **Decrease in government spending or autonomous consumption/investment:** Shifts the IS curve to the left, reducing equilibrium income.

Example:
A fiscal stimulus (increase in *G*) raises aggregate demand, shifting the IS curve rightward. At each interest rate, equilibrium income is higher.

7.5 Adjustment to Equilibrium

If the economy is not at equilibrium (i.e., aggregate demand does not equal output), market forces will act to restore balance:

- **If aggregate demand exceeds output:** Firms will increase production, raising income.
- **If aggregate demand is less than output:** Firms will reduce production, lowering income.
- **The interest rate adjusts to ensure that investment equals saving at each level of income.**

This adjustment process is analogous to the market-clearing mechanism in microeconomics, where prices adjust to eliminate excess demand or supply.

6. Policy Implications

- **Fiscal Policy:** Changes in government spending or taxation shift the IS curve, affecting equilibrium income and interest rates.
- **Monetary Policy:** Changes in the money supply influence interest rates, which in turn affect investment and the position along the IS curve.
- **Multiplier Effect:** An initial change in spending can have a magnified effect on income, depending on the marginal propensity to consume.

7.6 Check your progress

Q1- What is the role of interest rate in determining the investment?

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Q2- What happens when the Aggregate Demand in not equal to the output?

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7.7 Let us sum up

The concept of demand side equilibrium in the product market is foundational to macroeconomic analysis. The **IS curve** provides a powerful framework for understanding

how equilibrium income and the interest rate are determined, and how changes in autonomous expenditures or interest rates affect the economy. By analyzing shifts in the IS curve, economists and policymakers can anticipate the effects of fiscal and monetary policies on output and employment. The adjustment mechanisms—whereby the economy moves toward equilibrium through changes in production and interest rates—mirror the market-clearing processes observed in microeconomics. A thorough grasp of these concepts is essential for designing effective economic interventions and achieving macroeconomic stability. The IS curve remains a vital tool for analysing short-run economic fluctuations and for formulating policy responses to economic shocks.

7.8 Keywords

- Demand Side Equilibrium: The situation where aggregate demand equals aggregate supply in the product market, ensuring no unintended inventory accumulation or depletion.
- IS Curve: The locus of all combinations of income (Y) and interest rate (r) where the product market is in equilibrium (aggregate demand equals aggregate supply, or saving equals investment).
- Interest Rate Elasticity of Investment: The degree to which investment responds to changes in the interest rate.
- Autonomous Expenditure: Components of aggregate demand (such as government spending, autonomous investment, or autonomous consumption) that are independent of the level of income or interest rate

7.9 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.

- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

7.10 Hints to check your progress

Q1- See section 7.3

Q2- See section 7.5

7.11 Examination-Oriented Questions

- Explain the concept of demand side equilibrium in the product market. How does the interest rate influence this equilibrium? Provide a step-by-step derivation of the IS curve.
- Illustrate, with a diagram, how an increase in government spending affects the IS curve and equilibrium income. What is the economic intuition behind this shift?
- Discuss the role of the interest rate in determining investment and aggregate demand. How does a change in the interest rate move the economy along the IS curve?
- Evaluate the macroeconomic policy implications of the IS curve, with reference to both fiscal and monetary policy interventions.

M.A. ECONOMICS **LESSON NO. 8**

COURSE NO.: ECO-107 **SEMESTER IST** **UNIT–II**

DERIVATION AND ANALYSIS OF THE IS CURVE AND LM CURVE

STRUCTURE:

8.0 Objectives

- To explain the concepts and derivation of the IS and LM curves within the IS-LM framework.
- To analyze how the equilibrium levels of national income and interest rate are determined by the intersection of the IS and LM curves.
- To examine the factors influencing the slopes and shifts of the IS and LM curves and their economic implications.
- To evaluate the policy relevance and limitations of the IS-LM model in macroeconomic analysis

8.1 Learning Outcomes

By the end of this chapter, students will be able to:

- Describe the process of deriving the IS and LM curves and explain their economic significance in the IS-LM model.
- Illustrate, with diagrams, how equilibrium is achieved in both the product and money markets.
- Analyze the impact of changes in autonomous expenditures, money supply, and interest rates on the IS and LM curves and on macroeconomic equilibrium.

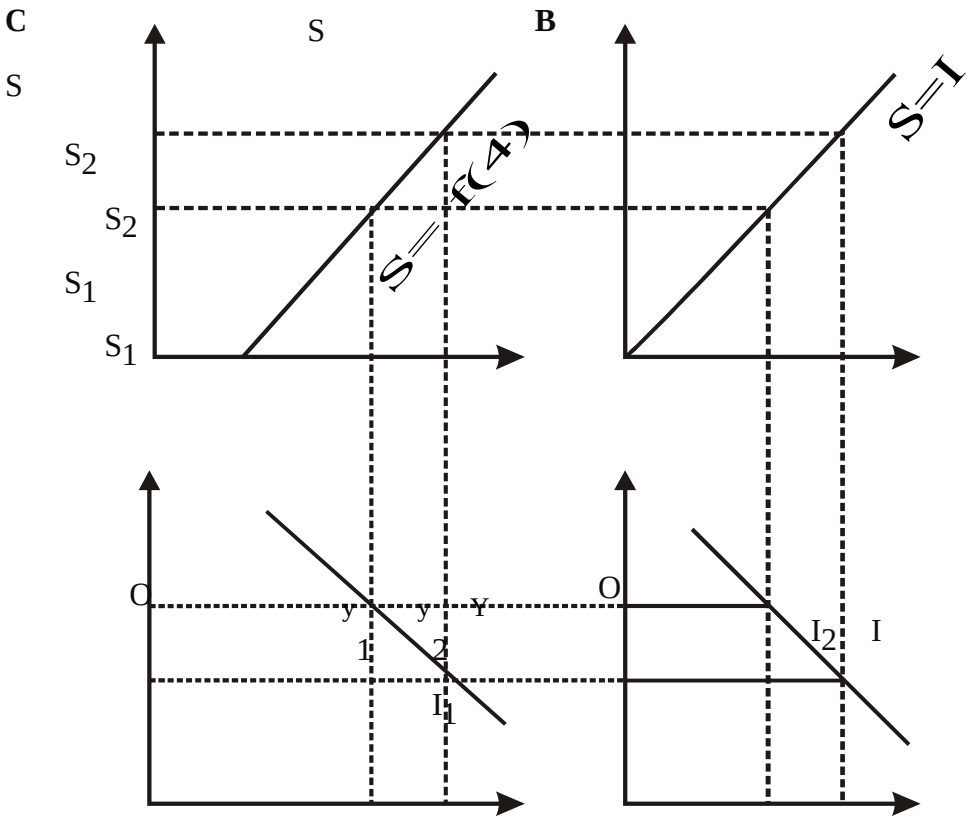
- Discuss the strengths and limitations of the IS-LM model as a tool for understanding and formulating macroeconomic policy.

8.2 Introduction

Dear learner, after going through this chapter, you would be able to understand how national income is determined in the Keynesian framework, particularly at the point where aggregate demand—comprising consumption and investment (C + I)—equals aggregate output, signifying goods market equilibrium. You will explore how Keynes initially treated investment as autonomous but later emphasized that investment is influenced by the rate of interest and the marginal efficiency of capital (MEC). You will also learn that the interest rate itself is determined in the money market through the interaction of the demand for and supply of money. Consequently, changes in the rate of interest, due to shifts in money supply or demand, affect investment levels and thereby influence national income and output. This understanding leads to the realization that the goods market and money market are interlinked. Furthermore, you will study how economists like J.R. Hicks, Hansen, Lerner, and Johnson expanded Keynes' ideas into an integrated framework known as the IS-LM model, where investment, national income, interest rates, and monetary variables are all mutually interdependent. The IS-LM model provides a comprehensive tool to analyze the interaction between the real and monetary sectors of the economy.

8.3 The Derivation of the IC Curve

The Product Market is said to be in equilibrium when the aggregate demand is equal to the income (i.e. AD=Y). The aggregate demand is composed of C and I where C is a direct function of Income [i.e. C= f(y)] or C is directly related to income and the levelof investment is an inverse function of ROI [i.e. I=f(r)]. The businessmen therefore undertake greater investment at lower level of ROI and vice-versa



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2

I

O y_1 y_2 O $_1$ I_2 I

Y

I

Fig. Derivation of IS - Curve

Panel (A) of the fig. 1 gives the relationship between I and ROI which is an inverse one. The straight line of 45^0 in Pannel (B) shows the saving and Investment equality. Pancel (C) shows that saving varies directly with income. The IS curve is Pannel (D) is derived from other part of the fig.

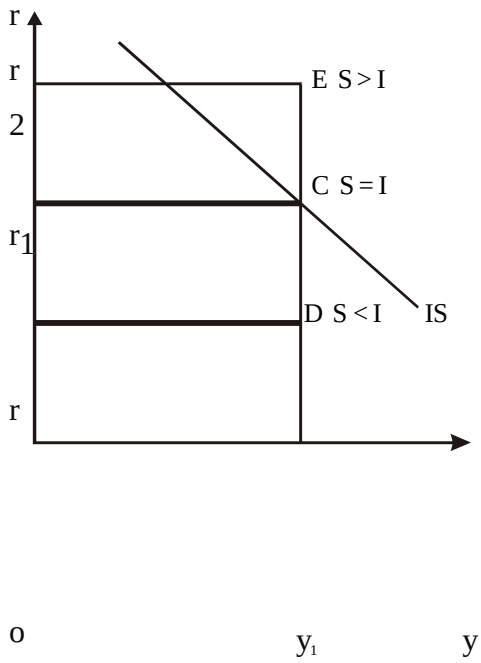
Let us assume the ROI is r_1 in Pannel (A), indicating that investment is I_1, In Pannel (B), to satisfies saving and Investment equality, saving 'S_1' should be equal to I_1. In Pannel (C), 'S_1' amount of saving arises out of Y_1 amount of income. Bringing

Y_1 amount of income from Pannel (C) and r_1 amount of ROI from Pannel (A), gives one combination of ROI and level of income at which S=I or Y= C + I.

Similarly, if we assume a lower ROI 'r_2', there will be an investment of I_2which yield income level Y_2 in pannel (C), therefore income y_2 and Interest rate 'r_2' is another combination of y and r, where Saving = Investment or y= C + I.

This shows a negative relationship between yand r in Pannel(D) of the fig. Threfore, we can say that IS curve shows the combination of y and r at which S = I or Y = C + I or goods market equilibrium. Therefore, IS curve is the locus of the combination of y are r where goods market is in equilibrium.

Disequilibrium:

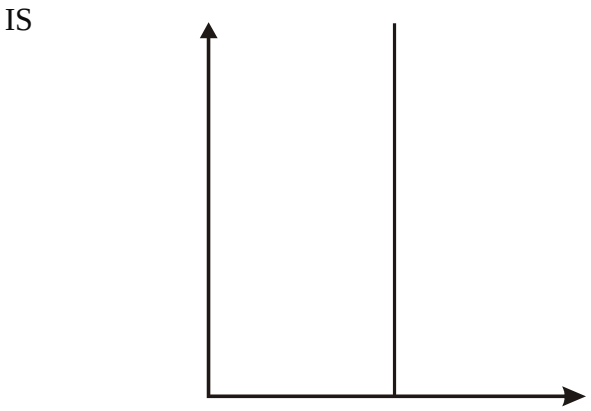


The IS-Curve represents all the various combinatin of interest (i) and income (Y), investment (I) and Saving (S) that keep the product market in equilibrium. The product market will not be in equilibrium at any point away from the IS Curve. The reason is, all other proints away from IS Curve violate the equilibrium condition (I=S) of the product market. For example, at any point to the right of the IS Curve i.e. at pt.E, S > I, and at any point to the left of the IS Curve, i.e. at pt. D, S<1. So the product market equilibrium has to be only on the IS Curve.

Slope of IS-Curve

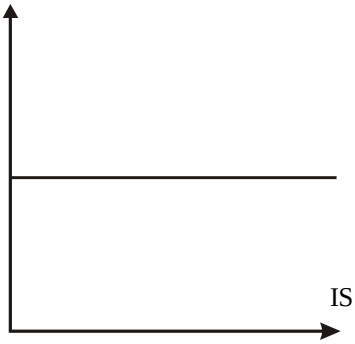
The IS Curve may be flat or steep depend upon the elasticity of investment, demand Curve and the size of multiplier in the economy. When the investment is very sensitive or more elastic to the ROI, the IS Curve will become a flat Curve. On the other hand, if the investment is not very sensitive to ROI, the IS Curve will be a steeper one. When the level of investment is inelastic to R i.e. (When I is insensitive to R), the IS Curve is vertical.

When Investment is perfectly elastic w.r.t. ROI, there will be a flat IS Curve i.e.



horizontal.

The Shape of IS Curve also depend upon the size of the multiplier. If the size of



multipler is large, income s more sensitive to changes in interest rate and IS Curve will become a flatter Curve and vice versa.

Shift in IS Curve

The IS Curve will shift due to change in autonomous investment. By autonomous investment, we mean investment expenditure, govt. expenditure and consumption expenditure which does not depend on the level of income or ROI.

Mathematical Derivation

At equilibrium,

$$Y = E = C + I + G$$

where Y = Output / Income

E = Aggregate expenditure $(C + I + G)$

We know,

$$C = a + bY_d$$

$$I = \bar{I} - i_1 r$$

$$Yd = Y - T$$

$$G = \bar{G}$$

- $y = a + byd + \bar{I} - i_1 r + \bar{G}$
- $y = a + b(y - T) + \bar{I} - i_1 r + \bar{G}$
- $y = a + by - bT + \bar{I} - i_1 r + \bar{G}$
- $y - by = a - bT + \bar{I} + \bar{G} - i_1 r$
- $y(1 - b) = (a - bT + \bar{I} + \bar{G}) - i_1 r$
- $y = \frac{1}{1 - b}(a - bT + \bar{I} + \bar{G}) - \frac{i_1}{1 - b} r$

$$y = \frac{1}{1-b}(A) - \frac{i_1}{1-b}r$$

Where $A = a - bT + I + G$

$$\Delta y = \frac{-i_1}{1-b}\Delta r$$

$$\frac{\Delta r}{\Delta y} = \frac{-(1-b)}{i_1}$$

Where i_1 = MPI

8.4 Derivation of LM Curve

The money market is said to be in equilibrium when the demand for money is equal to the supply of money, denoting 'L' or 'M^d' for money demand and 'M^s'for money supply. Equilibrium will occur when Md = Ms. The demand for money (M^d) consists of two types of demand, i.e. (i) Transaction demand (M_1) [includes Precautionary demand also]. (ii) Speculative demand (M_2)

The transaction demand for moey is positively related to income level. [It means al income increases, transaction demand for money also increases].

$M_1 = f(Y) = KY$

Where, K = proportion of money the individual hold for transaction motive.

The speculative demand for money is inversely related to interest rate i.e.

$M_2 = f(r) = -br$

$M^d = M_1 + M_2$

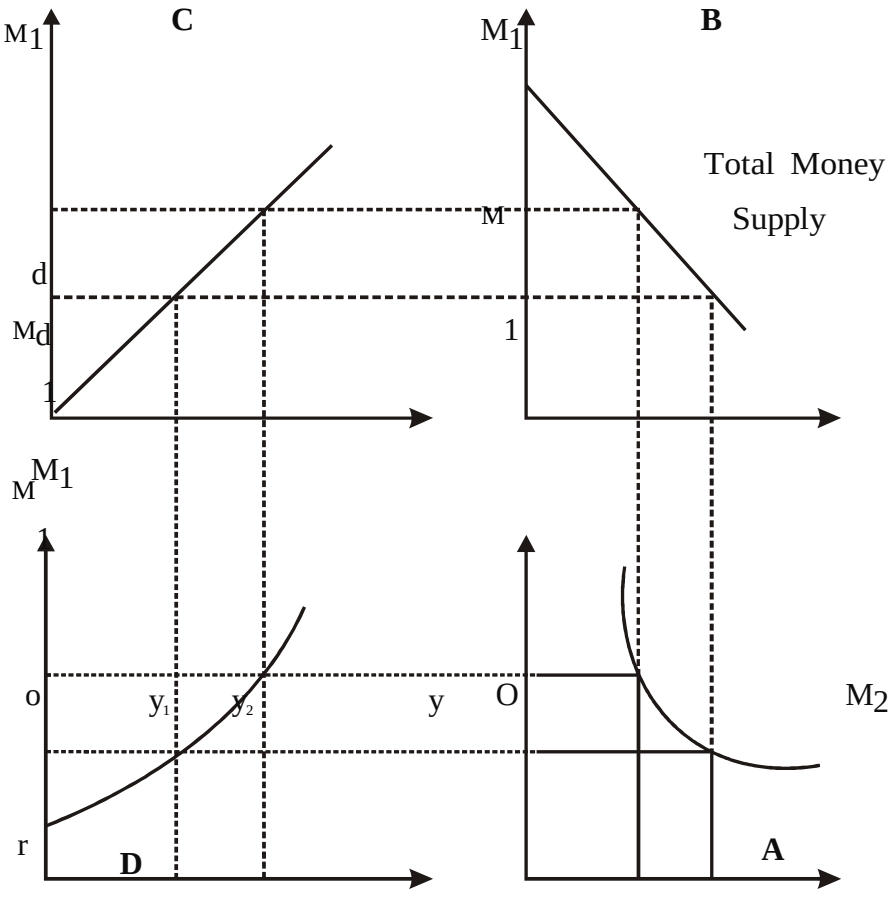
$= Ky - br$

Where b = degree of responsiveness of speculative demand.

Money Supply :

Money supply is determined by monetary authority or the Central bank fo the Country. At a given point of time, the supply of moey is constant. For money market to be in equilibrium.

$$M^d = M^S \quad \text{or}$$
$$M_1 + M_2 = M^S$$



LM

r1

r

1

r2

r

2

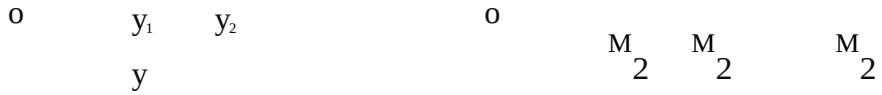


Fig. 2 Derivation of LM Curve

In Panel (A), we shows speculative demand is an inverse function of ROI. In Panel (B), we show total money supply as (M_1 + M_2) all of which must be held in either transaction or speculative balances. The point along the line indicate all the possible ways in which the given money supply must be divided between M_1 and M_2.

In Pannel C, we show the amount of money required for transaction purpose at each level of income. There is a direct relationship between the level of income and transaction demand for money. The LM Curve in Pannel (D) is derived from other parts of the fig. Let us assume in Pannel (A), the ROI is r_1, at which public

want to hold M_2 amount ofspeculative demand. In Pannel B, substracting M_2 of speculative demand from balance, we get M^d_1 of transaction demand at income level Y_2. Finally,

bringing together income of Y_2 from Pannel C and ROI 'r_1' from Pannel A, we get one combination of y and r at which $M^d = M^s$ knwon as Money Market.

Equilibrium:

If we assume a lower ROI amount of r_2 in Pannel A indicating the speculative balances of M . In Pannel B, Corresponding to M^1 speculative demand, the transaction

2 2

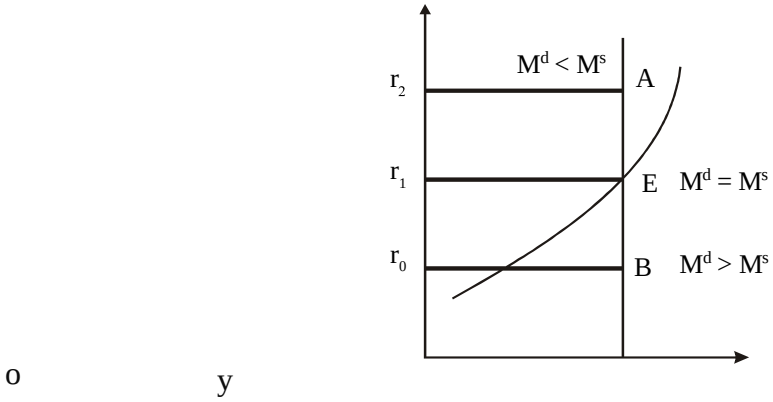
demand is M_1 and corresponding to M_1 transaction demand the income level is y_1, in Pannel (C).

Finally bringing together y_1 from Pannel C and r_2 ROI from Pannel A, we get another combination of y & r, at which there is money market equilibrium. If we join all the combination of y & r at which $M^d = M^s$, then we get the LM Curve.

Thus, LM Curve is locus of Combination of y & r at which money market are in quilibrium

Disequilibrium :-

The LM Curve represents all the various combinations of income and rate of



interest. The money Market will not be in equilibrium at any point away from LM Curve. The reason is, all other ponts violete the equilibrium condition ($M^d = M^s$) of money market. For eg. at any point to the left of LM Curve i.e. at pt. A, $M^d < M^s$, and at any point to the left of LM Curve, i.e. at pt. B, $M^d > M^s$. So the money market equilibrium has to be only on LM Curve.

Slope of LM Curve :-

The LM Curve slopes upward from Left to right LM Curve represent money market equilibrium i.e.

$M^d = M^s$ □ $M_1 + M_2 = M^s$.

The slope of LM Curve depends upon two factors:

i) Responsiveness of D^M to change is income.

i) Responsiveness of demand for money to change in interest rate.

The greater the extent to which demand for money for transaction motive increase with the increase in income, the greater decline in the money supplyavailable for speculative motive, the higher will be the rise in the ROI & the LM Curve is steeper.

The lower the elasticity of liquiditypreference for speculative motive, with respect to change in interest rate, the steeper will be the LM Curve.

Shift in LM Curve:

The Shift in LM Curve occurs due to two factors: -

i) The LM Curve is drawn by keeping the stock of money supply as fixed. The LM Curve will shift to the right when the stock of money supply is increased and vice-versa.

i) A change in liquidity preference for a given level of income.

Mathematical Derivation

We know that

$$M^s = M^d \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (1)$$ [For money Market equilibirium]

- $Md = M_1 + M_2$

$= M_1 (y) + M_2 (r)$

$M^d = C_0 + C_1y - C_2r, \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$

Where C_1 & $C_2 > 0$

Put the value of eq. 2 in equation 1

- $M^s = M^d$
- $M^s = C_0 + C_1y - C_2r$
- $C_2r = C_0 + C_1y - M^s$
- $r = \frac{C_0}{C_2} + \frac{C_1}{C_2}y - \frac{M^s}{C_2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$

The equation 3 represents LM Curve.

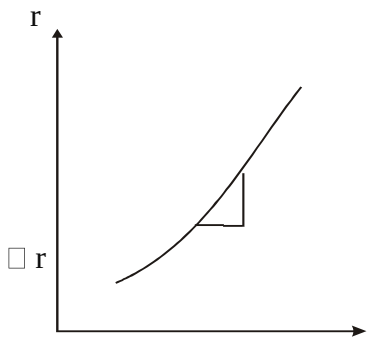
The Slope of LM Curve are

$\frac{\Delta r}{\Delta y}$

Now, From equation (3)

$\Delta r = \frac{C_1}{C_2} \Delta y$

$\frac{\Delta r}{\Delta y} = \frac{C_1}{C_2}$

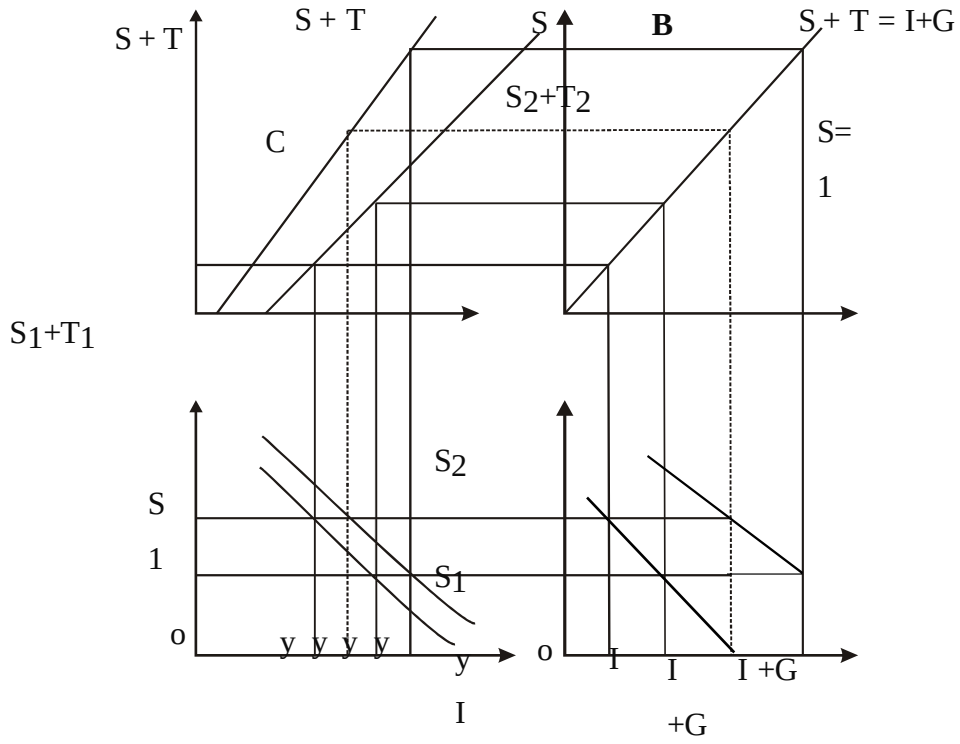


$$\frac{C1}{C2} > 0 \qquad \frac{\partial}{\partial} \qquad \frac{\partial \square}{\partial y}$$

Now, the slope chagne, either change in C_1 or C_2, then LM Curve will shift.

8.5 Derivation of IS Schedule and Product Market Gm in 3-Sector IS - LM Model

Let us begin with the two sector model the investment function I in quadrant (A) shows the investment without government expenditure, G. Corresponding to the investment and saving functions (I and S), the two-sector product - market equilibrium is presented by the IS Schedule in quadrant (d).



1 1 2 2 1

r

2

r 1

r **D** r

r 2

S 1 2 1 2

1 1

A

I+G

I

o y_1 $_1$ y_2 $_2$ y^2 o I_1 $_2$ I_1+G_1 I

y1 I

y

Let us assume the govt. purchases of goods and services and taxes are independent of the Y level. It means the government expenditure and taxes are automonous in nature.

Suppose there is an autonomous government expenditure which shifts the I curve to I + G in quadrant (A) of the fig. Once we introduce government sector (Govt. expenditure & taxation) the equilibrium condition will be S + T = I + G in the product market which is shown in part B of the fig. Quadrant (C) of the fig. explain how saving (including fixed amount of taxation) is related to income level. Once we introduce the tax, the saving curve is shift leftward. Finally part-D of the fig. represent the IS curve. Let us assume at ROI r_1, investment and government expenditure is $I_1 + G_1$ in part A of the fig. This $I_1 + G_1$ must be equal to $S_1 + T_1$ in part B in the fig. for the product market to be in equilibrium. Corresponding to this level ($S_1 + T_1 = I_1 + G_1$) the income level is y_1, which is shown in part-C of the fig. Now bringing r_1, from part A and y_1 from part-C we get (r_1, y_1) combination of r and y. Similarly, at r_2 ROI, we get (r_2, y_2) combination of r and y. If we join all the equilibrium point of r and y, we get IS curve IS, which is parallel to IS Curve.

8.6 Check your progress

Q1- What are the conditions under which the product market will not be in equilibrium?

……
……
……
……

Q2- What are the factors responsible for shifting of LM Curve?

……
……
……
……
……

8.7 Let us sum up

The IS-LM model provides a robust framework for understanding the short-run determination of national income and interest rates through the interaction of the product and money markets. By illustrating how equilibrium is achieved and how policies can shift the IS and LM curves, the model offers valuable insights for policymakers. However, its assumptions—such as fixed prices and a closed economy—highlight its limitations, especially when applied to complex, real-world scenarios. Nevertheless, the IS-LM model remains a cornerstone of macroeconomic theory and a vital tool for analyzing the interplay between fiscal and monetary policies

8.8 Keywords

- IS Curve: The graphical representation of all combinations of income (Y) and interest rate (r) at which the product market is in equilibrium (saving equals investment).
- LM Curve: The graphical representation of all combinations of income (Y) and interest rate (r) at which the money market is in equilibrium (money demand equals money supply).

- General Equilibrium: The point at which both the product and money markets are simultaneously in equilibrium, determined by the intersection of the IS and LM curves.
- Autonomous Expenditures: Components of aggregate demand (such as investment, government spending, or consumption) that are independent of the level of income or interest rate.

8.9 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

8.10 Hints to check your progress

Q1- See section 8.3

Q2- See section 8.4

8.11 Examination oriented questions

- Explain, with the aid of diagrams, the derivation of the IS and LM curves and show how their intersection determines general equilibrium in the IS-LM model.
- Discuss the factors that influence the slope of the IS and LM curves and analyze their implications for macroeconomic equilibrium.
- How do changes in autonomous government expenditure and money supply affect the IS and LM curves, respectively? Illustrate your answer with diagrams.
- Critically evaluate the usefulness and limitations of the IS-LM model in macroeconomic policy analysis.

M.A. ECONOMICS **LESSON NO. 9**

COURSE NO. : ECO-107 **SEMESTER IST** **UNIT–II**

EQUILIBRIUM IN PRODUCT AND MONEY MARKETS: THE ISLM MODEL

9.0 Objectives

- To explain the concepts of equilibrium in the product and money markets using the IS and LM curves.
- To analyze the derivation and properties of the IS and LM curves and their economic interpretations.
- To demonstrate how the intersection of the IS and LM curves determines the equilibrium levels of income and interest rates.
- To evaluate the policy implications of the IS-LM model for fiscal and monetary interventions.

9.1 Learning outcomes

After studying this chapter, students will be able to:

- Describe the process of achieving simultaneous equilibrium in the product and money markets using the IS-LM model.
- Illustrate and interpret the effects of policy changes and external shocks on the IS and LM curves and on macroeconomic equilibrium.
- Assess the strengths and limitations of the IS-LM model as a tool for macroeconomic analysis and policy formulation.

9.2 Introduction

Dear learner, after going through this chapter, you would be able to understand the detailed analysis of equilibrium conditions in both the goods market and the money market. You will also be able to comprehend how appropriate monetary and fiscal policies are implemented simultaneously to achieve general equilibrium in an

economy. This knowledge will enable you to analyze the coordinated functioning of real and monetary sectors in guiding an economy towards stability and growth.

9.3 IS - LM Equilibrium or Equilibrium in Product and Money Market

The equilibirum between saving and investment is possible at different combination of y and r indicated by the IS Curve. Similarly the equilibrium between demand for money and supply of money is also possible at different combination of y and r. There will, however be only a possible single combination of y and r at which both product and money market will in equilibrium. This combination is defined by the intersection of IS and LM Curve. It is clear from the fig. IS Curve

shows the equilibrium level of y at different levels of r with the condition that I=S. Similarly LM Curve shows the equilibrium level of y at different levels of r wit the condition that $M^d = M^s$. As shown in figure, the IS and LM Curve intersect at pt. C. Point E gives the unique combination of y and r that satisfies the equilibrium conditions of both the product and the money market. Any deviation from pt. E represent disequilbriumeither in one market or both the market. Therefore pt. A, in zone I, B in II, C in III and D in IV represent disequilibrium in both markets.

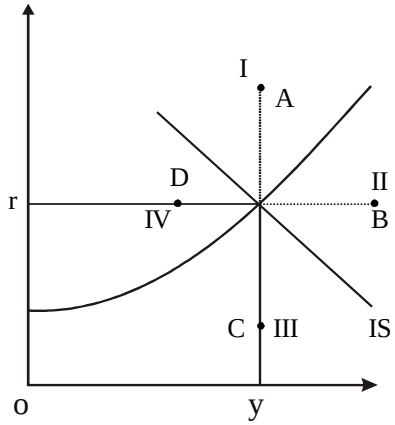


Fig. 3 Equilibrium in Goods and Money Market.

Zone	**Product Market**	**Money Market**
I	S > I, Y > C + I	Md < Ms
II	S > I, Y > C + I	Md > Ms
III	I > S, Y < C + 1	Md > Ms
IV	I > S, Y< C + I	Md < Ms

IS - LM Model with Government Sector or IS - LM Model in 3-Sector economy or IS-LM Model with Government expenditure and Taxation.

In 3-Sector economy along with consumption and investment we have government expenditure in aggregate demand schedule. Once the government spending and taxation have been added to the model, the equilibrium condition will be changed. In a 2 -Sector economy the equilibrium condition is S = I for the goods market or the product market to be in equilbrium and Md = Ms for the money market to be in equilibrium. But in case of 3-Sector economy the aggregate output or income (Y) is must be equal to Aggregate expenditure (E= C + I + G) for the product market to be in equilibrium. So after the addition of G and T, the three-sector product market equilibrium

condition is expressed as follows.

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

Since C is common to both sides, the three sector product market equilibrium can also be written as

$$I + G = S + T$$

and the equilibrium condition in the money marekt is

$$M^d = M^s$$

Equilibrium in product market with government expenditure and taxation or The general equilibrium and shift in IS Curve : Let us assume again the money market is not affected by the introduction of government expenditure and taxation and that the LM function remains unaffected Fig. illustrates the general equilibrium based on this assumption. Suppose that the initial IS Schedule is given by IS. The IS_1 and LM schedules intersect at pt. E. Point E, is therefore the pt of general equilibrium in the 3-sector model. This pt. of equilibrium will remain stable until there is a shift is IS and LM Schedules.

Let us now illustrate the shift in the general equation due to shift in the IS Schedule, assuming no shift in the LM Schedule. Ashift in the IS Curve (leftward or righward) results either from a change in government expenditure or a change in taxation.

when government. expenditure increases or taxation decreases, the IS curve shifts rightward and vice-versa.

It can be seen in figure that with the shift in the IS curve, the pt. of the general equilibrium shifts too. It is important to note here that an upward shift in IS Schedule, LM curve remainig the same, causes a rise in both the equilibrium levels of the interest rate and the income and vice-versa. For eg., with an upward shift in the IS schedule, the equilibrium ROI increases from r_1 to r_2 and the equilibrium levelof income increases from Oy_1 to Oy_2.

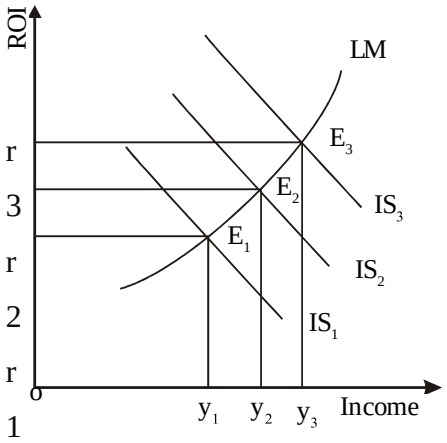
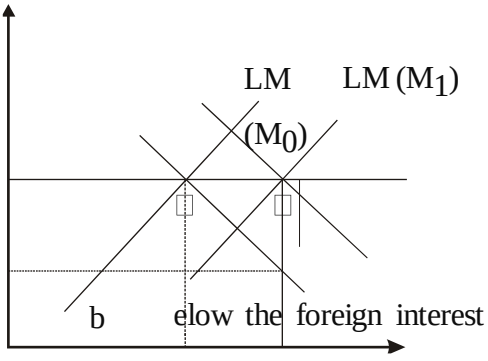


Fig : Shift in IS Curve and General Equilibrium

9.4 Policy effects Under Flexible exchange rates :

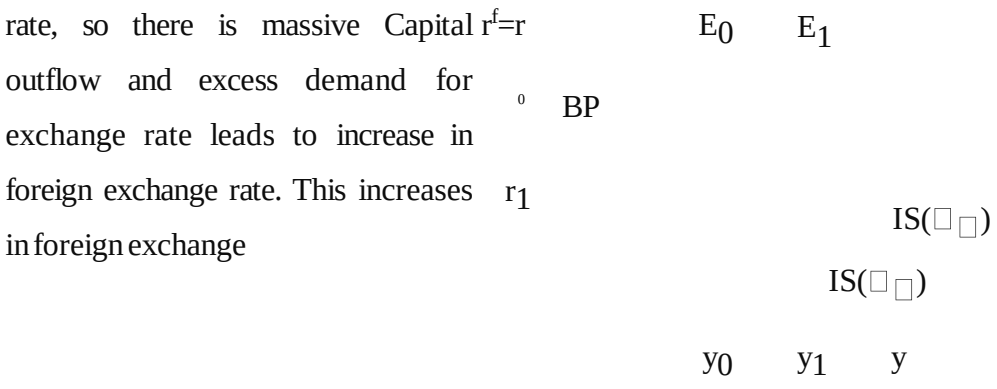
i) Monetary Policy :

An increase in money supply cause LM schedule to shift from LM (M_0) to LM (M). The domestic interest rate fall



1 b elow the foreign interest

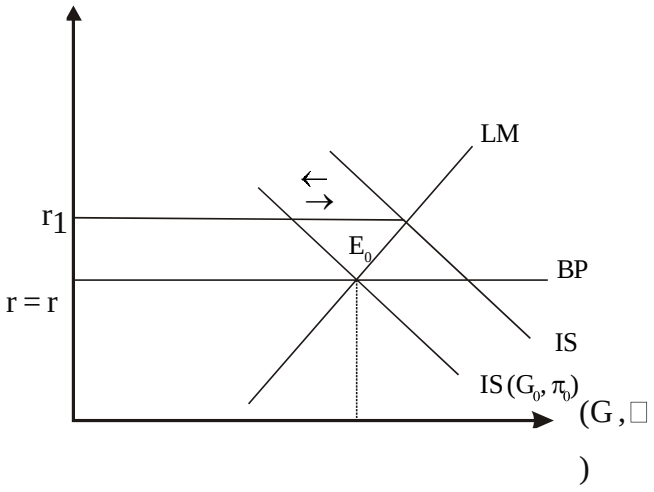
rate, so there is massive Capital outflow and excess demand for exchange rate leads to increase in foreign exchange rate. This increases in foreign exchange



exchange rate results in the shift in IS curve from IS (□ □) to IS (□ □) and the new equilibrium point will be restored at point E_1 where the two interest rate are equal. The income level also increase from y_1 to y_2 and the monetary policy is effective in this case.

ii) Fiscal Policy :

An increase in government spending cause the IS schedule to shift from IS (G_0, □) to IS (G , □). As a result, the domestic interest rate rises above the foreign
0 1 □
interest rate with a massive capital inflow, which with a flexible exchange rate causes the exchage rate to fall. As a result exports fall and imports riss, which shifts IS schedule to the left i.e. IS (G , □) = IS (G , □). The domestic interest
0 0 1 1
rate is requated witht he foreign interest rate when the income level returns to initial level. So fiscal policy is ineffective in this case.



f 0

1 1

y_0 y

9.5 Roles Of Monetary Fiscal Policies

Monetary policy refers to adoption of suitable policy regarding rate of interest and credit availability. Economists have followed conciliatory strategy to clarify efficiency of monetary and fiscal policies. They have just reconciled extreme approaches of Keynesians as well as monetarists by way of presenting their range analysis.

MONETARY POLICY

Monetary policy is explained in Figure 9.1 where the three-range LM curves LM_1 and LM_2 are shown with three IS curves. The LM_2 curve emerges after an increase in the money supply.

The Keynesian Range

First consider the Keynesian range where the LM curve is perfectly elastic. This is the Keynesian liquidity trap situation in which the LM curve is horizontal from R_1 toA, and the interest rate cannot fall below OR_1. An increase in the money supply shifts the LM curve from LM_1 to LM_2. This shift in the curve has no effect on the rate of interest. Consequently, investment is not affected at all so that the level of income remains unchanged at OY_1. This is because at a very low rate of interest such as OR1, people prefer to keep money in cash rather than in bonds (or securities) in the hope of converting it into bonds when the interest rate rises. Thus under the Keynesian assumption of the liquidity trap, the horizontal portion of the LM curve is not affected by an increase in the money supply. The IS curve intersects the LM curve in the flat range at A with little effect on the interest rate, investment and income. Monetary policy is, therefore, totally ineffective in the Keynesian range.

The Classical or Monetarist Range

Consider the classical range where LM curve is perfectly inelastic. In the classical range, the system is in equilibrium at D where the IS_3 curve intersects the LM1 curve and the interest rate is OR_5 and income level OY_4. Suppose the central bank adopts an expansionary monetary policy whereby it increases the money supply by open market operations. The increase in money supply shifts the LM_1 curve to the right to LM_2

position. As a result, the income level increases from OY_4 to OY_5 and the interest rate falls from OR_5 to OR_4, when the IS_3 curve crosses the LM_2 curve at E.

