MACROECONOMICS II

COURSE CODE: M23EC06DC

Postgraduate Programme in Economics

Discipline Core Course

Self Learning Material

SREENARAYANAGURU OPEN UNIVERSITY

The State University for Education, Training and Research in Blended Format, Kerala

SREENARAYANAGURU OPEN UNIVERSITY

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To increase access of potential learners of all categories to higher education, research and training, and ensure equity through delivery of high quality processes and outcomes fostering inclusive educational empowerment for social advancement.

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Pathway

Access and Quality define Equity.

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(With Model Question Paper Sets)

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MESSAGE FROM VICE CHANCELLOR

Dear learner,

I extend my heartfelt greetings and profound enthusiasm as I warmly welcome you to Sreenarayanaguru Open University. Established in September 2020 as a state-led endeavour to promote higher education through open and distance learning modes, our institution was shaped by the guiding principle that access and quality are the cornerstones of equity. We have firmly resolved to uphold the highest standards of education, setting the benchmark and charting the course.

The courses offered by the Sreenarayanaguru Open University aim to strike a quality balance, ensuring students are equipped for both personal growth and professional excellence. The University embraces the widely acclaimed "blended format," a practical framework that harmoniously integrates Self-Learning Materials, Classroom Counseling, and Virtual modes, fostering a dynamic and enriching experience for both learners and instructors.

The university aims to offer you an engaging and thought-provoking educational journey. The postgraduate programme in Economics builds on the undergraduate programme by covering more advanced theories and practical applications. The course material aims to spark learners' interest by using real-life examples and combining academic content with empirical evidence, making it relevant and unique. The Self-Learning Material has been meticulously crafted, incorporating relevant examples to facilitate better comprehension.

Rest assured, the university's student support services will be at your disposal throughout your academic journey, readily available to address any concerns or grievances you may encounter. We encourage you to reach out to us freely regarding any matter about your academic programme. It is our sincere wish that you achieve the utmost success.

Regards,
Dr. Jagathy Raj V. P. 01-10-2024

Contents

MASTER OF ARTS ECONOMICS

Macroeconomic Policy

Block 1

UNIT 1
Introduction to Macroeconomic Policy

Learning Outcomes

After completing this unit, the learner will be able to:

- understand macroeconomic policies
- examine the objectives of macroeconomic policies
- differentiate between target variables and instrument variables

Background

Macroeconomic policy aims to guide and stabilise economies towards desirable outcomes while reducing the impact of adverse events. These policies serve as the tools of governments and central banks, enabling them to respond to a lot of economic challenges and opportunities. Whether it is combating inflationary pressures, stimulating sluggish growth, or protecting against economic recession, macroeconomic policies provide solutions for governments and central banks to overcome these issues. To make good policies, policymakers need to understand how economies work and be careful about the choices they make. They have to think about what is best for the economy in the short term and the long term.

The target variables and instrument variables are the concepts that serve as the backbone of economic policy formulation, guiding policymakers in their search to achieve desired economic outcomes. The target variables represent the ultimate goals of economic policy. These targets cover a range of macroeconomic indicators, from controlling inflation and unemployment to promote sustainable economic growth. Through instrument variables, policymakers seek to influence the economy and direct it towards these targets. These instruments can take various forms, including interest rates, government spending, taxation, and regulatory policies.

Keywords

Macroeconomic Policy, Target Variable, Instrument Variable

Discussion

1.1.1 Macroeconomic Policies

- Macroeconomic policy aims for economic stability and growth

Macroeconomic policy refers to a set of actions taken by authorities to manage and influence key macroeconomic variables to achieve macroeconomic goals of the society. In the words of John Brooks and Robert W Evans, "Macroeconomic policy can be thought of as an attempt by the authorities to achieve target levels of certain major economic aggregates." These targets typically include sustainable economic growth, maximising employment, equitable distribution of national income, stable equilibrium and balance of payments. The scope of macroeconomic policy covers a wide range of real and monetary variables. Real variables include the Gross National Product (GNP), total employment, aggregate expenditure, saving and investment, government expenditure, tax and non-tax revenue, exports and imports, and the balance of payments. Monetary variables include supply of money, demand for money, supply of credit, bank deposits and interest rate. To control these variables, policymakers use two main tools. They are, monetary measures related to money supply and interest rates and fiscal measures related to government spending and taxation.

1.1.1.1 Emergence of Macroeconomic Policies

- Great Depression led to active government intervention

Even though economic issues have existed throughout history, it is only recently that governments took a more active role in managing them through macroeconomic policies. Before the Great Depression of the 1930s, the prevailing classical economic thought emphasised minimal government intervention and free market principles. However, the severity of the Great Depression exposed the limitations of classical economics as it could not explain or solve the crisis. This paved the way for the development and use of macroeconomic policies by governments to address economic problems.

John Maynard Keynes is credited with highlighting the importance of government intervention in managing the

- Keynes advocated government intervention for economic stability

economy for growth and stability. His ideas gained importance after World War II, especially in rebuilding war-ravaged economies. The success of these government interventions fuelled the belief that governments, through fiscal policy measures like taxation and public expenditure, could act as major contributors in the economy by accelerating growth, reducing unemployment, and stabilising the economic system.

Economists argue that economic fluctuations or shocks necessitate macroeconomic policy because the market does not self- correct effectively. The initial success of Keynesian ideas in developed economies led to the belief that macroeconomic policies could also solve problems in developing nations. These included:

- Macroeconomic policy addresses challenges in developing economies too

i) Breaking the vicious circle of poverty: Helping developing economies escape low growth traps and achieve sustained development.

ii) Boosting capital formation and growth: Creating conditions that encourage investment and economic expansion.

iii) Tackling unemployment: Addressing chronic unemployment issues.

iv) Reducing income inequality: Narrowing the gap between rich and poor.

Thus, the macroeconomic policy became a tool for developing economies to stimulate growth and address key challenges.

1.1.1.2 Objectives of Macroeconomic Policies

- Policy goals adapt to the country's changing needs

The objectives of macroeconomic policies are set by policymakers based on a country's specific needs and aspirations, which can change over time. For example, after the Great Depression, the top priorities for most industrialised nations were employment generation, economic stability, and preventing future economic crisis . These became the primary objectives of macroeconomic policies during that period. Following World War II, additional goals were added. Let us discuss the major objectives of macroeconomic policies.

1. Economic Growth

For a long time, economic growth has been a top goal for rich and poor countries. The focus on achieving a high and sustainable growth rate has grown even stronger in recent decades. Economists and politicians view growth as key to meeting people's needs, national security, and international prestige. It is also seen as the answer to unemployment and poverty. A reasonably high growth rate with a target of 5-6% annual growth is viewed as an indispensable economic and political objective of most nations. However, there are growing concerns. Some argue that the relentless pursuit of growth comes at a cost, harming the environment and creating unequal benefits. They point to developing nations where growth has not improved the quality of life for the poor. This has led some to believe that tackling poverty and inequality should be a higher priority than just maximising GDP growth.

- Growth is essential, yet inequality concerns are emerging

2. High Rate of Employment

Attaining and sustaining full employment has been a key focus of Keynesian macroeconomic policy. Keynes himself pointed out the failure of contemporary economic systems to achieve this goal. Full employment does not mean zero unemployment. It refers to a low unemployment rate, where frictional and seasonal factors cause temporary unemployment. The objective of full employment is justified due to the social and economic benefits of employment, such as increased output, reduced social and economic hardships for the unemployed, and improved well being. Arthur Okun's influential Okun's Law further emphasised the importance of full employment, showing that higher unemployment rates are associated with significant declines in real GDP. Therefore, policymakers often prioritise strategies aimed at achieving and maintaining full employment to promote economic stability and prosperity.

- Full employment vital for economic stability and prosperity

The common view is that economic expansion and full employment go hand in hand. After World War II, many governments, like Britain and the US, took responsibility for job creation and high employment. This became a major goal of macroeconomic policy, especially in developed countries. Similarly, after gaining independence developing nations facing high unemployment adopted Keynesian policies that focused on job creation. This objective has been central to their development plans. For instance, creating jobs has been a key aim of India's Five Year Plans.

- Employment generation integral to macroeconomic policy

3. Price Stability, Output Growth, and Full Employment

Following the Great Depression, stabilising prices became a primary focus of macroeconomic policy in industrialised nations. In Britain, influential committees like the Macmillan Committee on Finance and Industry (1931) emphasised the importance of raising and maintaining the price level to combat economic downturns. Recommendations from these committees, reflected in government documents like the British White Paper of 1944, Stressed the need to prioritise high and stable employment levels in the post-war period. These suggestions marked a shift in policy approach towards addressing macroeconomic challenges, with governments taking on a more active role in managing economic stability and employment levels.

- Stabilising prices crucial for economic stability

In the United States, similar to Britain, addressing unemployment and ensuring price stability became central concerns. Although the US Employment Act of 1946 did not explicitly mention price stabilisation, it was understood as an underlying goal. However, during the late 1950s, as the US faced significant inflation, President Dwight David Eisenhower proposed amending the Employment Act to explicitly include achieving reasonable price stability as a federal economic policy objective. Price stability, as a macroeconomic policy objective, does not mean keeping prices constant but rather ensuring that price indexes show no significant upward trend after accounting for inherent biases. Additionally, a moderate rate of inflation is often considered acceptable. Therefore, the goal of price stabilisation involves maintaining price increases within desirable limits, typically around 2-3% in developed countries and 4-5% in less developed countries, and avoiding sharp fluctuations in price levels.

- Price stability aims for controlled inflation rates

4. Economic Equity

The track record of both developed and developing economies reveals an important reality. Simply achieving economic growth does not automatically lead to improved well being for all citizens. Instead, growth often coincides with widening income disparities, where a small segment of society prospers while others struggle in poverty. This inequality not only undermines social unity but also imposes limits on economic growth by limiting market size and demand. As a result, ensuring economic equity has emerged as a crucial objective of macroeconomic policy. Addressing income disparities becomes essential not only for social justice but also for sustaining long term economic prosperity. By prioritising economic equity, policymakers aim to create a more inclusive

- Economic equity vital for sustainable and inclusive growth and sustainable economy where the benefits of growth are shared more evenly among all members of society thereby promoting greater stability and prosperity for everyone.

5. Stabilising Balance of Payments

- Stable BOP ensures economic stability

In the post-World War II era, the rapid expansion of international trade combined with insufficient growth in international currency reserves, resulted in imbalances in the Balance of Payments (BOP) of many countries. These imbalances were worsened by protectionist measures, currency devaluations, and trade restrictions. Consequently, maintaining a stable position became a significant objective of macroeconomic policy starting from the 1950s. A satisfactory BOP position is challenging to define precisely but generally involves avoiding persistent deficits or surplus. Persistent deficits, especially if large, can lead to external payment problems and increase international indebtedness, as seen in cases like the foreign exchange crisis in India in 1990s. Countries like Argentina, Brazil, and Mexico have experienced economic turmoil due to adverse BOP situations. Thus, ensuring a healthy BOP position is crucial for economic stability and avoiding crisis.

Objectives of Macroeconomic Policy of India

India's macroeconomic policy objectives are outlined in various official documents such as the Five Year Plan papers, Ministry of Finance policy papers, publications from the Planning Commission and Reserve Bank of India. These objectives are also highlighted in the annual government budget. Furthermore, the interaction between government bodies and the academic world helps to refine and provide insights into these objectives. India's macroeconomic policy aims to achieve several key objectives, including:

1. Attaining a growth rate of 5-6% annually
2. Creating job opportunities for the unemployed and underemployed
3. Reducing economic disparities
4. Eradicating poverty
5. Controlling inflation and stabilising prices, and
6. Preventing balance of payments imbalances.

- India's macroeconomic policy aims for multifaceted goals

India's experience shows that, even with well designed policies, achieving all economic goals can be tough. Developed and developing countries alike struggle with issues like slow growth, unemployment, inequality, and inflation. This reminds us that managing the economy is complex and requires constant adjustments.

1.1.2 Macroeconomic Policy Formulation

Policy formulation is the responsibility of policymakers, who must guide conflicting macroeconomic objectives and find a balance. While there are no fixed rules for developing these policies, there is a general procedure followed. Policymakers analyse the situation and devise strategies accordingly. This process involves considering various factors and trade off between conflicting macroeconomic objectives to develop effective policies that address economic challenges.

- Policy formulation requires clear objectives and strategies

The three most important aspects of policy formulation are:

i. Determination of policy objectives

ii. Choice of policy, and policy instruments

iii. Determining the target variables and targets.

Let us look into the details.

1.1.2.1 Determination of Policy Objectives

- Policymakers prioritise objectives based on social needs

Policy objectives are determined based on the economic needs and social aspirations of a country's people. These needs and aspirations are influenced by the views of politicians, social thinkers, philosophers, and intellectuals, as expressed in their writings and speeches. However, the main objectives typically revolve around economic growth, employment, equity, and stability. The importance given to each objective may differ between countries and over time. It is the responsibility of policymakers to select from these objectives and prioritise them according to the specific context and circumstances.

The choice and prioritisation of policy objectives depend on factors such as policymakers' understanding of the country's economic, social, and political challenges, their approach to analysing these issues, their ideological leanings, and their expertise in economic theory and tools. Generally, macroeconomic policy objectives are determined by considering the economic needs and social pressures. In poorer countries, the primary focus is often on breaking the cycle of poverty and promoting rapid economic growth while creating employment opportunities. Contrarily, in economically advanced or developed nations, stabilising prices and employment levels typically take precedence on the economic agenda.

- Policy objectives differ between poorer and advanced nations

1.1.2.2 The Choice of Policy and Policy Instruments

Once macroeconomic goals are set, the next step is choosing the right policy. This involves selecting from various options available, such as fiscal policy, monetary policy, and income policy. Each policy option has its own strengths and limitations, and policymakers must carefully consider which combination of policies will be most effective in achieving the desired economic outcomes. Initially, they decide between fiscal and monetary policy. In less developed economies with limited banking systems, fiscal policy is often favoured, while monetary policy is preferred in developed economies. However, in both cases, policymakers aim to balance fiscal and monetary instruments. If these policies fail to meet goals, direct controls like price and wage freezes, industrial licensing, and import controls may be considered as alternatives.

- Policymakers choose from diverse policy options available

1.1.2.3 Determining the Target Variables and Instrumental Variables

Once policymakers have chosen a policy, their next task is to select the target variables and corresponding policy instruments. Let us examine these target variables.

Target Variables: Target variables are crucial economic indicators that policymakers aim to control and regulate to achieve desired outcomes. Targets in economic policy are specific goals set to benefit society, typically focusing on output, prices, unemployment, and inflation. They are divided into ultimate targets, such as achieving zero inflation, and intermediate targets, which are steps towards achieving ultimate goals. For instance, a central bank might be tasked with maintaining a 2 percent annual growth rate of the money supply. Targeting money supply growth can be an effective strategy for achieving broader economic objectives. Essentially, intermediate targets serve as milestones on the path to fulfilling overarching social goals.

- Target variables guide policymakers in specific economic goals

- Policy targets guide interventions for economic stability

In monetary policy, target variables include the aggregate supply of money, aggregate demand for money, and credit created by banks. For fiscal policy, target variables include disposable income, consumption expenditure, savings and investment, and individual wealth holdings. These variables serve as key measures to monitor and adjust policy interventions effectively, directing policymakers in their efforts to achieve broader economic goals.

- Direct policy tools to achieve economic objectives

Instrumental Variables: Instruments in economic policy are the direct tools that policymakers use to achieve their objectives. For instance, if a central bank aims to maintain a specific exchange rate target, its instrument would involve buying or selling foreign currency. These instruments are the tangible means through which policymakers enact their desired changes in the economy. They allow policymakers to directly influence economic conditions and outcomes according to their goals. Examples of instrument variables include the central bank's discount rate, cash reserve ratio, tax rates, and levels of public expenditure. These instrumental variables, provide policymakers with the means to implement monetary and fiscal policies effectively. By changing these variables as needed, governments can respond to economic challenges and pursue their policy objectives, such as controlling inflation, stimulating economic growth, or stabilising employment levels.

- Central banks control economies through monetary policy instruments

Monetary policy instruments are tools used by central banks to influence the demand for money and control the flow of funds within an economy. In the previous semester, learners might have become familiar with monetary policy instruments such as the bank rate or discount rate, Open Market Operations (OMO), Cash Reserve Ratio (CRR), selective credit controls, moral suasion and direct controls. By adjusting these instruments, central banks can affect the availability of credit in the economy, which in turn impacts individuals' cash holdings and spending behaviour. Ultimately, these monetary controls influence real economic variables by guiding the flow of institutional credit and impacting economic activity.

Fiscal policy instruments are tools used by governments to influence economic conditions and to achieve policy objectives. These instruments include public expenditure, taxation, public debt, and deficit financing. When policymakers make discretionary changes to these fiscal instruments, it leads to adjustments in fiscal target variables. These changes

- Fiscal policy instruments influences individuals economic decisions

primarily impact real economic variables such as disposable income, consumption expenditure, savings and investment, and individuals' wealth holdings. Fiscal measures influences a wide range of economic decisions made by individuals and entities with taxable income, consumption habits, savings, investments, or holdings of government bonds.

- Fiscal and monetary policies mutually influence each other

Monetary and fiscal variables are closely connected and influence each other. Changes in fiscal policies, such as government spending or taxation, impact monetary variables, such as money supply or interest rates. Similarly, changes in monetary policies, like adjusting interest rates or reserve requirements, affect fiscal variables. For instance, when government spending increases, it boosts the money supply in the economy, leading to higher household spending.

1.1.2.4 The Rules for Policy Instruments

- Policymakers choose suitable instruments for policies

Once policymakers have chosen a specific policy or combination of policies, such as fiscal, monetary, or a mix of both, they must select the appropriate instruments to implement these policy. This is because each policy contains different tools or instruments aimed at achieving its respective economic goals. However, not all instruments are equally effective or suitable for a particular economy. Therefore, there are no fixed rules for choosing between policy instruments, and the decision largely relies on the analytical skills and judgment of policymakers.

Nonetheless, following procedural rules and requirements of policy formulation can help reduce uncertainty and guide policymakers in selecting the most effective instruments for achieving their objectives.

i. Reliable estimates of key macro variables: Accurate assessments of important economic indicators that need regulation.

ii. Trends and rate of change in key macro variables: Understanding the direction and pace of change in these indicators.

iii. Reliable estimates of key coefficients and relationships between interrelated variables: Understanding how different economic factors influence each other.

iv. Projections of target macro variables based on simulations: Predicting future values of these indicators using economic models.

v. Selection of policy instruments: Choosing the appropriate tools to influence these variables, considering the above factors.

- Procedures guide effective policy instrument selection

vi. Assessing the time lag and acceptability: Evaluating the delay between policy implementation and its impact, and whether this delay is acceptable.

vii. Checking administrative and political feasibility: Ensuring that the chosen policy instruments can be practically implemented and are politically viable.

- Tinbergen's rule match policy instruments to objectives

Jan Tinbergen, a Nobel Prize winning economist from the Netherlands, introduced a theory of policy formulation known as Tinbergen's rule. According to this rule, the number of policy instruments should match the number of policy objectives to ensure an effective outcome. If there are more objectives than instruments, the system is underdetermined, while if there are more instruments than objectives, the system is overdetermined. While some economists have tried applying Tinbergen's Principle to find suitable combinations of fiscal and monetary policies, its widespread adoption has been limited. Additionally, merely selecting policy tools is not enough; what matters most in policy formulation is emphasis on practicality over theoretical rigidity.

Summarised Overview

Macroeconomic policies are strategies used by governments to guide and regulate the economy to attain specific economic goals. Policymakers use two main tools to influence these factors viz; monetary policy related to money supply and interest rates, and fiscal policy related to government expenditure and taxation. The emergence of macroeconomic policies gained momentum after the Great Depression. John Maynard Keynes advocated for government intervention to achieve economic stability and growth. Key objectives of macroeconomic policies include economic growth, maintaining full employment, stabilising prices, promoting economic equity, and ensuring a stable balance of payments. In India, these policies are outlined in various official documents and aim to achieve multifaceted goals like steady growth rates, job creation, poverty alleviation, inflation control, and balanced international trade.

Target variables are key economic indicators that policymakers aim to control to achieve specific objectives like output, prices, unemployment, and inflation. They help in setting clear economic goals and are divided into ultimate targets like zero inflation and intermediate targets that act as milestones. Instrumental variables are the direct tools policymakers use, like bank rates in monetary policy or taxation in fiscal policy, to achieve these goals. For instance, central banks use tools such as Open Market Operations, Cash Reserve Ratio, and interest rates to influence money supply and economic activity. Similarly, governments use fiscal tools like public expenditure and taxation to impact disposable income and investment decisions.