The increase in the income level and fall in the interest rate as a result of the increase in the money supply is based on the classical assumption that money is primarily a medium of exchange. When the central bank buys securities in the market, the security prices are bid up and the rate of interest falls. The wealth holders then find other assets more attractive than securities. They, therefore, invest the increased cash holdings in new or existing capital investments which, in turn, raise the level of income. But as long as wealth holders possess more money balances than are required for transactions purposes, they will continue to compete for earning assets. Consequently, the interest rate will continue to fall and investment will continue to rise until the excess money balances are absorbed in such transactions. Ultimately, the equilibrium level of income rises by the full amount of the increase in the money supply. Thus, the monetary policy is highly effective in the classical range when the economy is at high levels of income and interest rate and utilizes the entire increase in the money supply for transactions purposes thereby raising national income by the full increase in the money supply.

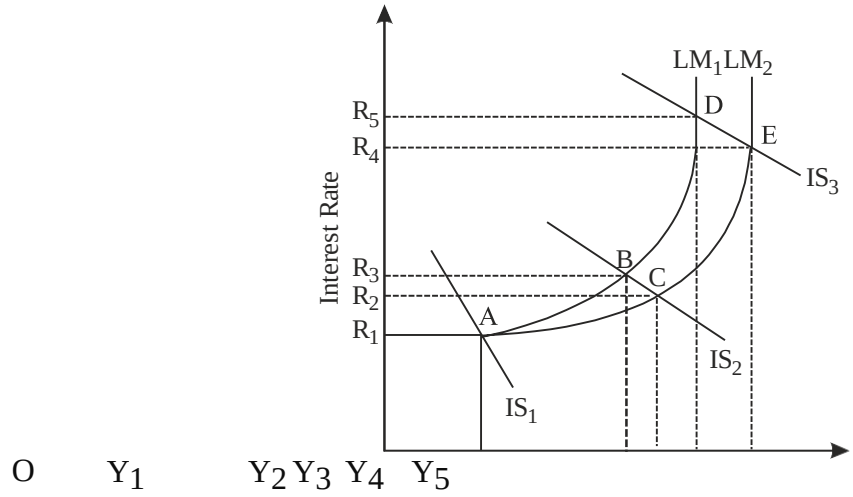


Fig. 15

Fig. 9.1

The Intermediate Range

Now consider the intermediate range when the initial equilibrium is at B where the IS_2 curve intersects the LM_1 curve, and the income level is OY_2 and the interest

rate is OR_3. The increase in the money supply shifts the LM_1 curve to LM_2 position. As a result, the new equilibrium is established at point C where the IS_2 curve crosses the LM_2 curve. It shows that with the increase in the money supply, the rate of interest falls from OR_3 to OR_2 and the income level rises from OY_2 to OY_3. In the intermediate range, the increase in income by Y_2Y_3 is less than that I the classical range, ($Y_2Y_3 < Y_4Y_5$). This is because in the classical case the entire increase in the money supply is absorbed for transactions purposes. But in the intermediate case, the increased money supply is partly absorbed for speculative purposes and partly for transactions purposes. That which is held for speculative purposes is not invested by wealth holders and remains with them in the form of idle balances. This has the effect of raising the income level by less than the increase in the money supply. Thus, in the intermediate range.

FISCAL POLICY

Fiscal policy is explained in Figure 9.2 in which the three range LM curve is taken along with six IS curves that arise after increase in government expenditure in the case of the Keynesian, intermediate and classical ranges.

The Keynesian Range

Consider first the Keynesian range when the initial equilibrium is at A where the IS1 curve intersects the LM curve. Suppose the government expenditure is increased. This brings about new equilibrium at B where the IS_2 curve cuts the LM curve. Consequently, the income level rises from OY_1 to OY_2 with the interest rate unchanged at OR. The increase in income in the Keynesian case is equal to the full multiplier times the increase in government expenditure. This is because with fixed money supply at low levels of interest rate and income, there is lot of idle money with the wealth holders. This can be used to finance higher transactions without raising the interest rate. When the interest rate does not raise the level of investment remains the same as before and the increase in income is equal to the full multiplier times the increase in government expenditure. Thus, in the Keynesian range, the fiscal policy is very effective.

The Classical or Monetarist Range

In the classical range, the LM curve is perfectly inelastic and the IS5 curve intersects it at E so that the interest rate is OR3 and the income level is OY_5. When the government expenditure increases for an expansionary fiscal policy, the IS5 curve shifts upward to IS_6. As a result, the IS_6 curve crosses the LM curve at F and the interest rate rises to OR_4 with income remaining unchanged at OY_5. This is because the classical case relates to a fully employed economy where the

increase in government expenditure has the effect of raising the interest rate which reduces private investment. Since the increase in government expenditure exactly equals the reduction in the private investment, there is no effect on the level of income which remains constant at OY_5. Thus, fiscal policy is not at all effective in the classical range.

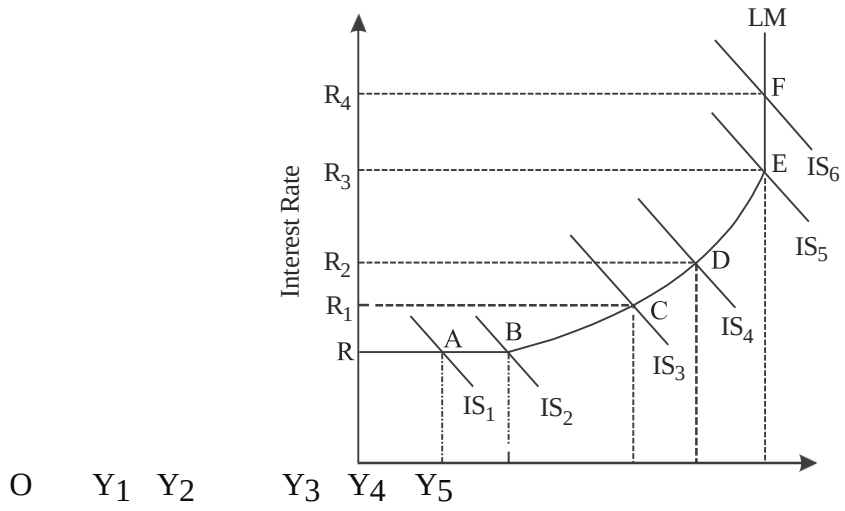


Fig. 9.2

The Intermediate Range

In the intermediate range, the initial equilibrium is at C where the IS_3 curve intersects the LM curve. Here OR_1 is the interest rate with OY_3 income level. With the increase in the government expenditure. The IS_3 curve shifts upward to the right to IS_4 and the new equilibrium between IS_4 and LM curves is established at point D. As a result, the increase in government expenditure raises the income level from OY_3 to OY_4 and the interest rate from OR_1 to OR_2. The increase in both the income level and the interest rate in the intermediate range is due to two reasons. First the increase in income resulting from a rise in government expenditure occurs because additional money balances are available for transactions purposes. Second, given a fixed money supply, a part of available transactions are held as idle balances by wealth holders which raise the interest rate. As a result of the rise in the interest rate, investment falls and the fiscal policy is not so effective as in the Keynesian range. In general, fiscal policy will be more effective the closer equilibrium is to the Keynesian range and less effective the closer equilibrium is to the classical range.

9.6 Check your progress

Q1- What are the conditions for equilibrium between product and money market ?

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Q2 - What are the factors which cause shift in Is curve?

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9.7 Let us sum up

The IS-LM model remains a vital pedagogical tool in macroeconomics, offering a clear framework for understanding how the goods and money markets interact to determine equilibrium income and interest rates in the short run. By analyzing the effects of fiscal and monetary policies within this model, economists and policymakers can better anticipate the outcomes of policy interventions and external shocks. While the IS-LM model has its limitations—such as the assumption of fixed prices and its focus on the short run—it provides a solid foundation for more advanced macroeconomic analysis and policy design.

9.8 Keywords

1. **IS Curve:** Represents all combinations of income and interest rates where the goods (product) market is in equilibrium, i.e., where planned savings equals planned investment.
2. **LM Curve:** Represents all combinations of income and interest rates where the money market is in equilibrium, i.e., where money demand equals money supply.

3. **General Equilibrium:** The point at which both the product and money markets are simultaneously in equilibrium, determined by the intersection of the IS and LM curves.
4. **Liquidity Preference:** The desire to hold wealth in the form of money rather than other assets, which depends on the level of income and the interest rate

9.9 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

9.10 Hints to check your progress

Q1- See section 9.3

Q2- See section 9.4

9.11 Examination oriented Questions

- Explain, with the help of a diagram, how equilibrium is achieved in the product and money markets using the IS-LM model.

- Discuss the factors that can cause shifts in the IS and LM curves and analyze their effects on equilibrium income and interest rates.
- Evaluate the effectiveness of fiscal and monetary policy interventions in the IS-LM framework, highlighting their impact on macroeconomic equilibrium.

M.A. ECONOMICS **LESSON NO. 10**

COURSE NO. : ECO-107 **SEMESTER IST** **UNIT–II**

FISCAL POLICY EFFECTS ON DEMAND: IMPLICATIONS FOR IS-LM FRAMEWORK

STRUCTURE

10.1 Objectives

By the end of this chapter, the reader will be able to:

- To understand the fundamental mechanisms through which fiscal policy influences aggregate demand and national income.
- To analyze the effects of fiscal policy changes within the IS-LM framework using both theoretical and diagrammatic approaches.
- To examine the interaction between fiscal and monetary policy in determining macroeconomic equilibrium.
- To evaluate the limitations and potential side effects of fiscal policy, such as the crowding out effect, within the IS-LM model

10.2 Learning Outcomes

After studying this chapter, students will be able to:

- Explain how government spending and taxation affect aggregate demand and shift the IS curve in the IS-LM model.
- Illustrate, with the aid of diagrams, the impact of expansionary and contractionary fiscal policy on equilibrium income and interest rates.
- Assess the role of the LM curve's slope in determining the effectiveness of fiscal policy and the extent of crowding out.

Critically discuss the real-world implications and limitations of fiscal policy interventions as revealed by the IS-LM framework

10.2 Introduction

Dear learner, after going through this chapter, you would be able to understand the concept of fiscal policy and its role in macroeconomic management through government spending and taxation. You will be able to analyze how fiscal policy influences aggregate demand, especially during economic downturns or periods of sluggish growth. Using the IS-LM framework, you will explore how fiscal measures interact with the goods and money markets, affecting national income and interest rates. The chapter will also enhance your ability to interpret diagrammatic representations of fiscal policy within the IS-LM model and evaluate its broader implications, including the phenomenon of crowding out.

10.3 Importance and Objectives of Fiscal policy

Importance of fiscal policy as a tool of economic control was first, of all pronounced by Keynes in his publication—-"General theory of Employment, interest and Money''. Before Keynes, earlier economists clarified impact of individual fiscal measures. But complete implication of public finance for entire economic situation were not followed by those economists. While government spent money as relief works, money so spent was collected by way of special taxes.

Fiscal policy, thus comprises of public borrowing, taxes and public spending. It is linked to public finance and it implies use of taxation, public borrowing and public expenditure by government of a sovereign nation for attaining economic stabilization as well as economic growth. In the words of Arthur Smithies fiscal policy is a policy where government uses its expenditure and revenues programmes to produce desirable effect and to avoid undesirable effect on national income, production and employment. According to G.K Shaw, fiscal policy is a policy to encompass any decision to change the level, composition and timing of government expenditure or to vary burden, structure or frequency of tax payments. Instruments employed by state to influence general level of economic activity comprises core of fiscal policy, which includes, taxes, nation's budget, borrowing, spending, subsidies, relief expenditure, transfer payments, social security

benefits. Efficient operation of nation's budget may help in attaining economic stability and higher rates of economic growth.

Objectives

It will not be proper to opine dogmatically objectives of fiscal policy as it will differ from economy to economy and also from time to time. But however, fiscal policy as a tool of economic growth having following principles:

1. Efficient and rational allocation of economic resources

Primary task of fiscal policy in an underdeveloped economy is allocation of scarce resources and mobilizing in desirable channels of productive investment. Available resources must locate their way towards socially desirable lines of development. Distribution of resources is to be determined depending upon priorities of the plan. Productive resources are within such limits, so that capable of being used growth.

Hence, fiscal policy should gravitate towards productive areas of investment.

2. Accelerating rate of capital formation

Fiscal policy is used as a tool of capital formation in developing countries. First of all it expands investment in public and private enterprises and by directing flow of resources from socially less desirable to more desirable investment. Secondly, changes content of total investment in an economy and creates capital by bringing a qualitative improvement in it.

Increase of investment in public sector is done by implementing planned programmes of development and by tracing requisite fund for this purpose. Qualitative changes are brought about by diverting investments towards socially desirable productive channels. Special emphasis is placed on economic overheads like transport, communications, irrigation, power etc. where investment is not profitable but attractive to private enterprise and are performed in public sector. Therefore, public finance should trace resources for investment purpose suitable for development.

Fiscal policy is an important tool which stimulates investment in private sector by providing depreciation in company taxation, provision of finance, development rebates, tax holidays, subsidies and other incentives. So, fiscal incentives are utilized to make diversion in utilization of resources from socially less desirable to more desirable directions. Therefore capital formation in private sector enjoys a great help as well as encourages from public finance operations.

3. Resource Mobilization

Underdeveloped countries suffer from low rate of voluntary private savings. Propensity to consume is high and propensity to save is low, due to low level of income. Therefore, it necessitates government intervention to mobilize resources and fiscal policy

plays a crucial role here. Fiscal policy stimulate private saving and encourage public saving by fiscal incentives by way of tax concessions for saving and investment and creating and implementing small savings scheme. Government borrowing programmes also possess similar objective. Success of small savings schemes, government borrowing programmes depends upon monetary incentives offered, relative yield of several investments, confidence of state, psychological behavior of capital market. As, some of these conditions are beyond control of government and thus impact of government policy on private savings are no doubt uncertain.

Alternative to voluntary private savings in forced savings especially for investment in public sector, which constitute two forms –increased taxation and inflation.

Tax policy is to be operated for effective mobilization of all scarce available resources and to utilize these in executing development programmes. It indicates, eliminating wasteful and luxury spending to savings and productive investment of increments which accrues to production because of development effects.

Taxation is an effective instruments of increasing total volume of savings as well as investment in any economy where propensity to consume is high. It promotes accelerate pace of development. In case of under – employment inflationary pressure and low level of income goal of fiscal policy should be promotion of highest possible rate of capital formation.

But, however, taxation is better than inflationary finance as the former is less harmful than the latter. Increased taxation results force savings and causes mobilization of resources which is otherwise very rare in a developing economy.

4. Development of private sector

In mixed economy, private sector occupies an important place of that economy. Therefore, objective of fiscal policy is to maximize mobilization of resources with the object of financing expansion of public sector should make significant contribution in the development of the economy and is to be encouraged. Capacity of state to make

economic growth is limited. Hence, expansion of private sector is also necessary for viability of economy.

Tax rebates, tax reliefs, liberal deprecation boost development of private sector. Fiscal measures are required to activate capital market to enable private sectors to raise finance. Public borrowing programme is to be arranged in a manner so as to leave enough scope for private sector finance.

For accelerating growth of the economy public finance or fiscal policy is utilized. Following are relative merits of fiscal policy:

- To promote savings is an economy and minimize current consumption.
- To mobilize human and material resources of an economy and maximize their flow.
- To restrains inflationary forces to attain economic stability.
- Equitable distribution of income and wealth in any country so that benefits of development are neutrally distributed. Eradicating economic inequalities and restricting concentration of economic power are two main objectives of fiscal policy in developing countries.
- To protect an economy from unhealthy developments from abroad i,e, to reduce exposure of an economy to ebbs and flows of world markets and to eliminate dependence on foreign food or foreign investments.
- To flow investment in productive channels both in public as well as private sector by giving suitable incentives.

10.4 Major Fiscal Functions Of A Modern Government

➢ Fiscal policy and Economic Development

Attitude of various economists and governments about role of fiscal policy has

changed as an outcome of Keynesian theory. Earlier concept of neutrality of public finance has got a new term viz, functional finance. Public finance in its fiscal measures has assigned a positive and dynamic role for promotion and acceleration of rate of economic development.

Keynesian analysis of fiscal policy is especially applicable to advanced countries but less suitable in case of under-developed nations. Problem of developed countries is to stabilize economic growth rate by maintaining effective demand at its fullest extent possible and for this purpose, fiscal policy tries to reduce savings of people and rise

propensity to consume. But in case of underdeveloped nations, the people require more savings to raise rate of capital formation and to attain higher rate of economic development. But ironically, people of under-developed country having low rate of income and saving but having high propensity to consume. According to the view of Nurkse, there is no doubt regarding Keynes's General Theory possess a bias against saving and in favour of spending….but while transplanted in the situations of underdeveloped nation it is found to be pernicious.

Thus, this analysis of problem in connection with voluntary saving shows that because of low per capita income and savings in underdeveloped economies, question of voluntary savings does not arise. According to UN study, annual per capita incomes in Middle East, in Asia and in U.S.A. are less than 200 US dollars or less than one-seventh of U.S.A. and one-fourth of Canadian level. It was also revealed that in I.M.F. staff papers that in India savings contributed two and half per cent of national income for development. Hence, major determinant of economic growth is rate of savings and it can't be left to them to grow automatically. On the other hand fiscal measures have to be implemented to raise savings of people and to mobilize them for productive purposes. According to Nurkse, fiscal policy possesses a new significance in the problem of capital formation in underdeveloped, countries.

Backward nations suffer from vicious circle of low income, high consumption, low savings, low rates of capital formation and also low income level. To come out from

this vicious circle of poverty, fiscal policy plays a constructive as well as dynamic role for economic development of underdeveloped countries. According to UN study, to break this circle without any foreign aid requires vigorous taxation and also government development programme. Thus, in poor nations, necessity of fiscal policy lies in increasing rate and volume of savings and divert those saving towards desired channels. If we go through UN report on taxes and fiscal policy, which states that fiscal policy is assigned central task of wresting from pitifully low output of underdeveloped nations, enough savings to finance economic development programme and make a condition for more private as well as public investment activity.

Shortcomings and ineffectiveness of monetary policy for accelerated rate of economic growth has further realized us regarding essentiality of fiscal policy. Fiscal policy generally designed to supplement monetary policy to have supplanted monetary policy altogether.

Importance of fiscal policy as a tool of economic development was first considered by Keynes in his General theory where he depicted total national income was an index of economic activity and established relationship of economic activity to total spending. Direct as well as indirect effect of fiscal policy on aggregate spending in the society were distinctly established and consequently budgetary policy of government as a device of economic control and development become prominent.

- Fiscal Policy and Rate of Saving

Shortage of capital resources is major obstacle in the process of economic development of underdeveloped nations there are certain forces functioning in these economies which enhances consumption and decline savings. Population pressure is first among them. Apart from high income groups those spend much of their earnings on conspicuous consumption and which is further reinforced by demonstration effect. Besides, major part of their meager savings are absorbed in unproductive channels like real estate, hoarding, jewellery, speculation etc. Aim of fiscal policy is to divert savings of

people into productive directions. Its aim is to increase incremental saving ratio by taxation and forced loans and creates funds available for investment in both public and private sectors. It is possible only by reducing conspicuous consumption and restricting flow of funds for unproductive investments. Thus, high rates of tax both on personal and corporate incomes and commodity taxation on articles of maximum use and simultaneously conspicuous consumption should be discourage to the extent of actual and potential consumption of people. In this context, report of the Taxation Enquiry Commission, Government of India, states that, a tax system, which promotes capital formation by two aspects saving and investment fulfills an essential conditions. It must be remembered that object of taxation must not be mere transfer of funds from private to public use but also enlargement of total volume of savings for investment purposes.

Thus, it necessitates curtailing and restrains consumption and rising volume of savings in the economy. For instance, in Japan, productivity of agriculture was doubled between 1885 and 1915 and device of taxation was utilized effectively and much of

increase was taken away from farmers in the form of additional rents and taxes and thereafter that amount were diverted towards productive investment. Forced loans were also imposed an businessmen to collect surplus funds for economic development. In U.S.S.R., collective farms were taxed highly and agricultural surpluses were siphoned off by increased prices of manufacturers relates to farm products. The Economic Bulletin for Asia and the far East states, noticed that, taxation is only effective instrument for curtailing private consumption and investment and transfer of resources to government for the purpose of economic development. In the words of Prof. Kurihara, fiscal policy is desirable for underdeveloped countries having lack of private initiative, voluntary saving and innovation. According to him, fiscal role of government is as an additional saver, investor, innovator as well as income-redistribution.

As an additional saver, government should maintain persistent budgetary surplus by:

(a) Reduction in propensity to spend,

(b) Rise in average propensity to tax,

(c) Reduction in government average propensity to make transfer payments.

Prof. Kurihara says, in underdeveloped economies budgetary surplus is relevant

position to be achieved and maintained. For that it necessitates to supplement private saving— a fiscal role of government as a saver which is to be performed.

As an additional investor, government should raise productive capacity of the economy and to establish an accelerated rate of economic growth by modifying pattern of investments and should emphasized on capacity building instead of income generating aspects, by curtailing government consumption and rising investment and also by increasing tax-rates which leaves its impact on reducing private consumption expenditures and enhance that portion of real income which is available for the purpose government investment.

As an innovator, government should encourage research and experiments and encourage innovations i,e, new process of production. It will reduce production cost which encourages investment. Further, government should also encourage innovation by providing subsidies and tax-relief to those firms which may introduce them of their own.

As income redistributor, government tries to eradicate economic inequalities upto maximum extent possible. A progressive tax structure may serve as a potent instrument it's the hands of the government, to enable effectively equitable distribution of income and wealth to the fullest extent possible.

1. Fiscal Policy and Optimum Pattern of Investment

An underdeveloped economy can hardly succeed to divert limited resources into socially desirable channels. Hence, it becomes mandatory to impose pattern of investment which will be sufficient enough to attain social marginal productivity. Heavy taxes on land value increments and capital gains etc. should be imposed to restrict flow of funds into unproductive channels like land, buildings, inventories or investment of speculative nature. It may be done by differential rates of taxation in one hand and grant of tax relief in certain areas on the other.

Investment in economic and social overhead like power, soil conservation, transport, education, technical training facilities, public health etc. is of great importance

for optimum pattern of investment for speed up development process. It widens the extent of market, curtails cost of production and enhances productivity by forming external economics. Private sector cannot provide such basic amenities for huge expenditure and low-yielding returns. So, government should undertake such projects financed through taxation system but not with borrowed debts. Increasing of compulsory saving by taxation for such development programmes is very popular now-a-days. Therefore, fiscal measures must be targeted to attain optimum pattern of investment for accelerating pace of economic development of under-developed countries.

2. Fiscal policy to counteract inflation

Process to economic development in underdeveloped economies suffers from inflationary pressure because of imbalances between demand for and supply of real resources. Pressures of wages on prices, market imperfections, structural rigidities, bottle-necks hinders supply of commodities and services and price levels begin to inflate. As a result, when inflation goes beyond control, ruins entire economy and progress becomes standstill. Because of above stated facts economic growth and stability are treated as combined objectives for underdeveloped nation to accomplish. But, now-a-days, choice is not between economic growth and stability but over inter-relationships and policies to attain it.

Fiscal measures must be for counteracting undue inflationary pressure by reducing effective demand. To attain this objective tax structure is to be modified and greater emphasis should be on progressive direct taxes and commodity taxes. Besides, special anti-inflationary taxes on excess profits, capital gains and other windfalls and also taxes on articles of conspicuous consumption in nature may also be imposed.

Besides, fiscal policies of government removal of market imperfections, removal of structural rigidities, subsidies, and protection of essential consumer goods industries are also required. But even if inflationary pressure goes on increasing further, capital levy on cash balances and liquid assets may be imposed to fight with inflation.

3. Fiscal Policy and Alternative Measures to Curb Inflation

Inflationary pressure creates because of excess demand, while spending on consumption and investment goods and foreign spending on commodities of home country in total exceed full employment and output. It indicates, true inflation begins only after full employment, but in reality it starts before full employment due to rigidities of factor supply, bottle-neck and pushes of profits, costs and wages.

Fiscal remedies of inflation are as follows:

(i) Reduction in government spending and no change in tax rates:

Such policy will provide a budget surplus and drain out purchasing capacity of community and will set a reverse process of government expenditure multiplier and brings contraction in national income and employment and leads to control on inflation.

(ii) Reduction in Government spending and Increase in Tax Rates:

This sort of fiscal measures is more effective than earlier one as rise in tax rates accompanied with a decline in government spending generates huge budget surplus and larger reduction will be affected or observed in national income and employment.

(i) Rigid Government spending and Increase in tax rates:

While government spending becomes rigid for example at the time of war. Reduction in aggregates spending is only possible by increasing tax rates— which in turn reduces private disposable income. Consequently declines private consumption and investment expenditure to curb inflation. By this process during second World War U.S.A. could siphon off purchasing capacity by a measure capable of finance more than 48% of cost of war out of tax proceeds.

4. Fiscal functions and Economic stability

Underdeveloped nations are susceptible to economic instability because of

deficiency of effective demand in short-run and fluctuations in demand for their commodities in world markets. Under-developed nations normally export agricultural as well as mineral products, demand for which is generally less elastic. On contrary, countries import capital goods, finished manufactured products, whose demand is elastic in nature. While price level of exported commodities declines in world market, terms of trade turns to unfavourable, earnings of foreign exchanges decreases, consequently national income declines and depression prevails in the economy. Underdeveloped nations are incapable to enhance their export to avail benefits of reduced prices due to limited production capacity. Likewise, due to boom conditions in international market, price of export increases, rise in foreign earnings does not result to increased output and employment, rather, it is dissipated in speculative investment as well as conspicuous consumption which create inflationary pressure in that economy.

Fiscal remedies can be adopted to offset international cyclical fluctuations in prices of exports. For instance, during boom period, heavy import and export duties should be imposed. Import duties will reduce conspicuous consumption and export duties will neutralize windfall gains from increase in international market price levels. Earnings from such duties will be helpful in capital formation. At the time of depression, subsidies may be provided to boost export and government should maintain level of effective demand by public works programme. Therefore contra-cyclical fiscal measures should be used to mitigate impact of world's cyclical movements and for the upliftment of entire economy and to curtail too much dependability exclusively on primary sector. So, a well planned fiscal policy is essential to promotes economic stability.

1. Fiscal functions and price Stability

Another types of instability in a developing economy is presence of inflation. It is a tendency for prices to increase due to huge development expenditure accompanied by corresponding rise in production. Production of basic consumable commodities especially food fails to maintain pace with increased income and as such inflationary gap is formed and price level goes up. Pressure created by demand pull are reinforced by

cost-push. Increase price are strengthened by increase wage-rates and thus a spiral is set up between wage and price. If the condition is not effectively administered, it may turn to hyper-inflation.

Therefore, anti-inflationary, fiscal policy has a crucial role in a developing economy. It involves reduction in public expenditure and rise in taxation as well as public borrowing. Decrease in government expenditure leads to decline in total spending in an economy and brings down total demand. Reduction may also be effected in unnecessary spending on the part of government but at the same time, it will be difficult to differentiate between necessary and unnecessary outlay. However, emphasis should be ultimately lies on taxation and public borrowing. Rise in these may help government to increase income and keep total demand at lower level and which in turn will provide resources to government for economic development. Progressive taxation will be helpful in this context.

2. Fiscal functions and Distributive Justice or Equitable Distribution

Underdeveloped countries normally suffer from inequalities in income and wealth. In a feudal economy, there exists a huge gap between economic position of lord and serf.

Thus, it is required for government to implement a fiscal policy to decrease inequalities. Most important element in this context is progressive taxation of income as well as wealth. There is also a requirement for tightening administrative machinery to collect tax and reducing tax evasion scopes which will help to accumulate huge capital resources. Next element of suitable fiscal policy is the public expenditure programme—which has to be flowed or directed towards progress of human and physical capital.

Human resources development possesses desirable redistributive effect. Public expenditure policy also brings regional balances in a particular economy.

Limitations Of Fiscal Policy

Effectiveness of fiscal policy depends upon measures adopted, their timing, exact variation effected in revenue of national income which is dependent on change in expenditure made by authority. It is also difficult to predict that a boom or slump is approaching. Measures adopted may be slow in taking effect. Thus, fiscal policy often becomes absolutely in appropriate instrument for economic stabilization and growth. Following are some of the limitations of fiscal policy:

1. There may be a clash among several objectives of fiscal policy. Fiscal measures for decreasing income, inequalities or curbing inflation may affect adversely capital formation and rate of economic growth.
2. Anti-inflationary and redistributive fiscal measures also possess their limitations. Likewise, there is also a limit to which taxes as well as deficit-financing can be used for the purpose of resource mobilization without affecting an economy adversely.
3. Considerable part of public expenditure is likely to be wasted in case of underdeveloped economies for undesirable, unproductive activities or swallowed by corrupt officials.
4. Fiscal policy sometimes becomes absolutely inaccurate tool for economic stabilization and growth.
5. Political and administrative delay in making decision especially while legislative sanction is required for modifying rates of changing expenditures an various programme.

ROLE OF FISCAL POLICY IN DEVELOPING COUNTRIES

Fiscal Policy in developing countries differs from that of advanced nations both its objects as well as its contents. Following four important objectives of fiscal policy

of a developing nation:

1. Promoting and accelerating capital formation both in public and private sector.
2. Creating conditions for a reasonable degree of stability in an economy according to the requirement of economic development.
3. To ensure social justice by redistribution of national income and wealth.
4. Mobilising real and financial resources for public sector without affecting expansion of resources for private expenditure.

10 Thus, there exists contradiction in objectives and achieving one may create difficulties in respect of other. For example, policy for rapid rise in capital formation may create inflationary conditions and widen inequalities of income. Again, an attempt to decrease inequalities may cause low rate of saving and capital formation. Hence, a suitable fiscal policy is required to bring harmony among all these targets or objectives.

10.5 Fiscal Policy In India

During nineteenth century, financial requirement of government were small and land revenue was main source of earning revenue in India. During first part of twentieth century public expenditure was continued of slow pace. But, the Second World War necessitated huge increase in government expenditure. New resources thus traced gradually. In the early years of post-war period. Fiscal policy get its importance for rehabilitation of industry and boost investment and capital formation.

In recent years, public expenditure has been raised further due to formulation and implementation of plan for attaining economic development and efforts to establish of a welfare state. Since 1951, government has adopted budgetary policy for rapid economic

development, price stability, reduction of inequalities of income and wealth, rising employment opportunities etc.

First of all, impact of fiscal policy on mobilization of resources for the purpose of economic development by planning process may be considered. Between 1957 and 1983 more than Rs. 1,75,000 crores have been invested in exclusively in public sector. To mobilize resources, government resorted to taxation, loans and deficit financing.

Secondly, fiscal policy since 1950-51 created inflationary pressure. Large scale investment particularly on basic and heavy industries and financing of development projects by budget deficits resulted to general rise in price level.

Thirdly, budgetary policy also caused rising inequalities of income and wealth. This is because of development of private sector by licensing and partly enabling rich class to evade taxes.

Lastly, impact of budgetary policy is also fall on employment. Large volume of investment in building up infrastructure reduced to some extent the problem of unemployment. Although, still this problem persists due to severe rise in population.

To sum up, since independence, government has initiated several steps to promote development.

An effective fiscal policy is required to deal with this complex situation.

10.6 Fiscal Policy and Aggregate Demand

Fiscal policy affects aggregate demand primarily through two channels:

- **Government Expenditure (G):** An increase in government spending directly raises aggregate demand.
- **Taxation (T):** A reduction in taxes increases households' disposable income, boosting consumption and thus aggregate demand.

In the Keynesian model, aggregate demand (AD) is given by:

$$AD=C+I+G+(X-M)$$

where C*C* is consumption, I*I* is investment, G*G* is government expenditure, and (X−M) is net exports. In a closed economy, net exports are often omitted for simplicity.

Fiscal policy refers to the use of government spending and taxation to influence the level of economic activity, particularly aggregate demand. Its effects on demand are central to macroeconomic management and are extensively analyzed within theoretical frameworks such as the IS-LM model1.

1. Channels of Fiscal Policy Impact on Demand

Fiscal policy affects aggregate demand primarily through two mechanisms:

- **Government Expenditure (G):** An increase in government spending directly raises aggregate demand by injecting additional resources into the economy. This can fund infrastructure, public services, or social programs, stimulating demand for goods and services.
- **Taxation (T):** Reducing taxes increases households' disposable income, which boosts consumption (C). Lower taxes on businesses can also encourage investment (I). Both effects raise aggregate demand.

The aggregate demand equation in a closed economy is:

$$AD=C+I+G$$

where C*C* is consumption, I*I* is investment, and G*G* is government spending.

2. Multiplier Effect

Fiscal policy changes can generate a **multiplier effect**. For example, an increase in government spending not only raises demand directly but also indirectly, as the recipients of government funds spend their additional income, further stimulating consumption and investment. The size of the multiplier depends on the marginal propensity to consume and other leakages from the spending cycle.

3. Expansionary vs. Contractionary Fiscal Policy

- **Expansionary Fiscal Policy:** Involves increasing government spending and/or reducing taxes. This shifts aggregate demand to the right, raising output and employment, especially effective during recessions or periods of economic slack.
- **Contractionary Fiscal Policy:** Involves decreasing government spending and/or increasing taxes. This shifts aggregate demand to the left, used to control inflation or reduce budget deficits.

1. **Crowding Out Effect**

A potential limitation of expansionary fiscal policy is the **crowding out effect**. Increased government borrowing to finance higher spending can lead to higher interest rates, which may reduce private investment. The extent of crowding out depends on the responsiveness of interest rates and the state of the economy.

2. **Contextual Factors**

The effectiveness of fiscal policy in influencing demand depends on several factors:

- **Economic Conditions:** During a recession or liquidity trap, fiscal policy is generally more powerful because there is excess capacity and interest rates are

low.

- **Monetary Policy Stance:** If monetary policy is accommodative, fiscal expansion is more effective; if monetary policy is tight, crowding out may be significant.
- **Open vs. Closed Economy:** In open economies, fiscal expansion can also affect the trade balance and exchange rates.

6. IS-LM Framework Perspective

In the IS-LM model, expansionary fiscal policy shifts the IS curve to the right, raising equilibrium income and, typically, the interest rate. The final impact on demand depends on the slope of the LM curve and the degree of crowding out.

10.7 Implications of Fiscal Policy on the IS-LM Framework

Fiscal policy—government decisions on taxation and public spending—plays a crucial role in influencing aggregate demand and overall economic activity. The IS-LM framework, a fundamental macroeconomic model, helps us understand how fiscal policy affects equilibrium income and interest rates by analyzing the interaction between the goods market (IS curve) and the money market (LM curve).

1. Fiscal Policy and Aggregate Demand

Fiscal policy impacts aggregate demand through two main channels:

- **Government Spending (G):** An increase directly raises aggregate demand by injecting additional expenditure into the economy.
- **Taxation (T):** A reduction in taxes increases households' disposable income, boosting consumption and thus aggregate demand.

In the Keynesian framework, aggregate demand (AD) is expressed as:

$AD=C+I+G+(X-M)$

For simplicity, in a closed economy without trade, net exports (X-M) are excluded:

AD=C+I+G$AD=C+I+G$

Here, consumption (C) depends on disposable income, investment (I) depends inversely on interest rates, and government spending (G) is exogenously determined by fiscal policy.

2. IS Curve: Goods Market Equilibrium

The **IS curve** represents all combinations of income (Y) and interest rate (r) where the goods market is in equilibrium (i.e., aggregate demand equals output). It slopes downward because:

- Higher interest rates increase borrowing costs, reducing investment.
- Lower investment decreases aggregate demand and equilibrium income.

When fiscal policy is expansionary (e.g., increased government spending), aggregate demand rises at every interest rate, shifting the IS curve **rightward**.

2. LM Curve: Money Market Equilibrium

The **LM curve** shows combinations of income and interest rates where the money market is in equilibrium (money demand equals money supply). It slopes upward because:

- Higher income increases transaction demand for money.
- To maintain equilibrium with fixed money supply, interest rates must rise to reduce speculative money demand.

Monetary policy shifts the LM curve, but for fiscal policy analysis, the LM curve is typically held constant initially.

4. Effect of Expansionary Fiscal Policy on IS-LM Equilibrium

Initial Situation:

- The economy is at equilibrium point E0$E0$ where IS00 and LM00 intersect.

- Equilibrium income is Y0*Y*0, and interest rate is r0*r*0.

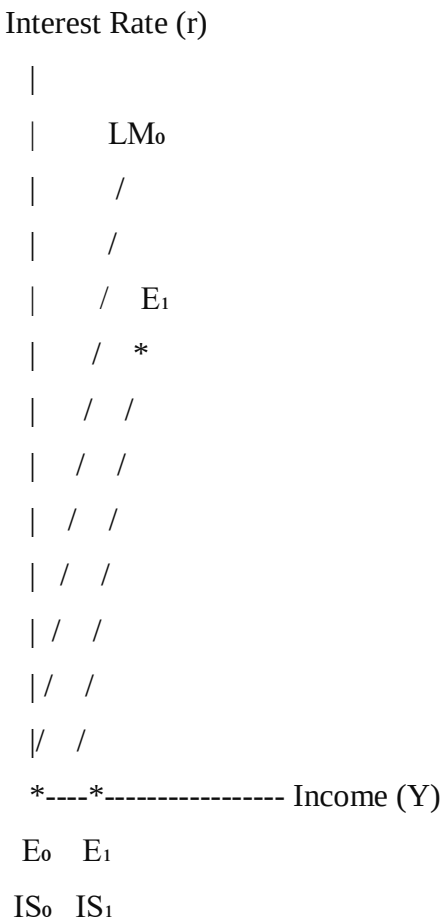
Fiscal Expansion:

- Government increases spending or cuts taxes.
- Aggregate demand rises, shifting the IS curve rightward from IS00 to IS11.

New Equilibrium:

- IS11 intersects LM00 at a new point E1*E*1.
- Equilibrium income rises to Y1*Y*1.
- Interest rate rises to r1*r*1.

Diagrammatic Representation



- **IS00 to IS11:** Rightward shift due to fiscal expansion.
- **E00 to E11:** New equilibrium with higher income and interest rate.

6. Crowding Out Effect

The rise in interest rate r0→r1*r*0→*r*1 can reduce private investment by making borrowing more expensive. This **crowding out** partially offsets the fiscal expansion's effect on income. The magnitude depends on the slope of the LM curve:

- **Steep LM curve:** Large interest rate increase → significant crowding out.
- **Flat LM curve:** Small interest rate increase → minimal crowding out.

In extreme cases, such as a **liquidity trap** (horizontal LM), fiscal policy is highly effective with no crowding out. Conversely, in the classical case (vertical LM), fiscal policy is ineffective due to complete crowding out.

7. Interaction with Monetary Policy

Fiscal policy effects depend on monetary policy stance:

- **Accommodative Monetary Policy:** If the central bank increases money supply (shifts LM right), it can offset interest rate rises, reducing crowding out and amplifying fiscal expansion.
- **Restrictive Monetary Policy:** If money supply is tight, interest rates rise sharply, increasing crowding out and reducing fiscal policy effectiveness.

8. Policy Implications

- Fiscal policy is most effective when the LM curve is flat (e.g., during recessions with low interest rates).
- Coordination between fiscal and monetary policy enhances stabilization efforts.
- In developing economies, structural constraints and underdeveloped financial markets may dampen these mechanisms.

- Excessive fiscal expansion risks inflation if the economy is near full capacity.

Summary Table of Fiscal Policy Implications in IS-LM Framework

Aspect	Description
IS Curve Shift	Rightward shift with expansionary fiscal policy (↑G or ↓T)
Income Effect	Increase in equilibrium income
Interest Rate Effect	Increase in equilibrium interest rate
Crowding Out	Higher interest rates reduce private investment, partially offsetting fiscal s
LM Curve Slope Role	Steeper LM → greater crowding out; flatter LM → less crowding out
Monetary Policy Interaction	Accommodative monetary policy reduces crowding out; restrictive increases it

10.8 Check your progress

Q1- What are the main objectives of Fiscal policy?

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Q2- What is the effect of expansionary fiscal policy on ISLM equilibrium?

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10.9 Let us sum up

Fiscal policy is a powerful tool for influencing aggregate demand and stabilizing the economy. Its effects are clearly illustrated in the IS-LM framework, where changes in government spending or taxation shift the IS curve and alter equilibrium income and interest rates. However, the effectiveness of fiscal policy can be limited by the crowding out effect, especially when the money market is tight (steep LM curve). Understanding these dynamics is crucial for designing effective macroeconomic policies that promote growth and stability

10.10 Keywords

- Fiscal Policy: The use of government spending and taxation decisions to influence a country's economic activity, particularly aggregate demand and overall output.
- IS Curve: A graphical representation in the IS-LM model showing all combinations of income (Y) and interest rates (r) where the goods market is in equilibrium, i.e., where aggregate demand equals output.
- LM Curve: A graphical representation in the IS-LM model showing all combinations of income (Y) and interest rates (r) where the money market is in equilibrium, i.e., where money demand equals money supply.
- Crowding Out: The phenomenon where increased government spending leads to higher interest rates, which may reduce or "crowd out" private investment, thus partially offsetting the stimulative effect of fiscal expansion.

10.11 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

10.12 Hints to check your progress

Q1- See section 10.4

Q2- See section 10.7

10.13 Examination Oriented Questions

- What are objectives of fiscal policy? What are limitations of obtaining price stability and full employment?
- What should be its objectives in a developing country like India?

- Explain, using a diagram, how expansionary fiscal policy shifts the IS curve and affects equilibrium income and interest rate in the IS-LM framework.

M.A. ECONOMICS		**LESSON NO. 11**
COURSE NO.: ECO-107	**SEMESTER IST**	**UNIT–II**

MONETARY POLICY EFFECT ON DEMAND AND CROWDING EFFECTS

STRUCTURE

11.0 Objectives

By the end of this chapter, the reader will be able to:

To understand the concept and objectives of Monetary policy and its significance in economic management.

To analyze the instruments and functions of monetary policy, particularly in the context of developing economies.

To evaluate the limitations of monetary policy in underdeveloped countries and its application in India.

To comprehend the concepts of crowding out and crowding in, and their implications for fiscal and monetary policy.

11.1 Learning Outcomes

Dear learner, after going through this chapter, you would be able to:

- Understand the concept, objectives, and importance of monetary policy in the overall management of an economy.
- Analyze the various instruments and functions of monetary policy, with special emphasis on their role in developing economies.
- Evaluate the limitations and challenges of implementing monetary policy in underdeveloped countries, particularly in the Indian context.
- Comprehend the concepts of crowding out and crowding in, and assess their implications for the effectiveness of fiscal and monetary policies.

11.3 Introduction

Dear learner, after going through this chapter, you would be able to understand the role of monetary policy as a vital tool for regulating the money supply and interest rates to achieve key macroeconomic goals such as price stability, full employment, and sustainable economic growth. You will gain insight into the effective use of various monetary policy instruments, including interest rates, reserve requirements, and open market operations. Furthermore, you will be able to analyze how monetary policy interacts with fiscal policy, leading to effects such as crowding out and crowding in, which influence overall demand in the economy. This understanding is essential for comprehending how economies are managed and stabilized in both theoretical and practical contexts.

11.3 Monetary policy and its objectives

Monetary policy is the oldest macroeconomic policy. During pre-Keynesian days, monetary policy was single instrument in the hands of policy makers for maintaining price stability. Two events during 1930s abruptly changed the role of monetary policy and its objectives.

1. Great depression which causes mass unemployment due to modified objectives of national economic policy targeting to achieve full employment.
2. Keynesian Revolution based on the General Theory of Keynes during 1936 adopted another policy instrument viz, fiscal policy as second objective for the purpose of restoring full employment which is in common words we call it economic stability.
3. In the word of Harry Johnson, monetary policy is an instrument in the hands of central Bank to control over supply of money for achieving objectives of economic policy like attaining full employment, price stability as well as rapid economic growth.

Objectives of the Monetary Policy

The scope and objectives of monetary policy have expanded after Keynesian Revolution of 1930s. Before 1930 the simple objective of monetary policy was to secure price stability. After great depression of 1929, restoration of full employment or economic stability became prime objective of monetary policy during post-war years. Monetary policy aimed at attaining some other objectives like decentralization of industries, encouragement to agriculture and to small-scale industries and removal of the poorest section of the community. Monetary instruments came to be gradually evolved to attain these objectives.

11.4 INSTRUMENTS OF MONETARY POLICY

In order to implement various objectives of monetary policy it has certain instruments and tools which may be classified into general or quantitative and selective or qualitative instruments. Let us discuss systematically various ways by which monetary policy operates as an instrument in the process of economic development.

1. Financial Institutions

Monetary policy can be used as an instrument of economic development, provided necessary currency and credit systems are available sufficiently in an underdeveloped country. There is major requirement of setting up banks and financial institutions to enhance credit facilities and diversion of saving towards productive activities.

Now-a-days, the central Bank is central authority of monetary and fiscal framework in every country of this world. Central Bank serves as fiscal agent of the government and therefore regulates public debts, issue government bonds and securities and sells them to people through Commercial Banks of that country. Additionally Central Bank should provide short-term, medium-term and long term credit at low rates of interest to peasants directly or indirectly through co-operative credit societies. As a

custodian of money market, Central Bank has enormous power to control operations of commercial banks for broad interests of economic development.

2. Policy of suitable interest rate

According to the opinion of certain economists underdeveloped nation should

3. Adjustment between demand for and supply of money

Monetary policy can be used as an instrument in bringing about a proper adjustment between demand for and supply of money. Shortage of money supply causes deflation whereas excess of money supply causes inflation, but both retard economic development. If Central Bank desires to change money supply, it should operate on bank reserve by way of open market purchase or sale of deposits. While, inflation prevails and there is a requirement to control it, Central Bank sells securities and reduces disposable income in the hands of public or community. But during deflation, Central Bank purchase securities, lends more and hence investment, output, income, employment, demand increases and reduction in price level may be prevented. Alternatively, in underdeveloped nation, supply of money should be managed in a manner so that level of price is to be checked from increasing alarmingly without affected investment and output.

4. Cost of Money

It implies Bank Rate at which Central Bank rediscounts first class bills of exchange and government securities held by commercial Banks. While inflation prevails Central Bank increases Bank rates and thus borrowing from Central Bank becomes costly. Consequently, Commercial Banks increases lending rates to business community and hence borrowers borrow small amount from Commercial Bank. This is a situation of contraction of credit and prices are prevented from further increase.

5. Availability of Credit and Credit Control

Total availability of credit depends upon bank advances and hire purchase advances. Former is dependent on Central Bank's directive regarding advances and specification of ceiling on advances. Latter is dependent on hire purchase terms.

So far a control of credit in concerned, monetary policy should control supply of credit to influence pattern of investment and production in developing economy. In this context, quantitative as well as qualitative credit control measures are adopted.

(a) Quantitative Credit Control:

Under quantitative credit control- policies like open market operations, bank rate policy and changing reserve ratio may be implemented. In underdeveloped nations open market operation have limited scope because of reluctance of commercial Banks in government securities and bonds due to comparatively lower rates of interest.

(b) Qualitative Credit Control:

Qualitative credit control technique is more effective than quantitative credit control to influence credit allocation and investment pattern. Qualitative credit control may be operated or exercised by moral persuasion, change in margin requirements, credit rationing, control over consumers credit direct action.

6. Debt Management

Debt Management implies, government borrowing and its regulation and control. Its basic purpose is to decide accurate timing and issuing of government bonds and securities, stabilizing prices and minimizing cost of servicing public debt. It is central Bank the appropriate monetary authority who undertakes buying and selling of government bonds and securities. Managing public debt is an essential function of monetary policy in underdeveloped nations. In the word of Dr. J. D. Sethi, primary objective of debt management is to generate situations where public borrowing can rise every year and

that too on large scale without any jolt in this technique.

11.5 FUNCTIONS OR ROLE OF MONETARY POLICY

Main functions or role of the Reserve Bank is make and implement monetary policy. Monetary policy means use of instruments adopted by central Bank to influence level of aggregate demand for commodities and services. Alternatively, monetary policy implies the implementation of monetary operation of the Reserves of Commercial Banks etc. Let us discuss different strategies in detail.

1. Working of Financial Institutions and Development of a Progressive Money Market

The Reserve Bank of India was set up in 1935 and nationalised in 1949. It has been acting as a custodian of our money market and succeeds in establishing a progressive and integrated money market now.

R.B.I. contributed in development of a stable money market by introducing Bill market scheme in 1952. Because of guidance of R.B.I. strong and comprehensive banking structure has been formed. Number of scheduled commercial banks increased from 93 in 1951 to 148 in 1980. Current and time deposits increased from Rs. 881 crores to Rs. 32,881 crores, Bank credit from Rs.547 crores to Rs. 23,118 crores in this period.

2. Suitable Interest Rate Policy

Economic development necessitates investment on huge scales both by public and private sector. So, cheap money policy is to be adopted to make public borrowing cheap, restricts costs of servicing public debt low and boost investment both public as well as private. Financing of large-scale programmes of economic development in all sectors of the economy need easy credit availability at low rate of interest to private entrepreneurs- which provides an incentive for investment

for economic development. But on the other hand, to prevent mishandling of this policy i,e, to prevent utilisation of fund for hoarding stock- piling or for other speculative transactions by private investors selective credit control may be introduced and in this manner diversion of direction of investment into productive activities will be possible.

But according to certain economists, high rates of interest will be justified in following situations:

(i) It will stimulate savings and thus rises supply of investible sources.

(ii) It will secure allocation of scarce capital resources into productive channels and will avoid unproductive and wasteful utilisation of resources.

(iii) It will act as anti-inflationary measures by preventing from borrowing from banks for speculative transactions as well as unproductive investments.

However, all these arguments do not carry much importance. Productive and efficient utilisation of resources can be effected by direct control over capital issue, qualitative methods of credit control. Regarding stimulus to saving, it is to be remembered that volume of saving is a function of level of income instead of interest rate.

Higher interest rate may be a shock tricks to decline speculation in commodities and securities while it goes beyond control and other measures also failed to restrict it. Therefore, developing countries should be pragmatic in their approach and must evolve a suitable interest rate policy which shall prevent superfluous spending, restrict inflationary pressure, promote capital formation, sustain investment activity at a level so that growth rate should not be slowed down.

Hence, it is very difficult to take an ultimate decision about rate of interest. Low interest rate will encourage investment but will discourage savings and will show inflationary tendency. On contrary, high rate of interest will promote stability but will discourage productive investment and will rise burden of public debt. In this context, R.B.I. adopts varying Bank Rate according to varying situations. It increases during inflation and declines during recession, as it happened during 1968.

3. Adjustment between Demand for and supply of money

In any developing economy, growing population, transformation of subsistence sector into commercial one, conversion of non-monetised sector into monetised one, rising level of income, output and employment rises demand for money. Thus, supply of money has to be enhanced to counteract deflationary pressure.

Heavy deficit financing, increase in public expenditure, plan outlays for heavy investment projects led to excessive expansion in supply of money. Supply of money was estimated Rs. 2,016 crores during 1951 which enhanced to Rs.11,530 crores during 1975. During this period 95% of supply of money comprised of paper-currency. Money supply further increased to Rs. 18,000 crores during 1979.

As such, though R.B.I. ensured expansion of money supply to fulfill growing demands of the economy, yet R.B .I and government also initiate firm actions time to time to prevent or control monetary expansion upto a certain extent.

In other words, monetary policy plays a crucial role in economic development by minimising fluctuation in price level and general economic activity by restoring balance between for money and production capacity of the economy.

4. Price Stability

Maintenance of stability in domestic price level and exchange rates is an important condition for economic growth. Economic development results inflationary pressure in underdeveloped nations because of a various structural rigidities and imbalances.

Inflationary rise in price levels affects propensity to save and diverts scarce capital resources into speculative and unproductive investment. So, monetary authority should observe movement of prices to regulate supply and direction of money and credit to check it from further rising.

Inflationary rise in prices causes devaluation of currency. Fluctuating exchange rates affect international trade and earning of foreign exchange decreases- which retard development of a nation. In other words, instability in internal prices and exchange rates obstruct sustained economic growth. At the same time, monetary policy aims at preventing excessive rise in prices and maintain exchange stability upto a realistic level. Thus, in this manner, it will prevent inflation and frequent devaluation of currency.

Developing country normally suffers from balance of payment problems due to high propensity to import and little capacity to export so, monetary authority should administer both traditional weapons like bank rate, open market operations etc. and direct control over foreign exchange for correction of adverse balance of payments.

In under developed economies, government spends on a large scale in planning process to achieve growth rates alongwith the growth rates of population and to provide social as well as economic overheads. But due to low rate of saving, government has to resort to deficit financing to meet increasing investment. Because of scarcity of complimentary resources and supply curve of commodities being inelastic, abnormal rise in effective demand caused by huge government expenditure leads to inflation.

As such best remedy to prevent inflation is to decrease aggregate spending, encourage saving, discourage hoarding, central bank increase bank rates to reduce demand for bank credit by meaning it costlier. On contrary, rise in interest rate will stimulate savings. For reduction of credit capacity of commercial banks, central Bank sells bonds and securities, increases reserve ratios etc. Hence, Central Bank, by following

both quantitative and qualitative credit control system can restrict inflation and helps in economic development.

6. Variation of Reserve Ratios

Every scheduled banks are desired to maintain part of their liabilities with R.B.I. in the form of cash reserves—which is known as reserve ratio or cash reserve requirements a statutory cash reserves. Initially its rate was 2% of time liabilities and 5% of demand liabilities. In 1962, R.B.I. raises it to 3% of total deposits. Again in June 1973, R.B.I. Further raised it to 5% and 7% in September, 1973. But, in 1974 R.B.I. reduced cash reserves to 5% and 4% thereafter. However, in September 1976,it was again increased

to 5% and in November 1976 raised to 6%. In May, 1981 it further raised to 7%. Thus, changes in cash reserve ratio helps to control credit administration and promotes price stability.

7. Bank Rates policy

Bank rate of R.B.I. is pacesetter for short term and long term market rates of interest. Thus, R.B.I differs bank rates as an instrument of anti-inflationary measures and reduces recession to some extent. After prolong cheap money policy, bank rate raised from 3% in Nov, 1951 to 4% in sep. 1964; 6% in February 1965. This rising trend of bank rates reversed in March, 1968 to 5% to revive the economy and control recession. But, in 1971 bank rates further increases to 6% and thereafter 7% in May, 1973.

In order to curb heavy inflationary pressures in early seventies bank rates increased from 7% to 9% in July, 1974 and at the same time lending rate also raised from 11% to 12%. Rate of interest on long term savings were also enhanced. In July, 1981 bank rate was further raised to 10%.

8. Variation of Statutory Liquidity Requirement

Apart from statutory reserve requirements commercial banks also maintains a

particular percentage of their liabilities in liquid assets in cash, gold and other unencumbered approved securities. This percentage is called as statutory liquidity Requirements (SLR). IN 1949 SLR was at 25% but in November 1972 it was raised to 30%, in 1973 to 32%, in 1974 to 33% and in Dec.1978 it was 34%. In October, 1981 it was fixed to 35%.

11.6 LIMITATIONS OF MONETARY POLICY IN UNDER-DEVELOPED COUNTRIES

Monetary policy in underdeveloped countries by itself cannot be very effective because of certain limitations:

1. Main limitations of monetary policy is time lag involved in executing a policy.
2. There are non-monetised sector in underdeveloped countries which lies outside the influence of monetary authority. In this sector, transactions are carried on the basis of barter system and availability and cost of credit exert little impact on the level of economic activity.
3. Money market are not properly organised. Unorganized sector lies outside the control of monetary authority as it happens in case of indigenous bankers in India.
4. It was evident that monetary policy failed to check depression in 1930..
5. Changes in interest rate, frustration in stock market and affect entire economy.
6. Central Banks are unable and unwilling to adopt vigorous monetary policy.
7. In developing countries, money supply comprises of currency in circulation. Bank deposits is only a small part of it. But because of lack of banking habits of people, it is not possible to control banking system.

8. In underdeveloped countries, because of the lapse of administrative machinery, there is huge accumulation of wealth by tax evasion and other illegal transactions, —which is popularly known as black money. It gives birth, of a parallel economy and helps in speculative and illegal dealings and makes monetary policy ineffective.

9. Developing nations generally resort to deficit financing to supplement resources for economic development. It creates inflationary pressure and reduces effectiveness of monetary policy.

However, still the presence of above shortcomings, monetary policy may be implementing successfully, for economic growth by way of influencing supply and use of credit, restricting inflation and restoring balance of payments equilibrium.

But simultaneously, it is true that now-a-days nature of economic problem in case of under developed and developed economies is so complicated that no uniform policy can achieve predetermined goal. Therefore, monetary policy must be supplemented by fiscal policy and other major policies of the government, which influences economic activities.

11.7 Monetary policy in India

India is engaged in the process of economic development and thus monetary policy of R.B.I. must be development oriented. Its major aim should be mobilization of productive resources on a large scale and also efficient allocation of resources. To achieve high rate of capital formation monetary authority should stimulate savings and canalize them into productive investment. Alternatively, monetary policy has to be operated for sustained and accelerated economic growth.

According to the R.B.I. Act, 1934,object of set up banking system is for regulation of bank notes and maintain reserve to secure monetary stability. It is only a single aspect of the R.B.I i,e, regulatory role. But after the planning period i,e, since 1951 R.B.I. also performing promotional role alongwith its regulatory function. Therefore,

it is required to reorient traditional monetary policy influencing supply and cost of borrowing and utilize it to the requirement of economic development.

Maintenance of stability in domestic level of prices and rates of exchange is an essential condition of economic growth. Rapidly increasing prices absorbs domestic savings and discourage foreign investment and thus rate of net investment declines. Likewise, fluctuating exchange rates affect international trade and reduces inflow of foreign exchanges which may be utilized for developmental works of that country. Alternatively, instability in internal prices and rates of exchange adversely affect rate of sustained economic growth. It implies adoption of such monetary policy will check inflation and frequent devaluation of currency.

In India, government is spending on large scale in planning process. But because of low rate of saving, government has to resort to deficit financing to meet the expenditure of increased investment. As there is lack of complementary resources, supply of goods being inelastic, followed by abnormal rise in effective demand creates inflationary pressure. Hence, it is required to encourage saving and discourage consumption. Apart from that,it is also required to stop hoarding, stock-piling of essential consumer commodities and raw materials. It is also mandatory to divert scarce resources into productive purposes only. Therefore, monetary policy in india has relied on quantitative and qualitative instruments of credit control.

Monetary Policy—Full Employment

For several decades price and exchange stability were considered as main objective of monetary policy. Publication of Keynes General theory also has been considered the importance of monetary policy to achieve full employment. In the words of Prof. Crowther, main object of monetary policy is to bring about equilibrium between saving and investment at full employment level.

According to the opinion of Keynes, objective of monetary policy should be optimum utilization of productive resources so as to promote full employment of

resources—which is considered as best and ideal objective of monetary policy in advanced countries of the west. Prof.Halm also has supported the above view.

Keynes considers that, object of monetary policy should be to eliminate ebb and flow of trade fluctuations and restore equilibrium between saving and investment at the level of full employment.

Keynes believes that, full employment of available resources can also be obtained by making adequate volume of expenditure in the country. Best way to stimulate investment is to adopt cheap money policy by decreasing rates of interest.

Policy of full employment is supported on following grounds:

1. Policy of full employment is humanitarian policy and attempts to solve a purely human problem.
2. This policy promotes maximum social welfare of the community.
3. It eliminates cyclical fluctuation in the economy.
4. In the context of present-day unemployment, full employment is best and ideal object of monetary policy.

But according to the opinion of Duesenberry, monetary policy is a set of instruments, which can be used to achieve the target of full employment. At the same time, concept of full-employment is a vague concept. Thus, instead of full employment, term optimum employment should be used which aaelerates economic growth.

11.8 CROWDING HYPOTHESIS

Refers to the argument that entry barriers and informational imperfections will be able to tend to crowd certain groups, chiefly women and blacks, into a limited range of occupations and in the process lower the relative wage of these occupations.

Fiscal Policy And Crowding Out

This section shows how changes in fiscal policy shifts the IS curve, the curve that describes equilibrium in the goods market. The IS curve slopes down words because a decrease in the interest rate increases investment spending, thereby increasing aggregate demand and the level of output at which the goods market is in equilibrium.

An Increase In Government Spending

We now show, in figure (10.2) given below, how a fiscal expansion raises equilibrium income and the interest rate. At unchanged interest rates, higher levels of government spending increase the level of aggregate demand. To meet the increased demand for goods, output must rise. In figure (10.2) given below, we show the effect of a shift in the IS schedule. At each level of the interest rate, equilibrium income must rise by $\propto G\ times$ the increase in government spending. For example, if government spending rises by 100 and the multiplier is 2, equilibrium income must increase by 200 at each level of the interest rate. Thus the IS schedule shifts to the right by 200.

If the economy is initially in equilibrium at point E and government spending rises by 100, we would move to point E" as shown in the figure given below, if the interest rate stayed constant. At E'' the goods market is in equilibrium in that planned spending equals output. But the money market is no longer in equilibrium. Income has increased, and therefore the quantity of money demanded is higher. Because there is an excess demand for real balances, the interest rate rises. Firms' planned investment spending declines at higher interest rates, and thus aggregate demand falls off.

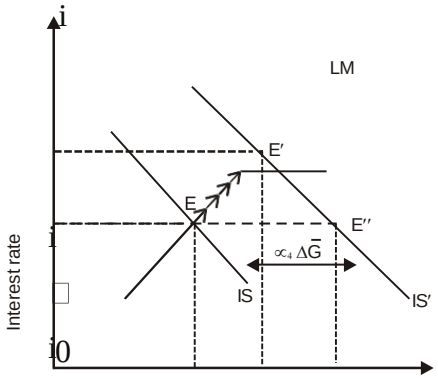

Figure : 11.2 Effects of an increase in Government spending

Increased government spending increases aggregate demands shifting the IS curve to the right.

What is the complete adjustment, taking into account the expansionary effect of higher government spending and the dampening effects of the higher interest rate on private spending? Figure (10.2) shows that only at point E' do both the goods and money market clear. Only at point E' planned spending equal to income and, at the same time, the quantity of real balances demanded equal to the given real money stock. Point E' is therefore the new equilibrium point.

Comparing E' to the initial equilibrium at E, we see that increased government spending raises both income and the interest rate. But another important comparison is between points E' and E'', the equilibrium in the goods market at unchanged interest rates. In comparing E'' and E', it becomes clear that the adjustment of the interest rates and their impact on aggregate demand dampen the expansionary effect of increased government spending. Income, instead of increasing to level Y'', rises only to y'0.

The reason that income rises only to Y'0 rather than Y'' is that the rise in the interest rate from I 0 to I' reduces the level of investment spending. We say that the increase in government crowds out investment spending. Crowding out occurs when expansionary fiscal policy causes interest rates to rise, thereby reducing private spending, particularly investment.

What factors determine how much crowding out takes place? In other words, what determines the extent to which interest rate adjustments dampen the output expansion induced by increased government spending? By drawing for yourself different IS and LM schedules, you will be able to show the following:

- Income increases more, and interest rates increase less, the flatter the LM schedule.
- Income increases less, and interest rates increase less, the flatter the IS schedule.
- Income and interest rates increase more the larger the multiplier, □ G, and thus the larger the horizontal shifts of the IS schedule.

In each case the extent of crowding out is greater the more the interest rate increases when government spending rises.

To illustrate these conclusions, we turn to the two extreme cases we discussed in connection with monetary policy, the liquidity trap and the classical case.

11.9 Check Your Progress

Q1. What is Crowding Out? What causes crowding Out?

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11.10 LET US SUM UP

- Monetary policy refers to the adoption of suitable policy regarding interest rate and availability of credit.
- Cost of money implies bank rate at which Central Bank rediscounts first class bills of exchange and government securities held by commercial banks.
- Under quantitative credit control—policies like open market operations, bank rate policy and changing reserve rate may be implemented.
- Qualitative credit controls may be operated by moral persuasion, change in margin requirement, credit rationing, control over consumer's credit, direct action.
- Debit management implies, government borrowing and its regulation and control.

11.11 Keywords

- **Monetary Policy**: The process by which a central bank manages the supply of money and interest rates in an economy to achieve specific objectives such as controlling inflation, maintaining employment, and fostering economic growth.
- **Crowding Out**: A situation where increased government spending leads to a reduction in private sector investment or consumption, often due to higher interest rates resulting from government borrowing.
- **Quantitative Credit Control**: Monetary policy tools such as open market operations, reserve requirements, and bank rate policy that affect the overall volume of credit in the economy.
- **Debt Management**: The strategy and process of managing a government's borrowing, including the timing, issuance, and servicing of government bonds and securities

11.12 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India

Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

11.13 Hints to check your progress

Q1- See section 11.8

11.14 Examination oriented questions

- Explain the main objectives and instruments of monetary policy. How do they contribute to economic stability?
- Discuss the limitations of monetary policy in underdeveloped countries. What challenges do these countries face in implementing effective monetary policy?
- Define the crowding out hypothesis. How does it affect the effectiveness of fiscal and monetary policy in an economy?
- Describe the role of the Reserve Bank of India in the implementation of monetary policy. How has monetary policy evolved in India since independence?

THEORIES OF CONSUMPTION: INTRODUCTION AND BACKGROUND

STRUCTURE:

12.0 Objectives

The main objectives of this lesson are to enable you to:

- Explain the significance of the consumption function in determining national income
- Discuss how consumption behavior influences overall economic activity and the role it plays in fiscal policy.
- Analyze the empirical findings on consumption behavior in both short-run and long-run perspectives
- Differentiate between short-run non-proportional consumption and long-run proportional consumption.
- Evaluate the challenges posed by the consumption puzzle and understand the drift theory of consumption
- Explore why Keynesian predictions of secular stagnation did not materialize post-World War II.

12.1 Learning Outcomes

After going through this lesson, you shall be able to:

- Describe the short-run and long-run consumption functions and explain their key differences.
- Analyze the consumption puzzle and its implications for Keynesian economics and fiscal policy.
- Critically evaluate the drift theory of consumption and the factors contributing to shifts in consumption behavior.

12.2 Introduction

Dear learner, understanding consumer expenditure is crucial in macroeconomic analysis, as it represents a significant portion of national income. The consumption function, first introduced by Keynes in the 1930s, laid the foundation for explaining how changes in income affect consumption and, consequently, national income.

This lesson explores the evolution of the consumption function, highlights empirical studies, and examines different hypotheses to explain both short-run and long-run consumption behavior. It also discusses the "consumption puzzle" that challenged Keynes' initial assumptions and led to new theories like the drift theory of consumption.

12.3 BACKGROUND CROSS SECTION DATA AND TRENDS

Consumer expenditure runs about 65 percent of GNP in the United States; so any analysis of the factors determining the level of GNP must be concerned with consumer expenditure at some point. Analytically, in 1936 Keynes made the consumption function the basic element in the income-expenditure approach to the determination of national income. We have seen in Part II that the consumption function is the principal building block in multiplier analysis.

The short-run consumption function that Keynes introduced is shown in Fig. 11.1, which plots real consumer expenditure c against real income y. This function reflects the observation that as incomes increase people tend to spend a decreasing percentage of income. The slope of a line from the origin to a point on the consumption function gives the average propensity to consume (APC), or the c/y ratio at that point. The slope of the consumption function itself is the

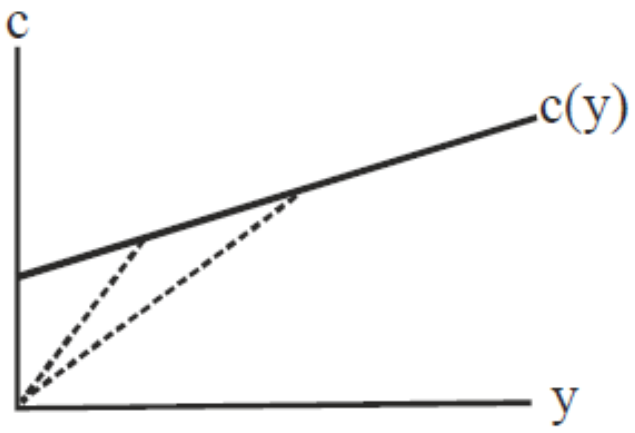


Figure 32.1 Keynes Consumption Function

Marginal Propensity to consumer *(MPC),* Using the notation of Part II, if C = *c (y), MPC = c'*. From the graph it should be clear that the marginal propensity to consume is less than the average propensity to consume. If the ratio *c/y* falls as income rises, the ratio of the increment to c to the increment to *y,c'*, must be smaller than *c/y*. Keynes saw this as the behaviour of consumer expenditure in the short run over the duration of a business cycle. He reasoned that as income falls relative to recent levels, people will protect consumption standards by not cutting consumption proportionally to the drop in income, and conversely as income rises, consumption will not rise proportionally.

The same kind of reasoning can also be applied to cross-sectional budget studies. Given a social standard of consumption, one would expect the proportion of income saved to rise as income rises. In the late 1930s cross-sectional budget studies were examined to see if Keynes' assumption that "rich people save proportionally more" was borne out. In general, these budget studies seemed to verify the theory.

Acceptance of the theory that MPC<APC, so that as income rises c/y falls,

led to the formation of the stagnation thesis around 1940. It was observed that if consumption followed this pattern, the ratio of consumption demand to income would decrease as income grew. The problem for fiscal policy that the stagnation thesis poses can be seen as follows. If is the condition for equilibrium growth of real output y, and there is no reason to assume that i/y will rise as the economy grows, then g/y must increase to balance the c/y drop to maintain full-employment demand as y grows. In other words, unless government spending increases at a faster rate than income, the economy will not grow but will stagnate.

During World War II, as government purchases soared, the economy did expand rapidly. However, many economists, following the stagnation thesis, feared that when the war ended and government spending was reduced, the economy would plunge back into depression. Yet precisely the opposite occurred. Private demand increased sharply when the war ended, causing inflation rather than recession. Why did this happen? One plausible explanation is that during the war people had earned large increases in income but consumer expenditure was curbed by rationing. Consumers put their excess funds, the savings "forced" by rationing, into assets in the form of government bonds. When the war ended, people had an excess stock of assets that they converted into increased consumption demand. This phenomenon suggests that assets, as well as level of income, have something to do with consumption. In other words, for a given level of income, consumption may also be a function of assets or wealth.

In 1946 Simon Kuznets published study of consumption and saving behavior dating back to the Civil War. Kuznets' data pointed out two important things about consumption behaviour. First, it appeared that on average over the long run the ratio of consumer expenditure to income, c/y or APC, showed no downward trend, so the marginal propensity to consume equaled the average propensity to consume as income grew along trend. This meant that along trend the c= c(y) function was a straight line passing through the origin, as shown in Figure 12.2, Kuznets' and c/y ratio was below the long-run average occurred during boom periods, and years with c/y above the average occurred during periods of economic slump.

This meant that the c/y ratio varied inversely with income during cyclical fluctuations, so that for the short period corresponding to a business cycle empirical studies would show consumption as a function of income to have a slope like that of the short-run functions of Figure 11.2 rather than the long-run function.

Thus by the late 1940s it was clear that a theory of consumption must account for three observed phenomena:

1. Cross-sectional budget studies show s/y increasing as y rises, so that in cross sections of the population, *MPC<APC.*
2. Business cycle, or short-run, data show that the c/y ratio is smaller than average during boom periods and greater than average during slumps, so that in the short run, as income fluctuates, *MPC<APC.*

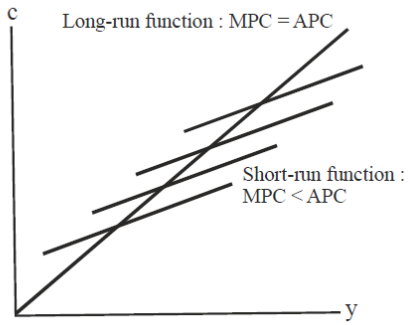


Fig. 12.2 Long sun and short run

Consumption function

3. Long-run trend data show no tendency for the c/y ratio to change over the long run, so that as income grows along trend.

In addition, a theory of consumption should be able to explain the apparent effect of wealth on consumption that was observed after World War II.

12.4 Theories of the Consumption Function: Keynes' Consumption Function: The Absolute Income Hypothesis

Keynes in his General Theory postulated that aggregate consumption is function of aggregate current disposable income. The relation between consumption and income is based on his Fundamental Psychological Law of Consumption which states that when income increases consumption expenditure also increases but a smaller amount.

The Keynesian consumption function is written as:

$C = a + cY \qquad a > 0 \qquad 0 < c < 1$

Where a is the intercept, a constant which measures consumption at a zero level of disposal income; c is the marginal propensity to consume (MPC), and Y is the disposal income.

The above relation that consumption is a function of current disposable income whether linear or non-linear, is called the absolute income hypothesis. This consumption function has the following properties.

1. As income increases, average propensity to consume *(APC = C/Y)* falls.
2. The marginal propensity to consume (MPC) is positive but less than unity ($0 < c < 1$) so that higher income leads to higher consumption.
3. The consumption expenditure increases (or decreases) with increase (or decrease) in income but non-proportionally. This non-proportional consumption function implies that in the short-run average and marginal propensities do not coincide *(APC > MPC)*
4. This consumption function is explained in Fig. 12.3 where C = a + cY is the consumption function. At point E_0 on the C curve the income level is OY, At this point, *APC > MPC* where $APC = OC_1/OY_1$, and $MPC = \Delta C/\Delta Y = ER/RE_a$. This shows disproportional consumption function. The intercept a shows the level of consumption corresponding to a zero level of income. At income level OY_0. Where the curve C intersects the 45º line, point E_0, represents $APC (=OC_0/OY_0)$. Below the income level OY_0,

consumption is more than income. In this range, APC>1. Above the income level OY_0, consumption increases less than proportionately with income so that APC declines and it is E less than one.

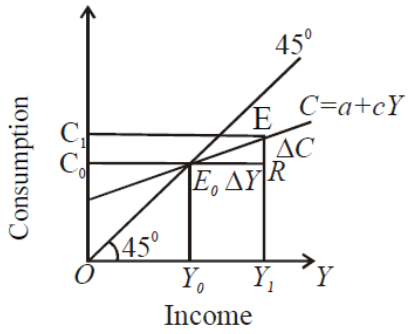


Figure 12.3

Empirical Studies

Keynes put forth this hypothesis on the basis of "knowledge of human nature" and "detailed facts of experience". His followers in a number of empirical studies based on cross-section budget figures and short-run time series data in the late 1930s and mid 1940 confirmed his hypothesis. They found that families with higher income levels consumed more which confirms that MPC is greater than zero (c>0), but by less than the increase in income (c<1). They also found that families with higher income levels saved more and so consumed a smaller proportion of income which confirms that APC falls as income rises.

The Consumption Puzzle

Keynes' assertion that the APC falls as income rises led some Keynesians to formulate the secular stagnation thesis around 1940. According to these economists, as income grew in the economy, households would save more and consume less. As a result, aggregate demand would fall short of output. If the government spending was not increased at faster rate than income, the economy would lapse into stagnation. But after World War II, the American economy experienced inflation rather than stagnation even when the government expenditures were reduced below 1941 level in constant dollars. The Keynesian consumption function had been proved wrong. This was due to the

conversion of government bonds into liquid assets after the War by the households in order to meet their pent up demand for consumer goods.

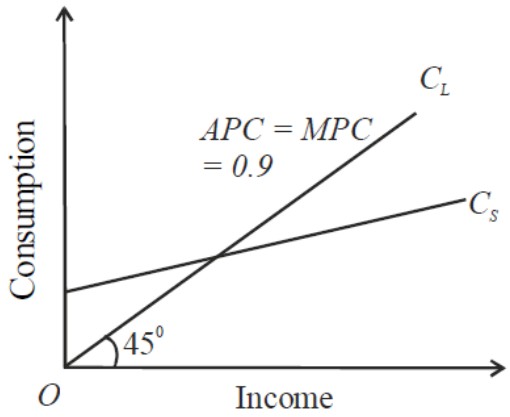


Figure 12.4

In 1946, Kuznets studied the consumption and income data for the United States during the period 1969-1938 and estimated the consumption function for this period as 0.9.[1] Further, he arrived at two conclusions': *one*, over the long-run, on the average, the APC did not show any downward trend so that the *MPC* equaled the *APC* as income increased long a long-run trend. This means that the consumption function is a straight line through the origin, as shown by the C_L line in Fig. 12.2, and *two*, the years in which the APC was below the long-run average were boom periods, and the years in which the APC was above the long-run average were of slump periods. This implies that in the short-run as income changes over the business cycle, the MPC is less than the APC, as shown by the CS curve in Fig. 12.2. These findings were later verified by Goldsmith in 1955 who found the long-run consumption function to be stable at 0.87,2

Thus these two studies revealed that for the short-run time series, the consumption function is not-proportional, *APC > MPC* and for the long-run time series, the consumption function is proportional, *APC=MPC.* The failure of the secular stagnation hypothesis and the findings of Kuznets and Goldsmith were a puzzle to the economists which is known as the consumption puzzle. Figure 12.4 illustrates this puzzle where there are two consumption functions. C_S is the Keynesian consumption function which is non-proportional *(APC>MPC)* and based on the short-run time series data. C_L is the long-run proportional consumption function *(APC=MPC)* based on long-run time series data. Over the year, economists have been engaged in solving this puzzle by reconciling the two consumption functions.

We study below few important theories which try to reconcile the two consumption functions.

12.5 THE DRIFT THEORY OF CONSUMPTION

One of the first attempts to reconcile the short-run and long-run consumption functions was by Arhur Smithies[3] and James Tobin[4], They tested Keynes' absolute income hypothesis in separate studies and came to the conclusion that the short-run relationship between consumption and income is non-proportional but the time series data show the long-run relationship to be proportional.

The latter consumption-income behaviour results through an upward shift or "drift" in the Tobin discuss the following factors:

1. **Asset Holdings.** Tobin introduced asset holdings in the budget studies of negro and white families to test this hypothesis. He came to the conclusion that the increase in the asset holdings of families tends to increase their propensity to consume thereby leading to an upward shift in their consumption function.

2. **New Products.** Since the end of the Second World War, a variety of new household consumer goods have come into existence at a rapid rate. The

introduction of new products tends to shift the consumption function upward.

3. **Urbanization.** Since the post-War period, there has been an increased tendency toward urbanization. This movement of population from rural to urban areas has tended to shift the consumption function upward because the propensity to consume of the urban wage earners is higher than that of the farm workers.

4. **Age Distribution.** There has been a continuous increase in the percentage of old people in the total population over the long-run. Though the old people do not earn but they do consume commodities. Consequently, the increase in their numbers has tended to shift the consumption function upward.

5. **Decline in Saving Motive.** The growth of social security system which makes automatic saving and guarantees income during illness. Unemployment disability and old age has increased the propensity to consume.

6. **Consumer Credit.** The increasing availability and convenience of short-term consumer credit shifts the consumption function upward. The greater ease of buying consumer goods with credit cards, debit cards, use of ATMs and cheques, and availability of installment buying causes an upward shift in the consumption function.

7. **Expectation of Income Increasing.** Average real wages of workers have increased and they expect them to rise in the future. These cause an upward shift in the consumption function. Those who expect higher future earnings tend to reduce their savings or even borrow to increase their present consumption.

The consumption drift theory is explained in Fig. 12.3 where C_L is the log-run consumption function which shows the proportional relationship between consumption and income as we move along it. C_{S1} and C_{S2} are the short-run consumption functions which cut the long-run consumption function C_L at points A and B. But due to the factors mentioned above, they tend to "drift" upward from point A

to point B along the C_L curve. Each point such as A and B on the C_L curve represents an average of all the values of factors included in the corresponding short-run functions, C_{S1} and C_{S2} respectively and the long-run function, C_L, connecting all the average values. But the movement along the dotted portion of the short-run consumption functions, CS1 and CS2 would cause consumption not to increase in proportion to the increase in income.

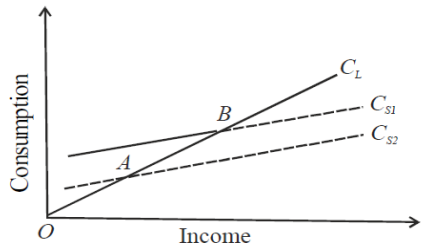


Figure 12.5

Criticisms:

The great merit of this theory is that it lays stress on factors other than in income which affect the consumer behaviour. In this sense, it represents a major advance in the theory of the consumption function. However, it has its shortcomings.

The theory does not tell the rate of upward drift along the CL curve. It appears to be a matter of chance.

It is just a coincidence if the factors explained above cause the consumption function to increase proportionately with increase in income so that the average of the values in the short-run consumption function equals a fixed proportion of income.

According to Duesenberry, all the factors mentioned as causes of the upward shift are not likely to have sufficient force to change the consumption-savings relationship to such an extent as to cause the drift.