Assignments

1. Discuss the historical context that led to the emergence of active government intervention in managing the economy through macroeconomic policies.
2. What are the key objectives of macroeconomic policies?
3. How are monetary and fiscal policies interconnected, and what impact do changes in one policy have on the other?
4. What are the main target variables in economic policy, and why are they important?
5. What are instrumental variables in economic policy, and how do they help policymakers achieve their objectives?

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Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

UNIT 2
Monetary Policy Frameworks

Learning Outcomes

After completing this unit, the learner will be able to:

- understand the rule based approach and discretion based approach in monetary policy
- analyse the Taylor rule and its application
- evaluate the concept of time inconsistency in monetary policy
- examine the concept of monetary targeting and inflation targeting

Background

As you learned in your Microeconomics I course during your first semester, monetary policy refers to the actions undertaken by a central bank to influence the availability of money and credit in the economy. By adjusting interest rates, managing the money supply, and setting other policy measures, central banks seek to achieve a variety of objectives, including controlling inflation, stabilising employment, and ensuring economic growth.

One of the fundamental debates in monetary policy revolves around the choice between rules and discretion. On one hand, some economists advocate for rule based approaches, where policymakers stick to pre-established guidelines when making policy decisions. These rules are often based on economic theories or empirical relationships and provide a transparent and predictable framework for policy implementation. On the other hand, others argue for discretion, allowing policymakers flexibility to respond to changing economic conditions and unforeseen events. This discretion can enable more active responses to crisis but may also introduce uncertainty and inconsistency into the policy process.

Even within a rule based framework, challenges such as time inconsistency can arise. Time inconsistency refers to the temptation for policymakers to deviate from their stated rules when faced with short term pressures or political considerations, potentially undermining the credibility and effectiveness of monetary policy. In addition to rule based approaches, we will also examine alternative strategies such as monetary targeting and inflation targeting in this unit. These frameworks involve setting specific targets for the growth of the money supply and the inflation rate.

Keywords

Monetary Policy, Rules, Discretion, Taylor Rule, Time Inconsistency, Monetary Targeting, Inflation Targeting

Discussion

1.2.1 Monetary Policy

- Monetary policy aims for economic stability and growth

Monetary policy, as defined by economists like Harry Johnson and G.K Shaw, is essentially the strategy used by central banks to manage the supply of money in the economy to achieve specific economic goals. Harry Johnson describes monetary policy as the central bank's control over the money supply to meet broader economic objectives. Shaw explains it as any deliberate action taken by monetary authorities to influence the quantity and availability of money. Monetary policy is a plan of action undertaken by central banks, aimed at regulating the amount of money circulating in the economy and controlling the flow of credit to achieve certain macroeconomic goals. The objectives of monetary policy are similar to the objectives of macroeconomic policy which include encouraging economic growth, promoting employment, maintaining stable prices, ensuring stability in foreign exchange rates, and achieving balance of payment equilibrium.

1.2.1.1 Scope of Monetary Policy

Monetary policy covers a wide range of economic activities and factors that central banks can influence through their policies. Its scope is determined largely by two main factors.

i) The level of monetisation of the economy, and

ii) The level of development of the capital market

- Monetary policy controls the economy through the money supply

In a fully monetised economy, where money is used for all transactions, monetary policy affects the general price level, impacting production, consumption, savings, investment, and foreign trade. This means that monetary policy can influence key macroeconomic variables such as GDP, employment, savings and investment rates, the general price level, and the balance of payments. Essentially, in such an economy, monetary policy has a broad reach, shaping various aspects of economic activity by controlling the money supply and influencing the purchasing power of currency .

- Developed capital market promotes monetary policy

The effectiveness of monetary policy also depends on the development of the capital market. Certain monetary tools, like the Bank Rate and Cash Reserve Ratio, operate through the banking system, but their effects also extend to the capital markets. In economies with a well developed capital market, monetary policy can influence economic activity more swiftly and efficiently. A developed capital market is characterised by financially robust banks and institutions, extensive use of capital markets for financial transactions, interconnected sub-markets, and a commodity sector responsive to capital market changes. To ensure widespread impact, monetary policy needs strong financial ties between commercial banks and other capital sub markets.

1.2.2 Rules versus Discretion

- Rules provide consistency, discretion allows adaptability

In economics, rules and discretion represent two approaches to policy making. Rules are like predetermined guidelines that dictate how policymakers should respond to specific economic indicators, such as adjusting interest rates in response to inflation changes. On the other hand, discretion involves the freedom to use judgment and flexibility in deciding the best policy actions for different situations. For instance, policymakers might consider external factors like pandemics or wars when determining interest rates. Rules offer consistency and predictability, while discretion allows for adaptability to unique circumstances. Essentially, rules provide structure, while discretion offers room for interpretation and response to changing conditions.

The debate between rules and discretion in economic policy revolves around whether policymakers should follow strict, pre-set rules or have the flexibility to use their judgment in decision making. When policymakers react without any planning to current events, it can lead to economic instability. Advocates for rules based policies argue that they provide clarity and consistency, reducing the risk of unpredictable responses. On the other hand, discretion allows policymakers to adapt to unique circumstances. However, this flexibility can also lead to inconsistency and uncertainty. So, the question remains; should economic policy be like autopilot, following predetermined rules, or should it be guided by the discretion of policymakers?

- Economic policy debates rules versus discretion for stability

Monetary policy rules are guidelines for central banks to manage the money supply. There are different types of rules. One simple rule is a constant growth rate rule, which maintains a steady increase in the money supply, typically at a fixed rate like 4 percent annually, regardless of economic conditions. Another example is a rule that adjusts the money supply growth based on unemployment rates. For instance, if unemployment exceeds a certain threshold, such as 5.5 percent, the money supply growth rate might be increased by 2 percent for every percentage point above that threshold. Mathematically, this rule can be expressed as

- Monetary policy rules guide money supply management

$$\frac{\Delta M}{M} = 4.0 + 2(u - 5.5) \text{ --(1)}$$

where the growth rate of money $\Delta M / M$ is an annual percentage rate, and u is the percentage unemployment rate. These rules provide clear guidelines for policymakers to manage the economy's money supply in response to changing economic conditions.

The activist monetary rule outlined in equation(1) is designed to adjust the money supply based on changes in the unemployment rate. When the unemployment rate is 5.5 percent , money supply stays at 4 percent. However, if the unemployment rate rises above 5.5 percent , money supply automatically increases. For example, with 7.5 percent unemployment, money supply would be 8 percent according to the rule using equation (1). Likewise, if the unemployment rate falls below 5.5 percent, money supply decreases to 4 percent. This rule effectively ties monetary stimulus to the business cycle indicator of unemployment, creating an activist, anticyclical monetary policy. Importantly, these adjustments occur automatically without requiring discretionary action from policymakers.

- Activist rule adjusts the money supply based on unemployment rate changes

- Activist rule avoids discretionary decisions

The debate between rules and discretion in monetary policy has often focused on whether policymakers should be actively adjusting policy or adhering to fixed rules, like the constant growth rate rule. However, it is important to recognise that we can design rules that incorporate activist elements. Equation (1) serves as an example of an activist rule because it adjusts the money supply based on unemployment rates, expanding money supply when unemployment is high and reducing money supply when unemployment is low. Importantly, such rules remove the need for policymakers to make discretionary decisions, providing a structured approach to managing the economy's monetary policy.

- Trade-off between certainty and flexibility in policy making

In the ongoing debate over monetary and fiscal policy, the question of whether to adhere to permanent rules or allow discretionary adjustments arises. While some argue for permanent rules to provide certainty about future policy, others advocate for flexibility to adapt to changing economic conditions. Practical issues emerge regarding who holds the authority to change these rules. At one extreme, rules could be incorporated in the country's constitution, while at the other, they could be left to institutions like the Federal Reserve (Central bank of the USA) or fiscal authorities. However, in the case of the USA, changing the Constitution is a lengthy process compared to adjusting policy by the Federal Reserve or fiscal bodies. Advocates for flexibility argue that the economy and our understanding of it evolve over time, necessitating the ability to respond swiftly to shocks and changing circumstances. They believe that granting the Federal Reserve considerable discretion allows for quick responses to disturbances in the financial system. However, proponents of rigid rules argue that past mistakes by central banks justify the need for rules that are difficult to change. The trade-off between certainty and flexibility in policy making remains a contentious issue, with differing perspectives on the optimal balance between the two.

- Policy deviations adversely affect private individuals and firms

The second issue in the rules versus discretion debate concerns whether policymakers should announce their policies in advance. Announcing policies can help private individuals to predict future economic conditions. But, in practice, it has been less effective because policymakers often deviate from their announced targets. For example, the Federal Reserve chairperson is required to inform Congress about the Federal Reserve's monetary targets, but if the Federal Reserve changes its original policy to maintain stable output and low inflation, these targets become less reliable for private individuals trying to forecast their future incomes or firms predicting demand for their products. In essence, while advance announcements can aid in forecasting, their effectiveness is undermined when policymakers do not adhere strictly to their stated policies.

- Rules enhance credibility, while discretion allows flexibility

Using rules in macroeconomic policy making offers benefits such as enhancing credibility and predictability. By committing to a rule, policymakers signal their intentions, reducing uncertainty and volatility. This helps anchor inflation expectations and encourages long term planning. However, rules can be rigid, making it difficult to respond to changing circumstances effectively and potentially leading to suboptimal outcomes. On the other hand, discretion in policy making allows for adaptability and responsiveness, adjusting actions to specific conditions. This encourages innovation and enables policymakers to address multiple objectives. Yet, discretion can undermine credibility and stability, creating uncertainty and opening the door to political interference. Balancing the advantages and disadvantages of both approaches is crucial for effective macroeconomic management.

1.2.3 The Taylor Rule

- Monetary policy's effect on inflation and interest rates

In recent years, discussions about monetary policy have been at the forefront of investment, policymaking, and everyday life, especially as inflation surged to 6-7% in many countries before moderating to around 3-4%, still above the target of 2% set by most central banks. Consequently, it is expected that central banks worldwide will maintain high interest rates until inflation reach the target level. So, will the Reserve Bank of India (RBI) raise interest rates again in 2024? How much longer will interest rates stay above 4-5%? What should be the central bank's interest rate level? There is no simple answer, as academic papers and articles show varying opinions. We will begin with a simple benchmark called the Taylor rule for this. How does monetary policy work? Most central banks in advanced economies aim to keep inflation at or below 2%. To achieve this, when faced with high inflation, the central bank may raise interest rates. This makes borrowing more expensive, leading to reduced demand from businesses and households, which in turn eases pressure on prices to rise. Consequently, inflation decreases. Conversely, when inflation is below the 2% target, the central bank may lower interest rates to stimulate demand.

Taylor's rule, named after John B. Taylor, a Stanford University economist and former Treasury undersecretary, guides central banks on setting interest rates in response to economic conditions. It provides a framework for policymakers to adjust interest rates based on factors like inflation and output levels. Essentially, Taylor's rule helps monetary authorities make informed decisions about interest rate adjustments to maintain economic stability. It is a monetary policy rule used by central banks to set short-term interest rates. The rule is based on the idea that the central bank should adjust interest rates in response to changes in inflation and the output gap.

$$i_t = 2 + \pi_t + 0.5 \times (\pi_t - \pi^*) + 0.5 \times \left(100 \times \frac{Y_t - Y_t^*}{Y_t^*}\right)$$

The equation given above represents the Taylor rule. Here's a breakdown of the variables:

i_t - nominal interest rate

π_t - current inflation rate

π^* - target inflation rate

Y_t - current GDP

Y_t^* - potential GDP

The constant '2' in the equation approximates the long-run average real interest rate.

- Taylor's rule guides central banks in setting interest rates

In simpler terms, the Taylor rule suggests that the central bank should raise interest rates if inflation is higher than the target rate and/or the economy is producing more than its potential output (positive output gap). Conversely, the central bank should lower interest rates if inflation is lower than the target rate and/or the economy is producing less than its potential output (negative output gap).

Taylor's rule provides a simple formula for central banks to determine the appropriate nominal interest rate based on economic conditions. In the equation, the target inflation rate is represented by π^*, and the constant '2' approximates the long-run average real interest rate. For instance, if the central bank aims for a 2 per cent inflation target, it would set the nominal interest rate at 4 per cent in a fully employed economy. Another example illustrates how the rule adjusts interest rates based on deviations from the target. Suppose, inflation is 5 percent with a 2 percent target and GDP is 1 percent above potential, the rule would recommend setting the nominal interest rate at 9 percent .

$$(2 + 5 + 0.5 \times [5 - 2] + 0.5 \times 1)$$

- Taylor's rule calculates interest rates based on inflation and output

This calculation involves adding the inflation rate, the output gap (difference between actual and potential GDP), and the constant multiplied by the inflation-target deviation. Essentially, Taylor's rule provides a clear guideline for central banks to respond to changes in inflation and output levels by adjusting interest rates accordingly.

According to the rule, if inflation exceeds the target by 1 percentage point, the Federal Reserve should increase interest rates by 1.5 percentage points to counteract the inflationary pressure. Similarly, when the GDP gap (the difference between actual and potential GDP) rises by 1 percent , interest rates should be raised by 0.5 percent. John Taylor, the economist behind the rule, argued that it provides a fairly accurate approximation of what the Federal Reserve historically did in similar situations. Essentially, Taylor's rule offers a straightforward framework for central banks to respond effectively to fluctuations in inflation and output, aiming to maintain economic stability.

- Taylor's rule offers a clear guideline for central bank

Taylor's rule utilises an important aspect of effective policy rules, i.e, negative feedback. In contrast to positive feedback, which amplifies a signal, negative feedback works to counteract changes. Negative feedback is a mechanism or process that works to counteract changes or deviations. In the context of Taylor's rule and monetary policy, it means that when there are deviations such as higher inflation than the target, the rule suggests actions like increasing interest rates that work to reduce or counteract those deviations, aiming to bring the system back to stability. When inflation rises above the target, the Taylor rule suggests increasing nominal interest rates by more than the increase in inflation. This action effectively raises real interest rates accounting for inflation thereby reducing inflationary pressure in the economy. By adjusting interest rates in this manner, Taylor's rule helps to stabilise the economy by responding appropriately to changes in inflation, ensuring that economic conditions remain in check.

- Taylor's rule uses negative feedback to stabilise inflation

The Taylor rule is gaining popularity in discussions about monetary policy because it emphasises setting policy based on clear rules rather than leaving it to the discretion of central bankers. While the Taylor rule is not considered optimal, it supports the idea promoted by economist Milton Friedman that it is better to have a good rule in place rather than wait for the perfect one. In essence, the Taylor rule provides a practical framework for central banks to follow when making decisions about interest rates in response to changes in economic conditions. It is a step towards greater transparency and consistency in monetary policy, aiming to achieve stability and promote economic growth.

- The Taylor rule promotes clear, rule-based monetary policy decisions

1.2.4 Time Inconsistency of Policy

Let us begin with an example before understanding the concept of time inconsistency of policy in detail. Suppose the government decides to limit its spending and maintain a balanced budget to ensure economic stability and avoid excessive debt. However, if economic conditions worsen or political pressures arise, the government may choose to increase spending to stimulate the economy, even if it means running a deficit. This shift in policy can lead to higher inflation and debt levels in the long run, which may not have been the optimal choice initially. Rational individuals anticipate this inconsistency in government policy and adjust their behaviour accordingly, potentially undermining the effectiveness of the original fiscal plan. If there were clear laws or strong commitments by the government to maintain fiscal discipline, individuals would have more confidence in the stability of economic policies, reducing the need for sudden changes and mitigating the negative effects of time inconsistency.

- Policy changes affect economic stability and confidence

A time inconsistency problem for policy arises when, as Stanley Fischer explains, a "future policy that forms part of an optimal plan formulated at an initial date is no longer optimal from the viewpoint of a later date, even though no new information has appeared in the meantime." In other words, time inconsistency in policy making occurs when a policy that seemed optimal when first announced becomes less desirable over time, even without any new information emerging. Suppose the monetary authority announces a plan to keep interest rates low to stimulate economic growth. However, due to this, as time passes and inflation starts to rise, the government may reconsider and want to raise interest rates

- Initially, optimal policy becomes suboptimal over time to control inflation. This creates a problem because economic agents, such as investors and consumers, anticipate this inconsistency. They know that the government might not stick to its original plan, which can undermine the effectiveness of the policy and create uncertainty in the economy. This is what we call a time inconsistency problem in policy.

- Initial output boost leads to troubles in the economy

In discretionary monetary policy, the time inconsistency problem arises when the policymakers are tempted to boost output above its natural rate to improve social welfare. This can occur due to distortions in the economy, such as labour and product market imperfections. For instance, if the natural rate of output is low due to these distortions, pushing output above this level could improve overall welfare but can lead to inflationary pressures later. Additionally, assume that the central bank can achieve this by having more money available to boost the economy and create jobs. They might think they can do this without causing prices to rise right away. But over time, people become aware of time policy shift. They start to expect prices to go up, so they might ask for higher wages or raise the prices of goods. This could lead to inflation, making things more expensive for everyone and hurting the economy in the long run. So even though it seemed like a good idea at first, the decision ended up causing more trouble later.

- Policymakers struggle to fight long term inflation

Imagine the policy makers say at the beginning of the year that they will not increase the amount of money in circulation to avoid inflation. But later, they decide it is better to create surprise inflation by increasing money supply. This surprise inflation might seem like a good idea initially, especially if it helps drive up employment. Workers, noticing that their wages can now purchase fewer goods and services, may ask for salary increases in the next year. This demand for higher wages can further fuel inflation because when employers raise wages to meet these demands, they often pass on these increased labour costs to consumers in the form of higher prices for goods and services. This creates a cycle where the central bank keeps printing money to counteract the falling purchasing power but ends up creating even more inflation. This problem is called the time inconsistency problem. The initial policy of maintaining stable money supply seemed optimal, but the temptation for short-term gains ultimately worsens inflation in the long run.

If monetary policy follows a rule that keeps inflation at zero, it would be advantageous compared to discretionary approaches. Such a rule encourages trust among the public, as people can rely on policymakers' consistent announcements. It mitigates time inconsistency problems that arise when policies change unexpectedly, leading to economic uncertainties. This principle extends beyond monetary policy. It can be illustrated by the example of patents. Initially, offering patents incentivises innovation, which is vital for progress. However, after inventions become widespread, maintaining patents may prevent competition and efficiency. Therefore, adopting clear rules, such as revisiting patent policies post-invention, can be more effective than discretionary decision making. This approach ensures stability, encourages long-term planning, and minimises disruptions in the economic system.

- Rule based policy encourages trust and stability

1.2.5 Monetary Targeting and Inflation Targeting

Before the 1980s, central banks used a strategy where they set a target rate for the growth of the money supply. The idea was straightforward, i.e., keeping the growth of the money supply low would result in low inflation on average. During economic recessions, the central bank would increase the rate of money supply, which would lower interest rates and stimulate economic activity. During periods of economic expansion, the central bank would reduce the rate of money supply to raise interest rates. Raising interest rates can help to cool down an overheating economy by making borrowing more expensive, thus reducing spending and investment. This action is often taken to prevent inflation from rising too rapidly during economic booms. However, this approach turned out to be ineffective.

- Monetary targeting failed to control inflation

Let us examine the case of the USA. First, the relationship between money supply and inflation in the United States was not as straightforward as initially thought. Figure 1.2.1 compares 10 year averages of inflation rates with 10 year averages of money supply rates from 1970 until the financial crisis of 2007-08. The inflation rate is calculated using the consumer price index (CPI), while the growth rate of nominal money is measured using the sum of currency and checkable deposits (M1). By using 10 year averages, economists can observe the medium term relationship between money supply and inflation more clearly. This approach is taken because, in the short term, changes in money supply mainly affect economic output rather than inflation. The analysis stops at the financial crisis, because during such periods, like when

- Short-term money supply changes mainly affect output rather than inflation

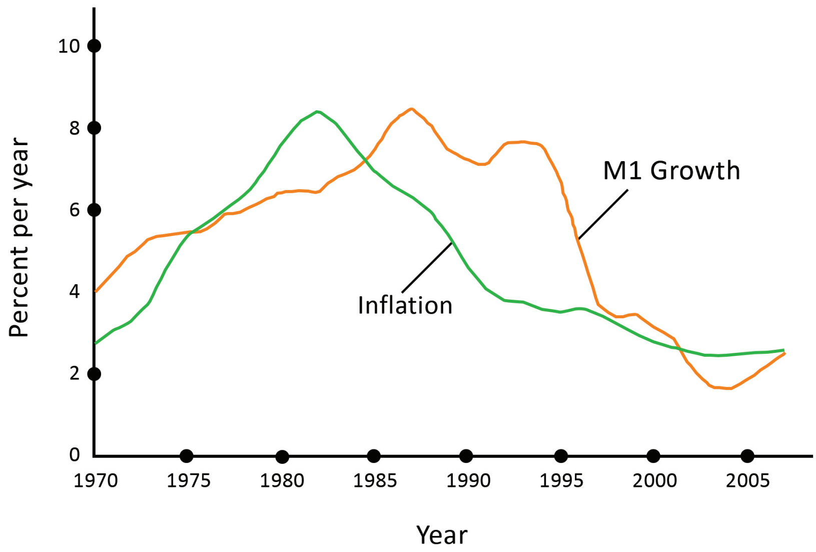

Fig 1.2.1 M1 Growth and Inflation

interest rates hit the 'zero lower bound' traditional monetary policy tools become less effective in influencing output and inflation. By excluding this period, economists can focus on understanding the effectiveness of monetary policy during more stable economic conditions.