Duesenberry also points out that many of the factors such as decline in saving motive would lead to a secular fall in the consumption function. Such saving plans as life insurance and pension programs tend to increase savings and decrease the consumption function. Moreover, people want more supplementary savings to meet post-retirement needs which tend to decrease their current consumption.

12.6 Check your progress

Q- What are the main properties of Absolute Income Hypothesis?

……
……
……
…….

12.7 Let's sum up

This lesson reveals the complexity of consumer behaviour and its profound impact on macroeconomic theory. While Keynes' short-run consumption function established foundational principles for understanding the relationship between income and consumption, empirical data and the experience of the post-World War II economy revealed significant deviations. The consumption puzzle challenged economists to rethink the assumption that APC declines with income growth, leading to the development of new theories like the drift theory. Ultimately, this highlights the dynamic nature of consumption patterns and the importance of incorporating wealth, expectations, and institutional factors into any comprehensive theory of consumption.

12.8 Keywords

- **Average Propensity to Consume (APC)**
  The ratio of total consumption to total income (APC = C/Y); indicates what proportion of income is spent on consumption.
- **Marginal Propensity to Consume (MPC)**
  The change in consumption resulting from a change in income; represents the slope of the consumption function.
- **Absolute Income Hypothesis**
  The Keynesian concept that current consumption is determined by current income, with consumption increasing less than proportionally as income rises.
- **Consumption Puzzle**
  The empirical finding that, over the long run, APC does not decline as income increases, contrary to Keynes' original short-run assumption.

12.9 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

12.10 Hints to check your progress

See section 12.4

12.11 Examination oriented questions

- Explain the difference between the Average Propensity to Consume (APC) and the Marginal Propensity to Consume (MPC).
- Discuss the consumption puzzle and how it challenged Keynes' original consumption function.
- Describe the drift theory of consumption and highlight at least three factors that cause the upward shift of the consumption function.
- Using a diagram, explain how cross-sectional budget studies support the idea that rich people save proportionally more.
- Why did post-World War II consumption behaviour not align with the predictions of the secular stagnation thesis?

DUESENBERRY'S RELATIVE INCOME HYPOTHESIS, FRIEDMAN'S PERMANENT INCOME HYPOTHESIS

STRUCTURE

13.0 Objectives

The main objectives of this lesson are to enable you to:

- Define the Relative Income Hypothesis proposed by James Duesenberry and its implications for aggregate consumption.
- Explain the Ratchet Effect and its role in shaping consumption during economic fluctuations.
- Analyze Milton Friedman's Permanent Income Hypothesis and its distinction between permanent and transitory components of income and consumption.
- Critically evaluate the strengths and limitations of both hypotheses in explaining consumer behavior.

13.1 Learning Outcomes

After going through this lesson, you shall be able to:

- Distinguish between the Relative Income Hypothesis and the Permanent Income Hypothesis.
- Illustrate how past income levels influence current consumption behavior.
- Critically assess the assumptions and criticisms of both theories in real-world contexts.

13.2 Introduction

Dear learner, this lesson explores two important theories of consumption: Duesenberry's Relative Income Hypothesis and Friedman's Permanent Income Hypothesis. Duesenberry's theory focuses on social factors and the interdependence of consumption behaviors among individuals, emphasizing the ratchet effect—where past peak income shapes current consumption. In contrast, Friedman's hypothesis distinguishes between permanent and transitory income, arguing that consumption depends more on long-term expectations of income rather than just current earnings. These theories enrich our understanding of short-run and long-run consumption patterns and their implications for aggregate demand and savings behavior.

13.3 THE RELATIVE INCOME HYPOTHESIS

The Relative Income Hypothesis of James Duesenberry is based on the rejection of the two fundamental assumptions of the consumption theory of Keynes. Duesenberry states that (1) every individual's consumption behaviour is not independent but interdependent of the behaviour of every other individual, and (2) that consumption relations are irreversible and not reversible in time.

In formulating his theory of the consumption function, Duesenberry writes; "A real understanding of the problem of consumer behaviour must begin with a full recognition of the social character of consumption patterns," By the "social character of consumption patterns" he means the tendency in human beings not only, "to keep up with the Joneses" but also to surpass the Joneses. Joneses refers to rich neighbours. In other words, the tendency is to strive constantly towards a higher consumption level and to emulate the consumption patterns of one's rich neighbours and associates. Thus, consumers' preferences are independent. It is, however, differences in relative incomes that determine the consumption expenditures in a community. A rich person will have a lower APC because he will need a smaller portion of his income to maintain his consumption pattern. On the other hand, a relatively poor man will have a higher APC because he tries to keep up with the consumption standards of his neighbours or associates. This provides the explanation of the constancy of the long-run APC because lower and higher APCS would balance out in the aggregate. Thus even if the absolute size of income in a country increases, the APC for the economy as a whole at the higher absolute level of income would be constant. But when income decreases, consumption does not fall in the same proportion because of the Ratchet Effect.

The Ratchet Effect

The second part of the Duesenberry theory is the "past peak of income". hypothesis which explains the short-run fluctuations in the consumption function and refutes the Keynesian assumption that consumption relations irreversible. The hypothesis states that during a period of prosperity, consumption will increase and gradually adjust itself to a higher level. Once people reach a particular peak income level and become accustomed to this standard of living, they are not prepared to reduce their consumption pattern during a recession. As income falls, consumption declines but proportionately less

than the decrease in income because the consumer dissaves to sustain consumption. On the other hand, when income increases during the recovery period, consumption rises gradually with a rapid increase in saving. Economists call this the Ratchet Effect.

Duesenberry combines his two related hypothesis in the following form:

$$\frac{C_t}{Y_t} = a - c \frac{Y_t}{Y_0}$$

Where C and Y are consumption and income respectively, t refers to the current period and the subscript (*0*) refers to the previous peak, a is constant relating to the positive autonomous consumption and c is the consumption function.
In this equation, the consumption-income ratio in the current period (C_1/Y_1) is regarded as function of Y_1/Y_0, that is, the ration of current income to the previous peak income. If this ratio is constant, as in periods of steadily rising income, the current consumption income ratio is constant. During recession when current income (Y_1) falls below the previous peak income (Y0) the current consumption income ratio (C_1/Y_1) will increase.

The relative income hypothesis is explained graphically in Fig. 13.1 where C_L is the long-run consumption function and C_{S1} and C_{L2} are the short-run consumption functions. Suppose income is at the peak level of OY_1 where E_1Y_1 is consumption. Now income falls to OY_0 Since people are used to the standard of living at OY_1 level of income, they will not reduce their consumption to E_0/Y_0 level, but reduce it as little as possible by reducing their current saving. Thus they move backward along the C_{S1} curve to point C_1 and be at C_1Y_0 level of consumption. When the period of recovery starts, income rises to the previous peak level of OY_0. But consumption increases slowly from C_1 to

E_1 along the C_{S1} curve because consumers will just restore their previous level of savings. If income continues to increase to OY_2 level, consumers will move upward along the C_L curve from E_1 and E_2 on the new short-run consumption function C_{S1}. If another recession occurs at OY_2 level of income, consumption will decline along the C_{S2} consumption function toward C_2 point and income will be reduced to OY_1 level. But during recovery over the long-run, consumption will rise along the steeper C_L path till it reaches the short-run consumption function C_{S1}.

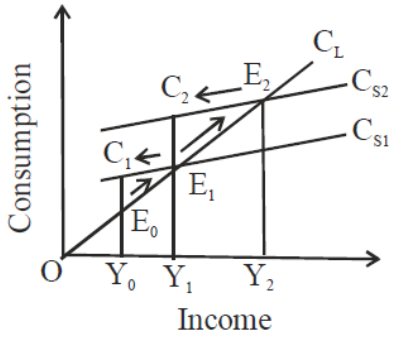


Fig 13.1

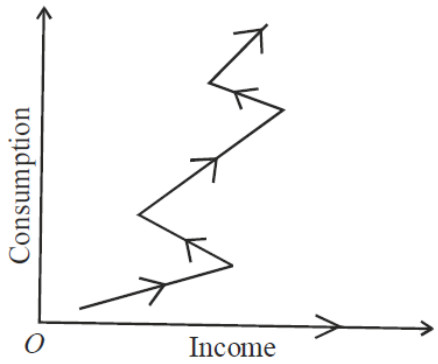
This is because when income increases beyond its present level OY_1, the APC becomes constant over the long-run. The short-run consumption function shifts upward from Cs_1 to Cs_2 but consumers move along the C_L curve from E1 to E_2. But when income falls, consumers move backward from E_2 to C_2 on the Cs_2 curve. These upward and downward movements from C_1 and C_2 points along the C_L curve give the appearance of a ratchet. This is the ratchet effect. The short-run consumption function ratchets upward when income increases in the long run but it does not shift down to the earlier level when income declines. Thus, the ratchet effect will develop whenever there is a cyclical decline or recovery in income.

Its Criticisms

Although the Duesenberry theory reconciles the apparent contradictions between budget studies and short-term and long-term time series studies, yet it is not without its deficiencies.

1. **No Proportional Increase in Consumption.** The relative income hypothesis assumes a proportional increase in income and consumption. But increases in income along the full employment level do not always lead to proportional increases in the consumption.
2. **No Direct Relation between Consumption and Income**. This hypothesis assumes the relation between consumption and income to be direct. But this has not been borne out by experience. Recessions do not always lead to decline in consumption, as was the case during the recessions of 1948-49 and 1974-75.
3. **Distribution of Income not Unchanged.** This theory is based on the assumption that the distribution of income remains almost unchanged with the change in the aggregate level of income. If with increases in income, a redistribution occurs towards greater equality, the APC of all persons belonging to the relatively poor and relatively rich families will tend to be reduced. Thus the consumption function will not shift upward from CS1 to CS2 when income increases.
4. **Reversible Consumer Behaviour. According to Micheal Events,** "The consumer behaviour is slowly reversible over time, instead of being truly irreversible. Then previous peak income would have less effect on current consumption, the greater the elapsed time from the last peak." Even if we know how a consumer spent his previous peak income, it is not possible to know how he would spend it now.
5. **Neglects other Factors.** The hypothesis is based on the assumption that changes in consumer's expenditure are related to his previous peak income. The theory is weak in that it neglects other factors that influence consumer spending such as asset holdings, urbanization, changes in age-composition, the appearance of new consumer goods, etc.

6. **Consumer Preferences do not Depend on Others**. Another unrealistic assumption of the theory is that consumer preferences are interdependent whereby a consumer's expenditure is related to the consumption patterns of his rich neighbour. But this may not always be true. George Katona's' empirical study has revealed that expectations and attitudes play n important role in consumer spending. According



to him, income expectations based on levels of aspirations and the attitudes toward asset holdings affect consumer spending behaviour more than demonstration effect.

Fig 13.2

7. **Reverse Lightning Bolt Effects.** Smith and Jackson have criticized Duesenberry's empirical evidence that the recovery in income after recession is not caused by ratchet effect. Rather, the consumption experience of consumer is similar to the reverse lightning bolt effect. That is why the consumer gradually increases his consumption due to his inconsistent habit stability with the increase in his income after recession. This is shown in Fig. 13.2 where the levels of consumption with the increments in income have been shown by arrows as reverse lightning bolt takes place.

13.4 THE PERMANENT INCOME HYPOTHESIS

Another solution to the apparent contradiction between the proportional long-run and non-proportional short-run consumption function is Friedman's permanent income hypothesis. Friedman rejects the use of "current income" as the determinant of consumption expenditure and instead divides both consumption and income into "permanent" and "transitory" components, so that

$$Ym \text{ or } Y = Y_P + Y_t \qquad \ldots(1)$$

And $$C = C_P + C_t \qquad \ldots(2)$$

Where P refers to permanent, t refers to transitory, Y to income and C to consumption. Permanent income is defined as "the amount a consumer unit could consume (or believes that it could) while maintain its wealth intact. "I is the main income of a family unit which in turn depends on its time-horizon and farsightedness." includes non- human wealth that it owns, the personal attributes of earners in the unit.. the attributes of the economic activity of the earners such as the occupation followed, the location of economic activity, and so on."

Y being the consumer's measured income or current income, it can be larger or smaller than his permanent income in any period. Such differences between measured and permanent income are due to the transitory component of income (Y_1). Transitory income may rise or fall with windfall gains or losses and cyclical variations. If the transitory income is positive due to windfall gain, the measured income will rise above the permanent income. If the transitory income is negative due to theft, the measured income falls below the permanent income. The transitory income can also be zero in which case measured income equals permanent income.

Permanent consumption is defined as "the value of the services that it is planned to consume during the period in question." Measured consumption is also divided into permanent consumption (C_p) and transitory consumption (C_t). measured consumption (or current consumption) may deviate from or equal permanent consumption depending on whether the transitory consumption is positive, negative or zero, Permanent consumption (C_p) is a multiple (k) of permanent income, Y_P.

$CP = kY_P$

And $k = f(r, w, u)$

Therefore, $C_P = k(r, w, u)\ Y_P$ $\qquad \ldots(3)$

where k is a function of the rate of interest (*r*), the ratio of property and non- property income to total wealth or national wealth (*w*), and the consumer's propensity to consume (*u*). This equation tells that over the long period consumption increases in proportion to the change in YP. This is attributable to a constant k($=C_p/Y_p$) which is independent of the size of income. Thus k is the permanent and average propensity to consume and *APC = MPC*.

Friedman analysis the offsetting forces which lead to this result. To take the rate of interest (*r*), there has been a secular decline in it since the 1920s. This tends to raise the value of *k*. But there has been a long-run decline in the ratio of property and non-property income to national wealth (*w*) which tends to reduce the value of *k*. The propensity to consume has been influenced by three factors. First, there has been a sharp decline in the farm population which has tended to increase consumption with urbanization. This has led to increase of *k*. Second, there has been a sharp decline in the size of families. It has led to increase in saving and reduction in consumption thereby reducing the value of *k*. Third, larger provision by the state for social security. This has reduced the need for keeping more in savings. It has increased the tendency to consume more resulting in the rise in the value of *k*. The overall effect of these off-setting forces is to raise consumption in proportion to change in the permanent income component.

Therefore, there is a proportional relation between permanent income and consumption.

$$C_p = kY_p \qquad \ldots(4)$$

where k is the coefficient of proportionality in which APC and MPC are endogenous and it depends upon the above mentioned factors. In other words, it is that proportion of fixed income which is consumed. Now take permanent income which is based on time series. Friedman believes that permanent income depends partly on current income and partly on previous period's income. This can be measured as

$$Y_{PT} = aY_t + (1 - a)\, Y_{t-1} \qquad \ldots (5)$$

where Y = permanent income in the current period, Yt = current income in the current period, Y_{t-1} = previous period's income, a = ratio of change in income between current period (*t*) and previous period (t–1).

This equation tells that permanent income is the sum of current period's income (Y_t) and previous periods income (Y_{t-1}) and the ratio of income change between the two (a). If the current income increases at once, there will be small increase in permanent income. For the permanent income to increase, income will have to be raised continuously for many years. Then only people will think that it has increased.

By integrating equations (4) and (5), short-run and long-run consumption function can be explained as

$$Ct = kY_{pt} = kaY_t + k(1 - a) Y_{t-1} \quad \ldots(6)$$

where C_t = current period consumption, *ka* = short-run MPC, *k* = long run *MPC* and k (1-a) Y_{t-1} is the intercept of short run consumption function.

According to Friedman, *k* and *ka* are different from one another and k > ka.

Further, k = 1 and ka = 0.

Equation (6) tells that consumption depends both on previous income and current income. Previous income is important for consumption because it helps in forecasting the future income of people.

Its Assumptions

Given these, Friedman gives a series of assumptions concerning the relationships between permanent and transitory components of income and consumption.

1. There is no correlation between transitory income and permanent income.

2. There is no correlation between permanent and transitory consumption.

3. There is no correlation between transitory consumption and transitory income.

4. Only differences in permanent income affect consumption systematically.

Explanation of the Theory

These assumptions give the explanation of the cross-section results of Friedman's theory that the short-run consumption function is linear and non-proportional, i.e. *APC>MPC* and the long-run consumption function is linear and proportional, i.e., *APC = MPC*. Figure 12.6 explains the permanent income hypothesis of Friedman where C_L, is the long-run consumption function which represents the long-run proportional relationship between consumption and income of an individual where *APC = MPC*. C_S is the non-proportional short-run consumption function where measured income includes

both permanent and transitory components. At OY income level where C_S and C_L curves coincide at point E., permanent income and measured income are identical and so are permanent and measured consumption as shown by YE.

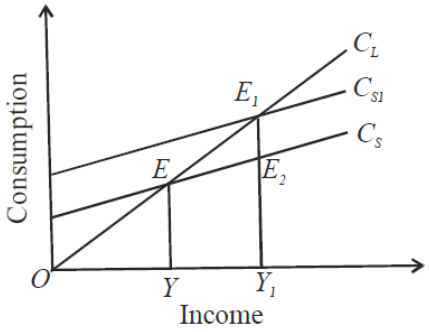


Fig 13.3

At point E, the transitory factors are non-existent. If the consumer's income increases to OY_1, he will increase his consumption consistent with the rise in his income. For this, he will move along the C_S curve to E_2 where his measured income in the short-run is OY_1 and measured consumption in Y_1E_2. The reason for this movement from E to E_2 is that during the short-run the consumer does not expect the rise in income to be
permanent, so APC falls as income increases. But if the OY_1 income level becomes permanent, the consumer will also increase his consumption permanently. Now his short-run consumption function will shift upward from C_S to C_{S1} and intersect the long- run consumption function C_L at point E_1. Thus the consumer will consume Y_1E_1 at OY1 income

level. Since he knows that the increase in his income OY1 is permanent, he will adjust his consumption Y1E1 accordingly on the long-run consumption function C_L at E_1 where *APC = MPC*.

Its Criticisms

This theory has been criticized on the following counts:

1. **Correlation between Temporary Income and Consumption.** Friedman's assumption that there is no correlation between transitory components of consumption and income is unrealistic. This assumption implies that with the increase or decrease

in the measured income of the household, there is neither any increase or decrease in his consumption, because he either saves or dissaves accordingly. But this is contrary to actual consumer behaviour. A person who has a windfall gain does not deposit the entire amount in his bank account but enjoys the whole or part of it on his current consumption. Similarly, a person who has lost his purse would definitely cut or postpone his present consumption rather than rush to the bank to withdraw the same amount of money to meet his requirements.

2. **APC of all Income Groups not Equal.** Friedman's hypothesis states that the APC of all families, whether rich or poor, is the same in the long-run. But this is against the ordinary observed behaviour of households. It is an established fact that low-income families do not have the capacities to save the same fraction of their incomes as the high income families. This is not only due to their meager incomes but their tendency to prefer present consumption to future consumption in order to meet their unfulfilled wants. Therefore, the consumption of low-income families is higher relative to their incomes while the saving of high-income families is higher relative to their incomes. Even in the case of persons at the same level of permanent income, the level of saving differs and so does consumption.

3. **Use of Various terms Confusing.** Friedman's use of the terms "permanent", "transitory", and "measured" have tended to confuse the theory. He concept of measured income improperly mixes together permanent and transitory income on the one hand, and permanent and transitory consumption on the other.

4. **No Distinction between Human and Non-human Wealth.** Another weakness of the permanent income hypothesis is that Friedman does not make any distinction

between human and non-human wealth and includes income from both in a single term in the empirical analysis of his theory.

Conclusion. Despite these weaknesses, "it can be fairly said", according to Micheal Evans, "that the evidence supports this theory and that Friedman's formulation has reshaped and redirected much of the research on the consumption function."

13.5 Check your progress

Q- What is ratchet effect?

……
……
……

Q- What are the key assumptions of Permanent Income Hypothesis?

……
……
……

13.6 Let's sum up

The study of Duesenberry's Relative Income Hypothesis and Friedman's Permanent Income Hypothesis offers a deeper insight into the complexities of consumer spending. While Duesenberry highlights the social and irreversible aspects of consumption, Friedman focuses on the role of expected long-term income in shaping consumption decisions. Understanding these theories helps economists and policymakers design effective fiscal policies and predict consumer responses to income changes, contributing to stable economic growth.

13.7 Keywords

- **Average Propensity to Consume (APC)**: The proportion of income that households spend on consumption.
- **Ratchet Effect**: The tendency of consumption to remain at a high level even when income falls, due to consumer habits and previous peak income levels.
- **Permanent Income**: The expected long-term average income of a household, used by Friedman to explain stable consumption patterns.
- **Transitory Income**: Short-term fluctuations in income due to temporary factors like bonuses or windfalls.

13.8 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

13.9 Hints to check your progress

Q1- See section 13.3

Q2- See section 13.4

13.10 Examination oriented questions

- Explain Duesenberry's Relative Income Hypothesis.

- Describe the Ratchet Effect and its implications for consumption during a recession.
- Differentiate between permanent and transitory income as per Friedman's hypothesis.
- Discuss the criticisms of the Permanent Income Hypothesis.
- Evaluate the relevance of Duesenberry's and Friedman's theories to modern consumer behavior.

LIFE CYCLE HYPOTHESIS AND MODERN APPROACHES

STRUCTURE:

14.0 Objectives

The main objectives of this lesson are to enable you to:

- Discuss the key principles and assumptions of the Life Cycle Hypothesis.
- Describe the implications of the hypothesis in short-run and long-run consumption behavior.
- Critically evaluate the limitations and criticisms of the Life Cycle Hypothesis.

14.1 Learning Outcomes

After going through this lesson, you shall be able to:

- Explain how lifetime income and savings decisions influence individual consumption.
- Illustrate the consumption behavior over different stages of life using the Life Cycle Hypothesis.
- Assess the strengths and criticisms of the hypothesis in comparison to other consumption theories.

14.2 Introduction

Dear learner, understanding how individuals make consumption decisions is a central theme in macroeconomic theory. Traditional models, such as the Keynesian consumption function, primarily link consumption to current income. However, such models fail to explain long-run consumption trends and savings behavior across different age groups. In response to these limitations, economists **Franco Modigliani** and **Albert Ando** developed the **Life Cycle Hypothesis (LCH)**.

The Life Cycle Hypothesis provides a more dynamic and realistic framework. It suggests that individuals plan their consumption and savings behavior over their entire lifetime, aiming to **smooth consumption** across different phases of life—youth, working years, and retirement. Consumption is thus viewed as a function of **expected lifetime income**, which includes both current income and the present value of future earnings and assets.

This lesson explores the structure, assumptions, and mathematical formulation of the Life Cycle Hypothesis. It also examines its implications for understanding consumer behavior, savings patterns, and the long-run stability of the Average Propensity to Consume (APC). The lesson concludes with an analysis of modern criticisms and the relevance of the hypothesis in contemporary economic thought.

14.3 THE LIFE CYCLE HYPOTHESIS

Ando and Modigliani have formulated a consumption function which is known as the Life Cycle Hypothesis. According to this hypothesis, consumption is a function of lifetime expected income of the consumer. The consumption of the individual consumer depends on the resources available to him, the rate of return on capital, the spending plan, and the age at which the plan is made. The present value of his resources includes income from assets or wealth or property' and from current and expected labour income. Thus his total resources consist of his income and wealth.

Its Assumptions

The life cycle hypothesis is based on the following assumptions:

1. There is no change in the price level during the life of the consumer.
2. The rate of interest paid on assets is zero.
3. The consumer does not inherit any assets and his net assets are the result of his own savings.
4. His current savings result in future consumption.
5. He intends to consume his total lifetime earnings plus current assets.
6. He does not plan any bequests.
7. There is certainty about his present and future flow of income
8. The consumer has a definite conscious vision of life expectancy.
9. He is aware of the future emergencies, opportunities and social pressures which will impinge upon his consumption spending.
10. The consumer is rational.

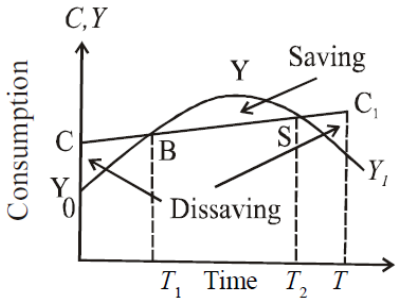
Its explanation

Given these assumptions, the aim of the consumer is to maximize his utility over his lifetime which will, in turn, depend on the total resources available to him during his life time. Given the life-span of n individual, his consumption is proportional to these resources. But the proportion of resources that the consumer plans to spend will depend on whether the spending plan is formulated during the early or later year of his life. As a rule, an individual's average income is relatively low at the beginning of his life and also at the end of his life. This is because in the early years of his life, he has little assets (wealth) and during the late years his labour-income is low. It is, however, in the middle of his life that his income, both from assets and labour, is high. As a result, the consumption level of the individual throughout his life is somewhat constant or slightly increasing, shown as the CC_1 curve in Fig. 14.1, the Y_0YY_1 curve shows the individual consumer's income stream during his lifetime T. During the early period of his life represented by T_1 in the figure., he borrows or dissaves CY_0B amount of money to keep his consumption level CB which is almost constant. In the middle years of his life represented by T_1T_2, he saves BSY amount to repay his debt and for the future. In the last years of his life

represented by T_2T, he dissaves SC_1Y_1

Fig 14.1

t



According to this theory, consumption is function of lifetime expected income of the consumer which depends on his resources. In some resources, his current income (Y) present value of his future expected labour income (Y^e) and present value of assets (A_t)

The consumption function can be expressed as :

$$C_t = f(V_t) \quad \ldots (1)$$

where V = total resources at time t.

and $V_t = f(Y_t + Y^e_{Lt} + A_t)$ …(2)

By substituting equation (2) in (1) and making (2) linear and weighted average of different income groups, the aggregate consumption function is

$C = \alpha 1 Y1 + \alpha 2\ Y1 + \alpha 3 A1$ 3

Now APC is

$$\frac{C_t}{Y_t} \alpha_1 + \alpha_1 \frac{Y^e}{Y_t} + \alpha_1 \frac{A_t}{Y_t}$$

APC is constant in the long-run because a portion of labour income in current income and the ratio of total assets to current income are constant when the economy grows. On the basis of the life cycle hypothesis, Ando and Modigliani make a number of studies in order to formulate the short-run and long-run consumption functions. A cross-section study revealed that more persons in the low-income groups were at low income level because they were at the end period of their lives. Thus their APC was high. On the other hand, more than average persons belonging to the high-income groups were at high income levels because they were in the middle years of their lives. Thus their APC was relatively low. On the whole, the APC was falling as income rose thereby showing *APC* > *MPC*. The observed Data for the U.S revealed the APC to be constant at 0.7 over the long-run.

The Ando-Modigliani short-run consumption function is shown by the C_S curve in Fig. 14.2. At any given point of time, the C_S curve can be considered as a constant and during short-run Income fluctuation, when wealth remains fairly constant, it looks like the Keynesian consumption function. But its intercept will change as a result of accumulation of wealth (assets) through savings. As wealth increases overtime, the non-proportional short-run consumption function C_S shifts upward to C_{S1} to trace out the long run proportional consumption function. The long-run consumption function is C_L, showing a constant APC as income grows along the trend. It is a straight line passing through the origin. The APC is constant over time because the share of labour income in total income and the ratio of wealth (assets) to total income are constant as the economy grows along the trend.

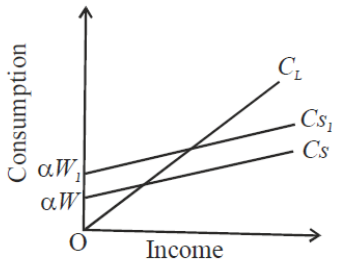


Fig.14.2

14.4 Check your progress

Q What are the basic assumptions of Life Cycle Hypothesis?

……
……
……

14.5 Implications and Criticism

Its Implications

1. The life cycle hypothesis solves the consumption puzzle. According to this hypothesis, the short-run consumption would be non-proportional as in the short-run time series estimates. Its intercept (αW) in Fig. 13.3 measures the effect of wealth and the life cycle consumption function looks like the Keynesian consumption function as C_S in the figure But it holds only in the short run when wealth is constant. As wealth grows (αW_1), this consumption function shifts upward as CS1.

The shifting of the Cs to C_{S1} traces out the long-run consumption function C_L. This is consistent with the evidence from long-run time series data that the long-run consumption function is proportional. The slope of the C_L curve shows that the average propensity to consume does not fall as income increases. In this way, Audo-Modigliani solved the consumption puzzle.

2. The life cycle hypothesis reveals that savings change over the life time of a consumer. If a consumer starts his life in adulthood with no wealth, will save and accumulate wealth during his working years. But during retirement, he will save and run down his wealth. Thus the life cycle hypothesis implies that the consumer wants smooth and uninterrupted consumption over his lifetime. During working years, he saves and when retires, he dissaves.

3. The life cycle hypothesis also implies that a high -*income family consumes a smaller proportion of his income* than a low-income family. In its peak earning years, its income is more than its consumption and its APC is the lowest. But in the case of a low-income family and a retiree family, the APC is high.

Its Criticisms

The life cycle hypothesis is not free from certain criticisms.

1. **Plan for Lifetime Consumption Unrealistic.** The contention of Ando and Modigliani that a consumer plans his consumption over his lifetime is unrealistic because a consumer concentrates more on the present rather than on the future which is uncertain.

2. **Consumption not directly related to Assets.** The life cycle hypothesis pre-supposes that consumption is directly related to the assets of an individual. As assets increase, his consumption increases and vice versa. This is also unwarranted because an individual may reduce his consumption to have larger assets.

3. **Consumption depends on Attitude.** Consumption depends upon one's attitude towards life. Given the same income and assets, one person may consume more than the other.

4. **Consumer not Rational and Knowledgeable.** The hypothesis assumes that the consumer is rational and has full knowledge about his income and future litetime. This is unrealistic because no consumer is fully rational and knowledgeable.

5. **Estimation of Variables not Possible.** This theory depends on many variables such as current income, value of assets, future expected labour income, etc., the estimation of so many variables is very difficult and not possible constraints for a consumer. Even if he possesses a definite and conscious vision of future income, he may have little opportunity for borrowing in the capital market on the basis of expected future income. As a result, consumption may response more to changes in current income than predicted on the basis of the life cycle hypothesis.

Conclusion. Despite these, the life cycle hypothesis is superior to the other hypotheses on consumption function because it includes not only wealth as a variable in the consumption function but also explains why APC> MPC in the short-run and APC is constant in the long-run.

14.6 Let's sum up

The Life Cycle Hypothesis offers a comprehensive framework to understand how individuals plan their consumption and savings throughout their lifetime. Despite some unrealistic assumptions, its inclusion of assets and future income expectations makes it a powerful tool to analyze consumption trends, both in the short-run and long-run.

14.7 Keywords

- **Lifetime Income** – The total income an individual expects to earn over the course of their life.
- **Dissaving** – The act of spending savings or borrowing money, typically occurring in early or late life stages.
- **APC (Average Propensity to Consume)** – The ratio of total consumption to total income.
- **Wealth Effect** – The impact of changes in an individual's asset holdings on their consumption behavior.

14.8 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

14.9 Hints to check your progress

Q1- See section 14.3

14.10 Examination oriented questions

- What are the key assumptions of the Life Cycle Hypothesis proposed by Ando and Modigliani?
- How does the Life Cycle Hypothesis explain the constancy of Average Propensity to Consume (APC) in the long run?
- Discuss three major criticisms of the Life Cycle Hypothesis and evaluate their validity.

THEORIES OF INVESTMENT: MARGINAL EFFICIENCY OF CAPITAL

STRUCTURE:

15.10 Examination oriented questions

15.0 Objectives

The main objectives of this lesson are to enable you to:

- Explain the concept and calculation of Marginal Efficiency of Capital (MEC).
- Distinguish between MEC and Marginal Efficiency of Investment (MEI).
- Analyze the relationship between MEC, interest rates, and the level of investment.
- Evaluate how changes in MEC and interest rates affect capital stock and economic equilibrium.

15.1 Learning Outcomes

After going through this lesson, you shall be able to:

- Calculate the marginal efficiency of capital for a given investment scenario.
- Explain the inverse relationship between present value and interest rates in investment decisions.
- Differentiate between the concepts of MEC and MEI and discuss their implications for investment and capital stock

15.2 Introduction

Dear learner, our concern in this lesson is to analyze of capital and investment and study relationship between capital budgeting and rates of investment. If at any point of situation actual stock equalizes profit maximizing stock, an excess of the latter over former will appear subsequently only if market rate of interest declines or if MEC Schedule shifts upward. Either variation will produce positive rates of net investment. For short-run analysis indicated rates of net investment may remain unchanged. However in the long- run, rise in stock of capital resulting from net investment will depress MEI Schedules. This long-run result considers that growth in

stock of capital produces a movement along on MEC Schedule which slopes downward. However, net investment spending rates actual stock of capital to profit maximizing level indicated by a given market rates of interest and a MEC Schedule, which may have shifted and thus there will be shift in MEI Schedule and also a change in rate of net investment. Now, it is understood the mechanics by which variation in profit maximizing capital stock are translated into variation in investment rate. We will concentrate on factors that produce shifts in or movement along MEC Schedule and thus produce change in profit maximizing capital stock.

15.3 DETERMINANTS OF THE LEVEL OF INVESTMENT

Marginal Efficiency of Capital (MEC)

The marginal efficiency of capital is the highest rate of return expected from an additional unit of a capital asset over its cost. In the words of Kurihara, "It is the ratio between the prospective yield of additional capital goods and their supply price. "The prospective yield is the aggregate net return from an asset during its life time, while the supply price is the cost of producing this asset. If the supply price of a capital asset is Rs. 20,000 and its annual yield is Rs. 2,000 the marginal efficiency of this asset is $\frac{2000}{20000} x100 = 10$ percent. Thus the marginal efficiency of capital (MEC) is the

percentage of profit expected from a given investment on a capital asset.

Keynes relates the prospective yield of a capital asset to its supply price and defines the *MEC* as "equal to the rate of discount which would make the present value of the series of annuities given by the returns expected from the capital assets during its life just equal to its supply price."[1]

Symbolically, this can be expressed as:

$$S_p = \frac{R_1}{(1+ i)^1} + \frac{R_2}{(1+ i)^2} + \frac{R_n}{(1+ i)^n}$$

Where SP is the supply price or the cost of the capital asset; R_1, R_2… and R_n are the prospective yields or the series of expected annual returns from the capital asset in the years, 1, 2…. And *n,* and i is the rate of discount which makes the capital asset

exactly equal to the present value of the expected yield from it. This i is the *MEC* or the rate of discount which equates the two sides of the equation. If the supply price of a new capital asset is Rs. 1,000 and its life is two years, it is expected to yield Rs. 550 in the first year and Rs. 605 in the second year. Its MEC is 10 per cent which equates the supply price to the expected yields of this capital asset.

Thus

$$(S_P)\text{Rs.}1000 = \frac{550}{(1.10)} + \frac{605}{(1.10)^2} = \text{Rs. } 500 + 500$$

In equation (1), the term $\frac{R_1}{(1+i)}$ is the present value (PV) of the capital

Asset. The present value is "the value of payments to be received in the future." It depends on the rate of interest at which it is discounted.

Suppose we expect to receive Rs. 100 from a machine in a year's time and the rate of interest is 5 percent. The present value of this machine is

$$\frac{R_1}{(1+1)} = \frac{100}{(1.05)} = \text{Rs. } 95.24$$

If we expect Rs. 100 from the machine after two years then its present value is

$$\frac{100}{(1.05)^2} = \text{Rs.}90.70$$

The present value of a capital asset is inversely related to the rate of interest. The lower the rate of interest, the higher is the present value, and vice versa. For instance, if the rate of interest is 5 per cent, *PV* of an asset of Rs. 100 for one year will be Rs. 95.24; at 7 per cent interest rate, it will be Rs. 93.45; and at 10 per cent interest rate, it will be Rs. 90.91.

The relation between the present value and the rate of interest is shown in Figure 15.1, where the rate of interest is taken on the horizontal axis while the present value of the project on the vertical axis. The curve PR shows the inverse relation between present value and rate of interest. If the current rate of interest is T_1, the present value of the project is P_1. On the other hand, a higher rate of interest (1_2) will lead to a lower present value P_2 and when the present value curve *(PR)* cuts the horizontal axis at point *(Z)*, the net present value becomes zero.

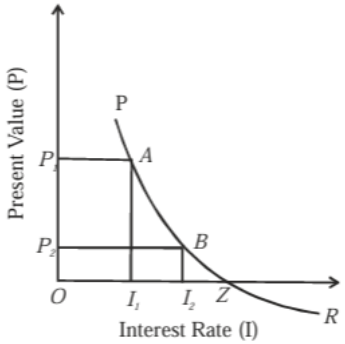


Fig. 15.1

As a matter of fact, the MEC is the expected rate of return over cost of a new capital asset. In order to find out whether it is worthwhile to purchase a capital asset, it is essential to compare the present value of the capital asset with its cost or supply price. If the present value of a capital asset exceeds its cost of buying, it pays to buy it. On the contrary, if its present value is less than its cost, it is not worthwhile investing in this capital asset.

The same results can be had by comparing the *MEC* with the market rate of interest. If the *MEC* of a capital asset is higher than the market rate of interest at which it is borrowed, it pays to purchase the capital asset, and vice versa. If the market interest rate equals the *MEC* of the capital asset, the firm is said to possess the optimum capital stock. If the *MEC* is higher than the rate of interest, there will be a tendency to borrow funds in order to invest in new capital assets. If the *MEC* is lower than the rate of interest, no firm will borrow to invest in capital assets. Thus the equilibrium condition for a firm to hold the optimum capital stock is where the *MEC* equals the interest rate. Any disequilibrium between the *MEC* and the rate of interest can be removed by changing the capital stock, and hence the *MEC* or by changing the rate of interest or both. Since the stock of capital changes slowly, therefore, changes in the rate of interest are more important for bringing equilibrium. The above arguments which have been applied to a firm are equally applicable to the economy. Figure 15.2 shows the *MEC* curve of n economy. It has a negative slope (from left to right downward) which indicates that the higher the *MEC*, the smaller the capital stock. Or, as the capital stock increase, the *MEC* falls This is because of the operation of the law of diminishing returns in production. As a result, the marginal physical productivity of capital and the marginal revenue fall. In the figure, when the capital stock is OK_1, the *MEC* is Or_1 As the capital increases from OK_1 to OK_2 the MEC falls from Or_1 to Or_2. The net addition to the capital stock K_1K_2 represents the net investment in the economy.

Further, to reach the optimum (desired) capital stock in the economy, the *MEC* must equal the rate of interest. If, as shown in the figure, the existing capital stock is OK_1, the *MEC* is Or_1 and the rate of interest is at Or_2. Everyone in the economy will borrow funds and invest in capital assets.

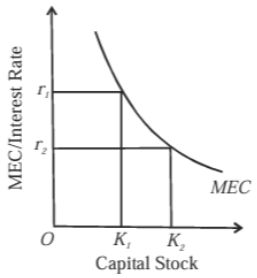


Fig. 15.2

This is because MEC *(Or_1)* is higher than the rate of interest (at Or_2). This will continue till the MEC *(Or_1)* comes down to the level of the interest rate (at Or_2). When the *MEC* equals the rate of interest, the economy reaches the level of optimum capital stock. The fall in the *MEC* is due to the increase in the actual capital stock from OK_1 to the optimum (desired) capital stock OK_2. The increase in the firm's capital stock by K_1K_2 is the net investment of the firm. But it is the rate of interest which determines the size of the optimum capital stock in the economy. And it is the *MEC* which relates the amount of desired capital stock to the rate of interest. Thus the negative slope of the *MEC* curve indicates that as the rate of interest falls the optimum stock of capital increases.

Marginal Efficiency of Investment (MEI)

The marginal efficiency of investment is the rate of return expected from a given investment on a capital asset after covering all its costs, except the rate of interest. Like the *MEC*, it is the rate which equates the supply price of a capital asset to its prospective yield. The investment on an asset will be made depending upon the interest rate involved in getting funds from the market. If the rate of interest is high, investment is at low level. Low rate of interest leads to an increase in investment. Thus the *MEI* relates investment to the rate of interest. The *MEI* schedule shows the amount of investment demanded

at various rates of interest. That is why, it is also called the investment demand schedule or curve which has a negative slope, as shown in Fig. 15 (A). At Or_1 rate of interest, investment is OI^1. As the rate of interest falls to Or_2, investment increases to OI^{11}.

To what extent the fall in the interest rate will increase investment depends upon the elasticity of the investment demand curve or the *MEI* curve. The less elastic is the MEI curve, the lower is the increase in investment as a result of fall in the rate of interest, and vice versa.