- M1 growth not consistently linked to US inflation

In the figure above, it is observed that in the USA, the relationship between the growth of M1 (a measure of money supply) and inflation was not very strong. Although both increased during the 1970s and decreased later, there was a noticeable difference afterwards. While inflation started dropping in the early 1980s, the growth rate of M1 remained high for about another decade and only began to decline in the 1990s. For instance, during the period from 1981 to 1990, average inflation was reduced to 4%, yet the average growth rate of money supply over the same period remained relatively high at 7.5%. This suggests that changes in the money supply did not consistently match with changes in inflation during this time in the U.S. economy.

Additionally, in the short term, the connection between the money supply and interest rates proved to be unreliable. For instance, when the money supply decreases due to weak economic activity, it did not always lead to predictable changes in interest rates. This variability made controlling the money supply a less reliable tool for influencing demand and

- Unreliable connection between money supply and interest rates

output in the economy. In simpler terms, even if the central bank tries to adjust the amount of money circulating in the economy to stimulate or slow down economic activity, the impact on interest rates could be unpredictable. This lack of reliability in the relationship between the money supply and interest rates adds complexity to the central bank's efforts to manage economic growth effectively.

- Shifts in money demand challenge economic stability

Both problems, the poor relation between money supply and inflation over the medium term, and the inconsistent relationship between interest rates and the money supply in the short term, arise from shifts in the demand for money. Let us consider an example. Consider a scenario where the introduction of credit cards prompts individuals to hold only half as much cash as they did before, meaning their real demand for money decreases by half. In the short run, at a given price level, this significant drop in money demand would lead to a substantial decrease in interest rates, even if the money supply remains unchanged. However, in the medium term, assuming a constant interest rate, the price level in the economy will adjust to reflect changes in the money supply and demand. Specifically, it implies that the purchasing power of the money supply, known as the 'real money stock', will decrease by half. Consequently, even if the nominal money supply or the actual amount of money in circulation remains the same, the price level would double over time. Therefore, there would be a period of inflation despite no growth in nominal money supply, resulting in a disconnect between nominal money growth (which remains zero) and inflation (which turns out positive). This demonstrates how shifts in money demand can disrupt the traditional relationship between money supply, interest rates, and inflation.

- Central banks shifted to a direct inflation targeting strategy

In the 1970s and 1980s, central banks faced challenges as shifts in money demand happened frequently like these and on a large scale. This posed dilemmas for central banks regarding whether they should stick to maintaining stable monetary targeting, which helps establish credibility but might not address short term economic issues, or whether they should respond to changes in money demand to stabilise output and inflation. However, in the early 1990s, there was a significant shift in the approach to monetary policy. Instead of focusing on controlling money supply growth, central banks started targeting inflation directly. This shift led to the adoption of interest rate rules, where central banks adjust interest rates to achieve their inflation targets. This change marked a significant transformation in monetary policy strategy, prioritising inflation control as a means to stabilising the economy.

Inflation Targeting

- Direct focus on inflation, interest rate adjustments

The reasoning behind inflation targeting emerged from the recognition that directly targeting inflation and using interest rates as the main tool to achieve it could be more effective from indirect methods. If a central bank's primary goal is to maintain low and stable inflation, it makes sense to focus directly on controlling inflation rather than indirectly through monetary targeting. Similarly, since interest rates have a direct impact on spending and economic activity, it is more practical for central banks to use interest rates as their main tool to influence the economy in the short run. Inflation targeting involves central banks committing to achieving a specific inflation rate and using adjustments in interest rates to achieve that target.

- Major central banks worldwide adopt inflation targeting strategies

Since the late 1980s, several central banks worldwide, including those in Australia, Canada, Finland, Israel, New Zealand, Spain, Sweden, and the United Kingdom, have incorporated inflation targeting in various forms. This approach can involve central banks publicly announcing their policy intentions or even being mandated by national laws to prioritise maintaining price stability as a primary objective. For instance, the Reserve Bank of New Zealand Act of 1989 instructed the central bank to focus solely on achieving and preserving stability in the general level of prices without mentioning other economic objectives like output, employment, or exchange rates. Despite not adopting inflation targeting officially, some members of the U.S. Congress have proposed legislation that would require the Federal Reserve to implement inflation targeting.

- Inflation targeting allows a flexible range

In countries where inflation targeting is adopted, central banks typically have a significant degree of flexibility. Instead of setting a specific inflation rate, targets are often established as a range, such as 1 to 3 percent . This gives central banks their own space to choose where within the range they aim to keep inflation. Additionally, central banks may be permitted to temporarily adjust their inflation targets if external events, like a sudden supply shock, cause inflation to deviate from the announced range. This discretion allows central banks to adapt their policies to changing economic conditions, maintaining stability and confidence in the economy.

Inflation targeting provides clarity and accountability in monetary policy decisions. While it grants central banks some flexibility, it also establishes clear guidelines for their actions. When a central bank is instructed to simply do the right thing, it becomes challenging to hold them accountable because interpretations of what is right can vary widely. In contrast, with inflation targeting, the central bank publicly announces a specific inflation target. This allows the public to easily assess whether the central bank is meeting its objectives. Although inflation targeting does not restrict the central bank's actions, it enhances the transparency of monetary policy, making central bankers more accountable for their decisions.

- Ensures transparent and accountable monetary policy

Based on the scholarly articles given by Svensson (1997a, 1997b) and Mishkin (2002), inflation targeting can be seen as a monetary approach consisting of six key components.

1. **Public Announcement of Targets:** Central banks publicly announce specific targets for inflation over the medium term.

2. **Commitment to Price Stability:** There is a strong commitment to maintaining low and stable inflation, usually around 2-3%, as the primary goal of monetary policy. The government assigns a loss function to the central bank, which means a framework that quantifies the costs or losses associated with deviations from the central bank's target for price stability.

- Inflation targeting focuses on public targets and price stability

3. **Information Inclusive Strategy:** Monetary policy decisions consider a wide range of economic variables, not just inflation, to determine appropriate policy settings.

4. **Transparency and Openness:** There is greater transparency in how monetary policy decisions are made, making it easier for the public to understand. Inflation targets are clearer and simpler to understand compared to monetary targets.

5. **Increased Accountability:** Central banks are held more accountable for achieving their inflation targets. The target provides a way to assess the central bank's performance, and by comparing inflation expectations with the target, policymakers can measure the credibility of their policies.

6. **Inflation Forecast Targeting:** Inflation targeting involves using inflation forecasts as a guide for monetary policy decisions. The central bank's inflation forecast becomes an intermediate target, guiding policy actions.

1.2.5.1 Inflation Targeting in India

- India adopted inflation targeting for growth and price stability

In February 2015, India formally adopted inflation targeting through an agreement between the Government of India (GoI) and the Reserve Bank of India (RBI), known as the Agreement on Monetary Policy Framework. This agreement aimed to establish a modern monetary framework designed to address the complexities of India's evolving economy. It emphasises that the primary goal of monetary policy is to maintain price stability, while also considering the importance of promoting economic growth.

The Agreement on Monetary Policy Framework outlines key principles to guide the implementation of inflation targeting in India.

1. **Inflation Target:** The RBI aimed to keep the Consumer Price Index (CPI) inflation below 6% by January 2016 and maintain it at 4% with a band of +/- 2% for subsequent years (2 - 6% being the acceptable range).

2. **Operating Procedure:** The RBI will publish operating targets and establish a procedure to achieve the inflation target. Any changes due to evolving conditions will also be published.

- RBI targets 4% inflation with +/- 2% band

3. **Transparency:** Every six months, the RBI will publish a document explaining the sources of inflation and forecasts for the next six to eighteen months.

4. **Failure to Meet Target:** The RBI will be deemed to have failed if inflation exceeds 6% for three consecutive quarters or falls below 2% for three consecutive quarters.

5. **Reporting Failure:** If the RBI fails to meet the target, it must report to the GoI explaining the reasons, proposed remedial actions, and an estimate of the time needed to achieve the target.

6. **Dispute Resolution:** Any disputes about the agreement's interpretation or implementation will be resolved between the RBI Governor and the GoI.

India's formal adoption of inflation targeting in February 2015, through the Agreement on Monetary Policy Framework between the Government of India and the Reserve Bank of India (RBI), followed the recommendations of the Urjit Patel Committee on monetary policy in early 2014. This move marked India's entry into the group of countries practicing inflation targeting.

Summarised Overview

Monetary policy is a strategy used by central banks to manage money in the economy. It aims to achieve economic goals like growth, employment, price stability, and trade balance. The scope of monetary policy is determined largely by two main factors viz; the level of monetisation of the economy, and the level of development of the capital market. There is a debate between using rules or discretion in economic policy. Rules are like fixed guidelines, while discretion allows flexibility based on unique situations. For example, rules might set a constant growth rate for the money supply, while discretion allows policymakers to adjust policies for factors like pandemics or wars. Rules offer stability, while discretion allows for adaptability.

The Taylor rule, named after economist John B. Taylor, offers a guideline for setting interest rates based on inflation and output levels. It suggests that interest rates should rise if inflation exceeds the target or if the economy is producing more than its potential, and interest rates shall be reduced if inflation is below the target or if the economy is below its potential output.

The traditional approach of targeting money supply growth to control inflation proved ineffective due to a weak connection between money supply and inflation rates. Central banks shifted to inflation targeting, where they directly aim for low and stable inflation, typically around 2-3%. This strategy involves public announcements of inflation targets, commitment to price stability, transparent policy decisions, and increased accountability for achieving inflation targets. In February 2015, India adopted inflation targeting through an agreement between the Government of India and the RBI, emphasising price stability while considering economic growth. RBI targets 4% inflation with a band of +/-2%.

Assignments

1. Describe the concept of monetary policy and explain how it differs from fiscal policy. Provide examples of tools used in monetary policy.
2. What are the main differences between rules based monetary policy and

discretionary monetary policy? Discuss the advantages and disadvantages of each approach.

3. Explain the Taylor rule and its significance in guiding central banks' decisions regarding interest rates.
4. What is the time inconsistency of policy in the context of economic decision-making? Provide examples of how time inconsistency can affect policy effectiveness and economic outcomes.
5. Compare monetary targeting with inflation targeting as strategies used by central banks. Discuss the rationale behind each approach and the key components involved in their implementation.
6. Discuss the adoption of inflation targeting in India through the Agreement on Monetary Policy Framework.

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UNIT 3
Fiscal Policy, Policy Lags and the Budget Deficit

Learning Outcomes

After completing this unit, the learner will be able to:

- understand the components of fiscal policy and its significance
- comprehend the concept of policy lags
- distinguish between inside lags and outside lags
- assess the economic consequences of budget deficit

Background

Fiscal policy is like a tool that governments use to manage the economy, similar to how you might budget your own money. The Government can increase expenditures or decrease taxes to boost the economy during a slowdown, and vice versa to mitigate inflationary pressures and promote price stability. However, these tools are not quick. It takes time for them to have an effect, which is called a policy lag. Let it be clear. As you observe monsoon clouds gathering, you quickly move to bring the laundry inside before the rain begins. Fiscal policy operates in a similar way. However, unlike your quick response, governments take time to decide on fiscal measures. This is known as inside lag. This delay can occur because they require additional information, must follow bureaucratic procedures, or may need to engage in deliberations and debates before reaching a decision. Even after the government decides to take action, it takes more time for those actions to actually affect the economy. This delay is called the outside lag.

In the context of fiscal policy, another key factor is the budget deficit. A budget deficit occurs when government expenditures exceed revenues within a given period, leading to a shortfall that must be financed through borrowing. The budget deficit reflects the imbalance between what a government spends to provide goods and services and the revenue it generates through taxation and other means. This imbalance can arise due to various factors, such as increased spending on social programmes, infrastructure projects, or defence, coupled with a shortfall in tax revenues resulting from economic downturns or inefficient tax collection mechanisms.

This unit will equip learners with the knowledge of fiscal policy, including key concepts like policy lags and budget deficits.

Keywords

Fiscal Policy, Policy Lags, Inside Lag, Outside Lag, Budget Deficit

Discussion

- Fiscal policy involves government spending, taxation, and borrowing

Fiscal policy involves government decisions on spending, taxation, and borrowing to achieve economic goals. Arthur Smithies defines fiscal policy as "a policy under which the government uses its expenditure and revenue programmes to produce desirable effects and avoid undesirable effects on the national income, production, and employment." G. K. Shaw focuses on changing government spending or taxes to influence the economy, assuming given economic goals. Samuelson and Nordhaus see fiscal policy as stabilising employment and prices in developed countries. In simpler terms, fiscal policy shapes how the government spends, levies taxes, and borrows to promote economic growth, employment, and income equality, and stabilise the economy.

- Receipts and expenditures of the government

Fiscal policy, also known as budgetary policy, revolves around the government's budget operations. It involves managing two aspects viz; receipts (money coming into the government) and expenditure (money going out). Receipts include taxes, non-tax revenue, and borrowings, while expenditure covers payments for goods, services, interests, subsidies, pensions, etc. From an economic standpoint, receipts depict money flowing from the private sector to the government, while expenditure shows money flowing back to the private sector. By changing taxation, spending, and borrowing, the government can adjust the magnitude and composition of these flows, affecting macroeconomic variables like aggregate consumption, private savings, and investment. These adjustments form the essence of fiscal policy, allowing the government to influence the economy's direction and stability.

1.3.1.1 Fiscal Instruments and Target Variables

Fiscal instruments refer to the tools and strategies employed by governments to shape economic activity through changes in taxation, spending, and borrowing. These instruments, also known as fiscal levers or handles, are pivotal in implementing fiscal policy. They are intricately linked to target variables, such as economic growth, inflation, and employment, which policymakers aim to influence. Understanding these instruments and their impact on target variables is essential for effective economic management and policymaking.

1. Fiscal Instruments

Some of the key fiscal instruments comprise the following measures:

- Budgetary policy can be balanced, deficit or surplus

a. Budgetary Balance Policy: Budgetary balance policy refers to the government's approach to managing its finances, which can be balanced, deficit, or surplus. A balanced budget occurs when government spending matches revenue, while a deficit budget involves spending exceeding revenue. Likewise, a surplus budget means spending is lower than revenue. Each approach has distinct effects on the economy, impacting growth, inflation, and employment.

- Government expenditure influences economic activity

b. Government Expenditure: It refers to the total amount of money spent by the government on various things like buying goods and services, making investments, and providing financial assistance through transfer payments like pensions and subsidies. The size and where this money goes are decided by the government based on available resources. When the government spends money, it injects it into the economy, which boosts overall demand for goods and services. However, the impact of this spending on the economy depends on how the government gets the money and how much additional economic activity it generates.

c. Taxation: It is the process by which the government collects money from individuals and industries without providing a direct service in return. There are two main types of taxes viz;

direct and indirect taxes. Direct taxes are levied on personal incomes, corporate profits, wealth, and property. In India, significant direct taxes include personal income tax and corporate income tax, which contribute a notable portion to the government's tax revenue. On the other hand, indirect taxes are imposed on the production and sale of goods and services. Goods and Services Tax (GST) is the most comprehensive indirect tax in India, introduced in 2017. It subsumed several other indirect taxes, such as excise duty, VAT, service tax, and others. GST is a destination-based tax levied at the point of consumption. It is levied at different rates on different goods and services, ranging from 0% to 28%.

- Crucial means through which the government generates revenue

d. Public Borrowings: These include both internal and external borrowing by governments, primarily aimed at financing budget deficits. Internal borrowings involve acquiring funds from the public through government bonds and treasury bills or borrowing directly from the central bank, known as deficit financing. These types of borrowings have distinct impacts on the economy. Borrowing from the public essentially shifts purchasing power from citizens to the government. On the other hand, borrowing from the central bank, termed as monetised deficit financing, directly injects funds into the economy. External borrowings, include loans from foreign governments, international organisations like the World Bank and IMF, and market borrowings.

- Governments borrow money to finance budget deficits

2. Target Variables

In the Keynesian framework of analysis, the ultimate target variable of fiscal policy is the intended change in aggregate demand. This is done by adjusting different components of aggregate demand and affecting the price levels. The target variables of fiscal policy, i.e., the variables that are sought to be changed through fiscal instruments include- private disposable incomes, which impact people's purchasing power, private consumption or expenditure, private savings and investment behaviour, exports and imports, as well as the level and structure of prices in the economy. By manipulating these variables, governments seek to stimulate economic activity and stabilise the economy.

- Variables sought to be changed through fiscal instruments

Understanding the relationship between fiscal policies and their target variables is pivotal, as these variables are interrelated and interdependent on each other. A modification

- Fiscal policy changes affect interconnected macroeconomic variables

in one policy variable aimed at impacting a specific target variable can have repercussions on all other macroeconomic variables. The degree of impact varies based on the strength of their relationships. For instance, changes in taxation influence disposable income, subsequently affecting consumption expenditure, savings, and investment. This, in turn, impacts the external balance by changing import levels.

1.3.2 Policy Lags

- Gradual adjustments in policies required

Consider economic stabilisation as similar to controlling the temperature in a large room using an air conditioning system. When you adjust the temperature of the air conditioning system (A/C), it does not instantly change the temperature; it takes time for the heating or cooling system to respond and for the room temperature to adjust accordingly. If the A/C is set too high and you notice the room getting too warm, lowering the temperature suddenly would not immediately cool the room down. Instead, it might lead to overshooting the desired temperature and then having to adjust again, potentially causing fluctuations in temperature. Similarly, economic policymakers must carefully manage fiscal and monetary policies, making gradual adjustments to steer the economy towards stability without causing abrupt shifts that could lead to instability.

- Policy response lags pose challenges in economic management

When economic problems arise, it often takes time for policymakers to identify them. For instance, if inflation is on the rise, policymakers may not immediately recognise it, sometimes attributing it to temporary factors like seasonal changes or supply shocks. Additionally, implementing policy measures requires approval, such as changes in tax rates during annual budget presentations. Even after identifying an issue and gaining approval, the effects of policy actions are not immediate. For example, if the government implements a relief package to counter a recession, it takes time for the economy to respond. By the time the effects of increased government spending become evident, the economy might already be heading towards higher inflation. This lag in response means that the government's actions may not correspond with the current state of the economy, potentially leading to unintended consequences or counterproductive outcomes. Therefore, while policymakers aim to address economic challenges, the timing and effectiveness of their actions are influenced by various factors, including the recognition of the problem, approval processes, and the lag in the economy's response to policy measures. Before taking action to address an economic disturbance, several steps must be followed, each involving delays or lags. Let us examine these lags in detail.

1.3.3 Inside and Outside Lags

- Delays involved in implementing and seeing the effects of economic policies

Economists identify two key lags in implementing stabilisation policies. They are the inside lag and the outside lag. The inside lag refers to the time it takes for policymakers to respond to an economic shock by implementing appropriate policies. This delay occurs because it takes time for policymakers to recognise the shock and decide on the best course of action. On the other hand, the outside lag is the time it takes for policy actions to actually impact the economy. This delay occurs because policies do not immediately affect spending, income, and employment. In simpler terms, the inside lag is the time it takes to decide what to do, while the outside lag is the time it takes for those decisions to show results in the economy.

- Lag is primarily due to the complex legislative process

Using fiscal policy to stabilise the economy faces a significant challenge due to the long inside lag, particularly in countries like the United States of America . This lag results from the requirement for approval from the President and both houses of Congress for changes in spending or taxes. The slow and complex legislative process often leads to delays, making fiscal policy less effective for stabilising the economy. In contrast, countries with parliamentary systems, like the United Kingdom, tend to have shorter inside lags because the governing party can enact policy changes more swiftly. This difference in legislative processes affects the speed and precision with which fiscal policy can be implemented to address economic fluctuations.