In Figure 15.3, the vertical axis measures the interest rate and the *MEI* and the horizontal axis measures the amount of investment. The *MEI* and MEI_1 are the investment demand curves. The *MEI* curve is Panel (A) is less elastic to investment which increases by I^1I^{11} This is less than the increase in investment $I_1 I_2$ shown in Panel (B) where the MEI_1 curve is elastic. Thus given the shape and position of the *MEI* curve, a fall in the interest rate will increase the volume of investment.

On the other hand, given the rate of interest, the higher the *MEI*, the larger shall be the volume of investment. The higher marginal efficiency of investment implies that the MEI curve shifts to the right. When the existing capital assets wear out, they are replaced by new ones and the level of investment increases. But the amount of induced investment depends on the existing level of total purchasing. So more induced investment occurs when the total purchasing is higher. The higher total purchasing tends to shift the *MEI* to the right indicating that more inducement to investment takes place at a given level of interest rate. This is explained in Figure 15.4, where MEI_1 and MEI_2 curves indicate two different levels of total purchasing in the economy. Let us suppose that the MEI_1 curve indicates that at Rs. 200 crores of total purchasing, OI_1 (Rs. 20 crores) investment occurs at Or_1 interest rate. If total purchasing rises to Rs. 500 crores, the MEI_1 curve shifts to the right as MEI_2 and the level of induced investment increases to OI_2 (Rs. 50 crores) at the same interest rate Or_1.

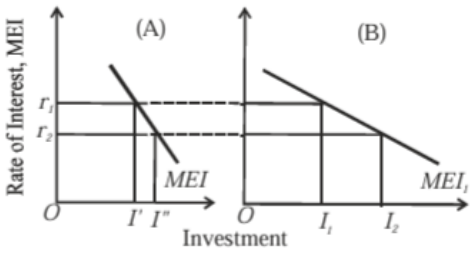


Fig. 15.3

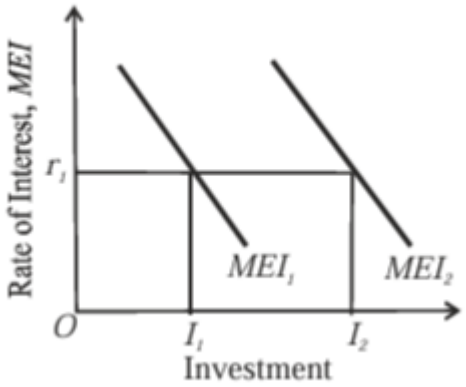


Fig. 15.4

15.4 Relation between the MEC (Capital Stock) and the MEI (Investment)

Professor Lerner pointed out as early as in 1946 that Keynes erred not only descriptively but also analytically by failure to distinguish between the marginal efficiency of capital *(MEC)* and the marginal efficiency of investment *(MEI)*. Following Lerner[2], Gardner Ackley[3] and some other economists have clearly defined and distinguished between the two concepts.

The *MEC* is based on a given supply price for capital, and the *MEI* on induced changes in this price. The *MEC* shows the rate of return on all successive units of capital without regard to the existing stock of capital. On the other hand, the *MEI* shows the rate

of return on only units of capital over and above the existing stock of capital. In the

MEC, the capital stock is taken on the horizontal axis of a diagram, while in the MEI the amount of investment is taken horizontally on the X-axis. The former is a 'stock' concept, and the latter is a 'flow' concept. The *MEC* determines the optimum capital stock in an economy at each level of interest rate. The *MEI* determines the net investment of the economy at each interest rate, given the capital stock. The net investment is the addition to the existing capital stock whereby the actual capital stock increases. Investment will, therefore, continue to be made in the economy till the optimum capital stock is reached. The amount of investment to be made to attain the optimum capital stock in the economy will depend upon the law of production under which the capital goods industry is operating under which the capital goods industry is operating. Under the law of constant costs, the supply curve of capital will be perfectly elastic, and the rate of investment per time period is determined as shown in figure 15.5.

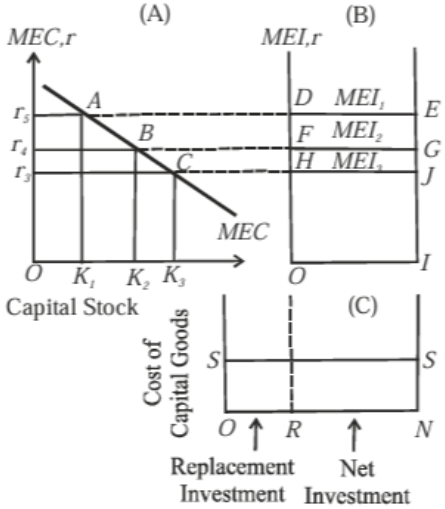


Fig. 15.5

Panel (A) of the figure shows the *MEC* curve relating the optimum capital stock to different interest rates. Panel (C) of the figure shows a perfectly elastic supply curve SS of the capital goods industry, given the gross investment of *ON*. Out of this *ON*

gross investment, the replacement investment is *OR* which is assumed to be constant, s shown by the dotted vertical line from point R. Thus the net investment rate per time period available for capital goods industry is *RN*. Panel (B) shows MEI curves relating the rate of investment to each market rate of interest. The MEI curves are horizontal (or perfectly elastic) because the supply curve of capital is perfectly elastic.

Given these, take point A on the *MEC* curve in Panel (A) of the figure where the interest rate equals the *MEC*. It is the equilibrium point where the optimum capital stock OK_1 is determined. If the rate of interest falls to Or_3 and equals the *MEC* at point *C*, OK_3 becomes the optimum or desired capital stock. Now OK_1 is the actual capital stock. So there is a gap between the actual and the desired capital stock equal to K_1K_3. This can be filled by increasing net investment in the capital goods industry. The rate of available net investment is *OI* in Panel (B) or *RN* in Panel *(C)* which is the capacity level of the capital goods industry.

Investment in capital goods industry can be increased on the basis of the *MEI* of the industry. When the capital stock is OK_1, the *MEI* curve is *DEI* in panel (B). When investment is made at interest rates below Or_5 the capital stock will increase per time period. Thus in period 1 when net investment is made at OI rate, the MEI curve is FGI, and the capital stock increases to OK_2 from OK_1. In period 2, with the same rate of investment *OI*, when the *MEI* curve is *HJI*, and the capital stock increases to OK_3.Thus when the rate of interest is Or_3 and equals the *MEC* at point C in Panel (A), the economy attains the optimum level of capital stock where the actual and the desired capital stock are equal. Just as a fall in the interest rate with no shift in the *MEC* curve raises the optimum stock of capital from its initial level, so an upward shift of the *MEC* curve with no change in the rate of interest will have the same result.

If the capital goods industry is operating under the law of increasing costs, its supply curve will be upward sloping which produces the downward sloping *MEI* curve. This is because the cost of capital goods increases as the rate of net investment increases. What will be rate of net investment in this situation to bring the equilibrium of the actual capital stock with the desired capital stock? This is explained with the help of Figure 15.6 (A), (B) and (C) Panels which show the *MEC* curve, the MEI curve and the rising supply curve of capital respectively.

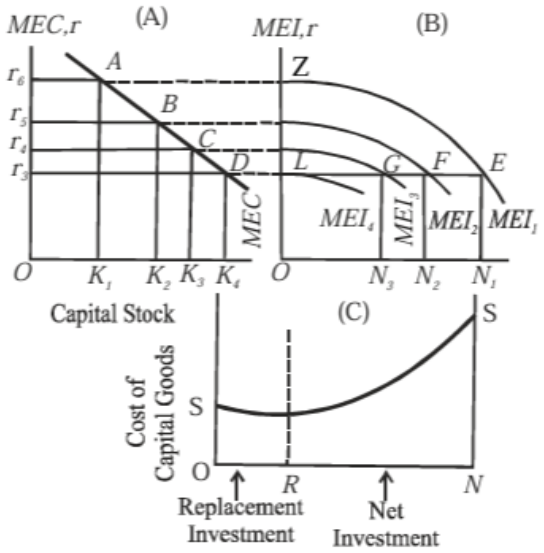


Fig. 15.6

In Panel (A), the equilibrium point for the capital goods industry is A where the interest rate Or_6 and the *MEC* are equal, and OK_1 optimum stock of capital is determined. Here net investment is zero because the actual capital stock equals the desired capital stock of the economy. This is shown by the MEI_1, curve at point Z in Panel (B) of the figure. If the rate of interest falls to Or_3, the desired capital stock will be OK_4 and OK_1 becomes the actual capital stock. Thus K_1K_4 is the gap between the actual capital stock and the desired capital stock. To bring equilibrium between the two capital stocks, net investment will have to be made,

The rate of net investment will be determined by the equality of the *MEI* with the reduced interest rate Or_3 in each period and so increase the capital stock. Starting from point Z on the MEI_1 curve when the rate of interest is Or_6, the rate of investment is zero. As the rate of net investment increases, the prices of capital goods rise and the rate of return on investment in these goods continues to fall till it equals the interest rate Or_3 of the desired capital stock. The MEI_1 curve equals the Or_3 interest rate at point *E* in Panel (B). Thus in period I, ON_1 rate of net investment increases the capital stock from OK_1 to OK_2, in Panel (A).

This increase in the capital stock by K_1K_2 reduces the *MEC* to point B on the curve *MEC*. Since the rate of interest is Or_3, the capital stock can be increased further. It depends upon the rate of net investment which is determined by the MEI_2 curve at point *F*. So, in period 2, the rate of net investment is ON_2 which raises the capital stock to OK_3 from OK_2. This increase in the capital stock by K_2K_3 further reduces the *MEC* to point *C*. The rate of investment in period 3 as determined by the MEI_3 curve corresponding to the level of *MEC* at point *C* is ON_3 which raises the capital stock to the level of *MEC* at point *C* is ON_3 which raises the capital stock to reach the optimum level OK_4, the *MEC* equals the rate of interest Or_3 and the corresponding *MEI* curve is MEI_4 which shows zero net investment at point *L*. "The rate of net investment spending per time period depends on how steep the downward slope of the MEI curve is (or its elasticity), and this in turn depends on how steep the upward slope (or the elasticity) of the supply curve of capital goods is. If the supply curve slopes sharply upward, the rate of investment spending will fall sharply downward with respect to the rate of interest. In any event, the capital stock will grow to the new optimum level, but its rate of growth will be slower the steeper the *MEI* curve."[4] We have seen above that it is the growth in the capital stock from the actual to the desired level that influences the rate of net investment. This is shown as a downward movement along the *MEC* curve. On the other hand, it is the flow of net investment that adjusts the actual capital stock toward its optimum level along each *MEI* curve with every fall in the rate of interest.

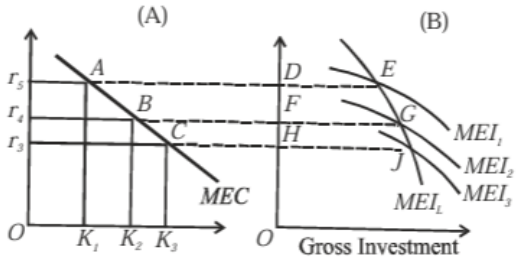


Fig. 15.7

Now what will be the investment demand in the short-run and the long run? Assuming the replacement investment to be given, the increase in the stock of capital and in the rate of net investment relating to fall in the interest rate in each period, as depicted by the *MEC* curve and the MEI_1 curve in Figure 15.7(A) and (B), relate to the long-run. If the replacement investment increases with the increase in the capital stock, then the MEI curves relating to each level of the rate of interest are the short-run curves, and the log-run *MEI* curve will be as shown in Figure 9. The *MEC* curve, in Panel (A) of the figure relates to the long-run. The curves MEI_1, MEI_2 and MEI_3 are the short-run *MEI* curves. As the rate of interest falls in each period, the capital stock gradually increases from OK_1 to OK_2 and finally to OK_3. This is because the rate of replacement investment increases from *DE* to *FG* and to *HJ*. The points E, G and J where the net investment is zero at each level of interest rate are joined to form the long run *MEI* curve MEI_L.

15.5 Check your progress

Q1- What is Marginal efficiency of Capital?

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Q2- What is Marginal efficiency of investment?

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15.6 Let's sum up

The theory of Marginal Efficiency of Capital provides a vital framework for understanding how investment decisions are made in the economy. By comparing the expected return on capital assets to their cost and prevailing interest rates, firms and policymakers can assess the desirability and timing of investments. The distinction between MEC and MEI further refines our understanding of investment dynamics, highlighting the importance of both stock and flow concepts in capital accumulation and economic growth.

15.7 Keywords

- **Marginal Efficiency of Capital (MEC):** The highest expected rate of return from an additional unit of capital asset over its cost, calculated as the discount rate that equates the present value of expected returns to the asset's supply price.
- **Supply Price:** The cost of producing or acquiring a capital asset.
- **Present Value:** The current worth of a future stream of returns, discounted at a specified interest rate.
- **Marginal Efficiency of Investment (MEI):** The expected rate of return on new investment, considering changes in the supply price of capital due to additional investment

15.8 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

15.9 Hints to check your progress

See section 15.3 and 15.4

15.10 Examination oriented questions

- Define Marginal Efficiency of Capital (MEC) and explain its significance in investment decisions.
- How is the present value of a capital asset related to the rate of interest? Illustrate with an example.
- Distinguish between Marginal Efficiency of Capital (MEC) and Marginal Efficiency of Investment (MEI).

- Explain the equilibrium condition for optimum capital stock in terms of MEC and the rate of interest.
- Discuss the effect of a change in the rate of interest on the level of investment using the MEC and MEI framework

INVESTMENT SUB SECTORS: BUSINESS, RESIDENTIAL, INVENTORY

STRUCTURE

16.0 Objectives

The main objectives of this lesson are to enable you to:

- Define the concept and scope of Business Fixed Investment (BFI), including its components and determinants.

- Analyze Residential Investment and its role in economic growth, employment, and financial markets.
- Explore the significance of Inventory Investment in stabilizing production processes and indicating business cycle fluctuations.
- Examine how these investment sub-sectors collectively influence economic stability, growth, and policy formulation.

16.1 Learning Outcomes

After going through this lesson, you shall be able to:

- Differentiate between business fixed, residential, and inventory investment and their respective economic roles.
- Identify key determinants influencing investment decisions in each sub-sector, such as interest rates, economic conditions, and government policies.
- Explain how these sub-sectors interact with broader economic cycles, affecting productivity, employment, and stability.

16.2 Introduction

Dear learner, investment is a crucial driver of economic growth, encompassing the allocation of resources into assets that promise future benefits. Economists divide investment into three primary sub-sectors: **Business Fixed Investment**, **Residential Investment**, and **Inventory Investment**. Each sub-sector plays a distinct role in shaping production, employment, and economic cycles. Understanding these sub-sectors enables policymakers, investors, and businesses to interpret economic trends and craft effective strategies for sustained development.

16.3 Business Fixed Investment

Business fixed investment (BFI) is the expenditure by firms on long-term physical and intangible assets intended to increase their productive capacity. It is the largest component of total investment, historically accounting for about three-quarters of all investment spending. BFI is traditionally subdivided into:

- Equipment: Machinery, computers, vehicles, and other tools essential for production.

- Structures: Factories, warehouses, office buildings, shopping malls, and plants.
- Intellectual Property: Software, research and development (R&D), and patents.

Purpose and Role

The primary aim of BFI is to enhance or maintain the productive capabilities of businesses. These investments are “fixed” because they involve assets that are used over several years in the production process, as opposed to being consumed or sold within a short period.

Determinants of Business Fixed Investment

Several key factors influence Business Fixed Investment:

- Economic Conditions: Firms invest more during periods of economic growth, as higher demand justifies expanding capacity
- Interest Rates: Lower interest rates reduce borrowing costs, making it cheaper to finance new investments. Conversely, higher rates can deter investment.
- Business Confidence: Optimism about future economic prospects encourages firms to invest. This confidence is shaped by market trends, consumer demand, and macroeconomic stability
- Government Policies: Tax incentives, subsidies, and regulatory frameworks can either encourage or discourage investment.
- Technological Advancements: The emergence of new technologies creates opportunities for efficiency gains, prompting firms to invest in updated equipment or processes.
- Market Demand: Rising demand for products or services often necessitates capacity expansion

Theoretical Framework

The neoclassical model of investment is commonly used to analyze BFI. It focuses on the marginal productivity of capital (MPK)—the additional output generated by an extra unit of capital. Firms continue to invest until the MPK equals the real rental price

of capital (R/P), where R is the rental cost and P is the price of output. This equilibrium ensures resources are allocated efficiently.

Economic Impact

BFI is highly sensitive to business cycles, often contracting sharply during recessions and rebounding during recoveries. It is a key driver of productivity growth, technological progress, and long-term economic expansion

16.4 Residential Investment

Definition and Scope

Residential investment encompasses expenditures on the construction or purchase of new housing units, including single-family homes, apartments, and other residential buildings. It also includes renovations and improvements to existing housing stock.

Components

- New Construction: Building of new homes and apartment complexes.
- Renovations: Upgrading or expanding existing residential structures.
- Land Development: Preparing land for residential use.

Determinants of Residential Investment

Residential investment is notably volatile and influenced by a range of factors:

- Real House Prices: Rising house prices increase the incentive to invest in new housing, as higher prices signal greater potential returns4.
- Interest Rates: Most home purchases are financed through mortgages. Higher interest rates increase borrowing costs, reducing demand for new housing. The effect of rate changes is especially pronounced during housing booms4.
- Demographic Factors: Population growth, net migration inflows, and changes in household size directly affect housing demand4.
- Income Levels: Higher incomes enable more households to afford home purchases, boosting residential investment4.

- Existing Housing Stock: A large existing stock can dampen new investment, while a smaller stock can spur construction activity4.
- Government Policies: Tax incentives, subsidies, and regulations related to housing can influence investment levels5.

Economic Impact

Residential investment is a critical driver of economic activity:

- Employment Generation: Construction projects create jobs across various sectors, from architects and builders to suppliers and manufacturers5.
- Wealth Creation: Homeownership builds household wealth, which can stimulate consumer spending and drive broader economic growth5.
- Financial Markets: The real estate sector influences financial markets and the mortgage industry, affecting liquidity and the stability of financial institutions5.
- Government Revenue: Property taxes and transaction fees provide significant revenue for governments, enabling public investment and fiscal policy interventions5.
- Economic Stability: A robust housing market can buffer the economy against shocks, supporting overall stability and resilience5.
- Cyclical Behavior
- Residential investment is highly cyclical, often serving as a leading indicator of economic downturns or recoveries. Its volatility is influenced by shifts in interest rates, demographic trends, and macroeconomic conditions

16.5 Inventory Investment

Definition and Scope

Inventory investment refers to the change in the stock of unsold goods, raw materials, work-in-progress, and finished products held by businesses over a given period3.

Components

- Raw Materials: Inputs awaiting use in production.
- Work-in-Process: Partially completed goods.
- Finished Goods: Products ready for sale but not yet sold.

Purpose and Role

Inventories allow firms to:

- Buffer against fluctuations in demand and supply.
- Ensure smooth production processes.
- Meet unexpected surges in customer orders.

Determinants of Inventory Investment

- Production vs. Sales: Inventory investment is the difference between goods produced and goods sold. If production exceeds sales, inventories rise; if sales outpace production, inventories fall3.
- Business Expectations: Anticipated changes in demand or supply conditions can prompt firms to adjust inventory holdings.
- Interest Rates and Storage Costs: Higher costs of holding inventories (due to interest rates or storage expenses) discourage large inventory build-ups.
- Technological and Logistical Improvements: Advances in inventory management, such as just-in-time systems, help firms minimize inventory levels and associated costs.

Economic Impact

Inventory investment is the most volatile component of total investment. It often amplifies business cycles, as firms rapidly adjust inventory levels in response to economic conditions. Large swings in inventories can signal turning points in the business cycle, making inventory data a valuable economic indicator

Comparative Overview

Category	Main Components	Key Influences	Economic Role	Cyclicality
Business Fixed	Equipment, structures, IP assets	MPK, interest rates, business confidence, policies, technology, demand	Expands productive capacity and productivity growth	High
Residential	Homes, apartments, renovations	House prices, interest rates, demographics, income, existing stock, policies	Provides housing, boosts construction, creates jobs, builds wealth	Very High
Inventory	Raw materials, WIP, finished goods	Production-sales gap, expectations, holding costs, technology	Buffers demand/supply, smooths production, signals business cycles	Highest

16.6 Check your progress

Q- What are the major differences between Business, Residential and Inventory Investment?

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16.7 Let's sum up

Investment in its various sub-sectors—business fixed, residential, and inventory—plays an indispensable role in driving economic progress and stability. Each sub-sector responds uniquely to shifts in interest rates, market conditions, and government policies, influencing everything from employment to innovation. A deep understanding of these investment types and their dynamics equips students, policymakers, and investors with the tools to interpret economic signals and make informed decisions that foster long-term growth and resilience.

16.8 Keywords

- Business Fixed Investment (BFI): Expenditure by firms on long-term physical and intangible assets to expand or maintain productive capacity, including equipment, structures, and intellectual property.
- Residential Investment: Spending on new housing, renovations, and land development to meet household demand, which also influences construction employment and household wealth.
- Inventory Investment: The change in the stock of raw materials, work-in-progress, and finished goods held by firms, affecting production and signaling economic trends.
- Marginal Productivity of Capital (MPK): The additional output produced by an extra unit of capital, used in neoclassical investment analysis to determine optimal investment levels.

16.9 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

16.10 Hints to check your progress

Q1- See section 16.3, 16.4, 16.5

16.11 Examination oriented questions

- Explain the concept of Business Fixed Investment (BFI) and discuss its main components.
- Analyze the determinants of Residential Investment and explain how demographic factors impact housing demand.
- Discuss the economic role of Inventory Investment and explain why it is considered the most volatile component of total investment.
- Compare and contrast the cyclical sensitivity of Business Fixed Investment, Residential Investment, and Inventory Investment.
- Using the neoclassical model of investment, explain how firms determine the optimal level of Business Fixed Investment.

STRUCTURE:

17.0 Objectives

The main objectives of this lesson are to enable you to:

- Define and classify different types of investment.
- Explain the concepts of short-run aggregate supply (SRAS) and long-run aggregate supply (LRAS).
- Analyze the impact of different types of investment on SRAS and LRAS.
- Use diagrams to illustrate shifts in aggregate supply caused by investment.

17.1 Learning Outcomes

After going through this lesson, you shall be able to:

- Grasp the theoretical and practical linkages between investment and aggregate supply.
- Differentiate between short-run and long-run effects of investment on output.
- Use economic diagrams to analyze changes in aggregate supply due to investment.
- Critically assess policy measures to stimulate investment and economic growth.

17.2 Introduction

Dear learner, investment is one of the most dynamic components of aggregate demand, but it also plays a **pivotal role in influencing aggregate supply**. Unlike consumption (which drives immediate demand), investment has a **dual effect**: in the short run, it can influence production costs and supply decisions, and in the long run, it determines the economy's productive capacity by adding to the capital stock, technology, and infrastructure.

Understanding how investment shapes aggregate supply is critical for policymakers, businesses, and students of economics. This lesson explores this relationship in depth, explaining both the theoretical underpinnings and real-world examples to illustrate how investment translates into greater economic output, higher productivity, and sustainable growth.

17.3 Investment: Definition and Types

Investment refers to **expenditure on capital goods** that are used to produce other goods and services in the future. It represents the process of increasing the economy's productive capacity and is a key driver of sustainable economic growth.

- **Types of Investment**

Type	Description	Example
Gross Fixed Capital Formation (GFCF)	Spending on durable goods like plant, machinery, factories, roads, bridges, and equipment.	A factory buying new assembly lines.
Inventory Investment	Changes in the stock of raw materials, work-in-progress, and finished goods.	A car manufacturer increasing its stock of vehicles before a new model launch.
Human Capital Investment	Spending on education, training, and health, enhancing workers' productivity.	Government subsidies for vocational training programs.
Public Investment	Government investment in infrastructure, transport, energy, and communication.	Building highways, power plants, and broadband networks.
Private Investment	Business investment driven by expected profits and market demand.	A tech company investing in new servers or software.
Foreign Direct Investment (FDI)	Investment by foreign entities in domestic projects, often bringing advanced technology and management practices.	A multinational carmaker building a plant in India.

17.4 Aggregate Supply: Meaning and Components

Aggregate supply (AS) represents the total output (goods and services) that firms are willing and able to supply in an economy at different price levels.

- **Short-Run Aggregate Supply (SRAS)**

- **Shape:** Upward-sloping.
- **Reason:** In the short run, some input prices (like wages and raw materials) are sticky, meaning they don't adjust immediately. Hence, firms may increase output if prices rise to earn higher profits.
- **Determinants:** Nominal wages, production costs, taxes/subsidies, technology.

Key Point: SRAS is sensitive to **cost conditions**—when investment leads to lower production costs, SRAS can shift right.

- **Long-Run Aggregate Supply (LRAS)**

- **Shape:** Vertical at the full-employment level of output (Y*).

- **Reason:** In the long run, all prices—including wages and input costs—adjust fully. Output is determined by **productive capacity** (capital stock, labor force, and technology).
- **Determinants:** Quantity and quality of factors of production (land, labor, capital, and entrepreneurship), technological progress, institutional framework.

Key Point: Investment **expands the capital stock and technological base**, shifting LRAS rightward.

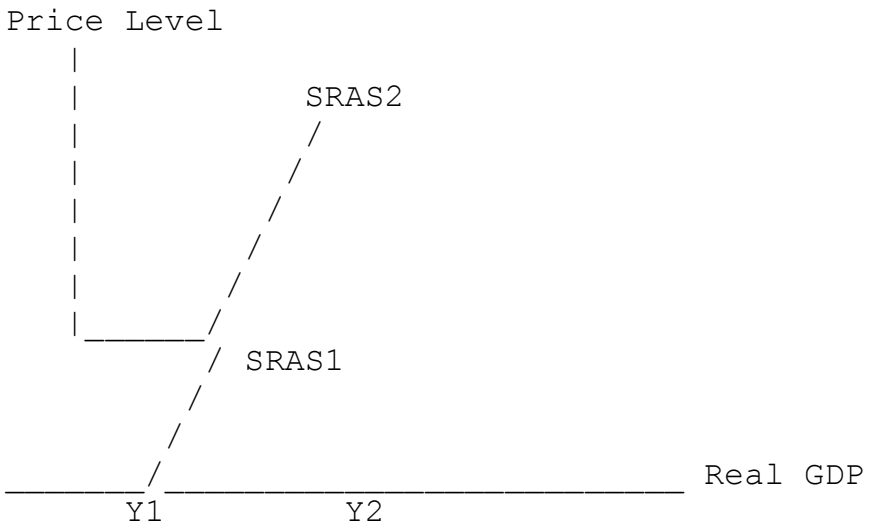
17.5 Theoretical Framework: Investment and Aggregate Supply

➢ Investment and SRAS

Investment in new machinery, equipment, and technology can:

- Increase efficiency
- Lower per unit production costs
- Enable firms to produce more output at the same price level.

Diagram 17.1: Investment Impact on SRAS



Explanation:

- Initially, the economy's SRAS is represented by SRAS1.

- Investment in cost-reducing technology shifts SRAS1 to SRAS2 (downward shift), indicating that firms can now supply a larger quantity of goods at each price level.
- This leads to an increase in real GDP from Y1 to Y2 in the short run.

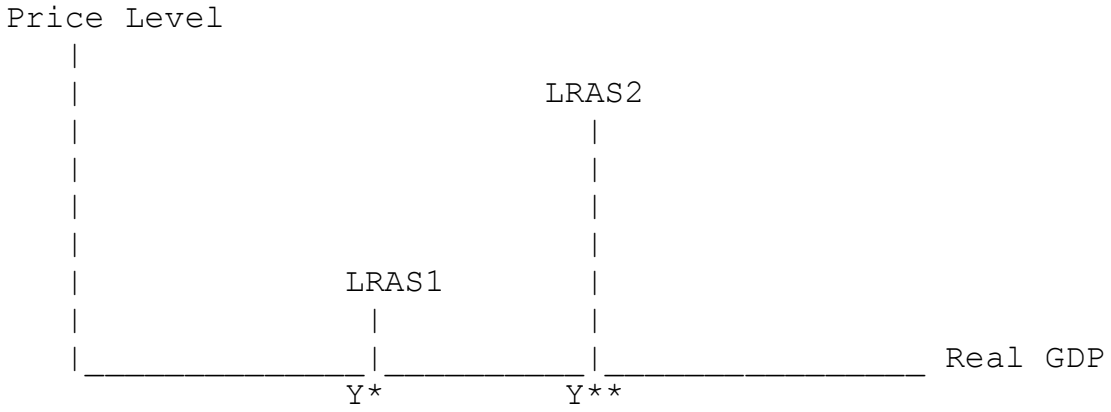
➢ **Investment and LRAS**

Investment increases:

- The stock of physical capital.
- Human capital via education and training.
- Technological innovation through R&D.

These factors expand the economy's potential output, **shifting LRAS rightward**.

Diagram 17.2 : Investment Impact on LRAS



Explanation:

- LRAS1 represents the initial potential output at Y*.
- With continuous investment, the capital stock grows, technology improves, and labor productivity rises, shifting LRAS rightward to LRAS2.
- The economy's capacity to produce at full employment level expands to Y**.

17.6 Mechanisms Linking Investment to Aggregate Supply

Mechanism	Impact on AS
Capital Accumulation	More machinery and equipment raise the productive capacity. Example: Automation lines in car factories.

Mechanism	Impact on AS
Technological Progress	Investment in R&D leads to process innovation and higher efficiency. Example: AI-driven production lines.
Infrastructure Development	Roads, ports, and ICT reduce logistics costs and bottlenecks, shifting both SRAS and LRAS right. Example: India's National Infrastructure Pipeline.
Human Capital Formation	Education and skills training enhance labor productivity. Example: Government-funded skill development programs.
Economies of Scale	Large-scale investments can reduce average costs and improve competitiveness. Example: Mega steel plants or semiconductor fabs.

17.7 Real-World Examples

- **India's Infrastructure Push**

- **Initiatives:** Bharatmala (roads), Sagarmala (ports), Digital India (broadband).
- **Impact:** Lower transportation costs → SRAS shifts right; expanded productive capacity → LRAS shifts right.

- **China's Manufacturing Investment**

- **Initiatives:** Belt and Road Initiative, high-speed rail networks, advanced manufacturing parks.
- **Impact:** Significant rise in both SRAS and LRAS, making China a global manufacturing hub.

- **FDI in Vietnam's Electronics Sector**

- **Initiatives:** Samsung, Intel, and Foxconn investing in manufacturing plants.
- **Impact:** Improved technology, skilled labor training, and infrastructure development → sustained shifts in both SRAS and LRAS.

17.8 Government Policy Measures

Policy Tool	Explanation
Fiscal Policy	Public investment in infrastructure "crowds in" private investment by improving business conditions.

Policy Tool	Explanation
Monetary Policy	Lower interest rates reduce borrowing costs, encouraging private investment.
Tax Policy	Investment tax credits and depreciation allowances incentivize firms to expand capacity.
Ease of Doing Business	Streamlining regulations reduces uncertainty and encourages both domestic and foreign investment.
FDI Policies	Liberalization and special economic zones attract foreign investors with technology and capital.

17.9 Check your progress

Q1- Define investment and list its types with examples.

Q2- Explain how investment affects SRAS.

17.10 Let us sum up

Investment is the **engine of economic growth**, influencing both short-run and long-run aggregate supply. In the short run, investment reduces production costs and increases output through technology and efficiency improvements. In the long run, it expands the economy's productive capacity by increasing the capital stock, fostering innovation, and enhancing human capital. Policymakers must carefully design fiscal, monetary, and structural measures to stimulate investment and achieve sustainable economic development.

17.11 Keywords

- **Investment** — Spending on capital goods that produce other goods and services in the future.
- **Aggregate Supply (AS)** — The total quantity of goods and services that producers are willing and able to supply at various price levels.
- **SRAS** — Short-Run Aggregate Supply, sensitive to input costs.
- **LRAS** — Long-Run Aggregate Supply, determined by factors like capital, technology, and labor.

- **Capital Stock** — The total value of productive assets in the economy.
- **Crowding-In** — When government spending on infrastructure stimulates private investment.
- **Productive Capacity** — The maximum output an economy can sustain using available resources and technology.

17.12 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India

17.13 Hints to check your progress

Q1- See section 17.3
Q2- See section 17.5

17.14 Examination-Oriented Questions

- Discuss the mechanisms through which investment affects both SRAS and LRAS. Illustrate your answer with diagrams.
- Evaluate the role of government policies in influencing investment decisions and shifting aggregate supply.
- Using real-world examples, explain how investment-led growth occurs in developing economies.

M.A. ECONOMICS LESSON NO. 18

COURSE NO. : ECO-107 SEMESTER-Ist UNIT-IV

BUSINESS CYCLES

STRUCTURE

18.0 Objectives

The main objectives of this lesson are to enable you to:

- Discuss the types, characteristics and phases of Business cycle
- Examine causes and effects of business cycles using various theoretical models (Kaldor, Hicks, Samuelson)

18.1 Learning outcomes

- Identify phases of business cycles (boom, recession, depression, recovery) using economic indicators.
- The students will be able to understand the different theories and concepts concerning business cycle.
- Develop policy recommendations for different phases of business cycles.

18.2 Introduction

Economic activity is subject to periodical fluctuations. Fluctuations which occurs in cyclical fashions in any business activity are called trade cycles or business cycles. In the words of Shapiro, business cycle are movements which occur in economic activity over years. There are four phases of trade cycles depression, recovery, boom and recession.

Earlier theories of business cycles those are associated with the name of Jevons, Hawtrey, Pigou, Hopson, Hayek, Schumpeter and others. There were not adequate to explain full concept of trade cycles. Thus, modern economists have developed some new theories of trade cycles.

MEANING

Business cycle or trade cycle is a part of the capitalist system. It refers to the phenomenon of cyclical booms and depressions. In a business cycle, there are wave-like fluctuations in aggregate employment, income, and output and price level. The term business cycle has been defined in various ways by different economists. Prof. Haberler's definition is very simple:"The business cycle in the general sense may be defined as an alternation of periods of prosperity and depression of good and bad trade." Keynes' definition in his *Treatise of Money* is more explicit: "A trade cycle is composed of periods of good trade characterized by rising prices and low unemployment percentage, altering with periods of bad trade characterized by falling prices and high unemployment percentages." Gordon's definition is precise: "Business cycles consist of recurring alternation of expansion and contraction in aggregate economic activity, the alternating movements in each direction being self-reinforcing and pervading virtually, all parts of the economy."

The most acceptable definition is by Estey: "Cyclical fluctuations are characterized by alternating waves of expansion and contraction. They do not have a fixed rhythm, but they are cycles in that the phases of contraction and expansion recur frequently and in fairly similar patterns."

18.3 Types and Characteristics Of Business Cycles

Business cycles are usually classified as under:

(1) **The Short Kitchin Cycle.** It is also known as the minor cycle which is of approximately 40 months duration. It is famous after the name of the British economist Joseph Kitchain, who made a distinction between a major and a minor cycle in 1923. He came to the conclusion on the basic of his research that a major cycle is composed of two or three minor cycles of 40 months.

(2) T**he Long Jugler Cycle.** This cycle is also known as the major cycle. It is defined "as the fluctuation of business activity between successive crises."In 1862 Clement Jugler, French economist showed that periods of prosperity, crisis and liquidation followed each other always in the same order. Later economists have come to the conclusion that a Jugler cycle's duration is on the average nine and a half years.

(3) **The very long Kondratieff Cycle.** In 1925, N.D. Kondratieff, the Russian economist, came to the conclusion that there are longer waves of cycles of more than 50 years duration, made of six Jugler cycles. A very long cycles has come to be known s the Kondratieff wave.

(4) **Building Cycles.** Another type of cycle relates to the construction of buildings which is of fairly regular duration. Its duration is twice that of the major cycles and is on an average of 18 years' duration. Such cycles are associated with the names of Warren and Pearson.

(5) **Kuznets Cycle.** Simon Kuznets, propounded a new type of cycle , the secular swing of 16-22 years which is so pronounced that it dwarfs the 7 to 11 years cycle into relative insignificance. This has come to be known as the Kuznets Cycle.

CHARACTERISTICS OF BUSINESS CYCLES

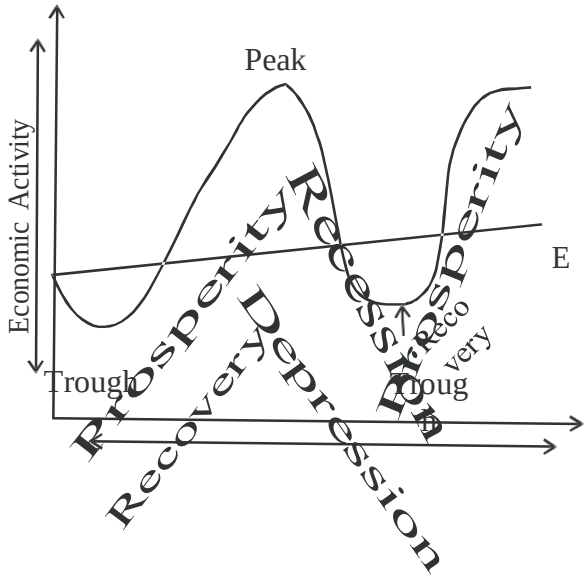
Business cycles possess the following characteristics:

1. Cyclical fluctuations are wave-like movements
2. Fluctuations are recurrent in nature
3. They are non-periodic or irregular. In other words, the peaks and troughs do not occur at regular intervals.
4. They occur in such aggregate variables as output, income, employment and prices.
5. These variables move at about the same time in the same direction but at different rates.
6. The durable goods industries experience relatively wide fluctuations in output and employment but relatively small fluctuations in prices. On the other hand, nondurable goods industries experience relatively wide fluctuations in prices but relatively small fluctuations in output and employment.
7. Business cycles are not seasonal fluctuations such as upswings in retail trade during Diwali or Christmas.
8. They are not secular trends such as long-run growth or decline in economic activity.
9. Upswings and downswings are cumulative in their effects.

Thus business cycles are recurrent fluctuations in aggregate employment, incomeoutput and price level.

PHASES OF A BUSINESS CYCLE

A typical cycle is generally divided into four phases: (1) expansion or prosperity or the upswing; (2) recession or upper-turning point; (3) contraction or depression or downswing; and (4) revival or recovery or lower-turning point. These phases are recurrent and uniform in the case of different cycles. But no phase has definite periodicity or time interval. As pointed out by Pigou, cycles may not be twins but they are of the same family. Like families they have common characteristics that are capable of description. Starting at the trough or low point, a cycle passes through a recovery and prosperity phase, rises to a peak, declines through a recession and depression phase and reaches a trough. This is shown in Figure 18.1 where E is the equilibrium position. We describe below these characteristics of a business cycle.



O

Time

Fig. 18.1

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Recovery

We start from a situation when depression has lasted for some time and the revival phase or the lower-turning point starts. The "originating forces" or "starters" may be exogenous or endogenous forces. Suppose the semi-durable goods wear out which necessitate their replacement in the economy. It leads to increased demand. To meet this increased demand, investment and employment increase. Industry begins to revive. Revival also starts in related capital goods industries. Once begun, the process of revival becomes cumulative. As a result, the levels of employment, income and output rise steadily in the economy. In the early stages of the revival phase, there is considerable excess or idle capacity in the economy so that output increases without a proportionate increase in total costs. But as time goes on, output becomes less elastic; bottlenecks appear with rising costs, deliveries are more difficult and plants may have to be expanded. Under these conditions, prices rise. Profits increase. Business expectations improve. Optimism prevails. Investment is encouraged which tends to raise the demand for bank loans. It leads to credit expansion. Thus the cumulative process of increase in investment, employment, output, income and prices feeds upon itself and becomes self-reinforcing. Ultimately, revival enters the prosperity phase.

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Prosperity

In the prosperity phase, demand, output, employment and income are at a high level. They tend to raise prices. But wages, salaries, interest rates, rentals and taxes do not rise in proportion to the rise in prices. The gap between prices and costs increases the margin of profit. The increase of profit and the prospect of its continuance commonly cause a rapid rise in stock market values. The economy is engulfed in waves of optimism. Larger profit expectations further increase investment which is helped by liberal bank credit. Such investments are mostly in fixed capital, plant, equipment and machinery. They lead to considerable expansion in economic activity by increasing the demand for consumer goods and further raising the price level. This encourages retailers, wholesalers and manufacturers to add to inventories. In this way, the expansionary process becomes cumulative and self-reinforcing until the economy reaches a very high level of production, known as the peak or boom.

The peak or prosperity may lead the economy to over full employment and to inflationary rise in prices. It is symptom of the end of the prosperity phase and the beginning of the recession. The seeds of recession are contained in the boom in the form of strains in the economic structure which act as brakes to the expansionary path. They are:

(i) scarcities of labour, raw materials, etc. leading to rise in costs relative to prices;
(ii) rise in the rate of interest due to scarcity of capital; and
(iii) (iii) failure of consumptionto rise due to rising prices and stable propensity to consume when incomes increase.

The first factor brings a decline in profit margins. The second makes investments costly and along with the first, lowers business expectations. The third factor leads to the piling up of inventories indicating that sales (or consumption)lag behind production. These forces become cumulative and self-reinforcing, Entrepreneurs, businessmen and traders become over cautious ad over optimism gives way to pessimism. This is the beginning of the upper turning point.

Recession

Recession starts when there is a downward descend from the 'peak' which is of a short duration. It marks the turning period during which the forces that make for contraction finally win over the forces of expansion. Its outward signs are liquidation in the stock

market, strain in the banking system and some liquidation of bank loans. And the beginning of the decline of prices. As a result, profit margins decline further because costs start overtaking prices. Some firms close down. Others reduce production and try to sell out accumulated stocks. Investment, employment, income and demand decline. This process becomes cumulative.

Recession may be mild or severe. The latter might lead to a sudden explosive situation emanating from the banking system or the stock exchange, and a panic or crisis occurs. "When a crisis, and more particularly a panic, does occur, it seems to be associated with a collapse of confidence and sudden demands for liquidity. This crisis of nerves may itself be occasioned by some spectacular and unexpected failure. A firm or a bank, or a corporation announces its inability to meet its debts. This announcement weakens other firms and banks at a time when ominous signs of distress are appearing in the economic structure; moreover, it sets off a wave of fright that culminates in a general run on financial institutions" …Such was the experience of the United States in 1873, in 1893, in 1907 and recently in 2008. In the words of M.W. Lee, "A recession, once started, tends to build upon itself much as forest fire, once under way, tends to create its own draft and give internal impetus to its destructive ability."[2]

Depression

Recession merges into depression when there is a general decline ineconomic activity. There is considerable reduction in the production of goods and services, employment, income, demand and prices. The general decline in economicactivity leads to a fall in bank deposits. Credit expansion stops because the businesscommunity is not willing to borrow. Bank rate falls considerably. According to ProfessorEstey, "This fall in active purchasing power is the fundamental background of the fall inprices, that despite the general reduction of output, characterizes the depression." Thusa depression is characterized by mass unemployment; general fall in prices, profits,wages, interest rate, consumption, expenditure, investment, bank deposits and loans;factories close down; and construction of all types of capital goods, buildings, etc. comes to a standstill. These forces are cumulative and self-reinforcing and the economyis at the trough.

The trough or depression may be short-lived or it may continue at the bottom forconsiderable time. But sooner or later limiting forces are set in motion which ultimatelytend to bring the contraction phase to end and pave the way for the revival. A cycle is thus complete.

CAUSES OF BUSINESS CYCLE

During the last several hundred years, philosophers, economists, stock brokers andmen in the street have tried to give various causes of business cycles. Some attributethem to monetary and non-monetary factors while others to psychological factors. Samuelson attributes business cycles to external and internal factors which we explainbelow:

External Factors

The external factors emphasize the causes of business cycles in the fluctuations ofsomething outside the economic system. Such external factors are sunspots, wars, revolutions, political events, gold discoveries, growth rate of population, migrations,discoveries and innovations. These outside factors change the level of national incomeby affecting either the investment or consumption component of aggregate demand. Forexample, a drought that destroys many crops due to sunspots may reduce the quantityof goods produced in the country and adversely affect both consumption and investment.

An innovation by opening the door to new markets, raw materials, products and production processes encourages new investments in plant and equipment. Inventions of railroads, electricity, telephone, automobiles, TVs, computers, etc. have led to the burst of investments in both capital and consumer goods from time to time. Discoveries of gold, oil and natural resources have led to large scale investments. Similarly, population expansion and migrations are the causes of huge investments in both housing and other infrastructure and consumer durables. All the above noted external factors have been responsible for booms in business cycles from time to time.

Internal Factors

The internal factors relate to "mechanisms within the economic system itself whichwill give rise to self-generating business cycles, so that every expansion will breed recession and contraction, and every contraction will in turn breed revival and expansion, in a quasi-regular, repeating, and never-ending chain." Haberler divides the internal factors into monetary and non-monetary which we briefly explain.

1. **Bank Credit.** Hawtrey, Friedman and other monetarists regard business cycles as "a purely monetary phenomenon". According to Hawtrey, cyclical fluctuations are caused by expansion and contraction of bank credit. These in, turn, lead to changes in the demand for money on the part of producers and traders. Bank credit is the principal means of payment. Credit is expanded or reduced by the banks by lowering or raising

the rate of interest or by purchasing and selling of securities to traders. This increases or decreases the supply of money in the economy. An increase in the money supply brings about prosperity and a decrease in the money supply leads to depression.

2. **Over Saving or Under-Consumption**. According to economists like Hobson, Foster and Douglas, business cycles are caused by over-saving or under-consumption. They argue that wide disparities of income and wealth lead to depression in the country. The rich people are not able to spend their entire income. So they save more and invest more in producing consumer goods. On the other hand, the poor people have low incomes or wages. As a result, their demand for consumer goods is low which means that there is under-consumption. According to Hobson, over saving leads to production of consumer goods in large quantities and to a boom. But under-consumption on the part of the workers due to low wages brings a fall in the demand for consumer goods.

Tocks pile up at the current level of prices. These, in turn, lead to a fall in the pricesof consumer goods and in the income of the producers. As a result, depression sets in.

3. **Over-Investment.** Hayek, Spiethoff, Cassel and Robertson find the root cause of business cycles in over-investment. According to Hayek, it is bank loans which lead to over-investment in capital goods industries relative to consumer goods industries that ultimately brings depression in the economy. When the total money supply exceeds the amount of voluntary savings, it leads to increase in the investment activity and ultimately to a boom. But banks cannot continue to give credit for long due to the shortage of voluntary savings. As a result, production will decline which will bring about a depression. Thus it is over-investment in the capital goods industries which is the cause of a boom and a depression.

4. **Competition.** According to Chapman, the main cause of business cycles is the existence of competition in an economy which leads to over-production and ultimately to a crisis (depression). Under competitive conditions, firms produce in anticipation of demand the profit motive attracts new firms. Production increases and boom starts. Competition and profits lead to overproduction and glut of commodities in the market and to fall in prices. On the other hand, the race to produce more and profit more on the part of producers increases the demand for factors of production. Competition among producers to hire more factors raises their prices. Thus costs rise which raise the prices of products. Demand falls and there is glut of commodities which eventually leads to fall in prices and to a depression.

5. **Psychological Causes.** According to Pigou, the alternating waves of "over optimism" and "over pessimism" are the sole causes of the industrial fluctuations. He

traces cyclical fluctuations to the tendency of businessmen to react excessively to the changing conditions of the economy. It is this tendency that causes alternating periods of over-production and under-production. Errors of optimism and pessimism are interacting forces. As soon as the business community discovers that it has made an error of optimism, it tries to correct it by making errors of pessimism. Each phase of the cycle produces a state of psychology which produces forces that bring about reversal of that psychology and in turn another reversal. These alternating waves of over-optimism (over-production) an over-pessimism (under-production), as a result of these reversals, are the main causes of business cycles.

6. **Innovations.** According to Schumpeter, innovations in the structure of an economy are the source of economic fluctuations. To him, "the cause of depression is prosperity." The boom consists in the carrying out of innovations in the industrial and commercial fields. The cyclical upswing is set in motion when an innovator starts making investment in his innovation of a new product. This enables him to make profit. Soon other entrepreneurs adopt this new product in "swarm-like clusters". Innovations in one field induce innovations in related fields. There is large increase in the output of new products. Consequently, money incomes and prices rise and help to create a cumulative expansion in the economy. Over optimism adds further to the boom. When there is glut of new products in the market, their prices fall, and profit margins of entrepreneurs are reduced. Banks ask for repayment of loans. The quantity of money is reduced and prices fall further. Some entrepreneurs cut down production and others are forced into liquidation. Thus the economy enters into depression.

7. **Marginal Efficiency of Capital (MEC).** According to Keynes, the cycle consists primarily of fluctuations in the rate of investment. And Fluctuations in the rate of investment are caused mainly by fluctuations in the MEC. The MEC depends on the supply price of capital assets and their prospective yield. The supply price of capital assets being stable in the short-run, the MEC is determined by the prospective yield of Capital assets. The prospective yield in turn, depends on business expectations. Fluctuations in the rte of investment are also caused by fluctuations in the rate of interest. But it is fluctuations in the MEC which are the principal cause of cyclical fluctuations.

8. Conclusion. To conclude with Samuelson, business cycles are caused both by external and internal factors. The economic system responds to fluctuations in external factors according to its internal factors, and vice versa.

EFFECTS OF BUSINESS CYCLES

Business cycles have both good and bad effects depending upon whether the economy is passing through a phase of prosperity or depression.

In the *Prosperity* Phase, "the real income consumed, real income produced and the levels of employment are high or rising and there are no idle or unemployed workers or very few of either." There is general increase in economic activity; aggregate output, demand, employment and income are at a high level. Prices are rising. Profits are increasing Stock markets are rapidly reaching new heights. Investments are increasing with liberal bank credit. This entire process is cumulative and self-reinforcing.

But different sections of the society are affected differently during the prosperityphase. The landless, factory and agricultural workers and middle classes suffer becausetheir wages and salaries are more or less fixed but the prices of commodities rise continuously. They become more poor. On the other hand, businessmen, traders, industrialists, real estate holders, speculators, landlords, shareholders and others withvariable incomes gain. Thus the rich become richer and the poor poorer.

The social effects are also bad. Lured by profit, there is hoarding, black-marketing, adulteration, production of substandard goods, speculation, etc. Corruption spreads inevery walk of life. When the economy is nearing the full employment level of resources,the ill-effects on production start appearing. Rising prices of raw materials and increasein wages raise costs of production. As a result, profit margins decline. There is prices in interest rates due to scarcity of capital which makes investment costly. These two factors lower business expectations. Lastly, the demand for consumer goods does notrise due to inflationary rise in prices. This leads to piling up of inventories (stocks) withproducers and traders. Thus sales lag behind production. There is decline is prices. Producers, businessmen and traders become pessimists and the recession starts.

During recession, profit margins decline further because costs start rising more thanprices. Some firms close down. Others reduce production and try to sell accumulated stocks. Investment, output, employment, income, demand and prices decline further.This process becomes cumulative and recession merges into depression.

During a depression, there is mass unemployment. Prices, profits and wages areat their lowest levels. Demand for goods and services is the minimum. Investment, bankdeposits and bank loans are negligible. Construction of all types of capital goods, buildings, etc. is at a standstill. There is mass unemployment in the economy. The government revenues from direct and indirect taxes decline. The real burden of the debt increases. The economic

development of the country suffers.

18.4 Theories of Business cycles

Kaldor's Theory

In the model of the trade cycle developed by Nicholas Kaldor, consumption (or saving) is a function of income while investment is directly related to income andinversely related to stock of the capital. In other words, the investment demand function is of the capital-adjustment type. Kaldor's theory of trade cycle appeared in 1940, barely four years after the publication of Keynes' book. The General Theory of Employment, Interest and Money." Although Keynes devoted Lesson 22 of the General Theory to "Notes on the Trade Cycle," he did not develop any full-fledged theory of the trade cycle because his chief concern was to develop an alternative theory of income and employment which could replace the classical theory of income an employment. Kaldor's theory is a very simple and neat discussionof trade cycle based on the Keynesian saving-investment analysis.

Kaldor's trade cycle theory is simply an extension of the income determinationmodel where the saving supply function was of the form $S = -a+SY$ and the investment demand function was of the form $I = |_A + eY$. The model of equilibrium income determination discussed in that lesson has been shown in Fig. 18.2. The stability condition required there was that the marginal propensity to invest (MPI) should beless than the marginal propensity to save (MPS), i.e., MPI < MPS. In other words,the slope of the investment demand function should be less than the slope of the saving supply function. This means that for the stability of equilibrium, the investmentdemand function must intersect the saving supply function from above. If the MPI >MPS, i.e., if the investment demand function intersects the saving supply function frombelow, the resulting equilibrium will be unstable. Part A and Part B of Fig. 18.2 showthe stable and unstable equilibrium positions. In both

the situations, the equilibriumincome is Ye corresponding to which the planned saving equals the planned investment.

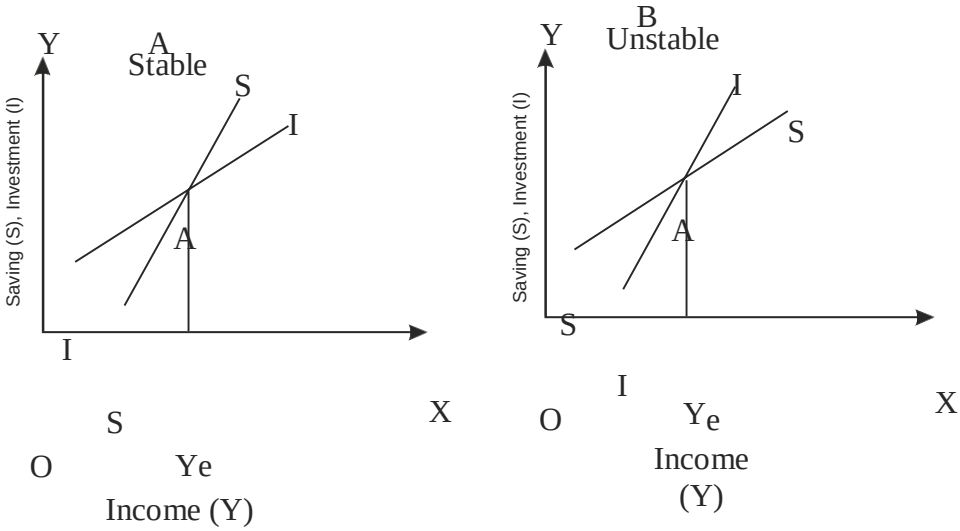


Fig. 18.2

In Fig. 18.2 the saving supply and investment demand functions are linear. From the point of view of trade cycle theory, these offer very little as in either case - stable or unstable equilibrium - trade cycle will not occur while in the real world cyclical fluctuations have certainly occurred. For his business cycle analysis, Kaldor takes the non-linear saving and investment functions. According to Kaldor, the saving supply and the investment demand functions cannot both be linear overthe entire range of changes in the income which take place during the course of business cycle.

Dividing the full trade cycle into relatively low, normal and relatively high income phases, the marginal propensity to invest will not be the same during all the three phases. The linear investment demand function, however, makes us believe that it will be uniform. During the course of business cycle, the non linear investment demand function will behave in such a manner that the MPI or the slope of the investment function will be relatively low at both relatively low and relatively high levels of income. To put differently, the investment demand function is likely to be income inelastic at low income levels due to the presence of excess plant capacity in the economy. It is also likely to

be so at very high levels of incomes due to the high construction costs and the high cost and increasing difficulty of borrowing funds.

According to Kaldor, the non-linear investment demand function has the shape as own in Fig. 18.3. Like the investment demand function, the saving supply function is also non-linear with the MPS varying corresponding to different income ranges. Thus, during the course of the trade cycle both for the relatively low and relatively high levels of income the MPS and, therefore, the slope of the saving supply function will be high. Figure 18.3B shows such a saving supply function. In other words, the saving supply function is income -elastic both at very low and very high levels of income. The saving supply function behaves so because when income is very low, people try to maintain their former high standard of living to which they are accustomed with the result that a further fall in their income is accompanied by almost the full amount of

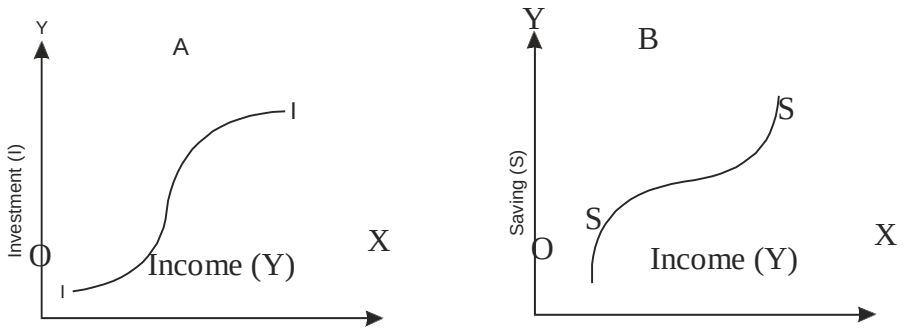


Fig. 18.3

Fall in savings. When income is very high, further increases in income are accompanied by a very large proportional increase in savings because people expect these high levels of income to be transitory. Consequently, they do not increase their consumption at all or at any rate increase it very insignificantly. Thus, the saving supply function has a steep slope both at relatively low and at relatively high levels of income.

By combining the investment demand and saving supply functions of Fig. 18.3 A and Figure 18.3 B into a single diagram as shown in Fig. 18.4 we obtain multiple equilibria, both stable and unstable. At equilibrium points A and B, the slope of the saving supply function is higher than the slope of the investment demand function. Consequently, the marginal propensity to save s greater than the marginal propensity to invest i.e., MPS > MPI. Accordingly, the equilibrium points A and B which correspond

to relatively low and relatively high levels of national income are points of stable equilibrium and Y_A and Y_B are stable income levels. Below Y_A and between Y_B and Y_C levels of income investment is greater than saving i.e., *I* >*S*. consequently, income rises until it reaches Y_A or Y_C. At income levels ranging between Y_A and Y_B or above Y_C levels of income saving exceeds investment, i.e., S>I. Consequently, the correspondingincome Y_B is unstable income. If income is between Y_C and Y_B, it will rise to Y_C and if it is between Y_B and Y_A, it will fall to Y_A. In other words, if the level of income is even slightly disturbed from Y_B, it will never tend back to Y_B. Moving farther awayfrom Y_B, it will move either toward Y_C or toward Y_A stabilizing itself at either of these
two stable income levels depending on the direction of disturbance or fluctuation. The economy will attain stability only either at some particular high level of income, such as Y_C, or at some particular low level of income, such as Y_A.

Fig. 18.4 does not, however, explain anything about the occurrence of the trade cycle composed of the alternating contractions and

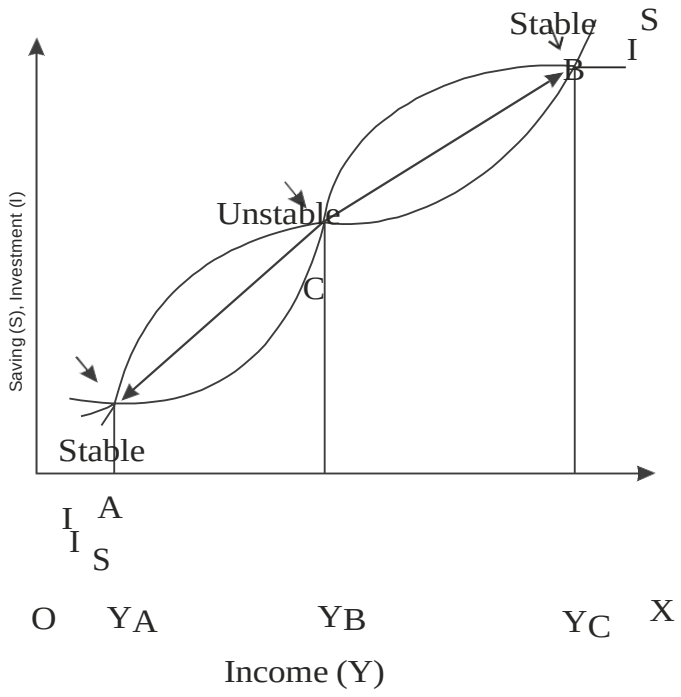

Stable
S
I
B
Unstable
C
Saving (S), Investment (I)
Stable
A
I
I
S
O
YA
YB
YC
X
Income (Y)

Fig. 18.4

expansions. It shows nothing more than the two positions of stable equilibriumtowards either of which income will tend to move. According to Kaldor, "the key to theexplanation of the trade cycle is to be found in the fact that each of these two positionsis stable only in the short period; that as activity continues at either one of these levels. Forces gradually accumulate which sooner or later will render that particular positionunstable." If we can show that stable equilibrium at B becomes unstable over time forcing a movement towards A and vice versa we can move ahead to show the generation of the trade cycle.

Fig. 18.4 shows that both the saving and investment vary as income changesduring the course of trade cycle. However, apart from income, saving an investment arealso affected by another variable. According to Kaldor, the capital stock in the economyalso causes cyclical changes in saving and investment. Saving is a direct function of thecapital stock such that higher the capital stock higher is the amount of saving & viceversa. In view is income function of the capital stock, such that for any level of incomehigher the capital stock, smaller is the amount of investment and vice versa.

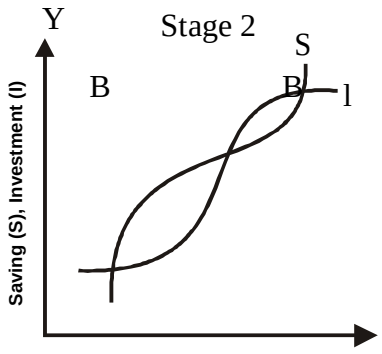
According to Kaldor, the investment and saving curves drawn in Fig. 18.4 areshort-run curves which shift over time. At the high level of income, investment willincrease more rapidly. Consequently, the economy's capital stock will continue to grow.After sometime, however, additions to capital stock will cause a downward shift in theinvestment demand curve. Saving supply curve will shift upward at high levels of incomeover time. This statement is similar to the view held by the under-consumptionists. Thesaving supply curve will shift upward at high levels of income because purchases ofconsumer durables will not increase as income increases. Fig. 16.5 shows changes thein the equilibrium position as the capital stock of the economy changes over time.

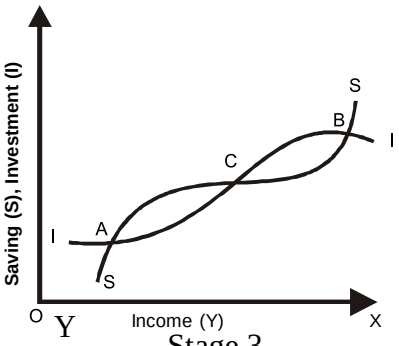
In Fig. 18.5, stage I corresponds to Fig. 18.4. We assume, to begin with, thatthe economy is initially in equilibrium at point B at relatively high or above normal levelof income. Corresponding to this high level of equilibrium income, investment is correspondingly high. Higher the rate of investment, more rapid is the increase in economy's total capital stock. It was explained in the previous Lesson that as the capitalstock grows, ceteris paribus, the marginal efficiency of capital falls causing a downwardshift in the marginal efficiency of investment schedule which in terms of Fig. 18.5 means a downward shift in the investment curve. At the same time an increase in economy'scapital stock, which is an increase in the economy's wealth, shifts upward the savingcurve. The upward shift in the

saving supply curve and a downward shift in the investmentdemand curve gradually shift the position of B to the left and that of C to the right bringing the two points closer to one another as shown in Stage 2 in Fig. 18.5. Eventually,as a result of the gradual upward and downward shifts in the saving and investmentcurves respectively these curves become tangential and points B and C coincide asshown in Stage 3 diagram of Fig. 18.5.

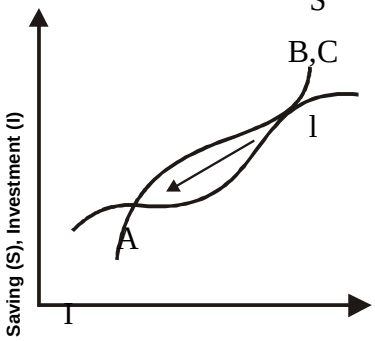
Both to the right and the left of the point of tangency between the investmentdemand and saving supply curves, saving is greater than investment, i.e., I. Consequently,the equilibrium at the B,C position in Stage 3 is unstable in a downward direction. Since deflationary pressures are at work, the economy will move downward from this unstable equilibrium position toward point A which shows the stable equilibrium position corresponding to very low level of income. At this low level of income, there will be the problem of excess plant capacity. Consequently, the entire capital stock which has depreciated will not be replaced. Thus, gross investment will be smaller than depreciation and, therefore, capital stock will decrease tending to shift the investment demand curve II upward. On the other hand at low income the saving supply curve SS will either fall (as consumer durables wear out causing demand for their replacement and as the demand increases for buying more new consumer durable goods) or flatten out. These shifts in the II and SS curves will tend to move point C closer to point A as shown

Stage 1



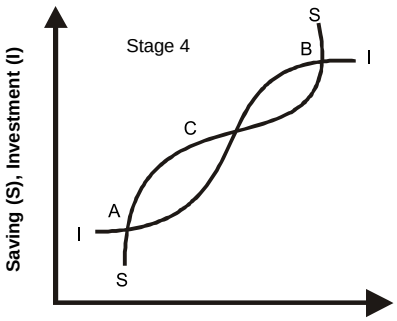


Stage 3

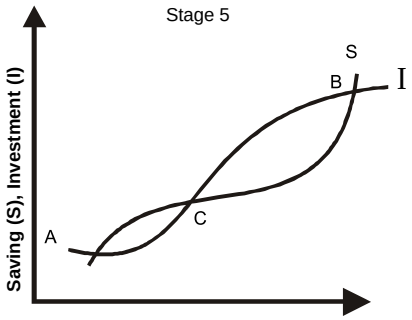


S

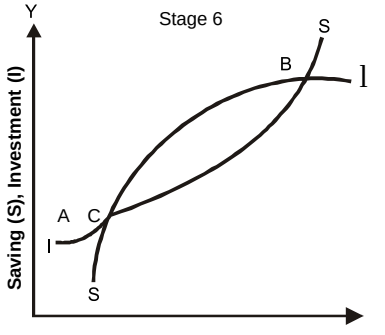
O Income (Y) X



Income (Y)



Income (Y)



O Income (Y)

Fig. 18.5

in stage 5 in Fig. 18.5 Eventually, points C and A will coincide as shown in Stage 6 in Fig. 18.5. Since both to the right and left of the point of tangency between the II and SS curves, shown by the position A, C, investment is greater than saving i.e., $I > S$, inflationary pressures are at work in the economy. Consequently, the economy will move upward toward point B. This process in which the economy moves downward and upward between points A and B can continue in definitely. Fig. 18.5 shows one complete trade cycle. The cycles generated by this mechanism will not necessarily be of the same length nor will expansions and contractions be necessarily symmetrical. These characteristics will depend on the slopes of and rate at which the II and *SS* curves shift. It is also possible that no trade cycle will occur.

Kaldor's theory is simple to understand and is quite ingenious. The cyclical process explained by Kaldor is self-generating. The upward movement to high levels of income generates forces which produce a downward movement to low levels of income and vice versa. These cycle generating forces - changes in the average propensity to save and increase and decrease in the capital stock - are inherent in the economic process. In other words, these forces are endogenous. In Kaldor's model, the non-linearities of the investment demand and saving supply functions which are due to excess capacity, the high costs of construction and the high cost and increased difficulty of borrowing funds are of crucial importance in explaining the trade cycle.

Kaldor's theory does not employ the acceleration principle in order to explain the cycle. In Kaldor's model, investment is related directly to the level of income and inversely to the amount of economy's capital stock. This approach does away with the unrealistic and inflexible tying of investment to changes in income which is implied in the rigid acceleration principle, retaining all the same the basic idea of the acceleration principle. Kaldor's model, which employs the investment demand function of the type $I_t = I_a = e\ Y_{t-1} - h\ K_t$ incorporating the capital stock adjustment principle, does not make any direct reference to the rate of change of income and output over the successive periods. Although the model retains the link between changes in the aggregate output and investment but it has been done in such a way as to avoid some of the weaknesses

of the rigid acceleration principle.

18.5 SAMUELSON'S MODEL OF BUSINESS CYCLE

Prof. Samuelson constructed a multiplier-accelerator model assuming one period lag and different values for the MPC (□) and the accelerator (□) that result in changes in the level of income pertaining to five different types of fluctuations.

The Samuelson model is

$$Yt = Gt+Ct+1t \quad \text{- (1)}$$

Where Yt is national income Y at time t which is the sum of government expenditure Gt, consumption expenditure Ct and induced investment It.

$$Ct = \square \qquad \ldots(2)^{**}$$

$$It = \square(C_t^{t-1} - C_{t-1}) \qquad \ldots(3)$$

Substituting equation (2) in (3) we have,

$$I_t = \square(\square Y_{t-1} - \square Y_{t-2}) \qquad \ldots.(4)$$

$$I_t = \square\square Yt\text{-}1 - \square\square Y_{t-2} \qquad \ldots.(5)$$

$$G_t = 1$$

Substituting equations (2), (4) and (5) in (1) we have

$$Y_t = I + \square Y_{t-1} + \square\square Y_{t-1} - \square\square Y_{t-2} \qquad \ldots(6)$$

$$= I + \square(Y^{t-1} + \square\square Y_{t-1}) - \square\square Y_{t-2}$$

$$= I + \square(I + \square)\ Y_{t-1} - \square\square Y_{t-2} \qquad \ldots(8)$$

According to Samuelson, "If we know the national income for two periods, the national income for the following period can be simply derived by taking a weighted sum. The weights depend, of course, upon the values chosen for the marginal propensity to consume and for the relation (i.e. accelerator)". Assuming the value of the marginal propensity to consume to be greater than zero and less than on ($0< \square <1$) and of the accelerator greater than zero ($\square > 0$). Samuelson explains five types of cyclical fluctuations which are summarized in the Table 1.

Table 1. Samuelson's Interaction Model

Case	Values	Behaviour of the Cycle
1	$\square = 0.5, \square = 0$	Cycleless Path
2	$\square = 0.5, \square = 1$	Damped Fluctuations
3	$\square = 0.5, \square = 2$	Fluctuations of Constant Amplitude
4	$\square = 0.5, \square = 3$	Explosive cycles
5	$\square = 0.5, \square = 4$	Cycleless Explosive Path

Case 1: Samuelson's case 1 shows a cycleless path because it is based only on the multiplier effect, the accelerator playing no part in it. This is shown in Fig. 18.6(A).

Case 2 shows a damped cyclical path fluctuating around the static multiplier level and gradually subsiding to that level, as shown in Fig. 18.6(B).

Case 3 depicts cycles of constant amplitude repeating themselves around the multiplier level. This case is depicted in Fig 18.6(C).

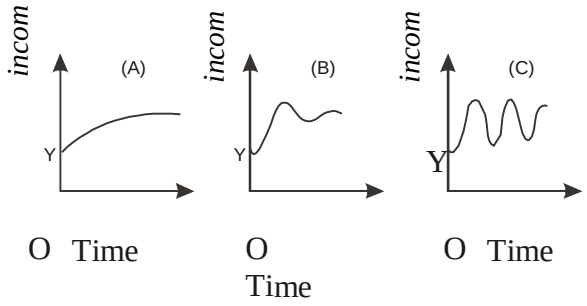
Case 4 reveals anti-damped or explosive cycles, see Fig. 18.6(D)

Case 5 relates to a cycleless explosive upward path eventually approaching a compound interest rate of growth, as shown in Fig. 18.6 (E)

Of the five cases explained above, only three cases 2, 3 and 4 are cyclical in nature. But they can be reduced to two because case 3 pertaining to cycles of constant

amplitude has not been experienced. So far as case 2 of damped cycles is concerned

these cycles have been occurring irregularly in a milder form over last half century. Generally, cycles in the post-World War II period have been relatively damped compared to those in the inter-World War II period. They are the result of "such disturbances - which may be called erratic shocks - arising from exogenous factors, such as wars, changes in crops, inventions and so on 'which' might be expected to come along with fair persistence." But it is not possible to measure their magnitude.



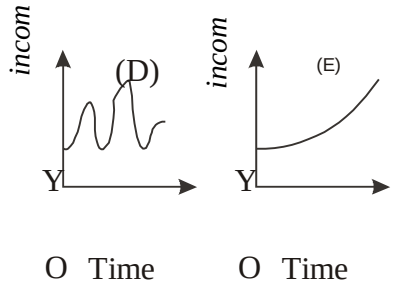


Fig. 18.6

Case 4 of explosive cycles has not been found in the past, its absence being the result of endogenous economic factors that limit the swings. Hicks has, however, built a model of the trade cycle assuming values that would make for explosive cycles kept in check by ceilings and floors.

Critical Appraisal of the Model

The interaction of the multiplier and the accelerator has the merit of raising national income at a much faster rate than by either the multiplier or the accelerator alone. It serves as a useful tool not only explaining business cycles but also as a guide to stabilization policy. As pointed out by Prof. Kurihara, "It is in conjunction with the multiplier analysis based on the concept of marginal propensity to consume (being less than one) that the acceleration principle serves as a useful tool of business cycle analysis and a helpful guide to business cycle policy." The multiplier and the accelerator combined together produce cyclical fluctuations. The greater the value of the accelerator

(□), the greater is the chance of an explosive cycle. The greater the value of the multiplier, the greater the chance of a cycleless path.

Limitations

Despite these apparent uses of the multiplier-accelerator interaction, this analysis has its limitations:

(1) Samuelson is silent about the length of the period in the different cycles explained by him.

(2) This model assumes that the marginal propensity to consume (□) and the accelerator (□) are constants, but in reality they change with the level of income so that this is applicable only to the study of small fluctuations.

(3) The cycles explained in this model oscillate about a stationary level in a trendless economy. This is not realistic because an economy is not trendless but it is in a process of growth. This has led Hicks to formulate his theory of the trade cycle in a growing economy.

(4) According to Duesenberry, it presents a mechanical explanation of the trade cycle because it is based on the multiplier-accelerator interaction in rigid form.

(5) It ignores the effects of monetary changes upon business cycles.

18.5 Hicks's Theory of Business Cycle

J.R. Hicks in his book *A Contribution to the Theory of the Trade Cycle* builds his theory of business cycle around the principle of the multiplier-accelerator interaction. To him, "the theory of the acceleration and the theory of the multiplier are the two sides of the theory of fluctuations." Unlike Samuelson's model, it is concerned with the problem of growth and of a moving equilibrium.

Ingredients of the theory

The ingredients of Hicks's theory of trade cycle are warranted rate of growth, consumption function, autonomous investment, an induced investment function, and multiplier-accelerator relation.

The warranted rate of growth is the rate which will sustain itself. It is consistent with saving-investment equilibrium. The economy is said to be growing at the warranted rate when real investment and real saving are taking place at the same rate. According to Hicks, it is the multiplier-accelerator interaction which weaves the path of economic fluctuations around the warranted growth rate.

The consumption function takes the form $C_t - \square Y_{t-1}$. Consumption in period t is regarded as a function of income *(Y)* of the previous period *(t-1)*. The consumption lags behind income, and the multiplier is treated as a lagged relation.

The autonomous investment is independent of changes in the level of output. Hence it is not related to the growth of the economy.

The Induced Investment, on the other hand, is dependent on changes in the level of output. Hence it is a function of the growth rate of the economy. In the Hicksian theory, the accelerator is based on induced investment which along with the multiplier brings about a *upturn*. The accelerator is defined by Hicks as the ratio of induced investment to the increase in income. Given constant values of the multiplier and the accelerator, it is the 'leverage effect' that is responsible for economic fluctuations.

Assumptions of the Theory

The Hicksian theory of trade cycle is based on the following assumptions:

(1) Hicks assumes a progressive economy in which autonomous investment increases at a constant rate so that the system remains in a moving equilibrium.

(2) The saving and investment coefficients are disturbed overtime in such a way that an upward displacement from equilibrium path leads to a lagged movement away from equilibrium.

(3) Hicks assume constant values for the multiplier and the accelerator.

(4) The economy cannot expand beyond the full employment level of output. Thus "the full employment ceiling" acts as a direct restraint on the upward expansion of the economy.

(5) The working of the accelerator in the downswing provides an indirect restraint on the downward movement of the economy. The rate of decreasein the accelerator is limited by the rate of depreciation in the downswing.

(6) The relation between the multiplier and accelerator is treated in a lagged manner, since consumption and induced investment are assumed to operate with a time lag.

(7) It is assumed that the average capital-output ratio (v) is greater than unity and that gross investment does not fall below zero. Thus the cycles are inherently explosive but are contained by ceilings and floors of the economy.

18.6 The Hicksian Theory

Hicks explain his theory of the trade cycle in terms of Fig. 18.7. Line *AA* shows the path of *autonomous* investment growing at a constant rate. *EE* is the equilibrium

level of output which depends on *AA* and is deduced from it by the application of the multiplier accelerator interaction to it. Line *FF* is the full employment ceiling level above the equilibrium path EE and is growing at the constant rate of autonomous investment. LL is the lower equilibrium path of output representing the floor or 'slump equilibrium line'.

Hicks begins from a cycle less situation P_O on the equilibrium path *EE* when an increase in the rate of autonomous investment leads to an upward movement in income. As a result, the growth of output and income propelled by the combined operation of the multiplier and accelerator moves the economy on to the upward expansion path from P_O to P_1. According to Hicks, this upswing phase relates to the standard cycle which will lead to an explosive situation because of the given values of the multiplier and the accelerator. But this does not happen because of the upper limit or ceiling set by the full employment level *FF*. Hicks writes in this connection: "I shall follow Keynes in assuming that there is some point at which output becomes inelastic in response to an increase in effective demand." Thus certain bottlenecks of supply emerge which prevent output from reaching the peak and instead encounter the ceiling at P1.When the economy hits the full employment ceiling at P_1, it will creep along the ceiling for a period of time to P_2 and the downward swing will not start immediately. The economy will move along the ceiling from P_1 to P_2 depending upon the time period of the investment lag. The greater the investment lag, the more the economy will move along the ceiling path. Since income at this level is decreasing relative to the previous stage of the cycle, there is a decreased amount of investment. This much of investment is insufficient to keep the economy at the ceiling level, and then the downturn starts.

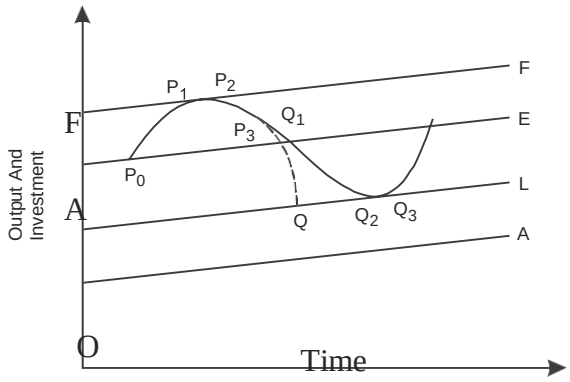


Fig. 18.7

During the downswing, "the multiplier accelerator mechanism sets in reverse, falling

investment reducing income, reduced income reducing investment, and so on, progressively. If the accelerator worked continuously, output would plunge downward below the equilibrium level EE, and because of explosive tendencies, to a greater extent than it rose above it." The fall in output in this case might be a steep one, as shown by P_2P_3Q. But in the downswing, the accelerator does not work so swiftly as in the upswing. If the slump is severe, induced investment will quickly fall to zero and the value of the accelerator becomes zero. The rate of decrease in investment is limited by the rate of depreciation. Thus the total amount of investment in the economy is equal to autonomous investment minus the constant rate of depreciation. Since autonomous investment is taking place, the fall in output is much gradual and the slump much longer than the boom, as indicated by Q1Q2. At Q2, the slump reaches the bottom or floor provided by the LL line. The economy does not turn upward immediately from Q2 but will move along the slump equilibrium line to Q3 because of the existence of excess capacity in the economy. Finally, when all excess capacity is exhausted, autonomous investment will cause income to rise which will in turn lead to an increase in induced investment so that the accelerator is triggered off which along with the multiplier moves the economy toward the ceiling again. It is in this way that the cyclical process will be repeated in the economy.

Its Criticisms

The Hicksian theory of the business cycle has been severely criticized by Duesenberry, Smithies and others on the following grounds:

1. **Value of Multiplier not Constant.** Hicks model assumes that the value of the multiplier remains constant during the different phases of the trade cycle. This is based on the Keynesian stable consumption function. But this is not a realistic assumption, as Friedman has proved on the basis of empirical evidence that the marginal propensity to consume does not remain stable in relation to cyclical changes in income. Thus the value of the multiplier changes with different phases of the cycle.