- Monetary policy has a shorter inside lag and longer outside lag

Compared to fiscal policy, monetary policy has a shorter inside lag, as central banks can decide and implement changes within a day. However, monetary policy faces a significant outside lag. This is because monetary policy operates by adjusting the money supply, which affects interest rates, influencing investment decisions. Yet, many firms plan investments well in advance. Consequently, the effects of a monetary policy change typically take about six months to impact economic activity. In simpler terms, while monetary policy can be enacted quickly, its effects on the economy are not immediately felt and often take several months to materialise.

1.3.3.1 The Inside Lag

The inside lag, further divided into recognition lag, decision and action lags, refers to the time it takes for policymakers to respond to an economic shock.

a. The Recognition Lag

- Time taken by policymakers to realise the need for action

The recognition lag is the time it takes for policymakers to realise that action is needed in response to an economic disturbance. This lag could potentially be negative if policymakers can predict the disturbance and plan appropriate policy actions beforehand. For instance, we are aware that certain seasonal factors, like increased demand for money during Christmas, affect economic behaviour. In anticipation of this, the Federal Reserve (Fed) adjusts by expanding the money supply to accommodate the seasonal demand, rather than allowing it to negatively impact the economy. This proactive approach helps policymakers address potential disruptions before they occur, contributing to smoother economic stability. John Kareken and Robert Solow's research found that recognition lag averages about five months. They noted that it tends to be shorter for expansionary policies, aiming to boost the economy, and longer for restrictive policies, which aim to rein in economic growth.

b. The Decision and Action Lags

- Time between recognising the need for action and making a policy decision

The decision lag, which is the time between recognising the need for action and actually making a policy decision, varies between monetary and fiscal policy. For the Federal Reserve, which handles monetary policy, decision-making happens frequently through meetings of the Open Market Committee, resulting in a short decision lag. Additionally, once a decision is made, the action lag, or the time between decision and implementation, is also short for monetary policy. This means that major monetary policy actions can be put into effect almost immediately after a decision is reached. Essentially, with the current setup of the Federal Reserve System, the decision lag for monetary policy is brief, and there is practically no delay in taking action once a decision is made.

Fiscal policy actions, unlike monetary policy, are generally slower due to procedural requirements. Once the need for fiscal action is recognised, the government must draft legislation

- Fiscal policy actions are generally slower than monetary policy

to enact the desired policy changes. This legislation then undergoes a thorough review and approval process in both houses of Congress, which can be time-consuming. Even after approval, there is still a delay in implementing the policy change. For instance, if the fiscal policy involves altering tax rates, it may take some time before individuals see the effects in their paychecks, creating an action lag. However, there are exceptions to this pattern. For example, in early 1975, when taxes were reduced, the decision-making process was relatively quick, with a decision lag of about two months. Nonetheless, in general, the process for implementing fiscal policy tends to be lengthier and more complex compared to monetary policy. This difference in speed can have implications for how quickly and effectively the government can respond to economic challenges and stimulate growth or manage inflation.

1.3.3.2 Automatic Stabilisers

- Automatic stabilisers act swiftly with no inside lag

The inside lag in policymaking reveals the importance of automatic stabilisers in economic management. Automatic stabilisers are mechanisms that operate without direct government intervention, automatically cushioning the economy from shocks. They work swiftly, with zero inside lag. Income tax is a prime example. By adjusting tax burdens based on income, it reduces the multiplier effect of any changes in aggregate demand. A higher income tax rate reduces the multiplier for changes in autonomous spending on GDP. Similarly, unemployment allowance serves as another crucial automatic stabiliser. When individuals lose their jobs and reduce spending, it can trigger negative multiplier effects on the economy. However, unemployment benefits counteract this by lessening the income loss experienced by workers, thereby reducing the multiplier effect on output. In essence, automatic stabilisers help stabilise the economy by softening the blow of economic shocks, contributing to smoother economic cycles and mitigating the need for immediate, discretionary government intervention. Thus, Automatic stabilisers are mechanisms like income taxes or unemployment benefits that help to stabilise the economy by moderating the impact of economic shocks.

1.3.3.3 The Outside Lag

The inside lag of policy is a discrete lag. Usually, it measures the time taken from recognising a problem to making and implementing a decision. The outside lag is generally a distributed lag. Usually, it measures the time it takes for the effects of a policy action on the economy to unfold. While there might be some immediate impact when a policy is enacted, other effects manifest gradually over time. The impact of policy on aggregate demand and income is often characterised by a distributed lag, which is illustrated in the figure below.

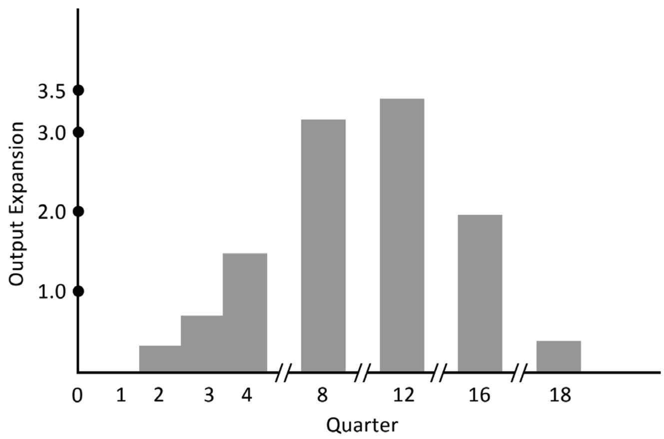

Fig 1.3.1 Outside Lag

- Inside lag is discrete lag and outside lag is distributed lag

In the above figure, each successive quarter is shown in the X axis and output expansion is shown in the Y axis. It is shown that there is a one-time 1 per cent increase in the money supply in period zero. Initially, its impact on the economy is very small, but it gradually intensifies over time. This gradual build up illustrates the lags inherent in monetary policy. It takes several quarters for the maximum impact of the increased money supply to be felt on spending and output, as the effects accumulate gradually. In the figure above, the twelfth quarter exhibits the maximum impact of the money supply.

- Policymakers must balance immediate needs with long-term effects

The distributed lag in the outside lag of economic policy has significant implications for policy making. For instance, if there is a need to quickly boost employment to overcome a demand shock, a substantial increase in the money supply might seem necessary. However, as time passes, the initial large increase in money supply would gradually lead to significant effects on GDP. This could potentially result in overcorrection of unemployment, leading to inflationary pressures. Essentially, while immediate actions may seem necessary to address economic challenges, policymakers must carefully consider the long-term consequences to avoid more complicated issues like inflation in the future.

• Policy lag due to a chain reaction of effects

The prolonged outside lags in economic policy, such as those seen in monetary policy, are primarily due to the sequence of effects it creates. Initially, monetary policy mainly influences interest rates rather than income directly. These interest rate changes affect investment and consumption, but with a delay, impacting aggregate demand over time. As spending increases gradually, it sets off a chain reaction of adjustments in output and spending throughout the economy. Policymakers must possess considerable skill to overcome these complexities effectively.

• Policymakers choose between gradualist and cold-turkey approaches

When it comes to achieving a specific policy goal, like reducing inflation, policymakers face a choice between gradualist and cold-turkey approaches. Gradualist policies aim to slowly steer the economy towards the target, while cold-turkey policies seek to hit the target as quickly as possible. Cold-turkey policies create a sudden impact, which can either disrupt the economy if enacted too quickly or enhance the credibility of policymakers if the action is seen as decisive. On the other hand, gradualist policies offer the advantage of adapting to new information as it unfold, allowing for more flexibility in response to changing economic conditions. Ultimately, the choice between these approaches depends on various factors, including the severity of the problem and the policymakers' assessment of the economic situation.

1.3.4 Budget Deficit

• The government borrows to cover spending, causing budget deficit

When a government spends more money than it brings in through taxes, it fills the gap by borrowing from private individuals and institutions, resulting in a budget deficit. Over time, these accumulated borrowings become the government debt. This issue has sparked ongoing debate in the United States since its inception. Alexander Hamilton, one of the country's founding fathers, argued that a moderate level of national debt could benefit the nation. He believed it could serve as a tool for economic growth and stability. However, James Madison, another influential figure in American history, viewed public debt as a burden on society, cautioning against its excessive accumulation.

During the late 20^{th} century, particularly from the 1980s to the 1990s, the United States saw a significant focus on government debt. This period witnessed substantial budget deficits, driven by increased spending and tax reductions by the federal government. Consequently, the ratio of government debt to

GDP doubled from 26 per cent in 1980 to 50 per cent in 1995. The debt-to-GDP ratio is the ratio of a country's public debt to its gross domestic product. It measures the proportion of national debt relative to the size of the economy. This spike in debt levels was unprecedented in U.S. history, as it occurred outside of wartime or the depression. The resulting concerns prompted economists and policymakers to re-examine the economic implications of government debt.

- US debt soared in 1980s-90s due to spending/tax cuts

1.3.4.1 The Size of the Government Debt

As per the data provided by fiscal data.treasury.gov; in fiscal year (FY) 2023, the U.S. government faced a national deficit, also known as the federal or U.S. deficit, of $1.70 trillion. This deficit occurred because total government spending amounted to $6.13 trillion, while total revenue was only $4.44 trillion. The difference between spending and revenue resulted in a shortfall of $1.70 trillion, marking an increase of $320 billion compared to the previous year. This rising deficit indicates that the government is spending more than it is earning, which adds to the national debt. Let us examine the historical data on the U.S. government debt-to-GDP ratio since 1790 with the following illustration. The debt-to-GDP ratio is a metric that compares a country's total public debt to its gross domestic product (GDP). It measures the proportion of national debt relative to the size of the economy.

- U.S. deficit rises to $1.70 trillion in 2023

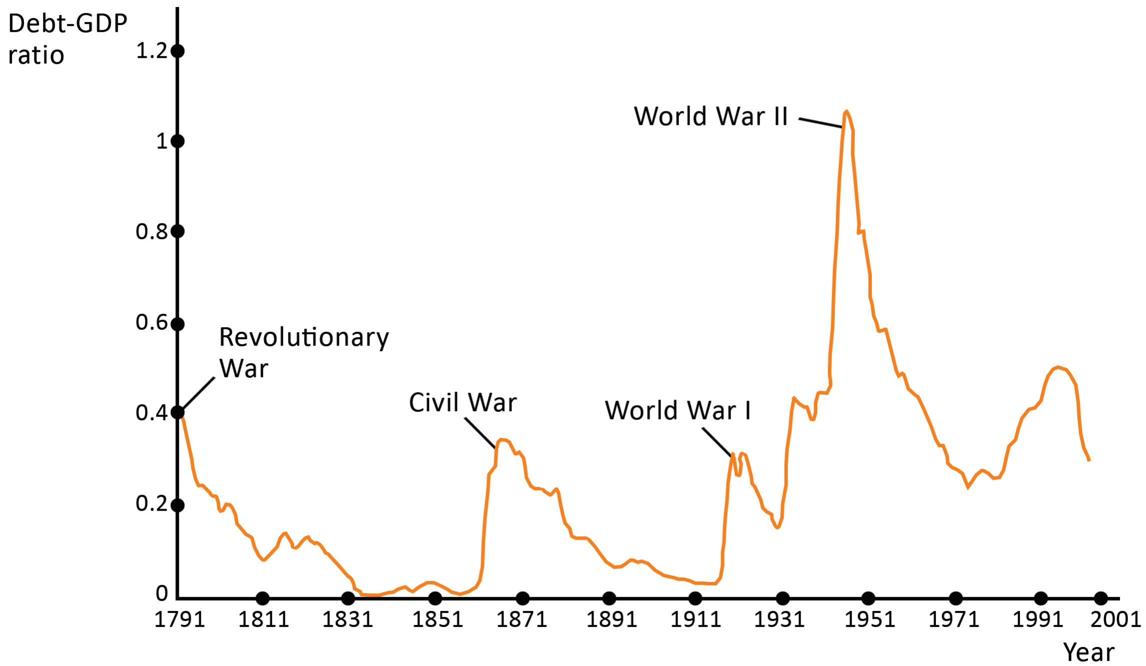

Fig:1.3.2 The Ratio of Government Debt to GDP Since 1790 in USA

Source: U.S. Department of Treasury, U.S. Department of Commerce, and T.S. Berry, "Production and Population Since 1789," Bostwick Paper No. 6, Richmond, 1988.

From the above figure it is understood that throughout history, in USA major wars have often led to significant increases in government debt, causing the debt-to-GDP ratio to increase. Conversely, during peacetime, this ratio tends to decrease slowly. However, during the 1980s and early 1990s, the United States experienced a substantial rise in government debt despite being at peace. This increase was primarily due to significant budget deficits. While some economists defend this approach as necessary for economic stability. Others criticise this approach, arguing that it unfairly places the financial burden on future generations without providing enough reason or justification for doing so. In the mid-1990s, the U.S. government took steps to reduce its budget deficit. Through a mix of raising taxes, reducing expenditure, and benefiting from strong economic growth, the ratio of debt to GDP stabilised and began to decrease.

- Despite peacetime, US debt rose in the 1980's - 90's

1.3.4.2 India's Budget Deficit in 2024-25

In the fiscal year 2024-25, the Indian government's budget underlines a clear focus on fiscal management and capital expenditure. The total receipts, excluding borrowings, are projected at ₹32.07 lakh crore, while the total expenditure is estimated at ₹48.21 lakh crore. This results in a significant fiscal deficit, estimated at 4.9% of GDP. The net tax receipts, which represent the government's income from taxes after transfers to states, are expected to be ₹25.83 lakh crore. A major feature of the Union Budget 2024 is the emphasis on capital expenditure, which is the government's spending on infrastructure and other long-term assets. The capital expenditure is pegged at ₹11,11,111 crore, or 3.4% of GDP, reflecting a strong commitment to boost economic growth through investment in infrastructure. This includes ₹1,50,000 crore earmarked as financial assistance to states for their capital projects. Notably, this represents a substantial increase, almost 3.3 times the capital expenditure of Fiscal Year (FY) 2019-20, and it accounts for 23.0% of the total expenditure for the year. The government remains committed to fiscal consolidation, a policy focused on gradually reducing the fiscal deficit. The fiscal consolidation path initiated in 2021 has proven effective, with a target to bring the deficit below 4.5% of GDP by the next fiscal year.

- India's latest budget shows 4.9% fiscal deficit

India's debt-to-GDP ratio has exhibited a fluctuating trend in recent years, reflecting the balance between economic growth and government borrowing. Following a significant increase due to the fiscal stimulus measures and increased spending in response to the COVID-19 pandemic, the debt-to-GDP ratio reached approximately 89% in FY 2021-22. Since then, the government has focused on fiscal consolidation efforts, leading to a gradual decline in the ratio. As of the latest estimates for FY 2023-24, the debt-to-GDP ratio is on a downward trajectory, aided by robust economic growth and a commitment to controlling the fiscal deficit. The Union government's debt was ₹155.6 trillion, or 57.1% of GDP, at the end of March 2023, with state governments adding about 28% of GDP to the overall debt burden. India's public debt-to-GDP ratio slightly increased from 81% in 2005-06 to 84% in 2021-22, and then back to 81% in 2022-23. The government's medium-term strategy is to reduce this ratio further, ensuring long-term fiscal sustainability while continuing to invest in critical infrastructure and social programmes.

- India's debt-to-GDP ratio dropped to 81%

1.3.4.3 Problems in Deficit Measurement

The government budget deficit is calculated by subtracting government revenue from government expenditure. However, despite its apparent simplicity, debates often arise in economics over how this deficit should be measured. Let us examine the four issues associated with the typical measure of the budget deficit.

1. Problem of Inflation

When we measure budget deficits, we need to consider the effects of inflation. Inflation causes the value of money to decrease over time, which can make the deficit seem larger than it actually is. For example, if the government's debt remains the same in real terms (after accounting for inflation), but inflation causes the nominal debt to rise, it can make the deficit look bigger than it truly is. Similarly, when the government pays interest on its debt, we should only count the real interest (adjusted for inflation) to accurately assess the deficit. So, using nominal debt alone to measure the deficit could lead to errors in understanding the true financial situation.

- Inflation distorts the nominal value of debt

2. Problem of Capital Assets

Another issue in measuring the budget deficit is the treatment of government assets. Some economists argue that to accurately assess the deficit, we should consider both government debt and assets. Capital budgeting does this by considering both. For instance, if the government sells a property to pay off debt, under capital budgeting, the deficit would not decrease or the government's net worth (total assets minus total liabilities) would remain unchanged because while the debt is reduced (a decrease in liabilities), the asset (property) is also reduced. However, deciding which government spending counts as investments in assets, like buildings or infrastructure, can be tricky. Some say we should use capital budgeting despite its challenges, while others think it is too hard to do well.

- Difficult to include government assets in deficit measurement

3. Problem of Uncounted Liabilities

The way we measure the budget deficit can be misleading because it does not include all of the government's debts. For example, when government employees earn pensions for their future retirement, it is like the government owing them money in the future. But we do not count this as part of the official government debt, even though it is a big financial commitment. Similarly, with Social Security, people pay into it during their working years and expect to receive benefits later, so this future liability should be considered. There are also other types of uncertain debts like guarantees the government makes for loans, which are not included in the deficit because it is hard to put a currency value on them. In simple terms, the government owes more than just what is officially recorded.

- Govt deficit underestimates obligations like pensions

4. The Problem of Business Cycle

The budget deficit of the government can change automatically in response to changes in the economy. For example, during a recession, people earn less, so they pay less in taxes, and the government spends more on assistance programmes like welfare and unemployment benefits. These changes in the deficit are not mistakes in how we measure it because the government really does borrow more during economic downturns. However, this can make it tricky to understand if changes in the deficit are due to government policy or just the natural ups and downs of the economy. To help with this, the government calculates a 'cyclically adjusted' deficit, which estimates what the deficit would be if the economy were at its normal level.

- Government adjusts deficit based on business cycles

- Measuring the deficit accurately demands supplementary data for clarity

Economists hold varying opinions on the significance of the challenges in measuring the budget deficit. While some argue that these issues render the measured deficit almost meaningless, most acknowledge them as important but still see the deficit as a useful indicator of fiscal policy. However, it is widely agreed that relying solely on the measured deficit is not enough to fully understand fiscal policy. Policymakers and economists examine additional data beyond the deficit, such as capital expenditures and credit programmes, to gain a more comprehensive view of the government's finances. This emphasises the need to carefully analyse economic statistics, especially those concerning government debt and deficits, to understand what they represent and what aspects they might overlook.

Summarised Overview

Fiscal policy involves government decisions on spending, taxation, and borrowing to achieve various economic goals. Fiscal policy, also known as budgetary policy, involves managing government receipts like taxes, non-tax revenue, and borrowings and expenditures like payments for goods and services, interests, subsidies, and pensions. Fiscal instruments, or tools used to shape economic activity, include budgetary balance policy, government expenditure, taxation, and public borrowings. These instruments target variables such as economic growth, inflation, and employment, aiming to influence aggregate demand, disposable incomes, consumption, savings, investment, and external balances.

Policy lags are delays in the implementation and effects of economic policies. Inside lag refers to the time it takes for policymakers to recognise and decide on actions in response to economic shocks, while outside lag refers to the time it takes for those actions to impact the economy. Fiscal policy has a long inside lag due to the complex legislative process, whereas monetary policy has a shorter inside lag but a significant outside lag. The inside lag includes recognition lag (time to realise action is needed) and decision and action lags (time between decision and implementation).

The outside lag, often a distributed lag, measures the time for policy effects to unfold in the economy, usually seen in gradual impacts on aggregate demand and income. Approaches to achieving policy goals can be gradualist (slow adjustments) or cold-turkey (quick, decisive actions), with each having distinct advantages depending on economic conditions.

When government spending exceeds its revenue, it borrows to cover the gap, resulting in a budget deficit. This borrowing accumulates over time as government debt. In FY 2023, the U.S. had a $1.70 trillion deficit. For FY 2024-25, India's budget shows a significant fiscal deficit of 4.9% of GDP due to high spending. India's debt-to-GDP ratio fluctuated but returned to 81% in 2022-23.

Assignments

1. Define fiscal policy and explain its primary objectives.
2. Differentiate between inside lags and outside lags in the context of fiscal policy.
3. What are the main causes of inside lags in the implementation of fiscal policy? Analyse the potential consequences of these delays on economic stability and growth.

4. Explain the concept of outside lags in fiscal policy. How do outside lags affect the time it takes for fiscal policy changes to impact the economy?
5. Define a budget deficit and discuss its short-term and long-term impacts on an economy.