2. **Value of Accelerator not Constant**. Hicks has also been criticized for assuming a constant value of the accelerator during the different phases of the cycle. The constancy of the accelerator presupposes a constant capital-output ratio. These are unrealistic assumptions because the capital output ratio is itself subject to

change due to technological factors, the nature and composition of investment, the gestation period of capital goods, etc. Lundberg, therefore, suggests that the assumption of constancy in accelerator should be abandoned for a realistic approach to the understanding of trade cycles.[11]

3. **Autonomous Investment not Continuous.** Hicks assume that autonomous investment continues throughout the different phases of the cycle at a steadypace. This is unrealistic because financial crisis in a slump may reduce autonomousinvestment below its normal level. Further, it is also possible, as pointed out bySchumpeter, that autonomous investment may itself be subject to fluctuations due to a technological innovation.

4. **Growth not Dependent only on changes in Autonomous Investment.** Another weakness of the Hicksian model is that growth is made dependent upon changes in autonomous investment. It is a burst of autonomous investment from the equilibrium path that leads to growth. According to Prof. Smithies, the source of growth should lie within the system. In imputing growth to an unexplained extraneous factor, Hicks has failed to provide a complete explanation of the cycle.

5. **Distinction between Autonomous and Induced Investment not Feasible.** Critics like Duesenberry and Lundberg point out that Hicks's distinction between autonomous and induced investment is not feasible in practice. As pointed out by Lundberg, every investment is autonomous in the short run and a major amount of autonomous investment becomes induced in the long run. It is also possible that part of a particular investment may be autonomous and a part induced, as in the case of machinery. Hence, this distinction between autonomous and induced investment is of doubtful validity in practice.

6. **Ceiling fails to explain adequately the onset of Depression.** Hicks has been criticized for his explanation of the ceiling or the upper limit of the cycle. According to Duesenberry, the ceiling fails to explain adequately the onset of depression. It may at best check growth and not cause a depression. Shortage of resources cannot bring a sudden decline in investment and thus cause a depression. The recession of 1953-54 in America was not caused by shortage of resources. Further, as admitted by Hicks himself, depression may start even before reaching the full employment ceiling due to monetary factors.

7. **Explanation of Floor and Lower Turning Point not Convincing.** Hicks's

explanation of the floor and of the lower turning point is not convincing. According to Hicks, it autonomous investment that brings a gradual movement towards the floor and it is again increase in autonomous investment at the bottom that leads to the lower turning point. Harrod doubts the contention that autonomous investment would be increasing at the bottom of the depression. Depression may retard rather than encourage autonomous investment. Further, Hicks's contention that revival would start with the exhaustion of excess capacity hasnot been proved by empirical evidence. Rendings Fels's study of the Americanbusiness cycles in the 19th century has revealed that the revival was not dueto the exhaustion of excess capacity. Rather in certain cases, revival startedeven when there was excess capacity.

8. **Full Employment level not Independent of Output Path**. Another criticism leveled against Hicks's model is that the full employment ceiling. As defined by Hicks, it is independent of the path of output. According to Dernburg and McDougall, the full employment level depends on the magnitude of the resources that are available to the country. The capital stock is one of the resources. When the capital stock is increasing during any period, the ceiling is raised. "Since the rate at which output increases determines the rate at which capital stock changes, the ceiling level of output will differ depending on the time path of output."

9. **Explosive Cycle not Realistic**. Hicks assumes in his model that the average capital-output ratio (v) is greater than unity for a time lag of one year or less. Thus explosive cycles are inherent in his model. But empirical evidence shows that the response of investment to a change in output (v) is spread over many periods. As a result, there have been damped cycles rather than explosive cycles.

10. **Mechanical Explanation of Trade Cycle.** Another serious limitation of the theory is that it presents a mechanical explanation of the trade cycle. This is because the theory is based on the multiplier-accelerator interaction in rigid form, according to Kaldor and Duesenberry. Thus it is a mechanical sort of explanation in which human judgement, business expectations and decisions play little or no part. Investment plays a leading role based on formula rather than on judgment.

11. **Contraction Phase not longer than Expansion Phase.** Hicks has been criticized for asserting that the contraction phase is longer than expansion phase of trade cycle. But the actual behaviour of the postwar cycles has shown that

the expansionary phase of the business cycle is much longer than the contractionary phase.

Conclusion : Despite these apparent weaknesses of the Hicksian model, it is superior to all the earlier theories in satisfactorily explaining the turning points of the business cycle. To conclude with Dernburg and McDougall, "The Hicks's model serves as a useful framework of analysis which, with modification, yields a fairly good picture of cyclical fluctuation within a framework of growth. It serves especially to emphasize that in a capitalist economy characterized by substantial amounts of durable equipment, a period of contraction inevitably follows expansion. Hicks's model also pinpoints the fact that in the absence of technical progress and other powerful growth factors, the economy will tend to languish in depression for long periods of time." The model is at best suggestive.

18.7 Let us sum up

1. Economic activity is subject to periodical fluctuation of, fluctuation which occursin a cyclical fashion in any business activity are called trade cycles or businesscycles.

2. Samuelson's model of business cycle relates to three sector closed system andits income equation is expressed as

$$Y+C_T+I_t$$

Where Y_T = National income at time t, C_t = Consumption expenditure, I_t =induced investment, G_t = Government expenditure.

3. Hicks developed his theory of trade cycle by combining principles of multiplier and accelerator - which he has borrowed from Keynes and has integrated the concepts of autonomous and induced investment a distinction originally made by Roy Harrod in his growth theory.

4. Kaldor's model of business cycle is based on the Keynesian idea of saving and investment. Kaldor thinks inequality between ex - antes saving and ex- antes investment which creates cyclical movements and considers influence of capital stock as investment decisions. Further, he thinks demand for capital goods to levels of income and not to rate of its change.

5. Prof. Von Hayek has developed a theory of trade cycle in terms of monetary over investment and consequent over production. In his opinion, there is natural or equilibrium rate of interest at which demand for loanable funds is equivalent to supply of funds through voluntary savings. At the same time, there is market rate of interest based upon demand and supply of loanable funds in market.

6. According to Hawtrey basic cause of trade cycle is a expansion and contraction of money in a country. In his opinion, change is the rate of interest cause changes in borrowing from banks and thus changes in supply of money which results changes in demand for commodities and services and variations in business activity.

18.8 Keywords:

Business Cycle: The recurring patterns of expansion and contraction in economic activity.

Boom: A phase in the business cycle characterized by rapid economic growth and low unemployment rates.

Recession: A period defined by two consecutive quarters of negative GDP growth.

Depression: A severe and prolonged downturn in economic activity.

Recovery: The phase during which economic activity begins to increase following a recession.

Multiplier-Accelerator Interaction: A theory that explains business cycles through the interplay of consumption and investment.

Real Business Cycle Theory: A theory that attributes economic fluctuations to real shocks rather than monetary factors.

18.9 Suggested readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

18.10 Hints to Check Your progress

Q1. 18.0
Q2. 18.3
Q3. 18.5
Q4. 18.5
Q5. 18.4

18.11 Examination Oriented Questions

- Define trade cycle and its phrase. Explain monetary theories of trade cycle in brief.

- Discuss Kaldor's theory of business cycle. Point out its limitations?
- Critically examine Hick's theory of business cycles.
- In Hicks business cycle theory the multiplier, the accelerator and the warranted rate of growth of income play a crucial role. Elucidate?
- Discuss Samuelson's model of business cycle.

GOODWIN'S MODEL OF BUSINESS CYCLE

STRUCTURE

19.0 Objectives

The main objectives of this lesson are to enable you to:

- Discuss the features and assumptions of Goodwin model.
- Describe the analysis and application of the model.

19.1 Learning outcomes

After going through this lesson, you shall be able to:

- Discuss the applicability of the Goodwin model.
- Explain the difference between Goodwin model and Hicks model of business cycle.

19.2 Introduction

Dear learner, the Goodwin model, first proposed by the American economist Richard M. Goodwin in 1967. It is often known as Goodwin's class struggle model, a dynamic model used to analyze economic growth and business cycles. It is an extension of Hicks Multiplier-Accelerator model. Goodwin's presents a non-linear model of trade cycle as against Hicks' linear model. It focuses on the interaction between labor and capital, specifically how wage share and employment rate affect investment and, consequently, economic growth. The model highlights how the conflict between workers and capitalists can lead to cyclical fluctuations in the economy.

Features of the Model

The main features of Goodwin's model are:

(a) A linear consumption function $C = \alpha Y + C_0$ where α = consumption-income ratio, C_0 = autonomous consumption.

(b) Net investment *(I)* is equal to the rate of change in capital stock which is the result of adjustment between actual capital, K and desired capital, *K* and $K = \beta Y + \alpha$ where β is the accelerator.

(c) Desired capital K is proportional to output, Y.

(d) Net investment changes due to a change in output which in turn, changes the level of desired capital. As a result, the accelerator which is non-linear brings a chang_e in output via net investment.

Goodwin shows three possibilities for net investment:

(1) When $K^{-} > K$, there will be increase in the rate of net investment which will

shift the economy to full capacity output for capital goods industries

(2) When $K = K$, this situation is maintained by meeting the replacement demand and by keeping net investment as zero, *i.e.*, $I = O$.

(3) When $K > K$, the adjustment takes place with the scrappage rate, K_2.

19.3 Analysis and Application

19.3 a. Analysis and application through Cyclical Path

To explain the cyclical path of Goodwin's model, we start with K = K- situation where the equilibrium level of output Y = ------ ($C + I$) and 1–□

I = □ is the technological growth factor.

These take the system along an equilibrium path. This path is similar to the Hicksian line *EE*. The Hicksian path relates to a steady increase in autonomous investment while Goodwin's path relates to a rise in desired capital resulting from a continuous technical change. Any divergence from this equilibrium path will not bring the economy toward it and there will be continuous fluctuations around it.

Take $K > K$, the desired capital stock being more than the actual capital, investment increases and the propelling forces of multiplier and accelerator will push the system in the upward direction. During this phase of expansion, given the constant rate of depreciation, net investment increases in proportion to the change in output. As the accelerator of Goodwin's model is non-linear, the increase in net investment is not related to the increase in output but to the difference between the actual stock *(K)* and the desired capital stock *(K)*. This difference is determined by the rate of change in output. This investment relationship being continuous, investment is immediately pushed to the extreme position. Thus expansion reaches a situation

Where I the rate of capital goods capacity output. This restricts the increase in output and the accelerator becomes discontinuous. During the expansion phase $K > K$ but at the peak $K = K$ which is due to a decline in the rate of autonomous investment. Once the desired capital *K* exceeds the actual capital stock *K*, the desired capital K will be equal to the scrappage or replacement rate K_2. This leads to a fall in the desired capital *K* and in the rate of autonomous investment. Thus the contraction path of the

system starts. During the contraction phase when $K>\bar{K}$, gap between the two is to be set by the scrappage rate K_2. Simultaneously, the desired capital K continues to rise by the technological growth factor. The gap between K and $\bar{K}$ is being closed by the gradual elimination of excess capacity through failure to replace and the steady occurrence of capital-using innovations. In this way, the contraction path pushes the economic system to the lowest extreme point of $I = -K_2$. When the economy reaches the lower turning point of $K = \bar{K}$, the level of desired capital K is to be raised. This is possible by stimulating the constant technical growth factor. When $K > \bar{K}$, the expansion again starts. So long as the technical progress continues, the economy cannot remain at the lower turning point. In fact, fast technical progress will expand the economy soon. As against, the Hicksian model, the Goodwin's cycle does not creep along the floor or the ceiling level. Rather, it jumps from these levels. Both boom and recession bring contraction and recovery of their own. If the growth factor does not exist in technological change, there will be autonomous investment in the capital stock.

Consequently, the economy will remain stuck in the contraction phase for a long time instead of expanding. Because it takes more time for capital to depreciate than in capital formation. In such a situation there will be one-sided formation of trade cycles, as shown in Figure 16.3. In the beginning of the expansion phase, K increases to OA level and $\bar{K}$ also rises and equals it. When $K = \bar{K}$, contraction or downswing starts, K is reduced to OB level and $\bar{K}$ also declines and equal K. There being no technological change in the growth factor, it takes more time for $\bar{K}$ to equal K.

There are two features of the Goodwin cycle in figure 19.1 (1) In the expansion phase, $K > \bar{K}$ and in the contraction phase, $\bar{K} > K$. (2) At the peak of each cycle, the common level of K is OA which is smaller than the OB level of $\bar{K}$ at the trough and shows more time for K to equal K. This is clear from the dotted horizontal lines at OA level in the upper portion and the dotted horizontal lines at OB level in the lower portion of Figure 19.1.

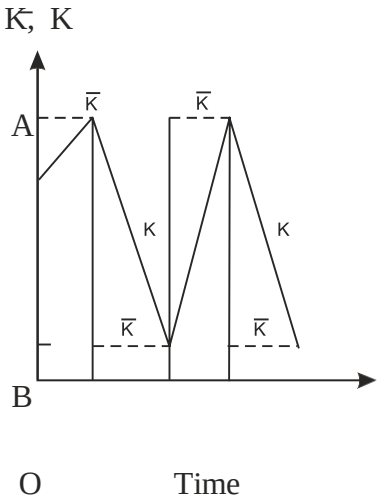


Fig. 19.1

On the other hand, if the growth factor for technological progress is inclu ded, $\bar{K}$ continues to increase with each cycle and it takes long time for K to equal K in the expansion phase. When the downswing starts, there being no growth factor the contraction phase becomes shorter. Thus the presence and absence of technological growth factor make the subsequent peaks and troughs at the higher level than the earlierpeaks and troughs in the Goodwin cycle. These are shown as upper and lower dottedlines in Figure 19.1.

In the figure aa line shows the technological growth factor which is similar to the Hicksian EE line where $K=K=a$. The upper and lower limits of K have been shown by the dotted lines. P represents peaks and T as troughs where $K = K$. The contractionpaths PT become shorter than the expansion paths, TP.

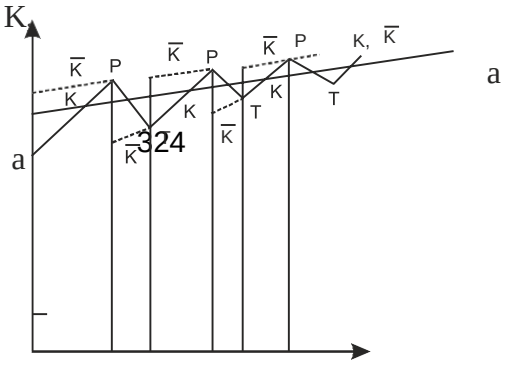


Fig. 19.2

19.3 b. Criticisms

The following are the weaknesses of Goodwin's model.

1. **Unrealistic.** The Goodwin model is unrealistic on two counts. First, it showsthat the recessionary phase is longer than the expansionary phase of the cycle, as shownin Figure 19.1. Second, the desired stock of capital becomes constant at the peak, as shown by the dotted lines in Figure 19.2.

2. **Empirically Wrong.** The Goodwin model shows that when the economy reachesthe peak and the trough, it at once takes a downturn and upturn respectively. This is empirically wrong because both recession and recovery are slow processes. As Hickshas also pointed out that the economy creeps along the upper and lower ceilings.

3. **Conclusion.** Despite these limitations, according to Prof. Allen, "The advantageof Goodwin's model is that the non-linear element is built in; the resulting oscillationmaintains itself without any dependence on outside factors or on particular initial (orhistorical) conditions."

19.3 c. Differences between Goodwin and Hicks Models

Goodwin's model is different from Hicks' model on the following points:

1. The Hicksian model shows only how cycles take place. But Goodwin's modeltraces the time path of a realistic cycle.

2. The Hicks model is linear which becomes non-linear when the ceiling and floorof a cycle meet. But Goodwin's model is throughout non-linear.

3. Hicks combine growth and cycle in his model and keep growth dependent on autonomous investment. According to Goodwin, growth depends on technological

change which continuously increases the productive capacity of the economy.

4. The equilibrium path *EE* of Hicks is based on continuous increase in autonomous investment. But Goodwin's growth path is based on the increase in desiredcapital *K* which is the result of continuous technological changes.

Check your progress

Q1- What are the limitations of Goodwin's model?

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Q2- Differentiate between Goodwin's model and Hick's model.

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19.4 Let us sum up

The Goodwin model provides a framework for understanding how labour-capital interactions and class struggle drive economic cycles. It analyzes economic growth and business cycles by focusing on how wage share and employment rates influence investment and economic growth. The model highlights how conflict between workers and capitalists causes cyclical economic fluctuations.

19.5 Keywords:

Cyclical fluctuations : It refer to the recurrent rise and fall in economic activity, especially employment and income distribution, driven by the interaction between wage share and employment rate.

Autonomous investment : It refers to investment that is independent of current income or profit levels. It can represent government expenditure, technological progress, or fixed capital formation that occurs regardless of immediate business conditions. In extended Goodwin-type models, autonomous investment is added to better explain long-term growth trends along with short-

term cycles.

19.6 Suggested readings

Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.

William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.

N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).

Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India

Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

19.7 Hints to Check Your progress

Q1 19.3 b
Q2 19.3 c

19.8 Examination Oriented Questions

1. Explain the cyclical path of Goodwin's model and critically examine the model in brief.

2. How Goodwin's model is different from Hicks' model, explain.

CONTROL OF BUSINESS CYCLES: POLICY APPROACHES AND INSTRUMENTS

STRUCTURE

20.0 Objectives

The main objectives of this lesson are to enable you to:

- Discuss the nature of business cycles
- Recognize the phases of business cycles and their impact on economic variables.
- Identify Policy Instruments
- Describe the main monetary and fiscal policy tools used to control business cycles.
- Analyze Policy Effectiveness
- Evaluate the strengths and limitations of different policy approaches in managing economic fluctuations.
- Apply Concepts to Real-World Scenarios
- Apply knowledge of business cycle control to contemporary economic issues and case studies.

20.2 Learning Outcomes

After going through this lesson, you shall be able to:

- Explain the phases of the business cycle and their significance.
- Describe the key instruments of monetary and fiscal policy used to stabilize the economy.
- Analyze the advantages and disadvantages of various policy measures in controlling business cycles.
- Discuss the role of direct controls and automatic stabilizers in economic stabilization.

20.2 Introduction

Dear learner, business cycles are recurring fluctuations in economic activity characterized by periods of expansion, peak, contraction, and trough. These cycles impact employment, investment, inflation, and overall economic stability. Governments and central banks use a variety of policy approaches and instruments—such as monetary policy, fiscal policy, and direct controls—to manage these cycles and maintain economic equilibrium. Understanding these tools is essential for anyone studying economics, as they form the foundation for macroeconomic stabilization efforts.

20.3 Understanding Business Cycles

Business cycles are recurrent fluctuations in economic activity, characterized by periods of expansion (growth), peak (maximum activity), contraction (decline), and trough (minimum activity). These cycles influence employment, investment, inflation, and

overall economic stability. The origins of business cycles are complex and can be attributed to various factors, including investment fluctuations, consumer and business confidence, technological innovation, and external shocks such as oil price changes or natural disasters.

Theoretical Foundations

Several theories explain the causes and dynamics of business cycles:

- **Keynesian Theory:** Emphasizes fluctuations in aggregate demand as the main driver of cycles. Advocates for active government intervention to manage demand and stabilize the economy.
- **Monetarist Theory:** Focuses on changes in the money supply as the primary cause of economic fluctuations. Suggests that central banks should control the money supply to maintain stability.
- **Schumpeter's Innovation Theory:** Links economic booms and busts to waves of innovation, where new technologies drive growth, and their diffusion leads to temporary slowdowns.
- **Real Business Cycle Theory:** Attributes cycles to external shocks, such as technological changes or resource price fluctuations, which affect the economy's productive capacity

20.4 Policies and Instruments to control Business cycles

Controlling business cycles is central to maintaining economic stability and fostering sustainable growth. Policymakers—primarily governments and central banks—use a combination of monetary, fiscal, and direct control instruments to manage the periodic fluctuations in economic activity. Below is a detailed explanation of these policies and instruments.

- **Monetary Policy**

Definition and Objectives:
Monetary policy is managed by the central bank and aims to influence the economy by controlling the money supply and interest rates. Its primary goals are price stability, maximum employment, and stable economic growth.

Key Instruments:

- **Interest Rates:** The central bank can raise or lower policy rates (such as the repo rate or bank rate). Lowering rates makes borrowing cheaper, stimulating investment and consumption during downturns. Raising rates discourages excessive borrowing and spending during expansions, helping to control inflation.

- **Open Market Operations (OMO):** The central bank buys or sells government securities to adjust the liquidity in the banking system. Buying securities injects

money into the economy, while selling them withdraws money, helping to manage inflation or stimulate demand.

- **Reserve Requirements:** Adjusting the cash reserve ratio (CRR) or statutory liquidity ratio (SLR) affects the amount of funds banks must hold in reserve, thereby influencing how much they can lend.

- **Discount Rate/Bank Rate:** The rate at which the central bank lends to commercial banks influences overall credit conditions in the economy.

Application Across Business Cycle Phases:

- **During Expansion:** Central banks may increase interest rates, sell securities, and raise reserve requirements to prevent overheating and inflation.
- **During Recession:** Lowering interest rates, purchasing securities, and reducing reserve requirements can stimulate borrowing, investment, and demand.

Limitations:
Monetary policy may be less effective in severe recessions (the "liquidity trap") or when interest rates are already very low. The transmission of policy effects to the real economy can also be slow or incomplete.

- **Fiscal Policy**

Definition and Objectives:
Fiscal policy involves government actions regarding taxation and spending to influence aggregate demand and economic activity. Its main goals are to stabilize the economy, reduce unemployment, and control inflation.

Key Instruments:
- **Taxation:** Lowering taxes increases disposable income, boosting consumption and investment during downturns. Raising taxes helps cool an overheating economy.
- **Government Spending:** Increasing public expenditure (e.g., on infrastructure, social programs) stimulates demand during recessions, while reducing spending helps prevent inflation during expansions.
- **Automatic Stabilizers:** Built-in features like progressive taxation and unemployment benefits automatically adjust government revenues and expenditures in response to economic conditions, providing a stabilizing effect without new legislation.
- **Deficit Financing:** The government may borrow to finance increased spending during recessions, supporting demand and employment.

Application Across Business Cycle Phases:

- **During Expansion:** Governments may reduce spending and increase taxes to

prevent overheating and inflation.
- **During Recession:** Increased spending and lower taxes can boost demand, reduce unemployment, and support economic recovery.

Challenges:

Fiscal policy can be slow to implement due to political and bureaucratic processes. There is also a risk of procyclical policies if measures are poorly timed or targeted.

- **Direct Controls**

Definition and Objectives:

Direct controls are government interventions in specific markets to regulate prices, wages, or resource allocation, typically used in extraordinary circumstances.
Key Instruments:
- **Price Controls:** Ceilings or floors on prices to prevent excessive inflation or deflation.
- **Wage Controls:** Limits on wage increases to control labor costs and inflation.
- **Resource Allocation:** Directing the use of key resources (e.g., energy, food) during crises.

Application:

Direct controls are usually reserved for emergencies, such as wartime or severe economic crises, when conventional policy tools are insufficient.

- **Other Policy Measures**

- **Regulatory Measures:** Governments may implement regulations to control speculation, prevent market manipulation, and ensure financial stability.
- **Stabilization Funds:** Setting aside funds during booms to be used during downturns to stabilize the economy.
- **Supply-Side Policies:** Investing in infrastructure, education, and technology to improve productivity and reduce the severity of cycles.

Comparison Table

Policy Instrument	Main Purpose	Typical Use Case	Strengths	Limitations
Monetary Policy	Control money supply, interest rates	Inflation control, recession	Quick to implement	Limited impact in liquidity trap
Fiscal Policy	Influence aggregate demand	Stimulus, demand management	Direct impact on demand	Slow implementation, political risk
Direct Controls	Immediate impact on prices/wages	Emergency stabilization	Fast, targeted	Distorts markets, short-term only
Automatic Stabilizers	Buffer against shocks	All phases, esp. downturns	Automatic, timely, predictable	Limited in low-income countries

20.5 Historical Examples and Lessons

- **2008 Global Financial Crisis**: Governments and central banks worldwide implemented expansionary fiscal and monetary policies to counter the severe contraction. These measures helped stabilize economies but also led to debates about debt sustainability and the effectiveness of stimulus.

- **COVID-19 Pandemic**: Governments increased spending and central banks cut interest rates to unprecedented levels to support economies. The crisis highlighted the importance of both automatic stabilizers and discretionary fiscal measures.

- **Japan's Lost Decade**: Prolonged economic stagnation despite aggressive monetary and fiscal stimulus, illustrating the limits of policy when structural issues are present

20.6 Check your progress

Q1- What do you understand by Business cycles?

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Q2- What are the key instruments of Monetary and Fiscal policies to control Business Cycles?

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……

20.7 Let us sum up

A mix of monetary, fiscal, and direct control instruments is essential for effectively managing business cycles. Monetary policy, managed by central banks, influences interest rates and money supply. Fiscal policy, managed by governments, adjusts taxation and spending to affect aggregate demand. Direct controls are used in emergencies to regulate prices, wages, or resources. Each instrument has its strengths and limitations, and their combined use enhances the ability to stabilize the economy and mitigate the impacts of business cycles

20.8 Keywords

- **Business Cycle:** The periodic rise and fall in economic activity, including phases of expansion, peak, contraction, and trough.
- **Monetary Policy:** Central bank actions aimed at controlling the money supply and interest rates to influence economic activity.
- **Fiscal Policy:** Government use of taxation and spending to influence aggregate demand and economic performance.
- **Automatic Stabilizers:** Built-in features of the fiscal system (such as progressive taxation and unemployment benefits) that automatically adjust government revenues and expenditures in response to economic changes.

20.9 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India

20.10 Hints to check your progress

Q1- See section 20.3
Q2- See section 20.4

20.11 Examination oriented questions

- Explain the main instruments of monetary policy and how they are used to control business cycles.
- Compare and contrast the effectiveness of fiscal policy and monetary policy in managing economic downturns.
- Discuss the role of automatic stabilizers in stabilizing the economy during a recession.

New Classical and Real Business Cycle Theory: Overview and Implications

STRUCTURE:

21.0 Objectives

The main objectives of this lesson are to enable you to:

- Explain the key assumptions and policy implications of the New Classical view on business cycles.
- Describe the role of rational expectations, continuous market clearing, and the Lucas supply function in New Classical economics.
- Outline the Real Business Cycle theory and differentiate it from other macroeconomic models.
- Evaluate the criticisms and limitations of both New Classical and RBC approaches.

21.1 Learning Outcomes

After going through this lesson, you shall be able to:

- Discuss how New Classical economists explain business cycles through expectations and market mechanisms.
- Analyze how Real Business Cycle theory attributes economic fluctuations to real (supply-side) shocks.
- Critically assess the assumptions and limitations of both theories, including their relevance to real-world economic phenomena.

21.2 Introduction

Dear learner, the study of business cycles is fundamental in macroeconomics, explaining fluctuations in output, employment, and overall economic activity. During the 1950s and 1960s, Keynesian economics dominated macroeconomic thought, emphasizing government intervention to manage the economy. However, dissatisfaction with Keynesian explanations of stagflation and monetary phenomena led to the emergence of new-classical theories, which challenged these ideas by focusing on rational expectations, market clearing, and the role of real (productivity) shocks. This lesson explores the New Classical view on business cycles, led by figures like Robert Lucas, and the Real Business Cycle (RBC) theory developed by Kydland and Prescott. Both perspectives highlight the role of expectations, micro-foundations, and dynamic stochastic general equilibrium models in understanding macroeconomic fluctuations.

21.3 New Classicals view on Business cycles

During the 1950s and 1960s, Keynesian economics dominated both academic thought and policy-making. Its emphasis on active government intervention in the economy was widely accepted. However, Milton Friedman challenged this view by emphasizing the central role of monetary policy in influencing national income. He argued that if the government had

implemented open market operations and repurchased bonds during the Great Depression, the increase in money supply could have softened the downturn's severity.

Friedman also disputed the Phillips Curve, which suggested a stable inverse relationship between inflation and unemployment. By introducing expectations into the analysis, he asserted that the Phillips Curve is vertical in the long run. This means that while a temporary trade-off may exist, unemployment ultimately returns to its natural rate, and cannot be permanently reduced by inflationary policies.

The credibility of Keynesian theory further declined in the 1970s due to stagflation—a combination of stagnant economic growth and high inflation—which it could not adequately explain. This gave rise to new-classical economics, spearheaded by economists such as Robert Lucas and Thomas Sargent, who brought a fresh approach to macroeconomic theory. Although they revived many classical ideas, they used modern tools and models, positioning new-classical theory in direct opposition to Keynesian policy suggestions.

New-classical economics is grounded in three main assumptions:

1. **Rational Expectations** – Economic agents can predict the effects of government policies and adjust their behavior accordingly, effectively neutralizing intended policy outcomes.
2. **Continuous Market Clearing** – All markets, including labor, are assumed to clear at all times, meaning supply equals demand and the economy remains in equilibrium.
3. **Aggregate Supply Dependence on Relative Prices** – The decisions of workers and firms to supply labor and goods are influenced by changes in relative prices.

From these assumptions, new-classical economists conclude that systematic policy interventions by the government are generally ineffective. Only unanticipated policy changes can create temporary deviations in output and employment from their natural states.

Despite assuming flexible wages and prices that adjust instantly, the idea of continuous market clearing—especially in labor markets—remains controversial. According to this theory, unemployment is considered voluntary: anyone willing to work at the prevailing wage rate is employed.

A core concept in new-classical theory is that macroeconomic behavior must be derived from **micro foundations**—that is, individual choices of households and firms. Households optimize utility while firms maximize profits based on production functions. These decisions are framed within **dynamic stochastic general equilibrium (DSGE)** models, which simulate how the entire economy responds over time to random, external shocks such as policy changes or productivity variations. The term *dynamic* reflects the forward-looking behavior of agents optimizing decisions over time, and *stochastic* indicates that these shocks are unpredictable.

DSGE models consist of three primary components: a demand block, a supply block, and a policy rule (such as a monetary policy equation). The parameters used in these models are not directly estimated from data but are instead **calibrated**. Calibration involves selecting parameter values based on previous studies and then simulating the model to replicate real-world economic patterns. This approach differs from traditional econometric estimation.

One may wonder why fluctuations in employment and output occur if markets always clear. New-classical theory attributes business cycles to two main mechanisms:

1. **Inter-temporal Substitution of Labor and Leisure** – When the real wage exceeds expectations, individuals choose to work more, increasing labor supply and output. This results in temporary output levels above the natural rate.
2. **Lucas Supply Function** – Firms may misinterpret a general price increase as a rise in the relative price of their own goods. Believing their goods are now more valuable, they ramp up production. This causes temporary increases in employment and output, leading to economic expansions.

Conversely, if real wages fall short of expectations, people choose more leisure over labor, reducing work hours and overall output. Likewise, firms that perceive declining relative prices will scale back production. These responses lead to recessions. In this framework, although the economy remains in equilibrium, output and employment can still fluctuate due to mistaken perceptions and rational responses to changing conditions.

21.4 Real Business Cycle theory

The Real Business Cycle theory was introduced by Kydland and Prescott in their influential 1982 paper, *"Time to Build and Aggregate Fluctuations."* They argued that economic fluctuations are not primarily driven by changes in monetary factors, but rather by real disturbances impacting the economy. RBC theory belongs to the broader framework of new-classical macroeconomics, which means it adopts the fundamental assumptions and analytical tools typical of new-classical models. Kydland and Prescott were pioneers in formally modeling a dynamic, stochastic general equilibrium for macroeconomic analysis.

In economics, shocks to the system are broadly categorized into two types: **nominal** and **real**. Nominal shocks, such as changes in money supply or demand, influence the LM curve. In contrast, real shocks — such as changes in productivity, government spending, or individual savings and consumption behavior — impact the IS curve, thus affecting both the goods and labor markets.

As the name implies, Real Business Cycle models attribute economic fluctuations mainly to **real shocks**. These often involve disturbances to the production function, also referred to as **supply shocks** or **productivity shocks**. Such shocks can result from various sources, including:

- Technological innovations or new production processes
- Changes in the efficiency or quality of labor and capital
- Variations in raw material availability or relative prices (e.g., an oil crisis)

- Extreme weather events (like droughts or floods)
- Government policy changes affecting production, such as tax adjustments or new subsidies

Positive productivity shocks, which enhance production efficiency, typically lead to economic expansions. Conversely, negative shocks reduce output and lead to recessions. For instance, a temporary negative supply shock would lower labor's marginal productivity, reducing labor demand and thus real wages (Figure 1). In response, households supply less labor, leading to reduced output and an economic downturn. If the shock is favorable, productivity rises, encouraging greater investment and labor effort in the short run. As a result, output and consumption increase, and the economy enters a boom. Once the shock's influence wanes, the economy reverts to its natural levels of employment and output.

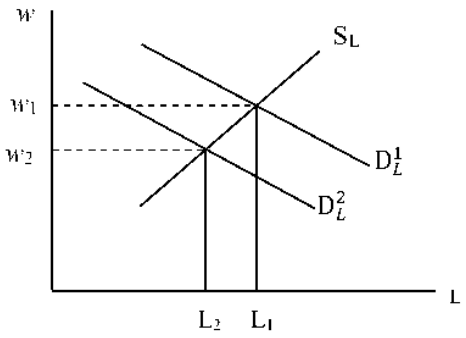

Figure 21.4: Effect of a temporary adverse supply shock

Real Business Cycle theory rests on two foundational ideas: first, that monetary factors have minimal influence on business cycles; and second, that these cycles represent the rational responses of households and firms to real shocks. The theory assumes that the economy remains in continuous equilibrium, with labor and output levels reflecting the expectations and choices of informed economic agents.

Despite sharing roots with new-classical thought, RBC theory diverges from it in several key ways:

1. **Integration of Growth and Fluctuation**: RBC theory does not separate short-run business cycles from long-run economic growth but views them as part of a unified process.
2. **Information Assumptions**: Unlike Lucas, who suggested that agents can be misled by price signals, RBC theory assumes agents have full information and make optimal decisions accordingly.
3. **Source of Shocks**: New-classical models often emphasize monetary disturbances, whereas RBC models focus solely on real (non-monetary) causes of economic fluctuations.

The Real Business Cycle perspective leads to several policy implications:

- Governments should prioritize price stability (inflation control) rather than output stabilization.
- Fiscal policy aimed at boosting demand (e.g., tax cuts or increased spending) is seen as ineffective, particularly due to considerations like Ricardian equivalence.
- Fiscal tools should instead be used to enhance the productive capacity of the economy, promoting positive supply-side developments.

Nonetheless, Real Business Cycle theory has been subject to criticism. The assumption that markets always clear instantly is seen as unrealistic, given the presence of wage and price rigidities in real economies. Moreover, empirical support for large-scale technology shocks as drivers of business cycles is limited.

21.5 Check your progress

Q- What are the three main assumptions of New classicals view on Business cycles?

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Q- How is the Real Business Cycle theory different from New Classicals view?

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21.6 Let's sum up

The new-classical and Real Business Cycle theories represent a major departure from Keynesian models, shifting the focus from demand management to supply-side dynamics and microeconomic foundations. By emphasizing rational expectations and real shocks, these models underscore the limited role of systematic government intervention in influencing output and employment. Although they have advanced our understanding of macroeconomic behavior, these theories have faced criticism for their assumptions of continuous market clearing and their downplaying of frictions like wage and price rigidities. Understanding these models enriches our broader comprehension of how economies function and respond to various shocks, laying the groundwork for evaluating both historical cycles and modern policy debates.

21.7 Keywords

- **Rational Expectations:** The assumption that individuals form predictions about the future using all available information, minimizing systematic forecasting errors.

- **Dynamic Stochastic General Equilibrium (DSGE) Models:** A framework for analyzing how the entire economy responds to random shocks over time, integrating the optimizing behavior of households and firms.
- **Lucas Supply Function:** A mechanism explaining how misinterpretation of price signals by firms leads to temporary fluctuations in output and employment.
- **Productivity Shocks:** Unexpected changes in the efficiency of production, often seen as a major driver of fluctuations in output and employment in RBC models.

21.8 Suggested Readings

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India.

21.9 Hints to check your progress

Q1- See section 21.3

Q2- See section 21.4

21.10 Examination oriented questions

- What are the main assumptions underlying new-classical economics? How do these shape its view of business cycles?
- Explain the Lucas supply function and its role in the new-classical interpretation of economic fluctuations.
- How does the RBC theory interpret recessions and expansions? Provide examples of real shocks that might trigger these fluctuations.
- Critically evaluate the effectiveness of fiscal and monetary policy within the new-classical and RBC frameworks.

M.A. ECONOMICS LESSON NO. 22

COURSE NO. : ECO-107 SEMESTER-Ist UNIT-IV

NEW KEYNESIAN ECONOMICS: POST-2009 CRISIS DEVELOPMENTS

STRUCTURE

22.0 OBJECTIVES

The main objectives of this lesson are to enable you to:

- Discuss the limitations of pre-2008 New Keynesian models exposed by the global financial crisis.
- Learn how new models include banks, financial markets, and different types of people.
- Explore new policy tools like quantitative easing, forward guidance, and negative interest rates.
- Recognize the growing importance of fiscal policy when interest rates are near zero.
- Identify how behavioral economics and better data have improved economic modeling.
- Explain how new challenges like climate change and digital currencies are being addressed in macroeconomic models.

22.0 LEARNING OUTCOMES

After going through this lesson, you shall be able to:

- Describe why old New Keynesian models failed to predict or manage the 2008 crisis.
- Explain how adding financial frictions and household differences changes economic predictions.
- List and explain new monetary policy tools used after the crisis.
- Discuss why government spending is more effective when interest rates are at the zero lower bound.
- Give examples of how behavioral economics and better data help improve policy decisions.
- Summarize how current models are adapting to address climate risks and digital money.

22.2 INTRODUCTION

Dear learner, the global financial crisis of 2008-2009 marked a watershed moment for macroeconomic theory and policy, fundamentally challenging the prevailing New Keynesian

framework and catalyzing a period of intense theoretical innovation and policy experimentation. This crisis exposed critical limitations in existing models and prompted a comprehensive reassessment of how monetary and fiscal policies interact with business cycles, leading to significant developments in both theoretical foundations and practical applications of New Keynesian economics.

22.3 THE CRISIS CHALLENGE TO NEW KEYNESIAN ORTHODOXY

Pre-Crisis Complacency and the Reality Check

Before 2008, the New Keynesian consensus had achieved what many considered a "Great Moderation" in macroeconomic volatility, with central banks successfully anchoring inflation expectations through inflation targeting regimes. The canonical three-equation New Keynesian model—consisting of a dynamic IS curve, a New Keynesian Phillips curve, and a Taylor rule—appeared sufficient to capture the essential dynamics of business cycles and guide monetary policy. However, the financial crisis revealed fundamental gaps in this framework, particularly its inability to account for financial frictions, asset price dynamics, and the potential for severe economic disruptions when conventional monetary policy reached its limits.

The crisis demonstrated that the assumption of efficient financial markets and the neglect of financial intermediation could lead to catastrophic policy failures. Traditional New Keynesian models had largely abstracted away from the banking sector and financial frictions, treating the transmission of monetary policy as a straightforward process through interest rate channels. This theoretical blind spot became glaringly apparent as the collapse of financial institutions and credit markets amplified the recession far beyond what standard models had predicted.

The Zero Lower Bound Challenge

Perhaps the most immediate challenge posed by the crisis was the binding of the zero lower bound (ZLB) on nominal interest rates, a constraint that fundamentally altered the effectiveness of conventional monetary policy. When policy rates approached zero across major economies by 2009, central banks found themselves unable to provide additional stimulus through traditional interest rate cuts, exposing a critical limitation in the New Keynesian policy toolkit. The ZLB problem had been largely theoretical before 2008, but its practical binding created what economists termed a "liquidity trap," where monetary policy became ineffective and fiscal multipliers potentially became much larger.

Research by Eggertsson and Woodford had shown that zero inflation targeting could lead to severe output contractions when the ZLB binds, but the crisis provided real-world validation of these theoretical concerns. The experience highlighted the need for alternative monetary policy tools and raised fundamental questions about optimal policy design in constrained environments.

22.4 THEORETICAL DEVELOPMENTS AND MODEL EXTENSIONS

Integration of Financial Frictions

The most significant theoretical development in post-crisis New Keynesian economics has been the systematic incorporation of financial frictions and banking sector dynamics. Building on the seminal work of Bernanke, Gertler, and Gilchrist (BGG), researchers developed increasingly sophisticated models that captured the role of financial intermediaries in amplifying and propagating economic shocks. These models showed that financial frictions could generate substantial amplification effects, where relatively small shocks to the financial sector could produce large and persistent effects on real economic activity.