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Suggested Reading

1. Froyen, R. T. (2013). *Macroeconomics: Theories and policies* (10th ed.). Pearson Education India
2. Romer, D. (2019). *Advanced Macroeconomics* (5th ed.). McGraw Hill Education
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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

MASTER OF ARTS ECONOMICS

National Income Accounting and Business Cycle

Block 2

UNIT 1
National Income and Business Cycle Theories

Learning Outcomes

After completing this unit, the learner will be able to:

- understand the basic concepts of national income
- analyse the phases of business cycle
- explain the basic theories of business cycle

Background

National income and its concepts were studied in detail in your lower classes. The concepts like Gross Domestic Product (GDP), Gross National Product (GNP), Net Domestic Product (NDP) and Net National Product (NNP) are familiar to you. A basic understanding of these national income concepts is indispensable for evaluating the growth of a nation and identifying the areas where it is lagging behind. Nations are evaluated and ranked based on these indicators which, embody the progress and economic strength of the economy. Decisions on investment, international business and maintaining international ties are based on the global positioning of countries in the national income order. Therefore, as a student of Economics, an understanding of national income concepts becomes necessary. Besides this, you are also familiar with various methods of national income like value added method, income method and expenditure method. The pattern of national income calculation over the years has become an important method for understanding the economic health of an economy. If one plots the values of national income over the years, it will take a wave like pattern with a series of expansion and contraction. These are called business cycle. The unit explains the expansion and contraction phase of the business cycle in detail and theories such as the Sunspots theory and the Hawtrey trade cycle theory.

Keywords

GDP, GNP, NDP, NNP, Net Factor Income from Abroad, Valued Added Method, Business Cycle, Procyclical, Acyclical, Counter Cyclical, Coincident, Lagging, Sun Spot

Discussion

2.1.1 National Income

- Earliest attempt to measure national income was in the 17th century in England and France

The earliest attempt to measure national income can be traced back to the seventeenth century from 1660-1980, in England and France. The first phase of national income estimation was initiated in England by William Petty and Gregory King who estimated and presented national income across social and occupational groups. King made a comparative study of national income in England, Holland and France. In addition to this, Gregory also conducted a time series to forecast income in the following years. Besides this, the United Nations also attempted the integration of national income of various countries from 1938-40. The statistical team developed a Standardised system of National Accounts (SNA) in 1952 and revised it in 1953.

- In India, the National Income estimation was constituted in 1949

In India, the National Income Committee was constituted in 1949 with P.C. Mahalanobis as its Chairman and D. R. Gadgil and V.K.R.V. Rao as members. The Report was published in 1954 and it recommended the calculation of National Income regularly. National Income concepts and their estimation have now evolved a long way and are playing a significant role in evaluating the economic health of a nation. It become a major determining factor for countries to initiate international business and other economic ties between the nations. The following section gives a brief account of various concepts of National Income, the estimation of National Income and the difficulties associated with it.

2.1.1.1 National Income Concepts

National income is a measure of total economic output or income generated by a country within a specific time period, usually a year. It reflects the overall health and performance of an economy. Several key concepts are used to define and measure national income, each capturing different aspects of a country's economic activity. Here are the main concepts of national income:

i. Gross Domestic product (GDP)

Gross Domestic Product measures the total value of goods and services produced in an economy within its domestic territory during a financial year. For example, a citizen of India working in Saudi Arabia may be earning her wage and it will be included in the Saudi Arabian GDP. Likewise, the wage or profit earned by an American working in India will be included in India's GDP.

It includes all the goods and services produced in the current time period. The market transactions of previously produced goods and services are not included in the calculation of GDP. Likewise, GDP only take into account the final goods and services while the intermediate goods are excluded. This is to avoid double counting. For example, if we count the value of flour once and then add it again when calculating the value of bread, it will result in double counting. Either the value of flour should be subtracted from the value of bread or the final good bread should be calculated. It is calculated at the market prices, that is the prices at which these products are sold in the market. For example, let us assume that an economy produces 10 bikes at Rs 100 per bike and 200 shirts at Rs 20 per shirt. Now the total goods produced in the economy is 10 bikes + 200 shirts is 210. The total value of goods produced can be calculated by considering the price of the commodity. By calculating the total value of bikes that is 10 bikes x Rs100 = Rs 1000 and the total value of 200 shirts that is 200 shirts x Rs 20 = Rs 4000 and adding these two values (1000 + 4000= 5000) will get the total national income as Rs 5000/-.

- Measures the total value of goods and services produced in a domestic economy during a financial year

There are two types of goods used in calculating GDP viz, capital goods and Inventory goods. Capital goods involves the plant, machines and types of equipment which are purchased by the firm for the production of goods and services within the time period. It should be noted that only a portion of the value of capital is used for production and the other portion of capital has suffered depreciation while producing the good in the preceding years. In calculating GDP, the whole of capital including depreciating is taken into account. The second type of intermediate good is inventory investment. Inventory investment refers to the change in the stock of raw materials, work in process, and finished goods within a firm or an economy over a specified period of time, or the net change in inventories of final goods awaiting sale or materials used

- There are two types of goods used in calculating GDP viz, capital goods and inventory goods in the production process. These are counted in current stock because it is used to produce goods in the current period.

GDP can also be broken down into its various components such as the consumption component, investment component, government purchases and net exports. The consumption component includes consumer goods such as food, dresses, consumer durables such as washing machines, refrigerators etc. and consumer services such as health, communication etc. Consumption is the largest component of GDP. The Second major component in the measurement of GDP is the investment component which can be further broken down into subcomponents such as business fixed investment which consists of purchases of newly produced plant and equipment or the capital goods and inventory investment, which is the change in business inventories. The third component or sector in the economy is the government sector which is concerned with the share of output by the government sector which comprises of central state and local government.The fourth and final sector in the economy is the foreign sector, where excess goods produced are exported to other countries, and goods that are uneconomical or unfeasible to produce domestically are imported. All these components together constitute the total goods and services produced in an economy.

- GDP= C + I + G + (X-M)

GDP = Consumption + Investment + Government Purchases + Net exports / Export-Imports

$$GDP = C + I + G + (X-M) \qquad \text{(eq 2.1.1)}$$

This means that the total value of final goods and services produced within a domestic territory is equal to the total of its consumption component, investment component, government purchases and net exports.

ii. Gross National Product (GNP)

Gross National Product (GNP) is the total value of goods and services produced by the nationals within the domestic economy and foreign economy, which means it includes income earned by Indian nationals and firms in foreign countries but excludes the income earned by foreign nationals and firms in India. For example, consider an Indian citizen who is working as CEO of an American company, her/his income will be calculated in US GDP whereas income will be included in Indian GNP. Similarly while calculating the GNP of India income earned by a foreigner working in India is subtracted.

GNP= GDP + NFIA (Net factor Income from Abroad)

- GNP= GDP + NFIA

Net factor income from abroad is the difference between income earned by a foreigner in a domestic country and the income by a citizen in a foreign country. National income is the sum of factor earnings from the current production of goods and services. Factor earnings are incomes of factors of production viz, land, labour, and capital. It must be noted that if there were no charges against GNP other than factor incomes, GNP and national income would be equal. However, there exist other factors that cause GNP to diverge from national income.

iii. Net Domestic Product (NDP)

- NDP = GDP- Depreciation

Net Domestic product is the net value of all goods and services produced in an economy within its geographic boundary. It is calculated by subtracting depreciation from GDP. Depreciation or wear and tear of a machine is the replacement and maintenance of a machine which is the value of destruction of an asset. If the difference between GDP and NDP is large, it means an increase in the value of the destruction of an asset.

NDP = GDP- Depreciation

iv. Net National Product

Net National Product is the total value of goods and services produced by the nationals within the domestic economy and foreign economy after subtracting depreciation from GNP.

- NNP = GNP - Depreciation

NNP = GNP – Depreciation

As discussed above, measuring National Income is an important factor while analysing the progress of a nation. Countries form economic ties, and carry out international business and international relations based on the national income of a country. Therefore measuring national income becomes important. The methods of measuring national income are discussed in the following section.

2.1.1.2 Methods of Measuring National Income

There are several methods of measuring national income, they are Product Method, Income Method, and Expenditure Method. In the product method or value added method, the national income is calculated by adding the value added of final goods and services. The intermediate goods that are further used as inputs for the production of final goods are subtracted and the value added is only included in the calculation of national income. Let us understand this with the help of an example. Let us assume a farmer who is producing a quantity of 10 kg wheat and sells it to a miller at Rs 100. Miller uses the intermediate product of wheat grains to grind it into his final product wheat flour. He then sells it off to a baker at a price 300. Here the value added by the miller while converting wheat grains into wheat flour is Rs 200 (Rs 300 – Rs 100). Now the baker who bought wheat flour from the miller at a price of Rs 300 will use the wheat flour to produce his final product, cakes. He sold this cake at a price of Rs 700 to Britannia industries which is a well known company. Here the baker has used wheat flour to make cake which has a higher value. In price terms, he has added Rs 400 (Rs 700-Rs 300) to make cake from the wheat flour. The Britannia company which has a good brand name use its goodwill and advertising techniques that add to the value of the product and sells at Rs 1500. Here the value added by Britannia is Rs 500 (Rs 1200-Rs700). Now in this example, the total value added is Rs 100 + Rs 200 + Rs 400 + Rs 500 = Rs 1200. The value added method is used inorder to avoid double counting which is a situation where the value of a product is counted more than once.

- In the product method, national income is calculated by adding the value added of final goods and service

In the income method, the national income is calculated by adding the income of factors of production such as wages given to labourers, profit earned by capitalists, rent earned for capital are added to obtain national income. Let wages and salaries be Rs 10,000, total profit be 30,000 and rent be Rs 5,000 then total national income is wages + profit + income is Rs 10,000+ Rs 30,000 + Rs 5,000 = Rs 45,000.

- In the income method, the national income is calculated by adding the income of factors of production

In the expenditure method, national income is calculated by expenditure undertaken in the economy. The expenditure is undertaken in consumption goods, investment goods such as firms, machines etc and government expenditure which includes the purchase of goods and services by the government, social security transfers, medicare insurance etc. In addition to this net exports (export-imports) are also added. Exports include the expenditure on goods and services by foreigners on domestic goods and imports include the expenditure of domestic people on foreign goods. Here the former which is the exports are included in the national income of the domestic country and therefore are included in the national income. Whereas the imports which are included in national income are subtracted from national income accounting. Suppose the total expenses on consumption is Rs 20,000 expenditure on investment is Rs 50,000, the government initiate an expenditure of Rs. 60,000, expenditure on on export is Rs 10,000 and expenditure on imports is Rs 6000. Therefore Net Export is Rs 10,000 - Rs 6,000 = Rs 4,000. Now the total national income in the economy is the sum total expenditure on consumption and investment goods, that is Rs 20,000 + Rs 50,000 + Rs 60,000 + Rs 4,000= Rs 1,34,000.

- In the expenditure method, national income is calculated by expenditure undertaken in the economy

Although the above-mentioned methods are used on a large scale, these are not free from limitations. The difficulties associated with national income accounting is discussed in the following section.

2.1.1.3 Difficulties in the Measurement of National Income

National income accounts measure the overall income received by the country in a specified time period. It is useful in analysing the economic profile of a country. There exist several difficulties in the measurement of national income.

- Elimination of non-market goods while calculating the national income accounts

Elimination of non-market goods is one of the major problems identified while calculating the national income accounts. It is observed that some useful goods such as home making, child rearing etc. are not included in GDP. This is because these goods are not produced in the formal market and are difficult to measure.

Another difficulty in the measurement of national income is the neglect of the cost and benefits of environmental goods such as the benefits of clean air and water which are not bought and sold in the market. This would trivialise the need to take action to reduce pollution. For example, suppose a firm produces goods worth 10 lakh rupees in a factory near a river. If it requires 1 lakh rupees to clean the river or prevent pollution, the firm's contribution to GDP will be 9 lakh rupees. But as the national income take into account only the total value of production of goods and not the abatement cost, the firm will tend to avoid the pollution abatement and produce 10 lakh worth of output. An added problem in the national income accounting is excluding the value of depletion and misuse of

- National income accounting excludes the value of depletion and misuse of natural resources

natural resources. For example, when a construction company uses sand from a river, it will calculate and include the value of the sand in the production of construction goods in the national income. But in reality, this is a depletion of natural resources which is a negative inventory investment. If this negative inventory investment were included in the national income accounts, this would reduce the computed value of GDP. One of the major problems raised by economists is that certain poor countries will over-exploit their natural resources inorder to increase the value of GDP thereby leading to harmful catastrophes in the future.

- The existence of illegal activities can also fail the economy from the correct accounting of national income

The existence of the underground economy, which includes the trade of both legal and illegal goods such as black market transactions, drug dealing, and gambling, is not within the purview of national income accounting. Illegal activities like the black market, tax evasion, inequitable distribution of income, and inflation make it difficult for government statisticians to obtain reliable data on the size of the underground economy.

- The value of services provided by the government sector is not considered in the national income calculation

Another component that is neglected in national income calculation is the value of services provided by the government sector such as public health, education, defence etc. which are not sold in the market. The statiscians find it difficult to measure the services received by an army official or the benefit reeaped through public education. It is only the salary given to the army officials or the teachers that are included in the national income accounting

It is clear from the discussion that there exist several difficulties in calculating national income however, it must be noted that despite these difficulties national and international agencies make concerted efforts to calculate national income and publish it on a public platform.

In today's world where the world economy converges to become one global village, it becomes important to understand the economic stature of the other countries. It is based on the analysis of these data that the countries formulate relationships with each other, both economic and strategic. The data collected by the statisticians and econometricians are based not just on the present values but the past values. This analysis of the national income of the countries over a long period of time led to the discovery of a cyclical wave like pattern in the value of variables related to national income over the years.

- Measurement of national income is important in understanding the economic health of a country

If we look at history, cycles lasting 8 to 11 years were first observed by the french economist Clement Juglar, mainly due to the post-Napoleonic wars that took place between 1815 and 1830. Later during the Great Depression of the 1930s there was a low level of economic activity which lasted for a certain period of time. However, this was followed by an economic expansion with the golden age of capitalism that lasted till the 1970s. This expansion was also short lived as there came the Oil Crisis in 1973 and the stock market crash. Such behaviour in the variables was observed in a later period as well. However, it was in 1946 that economists Arthur F. Burns and Wesley C. Mitchell provided the definition and characteristics of these cyclical patterns, known as the Business Cycle.

2.1.2 Phases of Business Cycles

- During a boom, there is a high level of economic activity, production, output and employment in the economy

Business cycles are a series of fluctuations that occur in economic activity, characterised by alternating phases of expansion and contraction, with each phase merging into the next. Imagine citizens living during the era of the industrial revolution. Until then, people traveled in bullock carts and primarily engaged in agriculture, using traditional methods. With the industrial revolution, individuals began traveling by steam engines, and new machines were invented across several sectors, eventually being used in agriculture. A person living in the 18th century, who used to rely on oil lamps at home, started using electricity. With the invention of electricity, the wealthier people in neighbourhoods set up large factories, providing employment and paying substantial salaries. As people earn higher incomes, they are able to purchase more products from the market and afford items that were previously beyond their financial reach. As demand for products increases on a larger scale, producers respond by increasing production, which involves hiring more labour and utilising additional machinery. This expansion raises production costs, resulting in higher prices. Consequently, the rising demand for goods and services across various sectors leads to an increase in both income and employment levels. The situation described represents an economy experiencing expansion. The peak of this expansionary phase is known as a boom or prosperity, characterised by high levels of economic activity, production, output, and employment. Additionally, during this phase, the economy experiences a rise in price levels as demand for products escalates due to increased income and employment. In this scenario, there is no involuntary unemployment, and the unemployment that exists is frictional or structural. A higher GDP is a key indicator of boom or prosperity.

- The beginning of the contractionary phase is recession and the lowest phase is depression

However, the economy does not remain in this phase indefinitely; rather, it may experience a decline in economic activity. This can be illustrated with the help of an example. Consider a country called Nation 1 where bankers became overconfident and lend it to people without checking their creditworthiness. Similarly, the government inflates the economic growth rates of the economy to showcase their potential in front of the whole world and attract foreign investment. Seeing the growth rates, the countries, Nation 2 and Nation 3 invested a huge amount of capital in Nation 1. It may continue this practice for some time but after a point, the bubble will burst leading to the collapse of the whole system. Several people and companies who borrowed from the banks may become defaulters, and the liquidity in the banks gets dried up. Several people in the defaulted company will lose their jobs, leading to reduced consumption and spending due to lack of income. This will affect multiple sectors and the result is overproduction. Eventually Nation 2 and Nation 3 who invested money in the country will withdraw their money leading to capital plight. The Nation 1 will experience a huge reduction in investment resulting in large scale unemployment and poverty. The prices of the over produced goods and services will reduce considerably but there will be no money to buy these goods and services. This phase is called recession which initiates the beginning of the contractionary phase.

- The contraction of the economy may be due to exhaustion of natural resources, full capacity utilisation of resources, war, calamities or a pandemic

The contraction takes place mainly due to internal factors such as exhaustion of natural resources or because the economy has reached its full capacity utilisation of resources and labour. In addition to this, there can be external factors such as war, calamities or the emergence of a pandemic that lead the economy to a recessionary phase. If the recession continues to persist, it may lead to the lowest level of economic activity at which, the policies become ineffective and the economy will be in a state of stagnation. However, the timeline of these phases is not certain and not predicted with precision. The recession may last for a longer period and the policy measures may stabilise the economy even before it reaches a state of depression. Similarly, the economy may recover and may continue to hover in a recovery phase and not reach a state of prosperity. Figure 2.1.1 shows a pictorial representation of the business cycle.

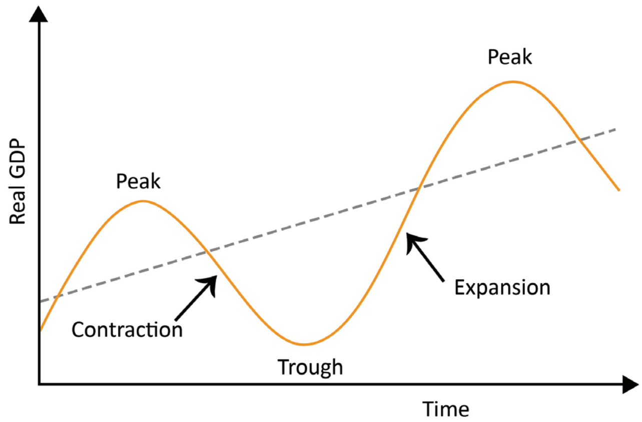

Fig 2.1.1 Business Cycle

The figure shows that the business cycles follow a wave like pattern. Generally, a business cycle goes through different stages viz. expansion, peaks, contraction and trough. The lowest and highest points in the business cycle, viz, trough and peaks respectively are called the turning points. The movement of an economy from peak to peak or trough to trough completes a business cycle. An expansion or boom phase in the business cycle refers to rapid economic growth and recession phase refers to decline in economic growth.

Business Cycle Facts

- A variable is procyclical when the direction of an economic variable moves in the same direction as the business cycle

Based on the direction and timing of the economic variables along with the business cycles, they are categorised into several ways. Let us consider a situation in which the economy is experiencing an upward swing or an expansionary phase. The production increases at an increasing rate, people will have more income with them and demand more goods and services as a result consumption increases. Besides this, the corporates and other investors earn huge amounts of profits, which are invested; as a result, investment also increases. The example shows that as economic activity expands, the production, consumption and investment expands. If the movement of an economic variable aligns with the business cycle-that is, the variable increases during expansions or prosperity and decreases during recessions and depressions-it is called procyclical.

Consider an economy which is experiencing a depression in which economic activities are decreasing or contracting.

- A variable which moves in the opposite direction to the state of the economy, is countercyclical

Production is decreasing, and consumption and investment are also decreasing. In such an economy the variable unemployment is expanding. The variable which moves in the opposite direction of the phase of the economy, that is expansion when the economy is contracting and vice versa is said to be counter cyclical. In addition, some variables are not affected by the business cycles and do not show a clear pattern, these are called acyclical.

- The variable which moves in advance of economic activity is called the leading variable

The second characteristic is the timing of variables in relation to the business cycle. Consider an economy in which the monetary authority intends to expand its money supply and credit facilities, resulting in a fall in interest rate. When the interest rate falls, the textile industry finds it profitable to take up loans to make investment. When an investment is made, the industry can use it to buy new machines expand its labour or increase the wages of labour. It can also use this investment to carry out Research and Development to produce a new good or an improved version of an existing good. The introduction of technology or the improvement of existing technology will lead to an improvement in the quality of production. If such investments are carried out in multiple firms, the production quality will improve and the productivity of labour will improve. Since the outputs of certain industries are the inputs used in other companies, the backward linkage will enhance the production of input manufacturing companies. In our example, the demand and production of the textile industry will increase the demand for firms manufacturing cotton silk, dyes etc. This result in an increase in output, employment opportunities, and income in the economy. This development wave will be transferred to other industries with the increased consumption by the employees in textile industries. This will eventually lead to an overall increase in the development of the economy. This is an example of a leading variable. The variable that moves in advance of economic activity is called the leading variable. In the above example money supply, interest rate, and investment are all examples of leading variables. The peaks and troughs (or the highest and lowest points) in these leading variables occur before the peaks and troughs in the economy.

Let us consider another timing component of the business cycle with an example. The economy which is explained in the previous example is experiencing increased economic activity due to the expansion of the textile company. Now the employees in the textile company go to a shoe factory to buy shoes. Now, the people working in shoe companies and those involved in the manufacturing of shoes get income, which they use for the consumption of food and entertainment. The food and entertainment industry now flourishes and more people are employed. It may be noted that as the economy starts to expand, consumption and employment expand along with it. These variables whose peaks and troughs coincide with the timing of peaks and troughs of the economy are known as Coincident Variables. Lastly, there are lagging variables in which peaks and troughs occur later than the corresponding peaks and troughs in the business cycle.

- The variables whose peaks and troughs coincide with the timing of peaks and troughs of the economy are known as Coincident Variables

2.1.3 Theories of the Business Cycle

2.1.3.1 Sunspot Theory

The sunspot theory was first analysed by W.S. Jevons according to which sunspots affect the economy by influencing rainfall. As per the theory, when the sunspots appear on a large scale, the amount of rainfall is reduced creating harmful effects on agriculture. Jevons has studied the prices of wheat in Delhi from the period 1763-1803 and observed recurrent famines and revival during this period. The literature during the concerned period indicates increased solar activity from 1788- 1804 and this had a serious impact on wheat cultivation in India thereby contributing to the rising prices. It is during the same period that Britain which has colonised India experienced a commercial crisis. The British economy was largely dependent on the economy of India and therefore any crisis that impacted India had a resonating effect on the British economy. In addition to this, the National Research Council report states that extreme weather conditions like sunspots and solar storms can have undesirable effects on power grids, electronic items, and solar ays can cause corrosion in oil pipelines. It can disrupt the navigation signals from Global Positioning System Satellite (GPS) and other radio communications which can influence the aviation routes required to fly aircraft. Thus the sunspots can have unexpected changes in the economy.

- When the Sunspots appear on a large scale, the amount of rainfall reduces creating harmful effects on agriculture

Let us understand this with the help of an example. Let us consider the case of a capitalist country and its colony which is primarily dependent upon agriculture. Let us assume that several sunspots appear on the surface of the sun and the world is experiencing a solar maximum phase. The extreme solar waves affect the agricultural product in the colony which exports raw materials and primary products to the mother nation. Now the capitalist country which imports raw materials and agricultural products from its colony experiences a shortage of these items. This leads to a fall in production, output and employment on one side and a rise in the price of products on the other. This may lead to an economic crisis in both capitalist country and its colony. Similarly, when solar waves disrupt the signals from GPS, this can impact the economy as well. The satellite that we have stationed in the earth's orbit performs a specific function. The function ranges from weather forecasting, the study of the earth, navigation, disaster management etc. When this system fails due to solar flares it will have an impact. The weather forecasts are indispensable for agriculture which depends upon the monsoons. A disruption of the GPS satellite, which is one of the major constituent of trade and commerce can have a significant impact on the business. This way sunspots are the exogenous factor that can have a significant impact on the economy

- Sunspots are the exogenous factor that can have a significant impact on the economy

2.1.3.2 Hawtrey's Theory of Business Cycles

Hawtrey theory of the business cycle was proposed by professor R.G. Hawtrey. According to Hawtrey business cycle results from monetary fluctuations in the economy. The quantity theory of money is the basis of the trade cycle model proposed by Hawtrey in which he points out that the changes in money supply have repercussions on economic activity.

In a monetary economy banking sector plays an important role by providing investment to the business sector through the process of credit creation. The lower interest rate policy followed by the banking sector during the credit expansion policy will encourage the business sector to undertake loans and advances and make investments. The increase in investment will further increase the production in the economy leading to an increase in the supply of goods and services. This increase in output is initiated by employing more factors of production such as land, labour, capital and organisation for which additional expenses are to be made by the firm in the form of rent, wage, interest, profit etc.

- In a monetary economy banking sector plays an important role in credit creation

During this initial phase of production, although the output has expanded, it is not necessary that the demand also expand. In cases when the demand has not shown a significant improvement, the firm's expenditure is more than the firm's revenue. This expenditure will result in more injection of money into the economy. Let us consider a situtation where a bank follows a credit expansion policy. A entrepreneur who notices the lowering interest rate in the bank takes up a loan of one crore. He uses this income to install more capital and employ more labourers. The people who own the capital are earning substantial amounts as rent and the labourers earn income. Besides this, the entrepreneur pays interest to the bank on a regular basis which is used by the bank to advance loans to another firm. The factors of production, the firm which rented capital, the labourer, and the organisation use their respective income for consumption and investment. This will ensure the regular flow of income into the economy and this will lead to increased economic activity. This way the expansion of credit by the banking sector leads to expansion of economic activity which is popularly known as a boom.

- The expansion of credit by the banking sector lead to a boom

However, it must be noted that this phase will change as the credit reserve in the banking sector decreases. At this stage, the banks, in order to increase the reserves will increase the interest rate which discourages the firms from taking loans and advances. This will lead to a reduction in output and employment. The income flow in the economy will be affected as a result there will be a reduction in aggregate demand in the economy. The excess of supply over demand will lead to a reduction in prices and the firms unable to meet the cost of production will incur loss. This will aggravate the already existing crisis in the economy ultimately leading the economy to its low level of depression. Thus the contraction of credit by the banking sector lead the economy to crisis. When the cash is restored by the bank, it again follows an expansionary credit policy leading to another boom in the economy.

- The contraction of credit by the banking sector lead to depression

Summarised Overview

The earliest attempt to measure national income was in the 17th century in England and France. In India, the national income estimation was undertaken by Dada Bhai Naoroji for the years 1867-68. The national income Committee was constituted in 1949 with P.C. Mahalanobis as its Chairman and D. R. Gadgil and V.K.R.V. Rao as members. The Report was published in 1954 and it recommended the calculation of national income on a regular basis. Among various concepts of national income, GDP is the most important indicator studied. GDP measures the total value of goods and services produced in an economy within its domestic territory during a financial year. Besides this, GNP, NDP and NNP are also discussed. GNP is the total value of goods and services produced by the nationals within the domestic economy and foreign economy. NDP and NNP are measured by subtracting depreciation from GDP and GNP respectively.

Measuring national income is an important factor while analysing the progress of a nation and countries form expectations based on these values. Therefore measuring national income becomes important. There are several methods of measuring national income, they are product method, income method, and expenditure method. In the product method or value added method, the national income is calculated by adding the value added of final goods and services. In the product method, national income is calculated by adding the value added of final goods and services. In the income method, the national income is calculated by adding the income of factors of production. In the expenditure method, national income is calculated by expenditure undertaken in the economy. Although these methods are used on a large scale, they are not free from limitations. Lack of reliable data, illiteracy and ignorance, the existence of a barter system and illegal activities that fail the economy from the correct accounting of national income.

It should be noted that the data collected are based not just on the present values but the past values. This analysis of national income data over the years led to the discovery of a cyclical wave like pattern which came to be known as the business cycle. Business cycles are a series of fluctuations that occur in the economic activity with a series of alternative expansions and contractions in the economy merging into expansion and contraction of the next phase. During a boom or prosperity, there is a high level of economic activity whereas a depression indicates a low level of economic activity. In the business cycle, the variables are classified as procyclical, acyclical and counter cyclical based on the direction with respect to the business cycle; leading, lagging and coincident based on timing. Regarding the theories of the business cycle, there is the Sunspot theory which is the influence of the sun in the economy and Hawtrey's theory of the trade cycle which the banking sector plays a significant role and the expansion of credit by the banking sector lead to expansion of economic activity which is popularly known as a boom, contraction of which creates depression.

Self Assessment

1. What are the difficulties associated with national income accounting?
2. Give a brief account of the business cycle.
3. Make a list of economic variables and classify them as Procyclical, Acyclical and Counter cyclical based on their direction and leading, lagging and coincident based on their timing.
4. Do you think the sun can influence economic activity? Explain.
5. How did Hawtrey explain the business cycle?

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Suggested Readings

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

UNIT 2
Business Cycle Models

Learning Outcomes

After completing this unit, the learner will be able to:

- understand the concept of business cycle
- discuss various business cycles proposed by Samuelson, Hicks, Kaldor
- explain the factors that influences the business cycle

Background

In the previous unit, you have learned about the business cycle as a series of fluctuations that occur in the economic activity with a series of alternative expansions and contractions in the economy. Among the theories of the business cycle discussed in the earlier unit, Hawtrey's theory of the business cycle gave credit to the banking sector in contributing to the expansion of economic activity. The current unit is an extension of these business cycle theories which gives due importance to investment. The theories in this unit include trade cycle theories by Samuelson, Hicks and Kaldor. Both Samuelson and Hicks have based their theories on the basis of multiplier and accelerator. As you have learned in lower classes, a multiplier is a change in investment that leads to multiple changes in income. It is also learned that the value of multiplier depends upon Marginal Propensity to Consume (MPC), i.e. when MPC increases, the multiplier increases. Likewise, you are also familiar with accelerator. It is the measure of an increase in investment goods as a result of demand for consumer goods. It is equivalent to capital-output ratio. Both Samuelson and Hicks combine the effect of multiplier and accelerator on the business cycle. On this background let us learn the theories of the trade cycle.

Keywords

Multipler, Accelerator, Super Multiplier, Autonomous Investment, Induced Investment, Replacement Investment

Discussion

2.2.1 Introduction

Business cycles are the fluctuations that occur in the economic activity with a series of alternative expansions and contraction in the economy merging into expansion and contraction of the next phase. Business cycle was observed and studied by several economists in the past, Keynes being one of the prominent ones. Keynes tried to explain the business cycle with the help of multplier, but he could not explain the long term persistence and cyclical nature of these economic cycles. Later Samuelson in his seminal paper "Interaction between the Multiplier Analysis and the Principle of Acceleration" (1939) convincingly wrote about the business cycle and its cumulative and cyclical nature with the help of multiplier and accelerator. This model is explained in the following section.

- Business cycles are the fluctuations that occur in the economic activity

2.2.2 Business Cycle Models of Samuelson

Samuelson developed his business cycle based on the concept of multiplier and accelerator. According to him, an initial increase in investment can have more than a proportionate increase in income. A change in investment leading to multiple times increases in income is called an Investment Multiplier. J.M. Keynes used this concept of Multiplier to explain the various changes in business cycles that are, how an increase in investment leads to an increase in income which inturn results in an upswing or boom in the economy. Likewise, a downward revision of investment or a decrease in investment can have an opposite effect on the income of the economy. When there is a decrease in investment, it will lead to a multiple times decrease in income, which further leads to reverse action of multiplier leading to a downswing or depression. It was noted that Keynes failed to explain the cumulative and cyclical nature of fluctuations in economic activity and used only the concept of multiplier to explain variations in business cycles.

- A change in investment leading to a change in income is called an investment multiplier

- An increase in investment goods as a result of an increase in consumer goods is called an accelerator

Samuelson reworked the theory of the business cycle explained by Keynes in his seminal paper, “Interaction between the Multiplier Analysis and the Principle of Acceleration” (1939) and incorporated the concept of accelerator to explain the business cycle. According to Samuelson, the cyclical and cumulative nature of business cycle cannot be explained only with multiplier, but with the study of accelerator. Let us understand the mechanism of the accelerator with the help of an example. Suppose, an economy experiences an increase in the income of its working population. When the income increases people demand goods and services. Let us assume that the demand for automobiles has increased due to an increase in income. Since demand for cars and other automobiles has increased, the manufacturing sector faced with an increased demand for their product, will make more investment in their capital goods. In the current example, demand for cars has increased, the demand for the products used for manufacturing automobiles such as steel, aluminium, rubber etc. will increase. This measure of the increase in investment goods as a result of an increase in consumer goods is called an accelerator.

i. Working with Multiplier and Accelerator

According to Samuelson, the business cycle takes place due to the combined effect of accelerator and multiplier. This can be explained with the help of an example. Consider the economic boom in the USA during the 1920s with the introduction of electricity by the public authority and its massive usage. This generation of power through electricity enabled the setting up of several factories and the initiation of production on a large scale. The emergence of these sectors provided employment to a large number of the population and consumption spending increased. By 1929 most of the houses in the USA had electricity and the manufacturing sector started the production of consumer goods such as refrigerator, washing machine etc. This was the time when Henry Ford also started his automobile manufacturing company popularly known as Ford. With the increase in income, demand for consumer goods such as refrigerators, washing machines and automobile goods such as cars and motorbikes also increased. When these sectors showed a huge spike in demand, the demand for capital goods such as steel, iron, rubber etc also increased. The people employed in these sectors also experienced a rise in income. Overall, the economy experienced an expansionary phase

- Autonomous investment is independent of the level of output and income

- An increase in the demand for consumer goods will increase the demand for capital goods

of the business cycle where there was increased economic activity, income and employment. In this example, there are two components of investment, one is autonomous investment and the other is induced investment. Autonomous investments are those investments undertaken by government institutions, that do not depend upon output or income. The investment made by the government sector on electricity can be considered as autonomous investment, whereas the investment that depends upon the level of income and output is called induced investment. The investments made by private individuals on capital goods such as steel, and rubber are induced investment.

According to Samuelson, an increase in autonomous Investment ΔI_a leads to a magnified increase in the level of income through a Multiplier effect. The increase in the level of income is used for demanding goods and services. This increase in the demand for consumer goods will require the firms to produce more consumer goods which necessitates the need for more capital goods. Therefore there will be Induced Investment in capital goods that will make the Accelerator (a) or the Capital Output ratio operational. This joint effect of Multiplier and Accelerator is called Super Multiplier. Thus, both Multiplier and Accelerator together will increase the aggregate income and output by a larger amount. The Autonomous Investment leads to increased income which in turn leads to an increase in

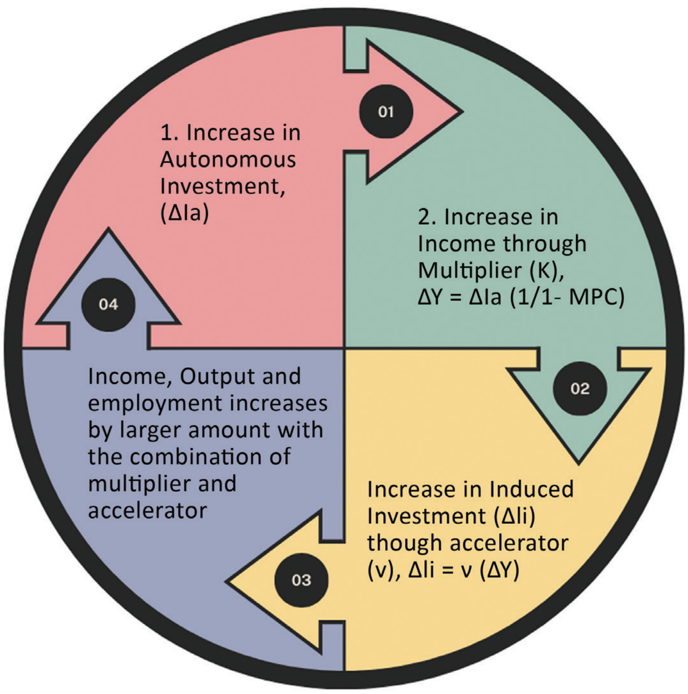

Fig 2.2.1 Interaction of Multiplier and Accelerator

Induced Investment and increase in income and employment. This process will continue cyclically. This is explained in the figure given above.

ii. Samuelson's Business Cycle Model

Samuelson's business cycle model is explained with the help of the following three identities of

$$\mathbf{Y_t = C_t + I_t \ldots(i)}$$

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

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

Where Y_t, C_t and I_t stands for income, consumption and investment respectively for a period t, C_a stands for autonomous consumption, I_a for autonomous investment, c for marginal propensity to consume and v for the capital-output ratio or accelerator.

The equations show the consumption in a period t depends upon or is a function of income of the previous period Y_{t-1}. That is, the present consumption depends upon previous income with a one year lag. For instance, let us take 't' in Y_t as the year 2024. As per the equation, Income in the year Y_t depends upon Y_{t-1}. When we consider the present time period 't' as 2024, the previous year t – 1 is 2023. Similarly, if we consider a two year lag that is Y_{t-2}, then t – 2 is 2022. Here the induced investment in period t, depends upon the change in income in the previous period. This implies that there is two year gap for changes in income to determine induced investment. In the equation (iii), induced investment equals

$$v(Y_{t-1} - Y_{t-2}) \text{ or } v\,(\Delta Y_{t-1}).$$

Substituting equations (ii) and (iii) in equation (i) we have the following income equation which states how changes in income are dependent on the values of marginal propensity to consume (c) and capital-output ratio v (i.e., accelerator).

$$Y_t = \mathbf{C_a + c\,(Y_{t-1}) + I_a + v\,(Y_{t-1} - Y_{t-2}) \ldots(iv)}$$

Here there are two possibilities, static equilibrium state and dynamic state. In a static equilibrium state, there are no

- The extent to which the economy deviates from equilibrium depends upon the value of MPC (c) and the accelerator or capital-output ratio

lags and therefore the lags such as Y_{t-1}, Y_{t-2}, Y_{t-n} etc will be equal to Y_t. Whereas in a dynamic state, the system represented in equation (iv) will move away from equilibrium. The extent to which the system deviates from equilibrium depends upon the value of Marginal Propensity to Consume (c) and the accelerator or capital-output ratio (v). Samuelson has explained the paths that the economy would follow based on the values of MPC and capital-output ratio or accelerator.

The Table 2.2.1 shows five different path of business cycle observed with various values of MPC (c) and capital-output ratio or accelerator (a) as explained by Samuelson.

It is clear from the table 2.2.1 that at various combinations of MPC(c) and capital-output ratio or accelerator (a), the business cycle follows different paths and oscillations. When the value of Multiplier is 2 and that of Accelerator is 0, the business cycle follows a path of smooth convergence and there is no oscillation. Likewise when the value of accelerator changes the path of business cycle and Oscillation changes. Samuelson has explained five cases of dynamic income path with the help of these given values. The figure 2.2.2 shows the dynamic income path explained by Samuelson.