The integration of financial frictions revealed that the monetary transmission mechanism was far more complex than previously understood, operating not only through traditional interest rate channels but also through credit availability, bank balance sheet effects, and risk premiums. Studies demonstrated that financial shocks, particularly negative bank capital shocks, could trigger substantial macroeconomic and financial fluctuations, especially when banks operated with high leverage ratios. This recognition led to the development of models where financial intermediaries play a central role in business cycle dynamics, fundamentally altering our understanding of how monetary policy affects the economy.

Heterogeneous Agent New Keynesian (HANK) Models

A second major theoretical innovation has been the development of Heterogeneous Agent New Keynesian (HANK) models, which incorporate individual-level heterogeneity in wealth, income, and consumption behavior. These models represent a significant departure from the representative agent framework that had dominated macroeconomics, acknowledging that aggregate responses depend critically on the distribution of characteristics across households. The HANK literature has shown that heterogeneity fundamentally alters the transmission of monetary policy, as different households respond differently to interest rate changes depending

on their financial positions and constraints.

Research by Liu and Plagborg-Møller developed new methodologies for combining micro and macro data in the estimation of heterogeneous agent models, providing a more empirically grounded approach to understanding aggregate dynamics. These advances demonstrated that parameters previously calibrated to match only macro moments could be more accurately estimated using the joint information content of both micro and macro data, leading to substantially different conclusions about policy effectiveness.

Behavioral Extensions and Bounded Rationality

The crisis also spurred interest in behavioral approaches to New Keynesian modeling, recognizing that the assumption of rational expectations might be too restrictive, particularly during periods of high uncertainty. Gabaix's behavioral New Keynesian model introduced a "myopia parameter" that quantifies how poorly agents understand future policy and its impact, showing that this single modification could resolve several puzzles in the traditional framework. The behavioral approach helped explain phenomena such as the "forward guidance puzzle," where in rational expectations models, announcements about future policy rates have implausibly large effects on current economic activity.

Behavioral models demonstrated that bounded rationality could significantly alter policy effectiveness, with implications for optimal monetary and fiscal policy design. These models showed that the Taylor principle—the idea that monetary policy must be aggressive enough to stabilize inflation—could be violated without creating indeterminacy when agents have limited understanding of policy. Additionally, behavioral elements helped explain why the zero lower bound was less costly than traditional models predicted and why fiscal stimulus could be particularly effective during crisis periods.

22.5 POLICY INNOVATIONS AND UNCONVENTIONAL TOOLS

Quantitative Easing and Balance Sheet Policies

The binding of the zero lower bound necessitated the development of unconventional monetary policy tools, with quantitative easing (QE) emerging as the primary response. Woodford's theoretical analysis of central bank balance sheet policies showed that while "quantitative easing" in the strict sense might be ineffective, targeted asset purchases could be highly effective when financial markets are disrupted. The key insight was that central banks could

affect longer-term interest rates and broader financial conditions through large-scale purchases of government bonds and other securities.

Empirical studies of QE programs found that these policies were effective in reducing long-term yields and improving financial conditions, though their effects on real economic activity were more modest. Research on optimal QE policy in monetary unions showed that the allocation of asset purchases should reflect not only different region sizes but also dimensions of portfolio heterogeneity, with optimal policies potentially favoring purchases from regions facing stronger portfolio frictions.

Forward Guidance and Communication Strategy

Forward guidance—central bank communication about the future path of monetary policy—emerged as another crucial tool for providing monetary stimulus when policy rates reached their effective lower bound. The theoretical foundation for forward guidance rested on New Keynesian models showing that expectations of future policy rates could significantly influence current economic conditions through intertemporal substitution effects. Central banks increasingly adopted explicit forward guidance, moving from general statements about policy inclinations to specific commitments about future rate paths.

However, research revealed important limitations to forward guidance effectiveness, particularly the "forward guidance puzzle" where theoretical models predicted implausibly large effects from distant future rate commitments. Behavioral New Keynesian models helped resolve this puzzle by showing that bounded rationality could mute the effects of forward guidance, making the policy tool more realistic but less powerful than initially hoped.

Negative Interest Rate Policies

Several central banks, particularly in Europe, pushed the boundaries of conventional monetary policy by implementing negative nominal interest rates. Research using New Keynesian DSGE models with banking sector intermediation found that monetary policy in negative territory remained effective, though at reduced potency compared to positive rate territory. Studies suggested that negative rates could stimulate the economy by lowering commercial bank lending rates, but they also risked eroding bank profitability by squeezing deposit spreads.

The effectiveness of negative interest rate policies was estimated to be between 60% and 90% as effective as conventional policy in positive territory, providing central banks with additional

policy space but not a complete substitute for conventional tools.

22.6 BUSINESS CYCLE IMPLICATIONS AND FISCAL-MONETARY INTERACTIONS

Enhanced Fiscal Multipliers at the Zero Lower Bound

One of the most important findings from post-crisis New Keynesian research concerns the behavior of fiscal multipliers when monetary policy is constrained by the zero lower bound. Traditional New Keynesian models typically predicted fiscal multipliers around or below unity, but crisis-period analysis showed that these multipliers could be substantially larger when conventional monetary policy was ineffective. The mechanism behind this result was straightforward: when central banks cannot offset fiscal expansion with higher interest rates, the crowding-out effects that normally reduce fiscal effectiveness are eliminated.

Research using regional variation in the American Recovery and Reinvestment Act found evidence supporting larger fiscal multipliers during the ZLB period, with studies estimating consumption multipliers significantly above those predicted by models with complete markets. These findings had important implications for the design of fiscal policy during severe recessions, suggesting that coordinated fiscal and monetary responses could be more effective than either policy operating in isolation.

Time-Varying Parameters and Structural Instability

The crisis highlighted the importance of time-varying parameters in macroeconomic models, as structural relationships appeared to shift significantly during periods of financial stress. Research on time-varying parameter DSGE models showed that constant parameter models could poorly approximate time-varying data generating processes, except in specific circumstances. This work revealed that linear approximations do not naturally produce time-varying decision rules, requiring higher-order approximations and careful treatment of parameter disturbances.

Studies found that incorporating endogenous variations in parameters controlling financial leverage substantially improved model fit, suggesting that the financial crisis represented a structural break in how financial frictions operated in the economy. These findings emphasized the need for models that could adapt to changing economic conditions rather than assuming

fixed structural relationships.

Asset Prices and Optimal Policy

Post-crisis research also examined the role of asset prices in optimal monetary policy, particularly given the housing boom-bust cycle that preceded the financial crisis. Woodford and Adam's work on robustly optimal monetary policy in models with housing sectors showed that when policymakers are concerned about potential departures from rational expectations, optimal policy should "lean against" housing price movements. This represented a significant departure from the pre-crisis consensus that monetary policy should focus exclusively on inflation and output gaps, ignoring asset price developments.

The research demonstrated that optimal policy responses to housing price increases should involve monetary tightening that leads to temporary undershooting of normal inflation and output targets, and vice versa for housing price declines. Importantly, this robustly optimal approach did not require central banks to distinguish between "fundamental" and "non-fundamental" movements in asset prices, making it more practical for policy implementation.

22.7 LET US SUM UP

The period following the 2008-2009 financial crisis has been one of remarkable innovation and development in New Keynesian economics, driven by the practical challenges of managing severe economic disruptions and the theoretical limitations exposed by the crisis. The integration of financial frictions, heterogeneous agents, and behavioral elements has fundamentally enhanced our understanding of business cycle dynamics and the transmission of monetary and fiscal policies. These theoretical advances have been accompanied by important policy innovations, including quantitative easing, forward guidance, and negative interest rates, which have expanded the toolkit available to policymakers facing extreme economic conditions.

The empirical validation of larger fiscal multipliers at the zero lower bound, the importance of financial accelerator effects, and the limitations of forward guidance have provided crucial insights for policy design. Methodological advances in estimation techniques and the integration of machine learning approaches have improved our ability to analyze complex economic relationships and provide real-time policy guidance.

Looking forward, New Keynesian economics continues to evolve in response to new

challenges, including climate change, digital currencies, and the lessons learned from the COVID-19 pandemic. The field's ability to adapt and incorporate new insights while maintaining rigorous theoretical foundations suggests that it will remain a central framework for understanding business cycles and designing macroeconomic policies in an increasingly complex and interconnected global economy. The ongoing development of more sophisticated models that can capture the full range of economic relationships and policy interactions will be essential for addressing future macroeconomic challenges and maintaining economic stability.

Check Your Progress I

1. What was the “zero lower bound” problem, and why did it matter during the 2008-09 crisis?

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2. How did adding banks and financial frictions to New Keynesian models change our understanding of recessions?

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3. What are Heterogeneous Agent New Keynesian (HANK) models, and why do they matter?

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4. Name two unconventional monetary policy tools used after the crisis and briefly explain how they work.

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22.8 KEYWORDS

Financial Frictions: Imperfections in financial markets that create wedges between the

returns faced by borrowers and lenders, potentially amplifying economic shocks through credit channel effects.

Zero Lower Bound (ZLB): The constraint that nominal interest rates cannot be reduced below approximately zero, limiting conventional monetary policy effectiveness during severe economic downturns.

Heterogeneous Agent New Keynesian (HANK) Models: Economic models that incorporate individual-level heterogeneity in wealth, income, and consumption behavior rather than using representative agents.

Quantitative Easing (QE): Central bank policy involving large-scale purchases of government bonds and other securities to provide monetary stimulus when conventional interest rate policy is constrained.

Forward Guidance: Central bank communication about the likely future path of monetary policy intended to influence current economic conditions through expectations channels.

Behavioral New Keynesian Models: Economic models that incorporate bounded rationality and other behavioral elements rather than assuming full rational expectations.

Fiscal Multiplier: The change in economic output resulting from a change in government spending or taxation, which can vary significantly depending on economic conditions.

DSGE Models: Dynamic Stochastic General Equilibrium models that provide microeconomically founded frameworks for macroeconomic analysis and policy evaluation.

Financial Accelerator: The mechanism by which adverse shocks to the economy may be amplified by worsening credit market conditions.

Liquidity Trap: A situation where monetary policy becomes ineffective because interest rates are near zero and savings rates remain high regardless of central bank actions.

22.9 SUGGESTED READINGS

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.

- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India

22.10 HINTS TO CHECK YOUR PROGRESS

CYP-I

1. Refer to section 22.3

2. Refer to section 22.4

3. Refer to section 22.4

4. Refer to section 22.5

22.11 EXAMINATION ORIENTED QUESTIONS

1. What was the "zero lower bound" (ZLB) problem, and why did it matter after the 2008 crisis?
2. Define Heterogeneous Agent New Keynesian (HANK) models.
3. What is quantitative easing (QE)?
4. How do financial frictions affect the business cycle?
5. Explain how the 2008-09 financial crisis exposed the limitations of pre-crisis New Keynesian models.
6. Discuss the role of unconventional monetary policy tools (such as QE and forward guidance) when interest rates are at the ZLB.
7. How do behavioral economics concepts improve the predictive power of New Keynesian models?
8. Analyze the importance of fiscal policy during periods when monetary policy is constrained by the ZLB.

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M.A. ECONOMICS LESSON NO. 23

COURSE NO.: ECO-107 SEMESTER-Ist UNIT-IV

NEW GROWTH THEORY: IMPLICATIONS FOR MACROECONOMIC POLICY AND BUSINESS CYCLE MANAGEMENT

STRUCTURE

23.0 INTRODUCTION

This lesson examines the revolutionary transformation in economic growth theory initiated in the 1980s and its profound implications for macroeconomic policy design and business cycle management. New growth theory, also known as endogenous growth theory, fundamentally challenged the traditional neoclassical framework by demonstrating that sustained economic growth emerges from deliberate economic activities rather than exogenous technological progress. The theory's emphasis on knowledge creation, human capital accumulation, and innovation as internal drivers of growth has reshaped our understanding of how macroeconomic policies can influence long-term economic performance and interact with business cycle dynamics.

23.0 OBJECTIVES

The main objectives of this lesson are to enable you to:

- Discuss how new growth theory explains long-term economic growth as driven by innovation, knowledge, and skills.
- Explain the importance of investing in education, research, and entrepreneurship for growth.
- Describe how government policies can have lasting effects on growth by supporting innovation and human capital.
- Recognize the connection between short-term business cycles and long-term growth.
- Explore how policies can protect and encourage innovation during both booms and recessions.

23.1 LEARNING OUTCOMES

After going through this lesson, you should be able to:

- Explain the difference between old (exogenous) and new (endogenous) growth theories.
- Describe why knowledge, innovation, and human capital are key for sustained growth.
- Identify policy actions (like R&D subsidies or education investment) that promote long-term growth.

- Discuss how business cycles can impact long-term growth through changes in innovation and investment.
- Give examples of how policy can support innovation and skills during economic downturns.
- Reflect on modern challenges (like digital transformation and green innovation) using new growth theory ideas.

23.3 THEORETICAL FOUNDATIONS AND HISTORICAL DEVELOPMENT

From Exogenous to Endogenous Growth

The traditional Solow-Swan growth model dominated economic thinking for decades by treating technological progress as an external force, essentially "manna from heaven" that determined long-run growth rates independently of economic policy. This framework suggested that government interventions could only affect the level of output temporarily, with no lasting impact on growth rates. However, empirical observations of persistent growth rate differences across countries and the failure of unconditional convergence predictions motivated economists to seek alternative explanations.

The emergence of new growth theory represented a paradigm shift by making technological progress and knowledge creation endogenous to the economic system. Paul Romer's pioneering work in 1986 introduced the concept of knowledge spillovers and increasing returns to scale, demonstrating how economies could sustain growth through deliberate investments in research and development. Robert Lucas's 1988 human capital model further emphasized the role of education and learning in driving sustained economic expansion.

Core Theoretical Mechanisms

New growth theory identifies several key mechanisms that distinguish it from traditional frameworks and create possibilities for policy intervention. Knowledge spillovers represent a central feature, where innovations by one firm or individual create positive externalities that benefit the entire economy. These spillovers generate increasing returns to scale in the production of new knowledge, preventing the diminishing returns that would otherwise limit

sustained growth.

Human capital accumulation serves as another crucial engine of endogenous growth, with individuals' decisions to invest in education and skills driving aggregate productivity improvements. The learning-by-doing process creates dynamic externalities where current production activities enhance future productive capacity. Innovation emerges as a purposeful economic activity rather than random discoveries, with entrepreneurs and firms deliberately investing resources to develop new technologies and products.

23.4 MACROECONOMIC POLICY IMPLICATIONS

Fiscal Policy and Growth Enhancement

New growth theory fundamentally transforms the analysis of fiscal policy by demonstrating that government interventions can have permanent effects on economic growth rates. Unlike the traditional framework where fiscal policy only influences short-term demand, endogenous growth models show how tax and spending policies affect long-term supply-side growth through their impact on innovation and human capital accumulation.

Research and development subsidies emerge as a particularly powerful tool for growth enhancement, as they directly address the market failures associated with knowledge spillovers. When firms cannot fully appropriate the returns to their innovations, they underinvest in R&D from a social perspective. Government subsidies can correct this market failure by increasing the private returns to innovation, leading to higher equilibrium growth rates.

Educational investments represent another crucial channel through which fiscal policy influences long-term growth. Public spending on education generates positive externalities through human capital spillovers, justifying government intervention even in well-functioning markets. The complementarity between public and private investments in human capital suggests that coordinated policy packages may be more effective than isolated interventions.

Tax Policy and Innovation Incentives

The structure of taxation plays a critical role in determining innovation incentives and long-term growth prospects. Distortionary taxes on capital income can significantly reduce private returns to R&D investment, leading to lower equilibrium growth rates. The optimal tax theory in endogenous growth models suggests that capital should be taxed in the short run but receive

its marginal product in the long run to avoid distorting innovation incentives.

Intellectual property protection emerges as a crucial component of the policy framework for supporting innovation-driven growth. Strong patent systems provide temporary monopoly rights that allow innovators to recoup their research investments, creating incentives for continued innovation. However, excessive intellectual property protection can impede knowledge diffusion and follow-on innovation, suggesting the need for carefully balanced policies.

Monetary Policy in Endogenous Growth Models

Traditional monetary theory suggests that money is neutral in the long run, with monetary policy affecting only nominal variables without influencing real economic growth. However, endogenous growth models reveal several channels through which monetary policy can have lasting effects on growth and innovation. Credit constraints on research and development activities represent a primary transmission mechanism, as financing frictions can prevent firms from undertaking socially beneficial innovation projects.

The optimal monetary policy in endogenous growth models must balance traditional stabilization objectives with considerations of long-term growth effects. Counter-cyclical monetary policy can help smooth business cycle fluctuations while supporting innovation activities during economic downturns. However, excessive monetary stimulus may create distortions in innovation incentives and resource allocation, suggesting the need for careful calibration of policy responses.

23.5 BUSINESS CYCLE INTERACTIONS AND ENDOGENOUS FLUCTUATIONS

Growth-Cycle Nexus

New growth theory reveals fundamental interconnections between long-term growth and short-term business cycle fluctuations that were absent in traditional models. Endogenous growth mechanisms create channels through which cyclical shocks can have permanent effects on the level and growth rate of output. Innovation activities exhibit strong pro-cyclical patterns, with firms increasing R&D investments during expansions and cutting them during recessions.

The creative destruction process central to Schumpeterian growth models generates

endogenous business cycles through the interaction between innovation and market structure. Waves of innovation create temporary monopoly rents that attract entry and investment, leading to expansion phases followed by contractions as competition erodes profit margins. This mechanism suggests that business cycles may be an inherent feature of innovation-driven economies rather than deviations from equilibrium.

Policy Implications for Business Cycle Management

The integration of growth and cycle considerations fundamentally alters the conduct of stabilization policy. Traditional Keynesian demand management policies must be evaluated not only for their short-term stabilization effects but also for their long-term growth implications. Counter-cyclical fiscal policy can support innovation activities during recessions by providing public funding when private financing becomes scarce.

Automatic stabilizers in endogenous growth models may have different properties than in traditional frameworks due to their effects on innovation incentives. Progressive taxation systems that provide more generous treatment during downturns can help stabilize R&D investment and preserve innovation capacity. However, the distortionary effects of high marginal tax rates during normal times must be balanced against their stabilization benefits.

Real Business Cycle Extensions

The integration of endogenous growth mechanisms into real business cycle models creates richer dynamics that better match empirical observations. Technology shocks in these models become endogenous responses to economic incentives rather than exogenous disturbances. The resulting models can generate realistic patterns of output volatility and persistence without relying on highly persistent exogenous shock processes.

Endogenous growth-cycle models also provide new insights into the sources of international business cycle correlations and growth convergence patterns. Countries with similar innovation capabilities and policy frameworks tend to experience synchronized business cycles through technology spillovers and knowledge transfer. This mechanism helps explain why convergence occurs within clubs of similar countries rather than globally .

23.6 POLICY DESIGN AND IMPLEMENTATION CHALLENGES

Coordination and Complementarity

Effective implementation of growth-enhancing policies requires careful coordination across multiple policy domains due to strong complementarities between different interventions. Education policies must be coordinated with innovation policies to ensure that human capital investments align with technological development needs. Infrastructure investments in information and communication technologies must complement R&D subsidies to maximize knowledge spillovers.

International coordination becomes increasingly important as knowledge spillovers cross national boundaries and innovation activities become globally integrated. Countries that fail to participate in international research collaboration may miss opportunities for technology transfer and knowledge acquisition. Trade policies must balance the benefits of international knowledge spillovers against the need to protect domestic innovation incentives.

Political Economy Considerations

The political economy of growth policies creates additional challenges for policy implementation, as the benefits of innovation and human capital investments often accrue over long time horizons while the costs are immediate. Electoral cycles may discourage politicians from making investments in growth-enhancing policies that will only pay off after they leave office. Interest group pressures may favor policies that benefit specific constituencies rather than economy-wide growth.

Distributional considerations become particularly important in the design of growth policies, as innovation-driven growth may increase inequality if the benefits are concentrated among high-skilled workers and capital owners. Progressive taxation and redistribution policies may be necessary to ensure that the benefits of endogenous growth are broadly shared across society. However, excessive redistribution may reduce innovation incentives and undermine the growth process.

23.7 LET US SUM UP

New growth theory has fundamentally transformed our understanding of the sources of economic growth and the role of macroeconomic policy in promoting sustained expansion. By making technological progress and human capital accumulation endogenous to the economic system, the theory demonstrates that government policies can have permanent effects on growth rates through their influence on innovation incentives and knowledge creation. The

integration of growth and business cycle considerations reveals complex interactions that require coordinated policy responses to achieve both stabilization and growth objectives.

The policy implications of endogenous growth theory extend far beyond traditional fiscal and monetary interventions to encompass education, research and development, intellectual property, and industrial policies. Contemporary applications to digital transformation, artificial intelligence, and climate change demonstrate the continued relevance and evolution of the theoretical framework. However, significant challenges remain in measuring the key variables, identifying causal relationships, and implementing coordinated policy packages in complex political economy environments.

Future research in endogenous growth theory must address these empirical and policy challenges while incorporating new developments in technology and global economic integration. The emergence of artificial intelligence as a potentially transformative technology requires new theoretical frameworks that can accommodate machine learning and automation effects. Climate change considerations demand integration of environmental constraints and green innovation incentives into growth models. As economies become increasingly knowledge-intensive and globally integrated, understanding the mechanisms of endogenous growth becomes ever more critical for designing effective macroeconomic policies that promote both stability and sustained prosperity.

Check Your Progress-I

1. What is the main difference between old (exogenous) and new (endogenous) growth theories?

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2. Explain how business cycles (booms and recessions) can affect long-term growth, according to new growth theory.

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3. What is a challenge policymakers face when trying to design growth-friendly policies?

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23.8 KEYWORDS

Endogenous Growth Theory: Economic theory that explains long-run growth as arising from activities within the economic system, particularly investments in human capital, innovation, and knowledge.

Knowledge Spillovers: Positive externalities created when innovations by one firm or individual benefit other economic agents, generating increasing returns to scale in knowledge production.

Human Capital: The skills, knowledge, and experience possessed by individuals that enhance their productive capacity and contribute to economic growth.

Creative Destruction: The process of industrial transformation that continuously revolutionizes economic structure by destroying old industries while creating new ones.

Learning-by-Doing: The process through which current production activities enhance future productive capacity through accumulated experience and knowledge.

R&D Subsidies: Government financial support for research and development activities designed to correct market failures associated with knowledge spillovers.

Intellectual Property Protection: Legal frameworks including patents and copyrights that provide temporary monopoly rights to innovators to encourage innovation investment.

Technology Spillovers: The diffusion of technological knowledge across firms, industries, or countries that enhances overall productivity.

Innovation Incentives: Economic and institutional factors that motivate individuals and firms to invest in developing new technologies and products.

Growth-Cycle Nexus: The interconnection between long-term economic growth and short-term business cycle fluctuations in endogenous growth models.

Convergence: The tendency for poorer economies to grow faster than richer ones, leading to a reduction in income differences over time.

Increasing Returns to Scale: A production characteristic where output increases by a larger proportion than the increase in inputs, often associated with knowledge-based activities.

23.9 SUGGESTED READINGS

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India

23.10 HINTS TO CHECK YOUR PROGRESS

CYP-I

1. refer to section 23.3

2. refer to section 23.5

3. refer to section 23.6

23.11 EXAMINATION ORIENTED QUESTIONS

- Discuss how government policies can have permanent effects on a country's growth rate according to new growth theory.
- Explain the relationship between business cycles and long-term growth in the context of new growth theory.
- Evaluate the challenges policymakers face in designing and implementing growth-friendly policies.

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TOWARD INTEGRATION: A UNIFIED VIEW OF BUSINESS CYCLES AND MACROECONOMIC POLICY

STRUCTURE

24.0 INTRODUCTION

The modern macroeconomic landscape demands a comprehensive understanding of the intricate relationships between business cycles and macroeconomic policy. This lesson presents a unified framework that integrates business cycle theory with macroeconomic policy analysis, providing a coherent foundation for understanding economic fluctuations and their management. Rather than viewing economic fluctuations as external phenomena to be managed through separate policy tools, this unified approach recognizes that business cycles and policy interventions are fundamentally interconnected systems that must be understood together.

24.0 OBJECTIVES

The main objectives of this lesson are to enable you to:

- Discuss how business cycles and macroeconomic policies are connected.
- Learn about different theories explaining why economies go through booms and recessions.
- Explore how modern models (like DSGE) help analyze the effects of policies on the economy.
- Examine the roles of monetary and fiscal policies in managing economic ups and downs.
- Recognize the importance of policy coordination, both nationally and internationally.
- Analyze real-world examples (like the 2008 crisis and COVID-19) to see how policies are used in practice.

24.1 LEARNING OUTCOMES

After going through this lesson, you shall be able to:

- Explain why business cycles and policy decisions should be studied together.
- Describe key business cycle theories (Real Business Cycle, New Keynesian).

- Identify how DSGE models work and why they are useful for policy analysis.
- Compare the tools and goals of monetary and fiscal policy.
- Discuss why coordination between different policy areas and countries is important.
- Use recent economic crises as examples to illustrate integrated policy responses.

24.3 THEORETICAL FOUNDATIONS OF BUSINESS CYCLES

Evolution of Business Cycle Theory

Business cycle theory has undergone significant evolution since its early origins, moving from classical views of self-correcting markets to sophisticated modern frameworks. The classical perspective emphasized temporary deviations from full employment equilibrium, but the Great Depression fundamentally challenged this view, leading to revolutionary developments in macroeconomic thinking.

The Keynesian revolution introduced the concept that business cycles could represent prolonged periods of underemployment equilibrium, fundamentally altering our understanding of economic fluctuations. This perspective laid the groundwork for modern activist fiscal and monetary policies, recognizing that aggregate demand deficiencies could persist for extended periods.

Contemporary Business Cycle Theories

Modern business cycle theory encompasses several competing yet complementary approaches. Real Business Cycle (RBC) theory, developed by Kydland and Prescott, emphasizes technology shocks as primary drivers of economic fluctuations. These models suggest that business cycles are efficient responses to real productivity shocks, with limited role for systematic monetary policy in affecting real variables.

The New Keynesian approach represents a synthesis of Keynesian insights with modern macroeconomic rigor. These models incorporate nominal rigidities, such as sticky prices and wages, which create scope for monetary policy to affect real variables in the short run. The presence of these rigidities means that markets may not clear instantaneously, leading to persistent deviations from full employment.

Austrian Business Cycle Theory offers an alternative perspective, emphasizing the role of

credit expansion by central banks in creating artificial booms that inevitably lead to busts. This approach highlights the importance of capital structure and temporal coordination of economic activity, suggesting that monetary interventions can distort natural coordination mechanisms.

Dynamic Stochastic General Equilibrium Models

The development of Dynamic Stochastic General Equilibrium (DSGE) models represents a significant advancement in business cycle modeling. These models combine microeconomic foundations with macroeconomic aggregates, providing a coherent framework for analyzing interactions between various economic agents and sectors.

DSGE models incorporate four key characteristics: they are dynamic (accounting for intertemporal optimization), stochastic (including random shocks), general equilibrium (ensuring market clearing), and micro-founded (based on explicit optimization by economic agents). These features make DSGE models particularly suitable for policy analysis, as they can account for the Lucas critique by modeling how policy changes affect agent behavior.

24.4 BUSINESS CYCLE DYNAMICS AND POLICY INTERACTIONS

Monetary Policy Architecture

Modern monetary policy operates within sophisticated institutional frameworks designed to achieve price stability while supporting economic growth. The evolution from discretionary monetary policy to rule-based approaches reflects deeper understanding of the importance of credibility and expectations in monetary transmission mechanisms.

Central banks today typically operate under inflation targeting regimes, which provide clear nominal anchors for inflation expectations while allowing flexibility in responding to short-term economic fluctuations. The Taylor Rule, which suggests that central banks should adjust interest rates in response to deviations of inflation from target and output from potential, has become a cornerstone of modern monetary policy analysis.

The implementation of unconventional monetary policies following the 2008 financial crisis expanded the central bank toolkit significantly. Quantitative easing, forward guidance, and negative interest rates represent new dimensions of monetary policy that operate through different transmission channels than traditional interest rate policy.

Fiscal Policy in the Modern Economy

Fiscal policy encompasses both automatic stabilizers and discretionary policy actions. Automatic stabilizers, such as progressive taxation and unemployment insurance, provide immediate counter-cyclical responses to economic fluctuations without requiring legislative action. These mechanisms help smooth business cycle fluctuations by automatically increasing government transfers and reducing tax burdens during recessions.

Discretionary fiscal policy involves deliberate changes in government spending or taxation designed to influence aggregate demand. The effectiveness of fiscal policy depends critically on various factors, including the fiscal multiplier, the degree of economic openness, the exchange rate regime, and the level of government debt.

The fiscal theory of the price level suggests that fiscal policy can have direct effects on inflation through its impact on government debt dynamics. This perspective highlights the interdependence between fiscal and monetary authorities and the importance of coordinated policy responses.

Supply-Side and Structural Policies

Supply-side policies focus on enhancing the economy's productive capacity rather than managing aggregate demand. These policies include investments in infrastructure, education, research and development, and institutional reforms that improve the efficiency of markets and institutions.

Structural reforms, such as labor market flexibilization, product market deregulation, and financial market development, can enhance the economy's ability to adjust to shocks and improve long-term growth prospects. However, these reforms often involve short-term adjustment costs that must be carefully managed through appropriate macroeconomic policies.

24.5 THE INTEGRATION CHALLENGE

Theoretical Integration

The challenge of integrating business cycle theory with macroeconomic policy lies in developing models that can simultaneously capture the sources of economic fluctuations and the mechanisms through which policy interventions affect the economy. This requires sophisticated theoretical frameworks that can account for various frictions, expectations

formation, and complex interactions between different economic agents.

New Keynesian DSGE models represent the current state-of-the-art in this integration effort. These models typically include households that maximize utility subject to budget constraints, firms that maximize profits subject to production technologies and price-setting constraints, and a government sector that implements fiscal and monetary policies according to specified rules.

The micro-foundations approach ensures that policy analysis accounts for the behavioral responses of economic agents to policy changes. This addresses the Lucas critique by explicitly modeling how agents' decision rules change in response to policy regime changes.

Empirical Challenges

Empirically validating integrated business cycle and policy models presents significant challenges. The complexity of modern economies means that multiple shocks and transmission mechanisms operate simultaneously, making it difficult to identify the causal effects of specific policies or shocks.

Bayesian estimation techniques have emerged as the preferred approach for estimating DSGE models, as they allow researchers to incorporate prior information about parameter values while letting the data inform the posterior distribution. These methods enable the estimation of complex models with many parameters while maintaining economic interpretability.

24.6 A UNIFIED FRAMEWORK FOR ANALYSIS

Core Components of Integration

A unified framework for analyzing business cycles and macroeconomic policy must incorporate several key components. First, it must account for various sources of economic fluctuations, including demand shocks, supply shocks, financial shocks, and policy shocks. Second, it must model the transmission mechanisms through which these shocks propagate through the economy.

Third, the framework must include realistic representations of policy institutions and their decision-making processes. This includes modeling central bank reaction functions, fiscal policy rules, and political economy constraints that influence policy decisions. Fourth, it must account for expectations formation and how policy credibility affects the transmission of

shocks and policies.

Policy Interaction and Coordination

The unified framework must explicitly address interactions between different policy instruments. Monetary and fiscal policies can be either complementary or substitutable, depending on the nature of shocks and the policy environment. During normal times, monetary policy typically takes the lead in stabilization, while fiscal policy focuses on long-term sustainability and structural objectives.

However, during severe downturns or when monetary policy is constrained by the zero lower bound, fiscal policy may need to play a more active stabilization role. The coordination between monetary and fiscal authorities becomes particularly important in these circumstances to ensure that policies are mutually reinforcing rather than working at cross-purposes.

International policy coordination adds another layer of complexity, particularly in an era of increased economic integration. Business cycle synchronization across countries has important implications for the effectiveness of national policies and the need for coordinated international responses to global shocks.

Dynamic Policy Optimization

The unified framework enables dynamic policy optimization that accounts for the full range of trade-offs faced by policymakers. This includes the short-run trade-off between output and inflation, the long-run relationship between debt sustainability and fiscal space, and the international spillover effects of domestic policies.

Optimal policy analysis in this framework typically involves solving complex dynamic programming problems that account for various constraints and objectives faced by policymakers [42][49]. The solutions often involve state-contingent policy rules that specify how policy instruments should respond to different economic conditions.

24.7 IMPLEMENTATION CHALLENGES AND SOLUTIONS

Institutional Design

Implementing a unified approach to business cycle management and macroeconomic policy requires appropriate institutional arrangements. This includes clear mandates for policy

institutions, effective coordination mechanisms, and robust accountability frameworks that ensure policies are implemented consistently with their theoretical foundations.

The design of policy rules and institutions must balance the benefits of systematic policy responses with the need for flexibility in responding to unusual circumstances. This has led to the development of constrained discretion frameworks that provide clear guidelines for normal times while allowing for appropriate responses to exceptional circumstances.

Communication and Transparency

Effective implementation of integrated policies requires clear communication with markets and the public about policy objectives, strategies, and decision-making processes. Central bank communication has evolved significantly in recent decades, with many institutions now providing detailed forward guidance about the likely path of policy rates.

Fiscal authorities face greater challenges in communication due to the political nature of fiscal decisions and the complexity of budget processes. However, the development of fiscal councils and independent fiscal institutions has helped improve the quality of fiscal policy analysis and communication.

Data and Monitoring Requirements

The implementation of sophisticated policy frameworks requires extensive data collection and monitoring systems. This includes high-frequency indicators of economic activity, detailed micro-data on sectoral developments, and forward-looking indicators such as business and consumer confidence surveys.

The development of nowcasting techniques and real-time economic monitoring has enhanced policymakers' ability to assess current economic conditions and adjust policies appropriately. Machine learning and artificial intelligence techniques are increasingly being used to process large amounts of data and identify patterns that may not be apparent using traditional analytical approaches .

24.8 CASE STUDIES AND APPLICATIONS

The Great Moderation

The period from the mid-1980s to the mid-2000s, known as the Great Moderation, provides an important case study in successful business cycle management. During this period, most developed economies experienced reduced volatility in output and inflation, which many attributed to improved monetary policy practices.

The adoption of inflation targeting regimes and increased credibility of central banks contributed to better anchored inflation expectations and reduced economic volatility. The experience of the Great Moderation validated many theoretical insights about the importance of credible monetary policy rules in stabilizing the economy.

The 2008 Financial Crisis

The global financial crisis of 2008 provided a severe test of integrated policy frameworks. The crisis originated in the financial sector but quickly spread to the real economy, requiring coordinated responses from monetary, fiscal, and regulatory authorities.

Central banks responded with aggressive monetary easing, including cutting policy rates to near-zero levels and implementing unconventional policies such as quantitative easing. Fiscal authorities implemented large stimulus packages to support aggregate demand and prevent a deflationary spiral.

The crisis highlighted the importance of international policy coordination, as the interconnected nature of global financial markets meant that unilateral policy actions could have significant spillover effects. The coordinated response by major central banks and G20 fiscal stimulus helped prevent a repeat of the Great Depression.

The COVID-19 Pandemic Response

The COVID-19 pandemic presented unique challenges that required unprecedented policy responses. Unlike typical recessions that involve demand deficiencies, the pandemic involved simultaneous supply and demand shocks accompanied by extraordinary uncertainty.

The policy response combined massive fiscal support with accommodative monetary policy and direct interventions in specific sectors. The speed and scale of the response demonstrated the importance of having robust policy frameworks that can be quickly scaled up in response to extraordinary circumstances.

24.9 FUTURE DIRECTIONS AND DEVELOPMENTS

Technological Integration

The increasing availability of big data and advances in computational techniques are opening new possibilities for business cycle analysis and policy implementation. Machine learning techniques can help identify patterns in large datasets that may not be apparent using traditional econometric methods.

Real-time monitoring systems using high-frequency data can provide policymakers with more timely information about economic conditions, enabling faster and more targeted policy responses. The development of digital currencies by central banks may also provide new tools for implementing monetary policy.

Climate and Sustainability Considerations

The growing recognition of climate change as a macroeconomic risk is leading to the integration of environmental considerations into business cycle analysis and policy frameworks. Central banks are beginning to incorporate climate risks into their monetary policy frameworks, while fiscal authorities are developing green fiscal policies.

The transition to sustainable economic growth models will require coordinated policy responses that address both short-term stabilization needs and long-term sustainability objectives. This represents a new frontier for integrated policy analysis that extends beyond traditional macroeconomic variables.

Global Integration and Cooperation

The increasing integration of global economies requires enhanced international coordination of macroeconomic policies. This includes the development of new frameworks for sharing information, coordinating policy responses to global shocks, and managing spillover effects.

The rise of emerging market economies as major players in the global economy requires new

approaches to international policy coordination that account for different institutional structures and policy frameworks in these countries.

24.10 LET US SUM UP

The integration of business cycle theory and macroeconomic policy represents a fundamental advancement in economic thinking that provides a more coherent and effective approach to economic management. This unified framework recognizes that business cycles and policy interventions are interconnected systems that must be understood and managed together.

The development of sophisticated theoretical models, particularly DSGE models, has provided the analytical tools necessary for this integration. These models enable policymakers to analyze complex interactions between different economic sectors and policy instruments while accounting for the behavioral responses of economic agents.

The practical implementation of integrated policy frameworks requires appropriate institutional arrangements, effective communication strategies, and robust monitoring systems. The experiences of recent decades, including the Great Moderation, the 2008 financial crisis, and the COVID-19 pandemic, have provided valuable lessons about the benefits and challenges of coordinated policy responses.

Looking forward, technological advances, sustainability considerations, and global integration will continue to reshape the landscape for business cycle analysis and macroeconomic policy. The unified framework developed in this lesson provides a foundation for addressing these emerging challenges while maintaining core insights about the importance of coordinated and credible policy responses.

Check Your Progress

1. Can you explain, in your own words, why business cycles and macroeconomic policy should be studied together rather than separately?

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2. What is a DSGE model, and why is it important for policy analysis?

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3. Name two challenges policymakers face when trying to implement integrated policy frameworks.

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24.11 KEYWORDS

Business Cycles: Recurring fluctuations in economic activity characterized by periods of expansion and contraction in aggregate output, employment, and other macroeconomic variables.

Dynamic Stochastic General Equilibrium (DSGE) Models: Sophisticated economic models that combine microeconomic foundations with macroeconomic aggregates, incorporating dynamic optimization, random shocks, market clearing conditions, and explicit agent behavior.

Taylor Rule: A monetary policy guideline suggesting that central banks should adjust interest rates in response to deviations of inflation from target levels and output from potential levels.

Automatic Stabilizers: Government policies that provide immediate counter-cyclical responses to economic fluctuations without requiring legislative action, such as progressive taxation and unemployment insurance.

Fiscal Multiplier: The ratio of change in national income to the change in government spending that caused it, measuring the effectiveness of fiscal policy in stimulating economic activity.

Real Business Cycle (RBC) Theory: An economic theory emphasizing technology shocks as primary drivers of economic fluctuations, suggesting that business cycles represent efficient responses to productivity changes.

New Keynesian Economics: A macroeconomic school incorporating nominal rigidities like sticky prices and wages, which create scope for monetary policy to affect real variables in the short run.

Zero Lower Bound: The constraint that nominal interest rates cannot fall below zero (or slightly below), limiting the effectiveness of conventional monetary policy during severe recessions.

Quantitative Easing: An unconventional monetary policy involving large-scale purchases of government bonds and other securities to lower long-term interest rates when conventional policy rates are at their effective lower bound.

24.12 SUGGESTED READINGS

- Dornbusch, Fischer and Startz: Macroeconomics, 12th Edition. McGraw Hill Education India.
- William H. Branson: Macroeconomic Theory and Policy, 2nd Edition, Universal Book Stall, New Delhi.
- N. Gregory Mankiw and Mark P. Taylor: Macroeconomics, 4th Edition, Cengage Learning (India).
- Richard T. Froyen: Macroeconomics Theories and Policies, 12th Edition, Pearson Education India
- Olivier Blanchard: Macroeconomics, 7th Edition, Pearson Education India

24.13 HINT TO CHECK YOUR PROGRESS

CYP-I

1. Refer to section 24.4

2. Refer to section 24.4

3. Refer to section 24.5

24.14 EXAMINATION ORIENTED QUESTIONS

- Explain the role of automatic stabilizers in fiscal policy.
- Discuss why it is important to integrate business cycle theory with macroeconomic policy analysis.
- Explain the features and importance of Dynamic Stochastic General Equilibrium (DSGE) models in modern macroeconomic analysis.

- Evaluate the effectiveness of monetary and fiscal policy coordination during a major economic crisis (e.g., the 2008 financial crisis or COVID-19 pandemic