Table 2.2.1 Five different path of Cycle with various values of MPC and Capital-Output Ratio or accelerator (a)

Region	**Marginal Propensity to Consume (c)**	**Multiplier**	**Accelerator**	**Different Paths of Trade/ Business Cycle**	**Types of Oscillations**
A	0.5	2	0	Smooth Convergence	No Oscillation
B	0.5	2	1	Damped Cycle	Stable Oscillation
E	0.5	2	2	Constant Cycle (special Case)	Constant Oscillation
C	0.5	2	3	Anti-Damped Cycle/ (Explosive Cycle)	Unstable Oscillation
D	0.5	2	4	Smooth expansion/ (Explosive Growth)	Unstable No Oscillation

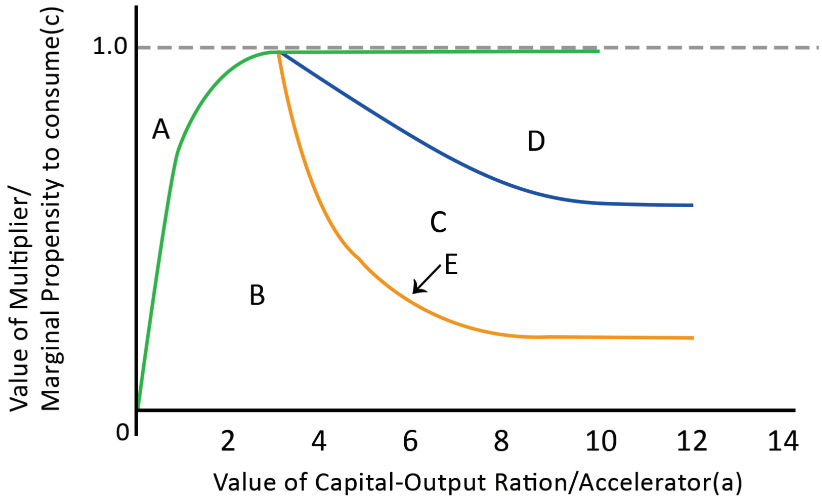

Fig 2.2.2 Samuelson Model of Business Cycle: Dynamic Income Path

- When the income increases at a decreasing rate it reaches the new equilibrium rate and no oscillation or cyclical behaviour is observed

The figure shows the dynamic income growth represented by region A, B, C, D and E as per the values of MPC (c) and accelerator. At Region A, the value of multiplier is 2 and accelerator is 0. Here with the change in autonomous investment or consumption, the income path move upward. This is explained further in Figure 2.2.3 where the income path increases and reaches a new equilibrium rate from where it moves parallel to X axis with no further oscillations. When autonomous investment or consumption changes, the value of accelerator increases to 1, value of multiplier remaining the same, the income take the shape of Region B. The cycle with respect to Region B is explained in figure 2.2.3 as a series of damped cycles. Similarly region C, the value of accelerator is greater than multiplier, Consequently, the fluctuation in income will grow successively at a greater magnitude which becomes explosive in nature. This explosive increase in income will further increase the value of multiplier. The oscillations or the pattern of income movement is explained in figure 2.2.3. Panel C showing anti damped cycles. The combination of MPC and accelerator in region D shows further upward or downward growth in income at an increasing rate. This causes economic system to explode and diverge from equilibrium. The pattern concerning the region D is depicted in Panel D of figure 2.2.3, representing smooth expansion with greater amplitude. Lastly there is a special case E where the value of Multiplier and accelerator are same. The growth path in this region is depicted between the boundary area of B and C. The pattern of Business cycle constituting Region E is explained in

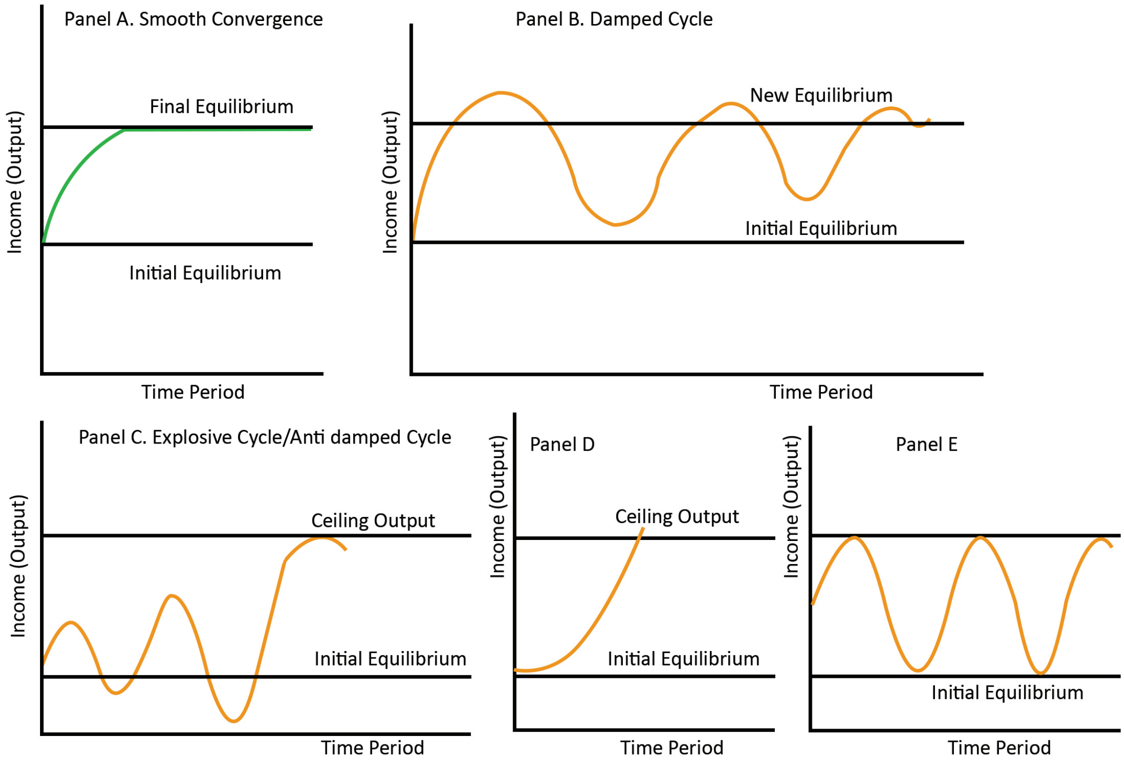

Fig 2.2.3 Pattern of Income movement for values of MPC and accelerator

Panel E of figure 2.2.3 that shows constant cycle.

The figure 2.2.3 shows various types of cycle that are formed at various combinations of multiplier. When the economy is at region A, the economy shows smooth convergence phase, in which an increase in autonomous investment or consumption lead to an increase in income or GDP. It is clear from the figure that the income increases at a decreasing rate and once it reaches the new equilibrium rate it becomes parallel to the initial equilibrium. This phase has no oscillation and no cyclical behaviour is observed.

- The accelerator increases, the value of multiplier remaining unchanged, the income fluctuates and it follows a series of damped cycles

When the values of accelerator increases, the value of multiplier remaining unchanged, the income fluctuates and it follows a series of damped cycles that goes on decreasing which ultimateley disappear. Panel B in figure 2.2.3 shows the damped fluctuations. The panel C, shows explosive cycle where accelerator becomes greater than multiplier and the cycle shows fluctuations. Both multiplier or MPC and accelerator or capital – output ratio together will lead to fluctuation in income which create explosive cycles which have greater and greater amplitude. It is clear from the cycle that these are not restrained by the ceiling and floor and successive oscillations get higher and higher.

- An increase in both multiplier and accelerator at an increasing rate causes the system to explode

The Panel D depicts the position of 'c' and 'v' at the region D which lead income to move upward or movement at an increasing rate causing the system to explode. The resultant cycle as observed from the c and v values deviate further from initial equilibrium . During extreme cases when the c and v values lies in region E, the observed cycle shows oscillations of same amplitude. It can be perceived from the trade cycle diagrams that Region A and B which are influenced by changes in autonomous investment or consumption represent stable equilibrium, whereas the multiplier and accelerator values at C and D region exhibits unstable equilibrium as it diverges from the initial state of equilibrium.

2.2.3 Business Cycle Model of Hicks

J. R. Hicks proposed business cycle in his book *Contribution to the Theory of Trade Cycle*, which is an advanced version of Paul Samuelson's business cycle proposed in 1939. In contradiction to Samuelson's theory, Hicks explains the business cycle theory in the background of long run equilibrium growth. As already explained in the previous accelerator-multiplier model, the economy will kick start when there is a change in investment and as long as the investment changes at the same level, the system can adjust to attain a new equilibrium position. However, it must be noted that it is not an economic progress but an economic change that represents a stationary state. We can alter this stationary state and attain a progressive state by bringing changes in levels of investment. Therefore it becomes important to differentiate between various investments.

- Hicks business cycle links investment changes to growth

Let us consider an economy in the absence of an accelerator, where the economy moves in a step like pattern from one equilibrium to another. This can be observed as a continuous change and occurs if the economy uses the entire old investment and that causes a change in investment. An equilibrium growth path can be constructed by joining the locus of equilibrium output positions that is income-determining rather than determined by income that represents adjustments to higher levels of investment. This investment is autonomous which

- Equilibrium can be attained only if there exists a balance between autonomous investment, induced investment and the rate of growth of output

sets up the economy in a higher growth path of equilibrium output. It should be noted that all the investment in the growth path is not necessarily autonomous but comprises induced investment also. The equilibrium can be maintained if the sum of autonomous and induced investment are equal to saving, where saving is a constant ratio of output and induced investment is a constant ratio of change in output. If the aggregate investment (autonomous + induced investment) is equal to saving, then the difference between saving and investment gives the autonomous investment. In other words, for a given level of autonomous investment, the rate of output growth must be sufficient to produce induced investment that when taken with the autonomous factor, will make aggregate investment equal to savings. If the equilibrium output is considered to be dependent on autonomous investment alone, then the concept of the accelerator is reintroduced, then the aggregate investment will be greater than saving and the system will experience a cyclically disturbed system which would tend to create income levels other than equilibrium level. Equilibrium can be attained only if there exists a balance between autonomous investment, induced investment and rate of growth of output. But in reality, this equilibrium situation is delicate and a small change in autonomous investment or induced investment can cause disequilibrium. It is conceived that the economy does not move smoothly along its equilibrium path, but suffers from cyclical interruptions.

Hicksian Trade Cycle

- Growth depends on investment, multiplier, accelerator

According to Hicks, the long run equilibrium growth is determined by the autonomous investment and the magnitude of the multiplier and accelerator. The figure 2.2.4 shows the Hicks Trade Cycle. On the X axis Time period is given, and on the Y axis, the National income is given. AA and EE are the paths of autonomous investment, and the level of equilibrium output respectively. Line FF is the 'limit' marked by the full employment level and the maximum capacity utilisation of the industries.

a. Expansionary Phase

Let us suppose that in figure 2.2.4, we start from a point at line EE which indicates a random cycleless position. At point P_0 there is an up kick caused due to an increase in autonomous investment that causes a displacement of the economy from

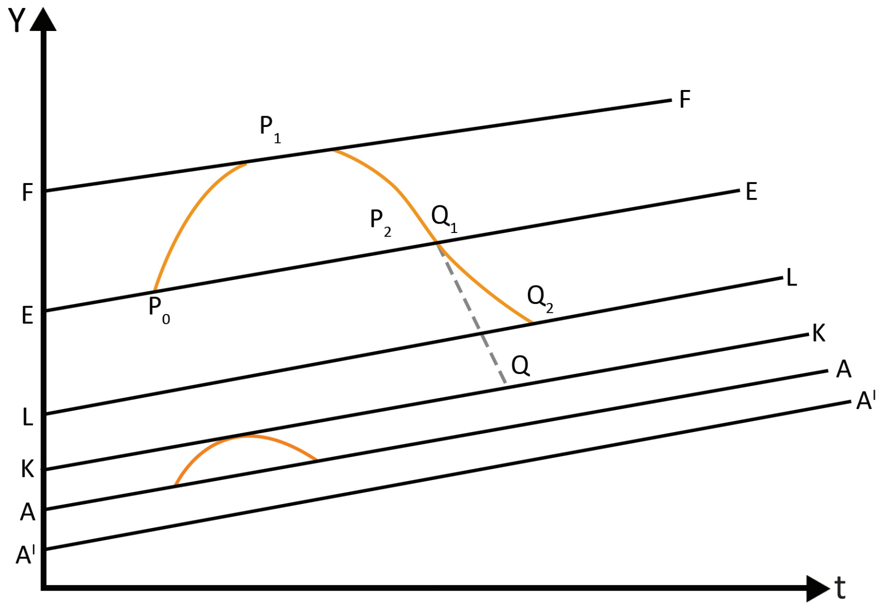

Fig 2.2.4 Hicksian trade cycle

- The autonomous investment acts as a triggering factor along with the help of a multiplier and accelerator

EE, this displacement will in turn activate the accelerator which causes a rise in induced investment. The autonomous investment acts as a triggering factor along with the help of a multiplier and accelerator that propels the economy away from the equilibrium along the expansion path P_0 P_1 and reaches the upper limit indicated by line FF. The line FF which represents the full employment or maximum capacity utilisation is the ceiling which indicates that beyond this output, the profit rates are declining, thereby putting a limit on further growth of output. Hicks follows the assumption of Keynes that at some point the output becomes inelastic to increase in effective demand. This unresponsive behaviour may be due to the existence of bottlenecks in the supply of goods and services such as the scarcity of resources, and rapidly increasing cost of production. It should be noted that the line LL is parallel to line EE and slopes upwards indicating a growing economy with an increasing ceiling level of output. As in the figure, once the economy reaches the ceiling at $P_{1,}$ the output grows at a lower rate than the expansion phase. After the expansion phase, the forces that initiated the upturn will diminish and the expansion is catalysed by the forces of induced investment. When the economy reaches its peak, Autonomous Investment declines to its normal pace.

b. Contraction Phase

The major forces that are active at the full employment ceiling line FF are higher induced investment and lower autonomous investment. This aggregate investment is insufficient to maintain the output at full employment level, therefore it must fall. The greater the investment lag, the greater the economy creeps along the ceiling before taking a downturn. The current investment will depend upon the output in the previous i.e., if the investment is taken in time period 't', then it depends upon the change in output in time period 't-1' or 't-2' period. The longer the economy hovers around the ceiling, the sooner the change in output will overtake the ceiling condition. This in turn forces a decline in Induced Investment which turns the economy down. Although reduction of both autonomous investment and induced investment causes the contractionary phase, it is induced investment that acts as an initiating force. The decline in investment led to the reverse working of multiplier and accelerator which also operate cumulatively as they worked during the expansionary phase and continued to contract the economy until it reached the line EE which represents growth at a normal pace with growth in autonomous investment. If longer the economy creeps to the ceiling due to lagged investment, more retarded will be the decline in induced investment. This will create explosive change in the forces which will then work in the reverse manner that takes the economy past the equilibrium. The accelerator effect is one of the powerful forces that take the system away from equilibrium. If the accelerator continues to work as in the upswing, the downward movement of the cycle cannot be stopped until it reaches an output say Q along the line KK, which is created by the effect of multiplier on autonomous investment. It should be noted that accelerators do not work well during the downswing because, if the decline in induced investment is severe, a point may be reached where the gross investment becomes zero and the accelerator ceases to exist. At this level, investment may be negative due to the depreciation. The total investment thus becomes the difference between autonomous investment and depreciation or line AA'. Here in the absence of a reverse accelerator, the multiplier effects of autonomous investment will lift the economy to a certain level which will be sufficient for the induced investment to take place.

- Hicks cycle theory connects investment shifts to economic fluctuations

2.2.4 Business Cycles Model of Kaldor

Nicholas Kaldor developed a trade cycle theory in 1940 based on the foundations of Keynes' saving - investment theory. He uses the non-linear saving and investment function in contrast to Keynes linear function to explain the trade cycle. Since Kaldor shows the cycle as the result of pressure that pushes the economy towards equality of saving and investment. It is important to understand linear saving and investment function.

i. Saving and Investment function

Figure 2.2.5 shows stable and unstable saving – investment function.

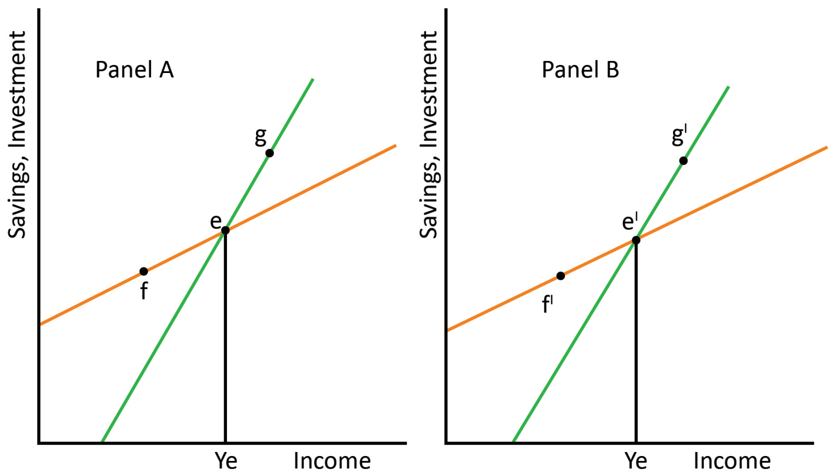

Fig 2.2.5 Stable and Unstable Saving and Investment Function

- An equilibrium is said to be stable when a deviation from the equilibrium will eventually bring the system back to equilibrium level

Figure 2.2.5 shows a two panel diagram which shows the stable and unstable saving and investment functions. The X axis shows output and the Y axis shows both saving and investment. In Panel A, the saving and investment function intersect at point e which represents stable equilibrium. An equilibrium is said to be stable when a deviation from the equilibrium will eventually bring the system back to equilibrium level. Now consider a point 'g' at which saving is higher than investment. When the investment falls in an economy the output will decrease, and employment will decrease thereby leading to a reduction in saving. Now consider another point 'f' at which investment is higher than saving. When investment increases, employment will increase and therefore output and income will increase, thereby leading to an increase in savings.

Now consider panel b which shows the intersection of the saving and investment function at point e^l which represents unstable equilibrium. When an economy is at unstable equilibrium, the variables will tend to diverge away from the equilibrium point. The point e^l is also considered to be full employment equilibrium because here saving is greater than investment which means, the entire income earned is saved. The investment at this point is at its lowest and the entire capital stock available in the economy is utilised. Now let us take a point 'g^1' which lies in the right to full employment equilibrium. This point is considered to be more than full employment equilibrium where Investment is greater than saving. When investment increases beyond the full employment level, it may lead to hyperinflation that makes the system unstable. On the other hand, if the economy is at point 'f^1' which lies left to full employment equilibrium where the saving is higher than Investment, the entire income earned by the workers is saved and Investment is at its lowest. If this continues, this will result in lower output and employment, and eventually, the national income becomes zero. According to Kaldor both stable and unstable conditions in a linear function are far from reality and represent an extreme condition. Therefore, Kaldor proposed a non-linear function to study the trade cycle.

- Stable and unstable conditions in a linear function are far from reality

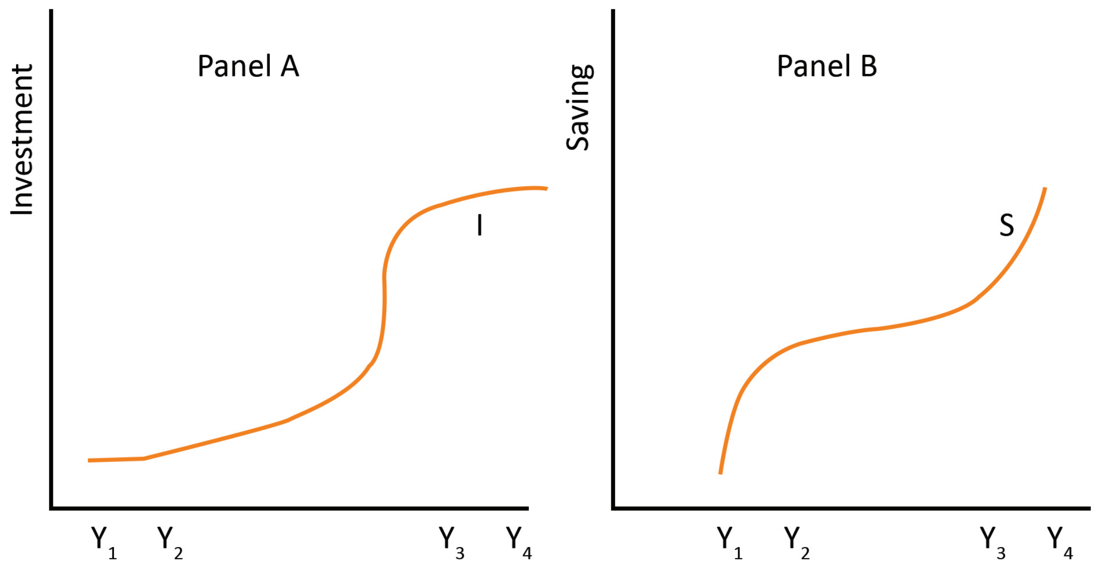

Fig 2.2.6 Non-linear Saving and Investment Functions

- At higher investment levels, costs of production will also be high which discourages further investment

In Panel A, at lower levels of Income, Y_1, Y_2, the Investment function is flat, which indicates that at lower levels of income, the Marginal Propensity to Invest (MPI) is negligibly small, almost equal to zero. This is because the economy already consists of excess capacity of capital which are to be utilised and at lower levels of income the rate of utilisation will be less therefore there will be no inducement to invest at this point. Beyond Y_2 income, investment increases as income increases. However, at income levels Y_3 and Y_4 the Investment curve is flat. This is because at higher investment levels, costs like interest on investment will increase, the cost of raw materials will be high and the Marginal efficiency of capital will be less which discourages investment.

- Saving will be less at both lower and higher levels of income

In panel B, the saving function is depicted. At relatively low income levels say Y_1 and Y_2 when the economy is undergoing a recessionary phase, people will tend to save more due to uncertainty in the future. Therefore at a lower level of income, Marginal Propensity to Save (MPS) is high as a result saving is high. Now if we notice higher income say Y_3 and Y_4, we observe that saving is high, this is because at higher income levels, people will have surplus income even after the consumption expenditure is met.

ii. The Model

The model is obtained by combining both the saving and investment functions together and this is shown in the figure.

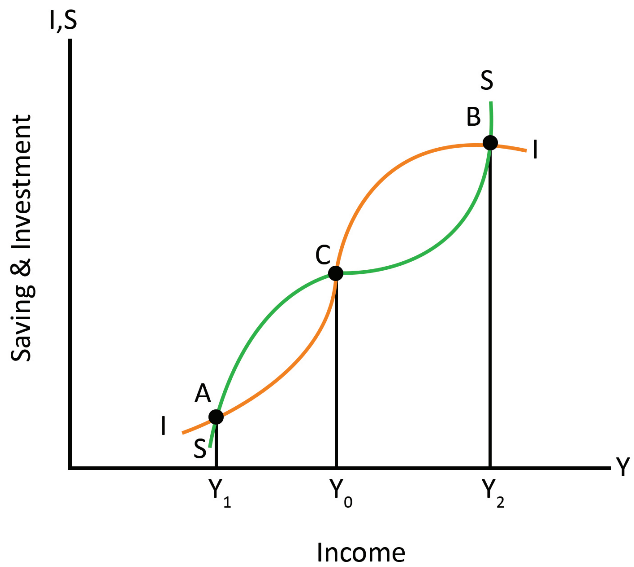

Fig 2.2.7 Saving and Investment Function

- Non- linear saving and investment functions show stable and unstable equilibrium

Figure 2.2.7 shows non-linear saving and investment function with income on X-axis and the saving - investment function on the Y-axis. The figure shows multiple equilibria at A, C and B where points A and B are stable points. An output below these levels will pressure the system to expand while an output above these points will cause the system to contract. Both these points are called 'switch points' as these are the points where the economy alters its direction. Point c is considered to be an unstable point in both directions. If it is closer to point A, the system is contracting while closer to B indicates expansion of the system.

Expansion Phase

The expansionary phase is explained with the help of the three-panelled figures 2.2.8 stage 1, stage 2 and stage 3.

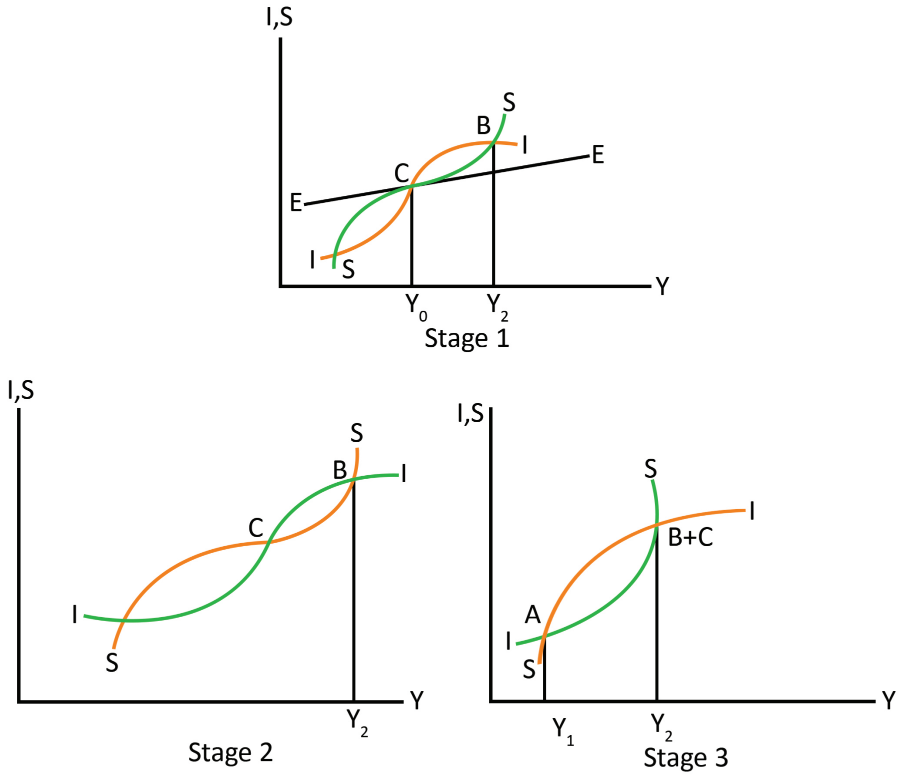

Fig 2.2.8 Expansion Phase in Kaldor's Trade Cycle

Consider stage I, starting from point Y_0, where the economy is at a long run equilibrium path EE. When I > S, there will be displacement of the economy from this position and the rate of growth in the economy exceeds along this path EE resulting in an expansionary phase in the economy. Although the economy is on an upswing, there are forces that limits the expansion.

This is because when the investment is leading to expansion of Capital stock, the MEC or expected return from capital will fall, leading to a reduction in Investment. This is a situation when dS/dY is overtaking dI/dK, means that the rate of increase in savings as income rises is outpacing the rate of increase in investment as capital stock increases. This is because people start saving a part of the wealth that is generated leading to an increase in the Average Propensity to Save (APS). This will shift the saving function to a higher level while the investment function is shifting to a lower level due to a lack of profitable investment opportunities. Therefore at the expansion, there is not only a decline in investment but also a postponement of investment. These events will narrow down the expansionary phase bringing C and B closer to each other as seen in stage II. Stage 3, shows the starting point of the contractionary phase where at some level of capital accumulation, despite a rise in the capital, the output may not rise enough and there is a contracting effect on Investment.

- A rise in APS and a reduction in Investment limit the expansion

Contractionary phase

The contractionary phase in Kaldor's cycle is explained in the stage 4 panel of Figure 2.2.9.

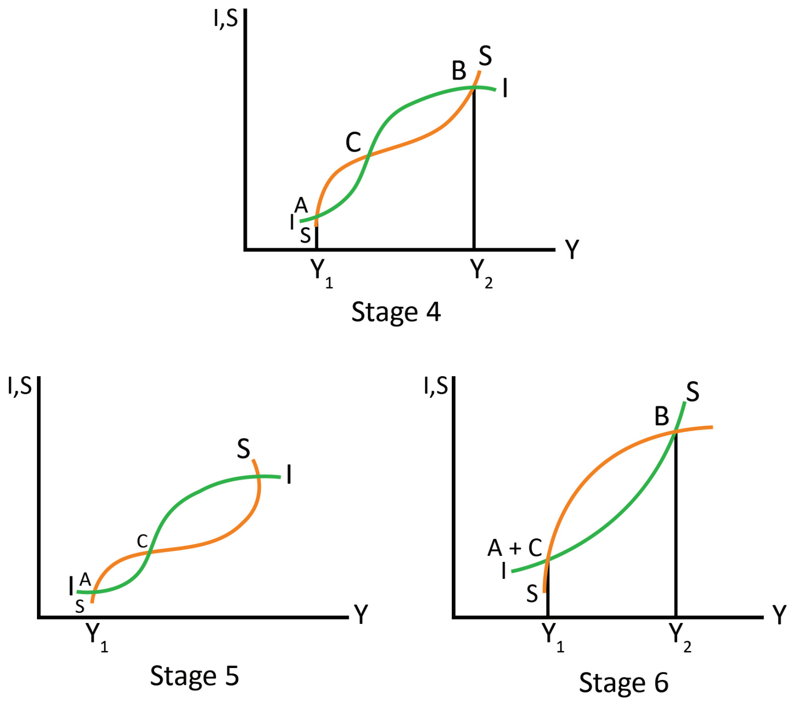

Fig 2.2.9 Contraction Phase in Kaldor's Trade Cycle

In this stage, the economy falls from Y2 to Y1. As the decline spreads, even the businessmen who have not experienced a decline start anticipating a decline and act accordingly. This will lead to a situation where a decline in the investment will become more than a decline in savings and now the system begin to decline rapidly over the middle range or normal range of contraction. The fall in Y will be lesser and a point will be reached at which Y will be sustained if there is no other reason, other than the amount for replacement expenditure. In addition to this other positive elements will also stop the decline in Y. In the later phase of contraction, A and C will come closer. The position of equality will be reached which is called underemployment equilibrium.

- In stage 6, A coincide with C triggers the expansion phase

Sometimes it so happens that the expansion may not be triggered at a lower equilibrium point which is mainly due to a zero investment situation. What is needed in such a situation is a shift of investment and saving or an increase in the rate of autonomous growth factor. This will shift the investment curve upward and the saving curve downwards. This is shown in stage 6 where A finally coincide with C which triggers the expansion phase.

Summarised Overview

Samuelson studied the cumulative and cyclical nature of the business cycle with the help of multiplier and accelerator. According to him, an initial increase in investment can have more than a proportionate increase in income. A change in investment leading to multiple times increases in a change in income is called an investment multiplier. Likewise a decrease in investment can have the opposite effect on the income of the economy resulting in a multiple times decrease in Income, which further leads to reverse action of multiplier leading to a downswing or depression. An increase in investment goods as a result of an increase in consumer goods is called an accelerator. According to Samuelson, an increase in autonomous investment leads to a magnified increase in the level of income through the multiplier effect. This increase in the demand for consumer goods necessitates the need for more capital goods. Therefore there will be Induced Investment in capital goods that will make the accelerator (a) or the capital output ratio operational. This joint effect of multiplier and accelerator is called super multiplier. Thus both multiplier and accelerator together will increase the aggregate income and output by a larger amount. Based on the values of the multiplier and accelerator, the business cycle forms cycles with various oscillations. When the income increases at a decreasing rate it reaches the new equilibrium rate and no oscillation or cyclical behaviour is observed. As the value of the accelerator increases, the value of the multiplier remains unchanged, the income fluctuates and it follows a series of damped cycles, whereas changes in both multiplier and accelerator lead to explosive cycles with greater and greater amplitude.

An increase in both multiplier and accelerator at an increasing rate causes the system to explode. The next, trade cycle theory by Hicks explains the business cycle theory in the background of long run equilibrium growth, where growth is determined by the autonomous investment and the magnitude of multiplier and accelerator. The combined effect of induced investment and autonomous investment leads to the expansionary phase. The decline in investment leads to the reverse working of the multiplier leading to a contractionary phase. Kaldor in his trade cycle theory uses non-linear saving and Investment functions in contrast to Keynes linear function to explain the trade cycle. Reduction in investment will cause output, employment and income to fall leading to a contractionary phase in the economy. When the investment is greater than replacement investment and saving, output and income will continue to increase.

Self Assessment

1. Explain Samuelson Trade Cycle model.
2. Dicuss the trade cycle theory proposed by Hicks.
3. How does Kaldor's trade cycle theory differ from Keynes?
4. Explain the stages of the crade cycle theory proposed by Kaldor.

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Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

UNIT 3
Real Business Cycle and Kalecki's Theory of Business Cycle

Learning Outcomes

After completing this unit, the learner will be able to:

- understand the Real Business Cycle theory
- explain the difference between Real Business Cycle theory and classical theory
- discuss the trade cycle theory formulated by Michael Kalecki

Background

In the earlier units, you learned about the concept of the business cycle and various trade cycle theories propounded by theorists such as Samuelson, Hicks, and Kaldor. In the present unit, the Trade Cycle theory formulated by Kalecki is studied. The first schools of thought in economics which you have learned in lower classes are classical and keynesian Schools. The classical school follows a policy of laissez faire or a non-interventionist policy. It believes that the economic variable self adjusts and will always be in equilibrium and the analysis was mainly focused on supply-side management of the economy. However the classical theories became ineffective during the period of the great depression of the 1930s, and keynesian theory became prominent. However, when a crisis hit in the late 1970s, it led to the fall of keynesian school and a resurgence of classical school. The followers of classical theorists formulated their own version of economics theory and the result was the emergence of the new classical school of thought, real business cycle theory and supply-side economics. In this present unit, the real business cycle theory is explained.

Keywords

Real Shock, Nominal Shock, Productivity Shock, Solow Residual, Inter- Temporal Substitution of Labour

Discussion

2.3.1 Real Business Cycle Theory

- As per Real Business Cycle theory shocks influence the Business Cycle

The debates between the classical and Keynesian systems began with the great depression when Keynesian emerged as a new discipline in economics by contradicting the theories and philosophies set by classical economics. However, the applicability of Keynesian economics was questioned when the world faced stagflation. This was the time when several economists who carried the essence of classical philosophies came forward with their independent school of thought that was rooted in the foundations of classical doctrines. These schools were real business cycle theory, the new classical school, and supply-side economists. In this unit, the real business cycle theory is explained. Major real business cycle theorists consist of Edward Prescott, Finn Kydland, Robert Barro, Charles Plosser, Lawrence H. Summer, Robert G. King etc. The real business cycle as explained is derived from the classical school of thought and therefore consists of the doctrines of classical theory. As we know classical school considers wages and prices to be flexible. It believed in the invisible hand of the economy and considered that there was no need for government intervention. The market forces are assumed to clear instantaneously and the system is always in equilibrium. Although the classical school of thought and its various branches of the school of thought start their journey together, the Real Business Cycle theory bifurcates and forms a model based on the existence of shocks that influence the business cycle. As per the Real Business Cycle theorists, shocks are the main cause of the business cycle. This is explained in the following section.

2.3.1.1 Cycles versus Random Walks

During the 1970s, the research on business cycles became relevant and the use of time series analysis to analyse the trends. A major problem with this analysis is that it is difficult to separate the trend from the cycle. The conventional approach by the neoclassical like Solow was to assume the economy along a path reflecting an underlying growth trend. It is also assumed that the long run trend component of GNP follows a smooth path where the short run fluctuations are determined by demand shocks. This was accepted by Keynesian, monetarist and new classical economists who also interpreted that the output deviations from the trend as temporary. The economists considered that the recession creates no long run adverse effects on GDP. Keynesian economists however believed this to have prolonged effects and therefore recommended stabilisation policy while the monetarists and new classicals rejected the need for stabilisation policy.

This was questioned by Nelson and Plosser in their paper published in 1982 where they argued that macroeconomics models that use monetary disturbances as a transitory or temporary fluctuation may be unsuccessful in explaining the output variation. It is also argued that the business cycle effects are not temporary if the real factors cause such fuctuations. Nelson and Ploser after studying the US data concluded that GNP followed a random walk. Based on this they have formulated a model which incorporates the random shocks in the short run.

$$Y_t = g_t + bY_{t-1} + z_t \qquad (1)$$

Where t represents time, g and b are constants, g_t represents the average growth rate of GNP which describes the deterministic trend, and z represents random shocks which have a zero mean. Suppose that there is some shock in the economy to z_t that cause output to change, if the shock is assumed to persist for one year, then Y_t depends on Y_{t-1}. According to the traditional approach, it will soon die out and return to the previous trend rate of growth, also called the trend-stationary state. The case of the trend stationary state is illustrated in figure 2.3.1, by assuming an expansionary monetary shock that takes place at time t_1. Nelson and Plosser also argued that most of the changes in GNP as permanent and no tendency to revert back and therefore follow a random walk.

Equation 2 shows a random walk with drift for GNP:

$$Y_t = g_t + Y_{t-1} + z_t \qquad (2)$$

In equation (2), gt reflects the 'drift' of output and, since output Y_t is dependent on Y_{t-1} , it shows permanent variation. The random walk with drift is shown in Figure 2.3.2.

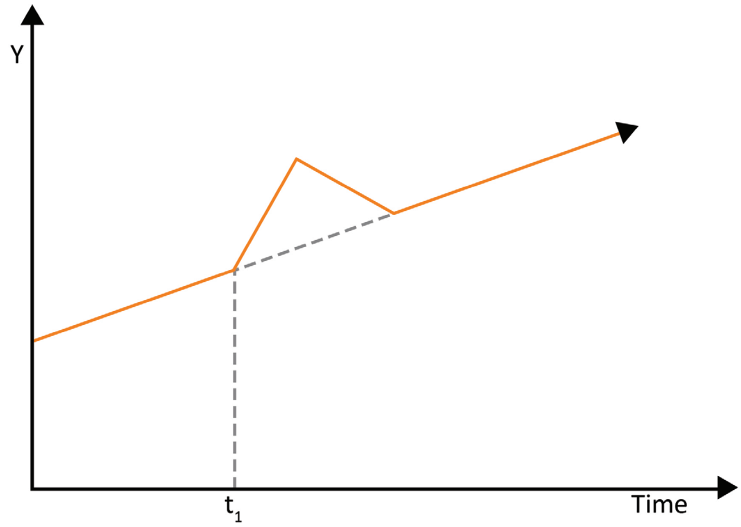

Fig 2.3.1 The Path of Output in the 'Trend-Reverting' Case

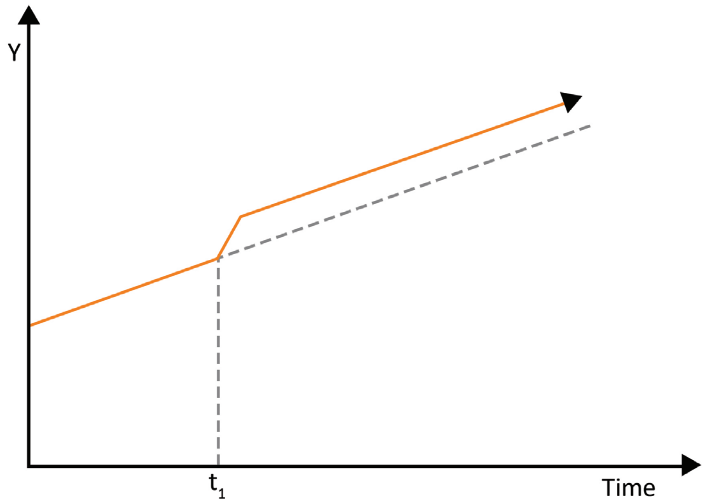

Fig 2.3.2 The Path of Output Showing the Permanent Influence

Suppose, a shock on z_t raises output at time t_1 in figure 2.3.2. Since the output in the time period is determined by the output in the previous time period t-1. The output in the future time period is determined by the output in time t. In the case of a random walk with drift, the output is said to have a 'unit root'; that is, the coefficient on the lagged output term in equation (2) is set equal to unity, b = 1. The identification of unit roots is assumed to be a manifestation of shocks to the production function.

2.3.1.2 Features of Real Business Cycle Theory

- Shocks on the demand side may be caused due to the instability in the components of IS schedule

The cyclical instability can be caused by the shocks in both aggregate demand and aggregate supply side or maybe a combination of both. The shocks on the demand side may be caused due to the instability in the components of IS schedule or maybe on the monetary side as explained by the LM curve. The supply side shocks may be described as those shocks that result in changes in productivity.

i. The occurrence of natural disasters such as floods, cyclones etc adversely affect agricultural productivity and output.

ii. Changes in the price of raw materials such as changes in energy prices such as the hike in oil price during the 1970s.

iii. Social and political causes such as war, political unrest, labour unrest etc. which are experienced by former Yugoslavia, the Soviet Union, Iraq etc.

iv. The government regulations such as import duties which damage domestic production.

v. The productivity shocks are characterised by the introduction of a new technique of production, development of a new product, change in management practices etc.

- The impulse mechanism is the initial shock, whereas the propagation mechanism is those forces which carry the elements of shock forward

It is these technological shocks that act as the driving force of the supply side in advanced countries. It was the studies and research initiated by Kydland and Prescott that took up the challenge posed by Lucas to build an artificial imitation economy that was capable of emanating the main features of the actual economy. It distinguishes between impulse mechanisms and propagating mechanisms. The impulse mechanism is the initial shock in the economy that causes a deviation from its steady state, whereas the propagation mechanism is those forces which carry the elements of shock forward and maintain the deviation from the steady state.

2.3.1.3 Technology Shocks

Consider a situation in which an improvement in knowledge of workers in Artificial Intelligence (AI), will increase the

- The real shocks are those which affect the real side of the economy

productivity of workers. The general income of the people will increase due to an increase in productivity. When the income increases, consumption also increases considerably and a part of the income is also saved. This situation is a real disturbance or real shock. The real shocks are those which affect the real side of the economy.

Although the real business cycle theory explains the real demand shocks, these models are driven by productivity shocks which are exogenous. Productivity shocks include the introduction of a new product, introduction of a new production methodology, source of new raw material, a new market for the product, change in the quality of labour and capital, favourable or unfavourable change in weather conditions, change in government regulations etc. According to the real business cycle theorist, boom or prosperity are the result of beneficial productivity shocks and depressions are the result of adverse productivity shocks. Consider the introduction of a new product, a new smart car at an affordable rate or the introduction of a new household robot which does the domestic work. The introduction of a new product or the innovation of an existing product will lead to an increase in demand for that product. For instance, the demand for smart cars at an affordable rate will increase the demand for the car, as a result, the automobile company will undertake mass production of the affordable smart car to meet the increasing demand. This will result in mass employment generation leading to an increase in aggregate demand. The expansion of various sectors in the economy leads to prosperity or a boom in the economy.

- Boom or prosperity are the result of beneficial productivity shock

Similarly, an adverse productivity shock will also affect the economy significantly. For example, let us consider a hypothetical case where the electric vehicles which are the flag bearers of green energy are encouraged and promoted generously by the government. The banking sector on the other hand is also encouraging its usage by giving low cost loans for electric vehicles. The result of these policies is an increase in demand for electric vehicles and a decline in demand for petrol, diesel, and oil. This will affect the oil and petroleum industry which will be causing an excess of supply over demand. This will lead to a fall in the price of oil and related industries resulting in a wage cut for employees residing in these industries. The wage cut will reduce the productivity of labour and the demand for labour fall. This will reduce

- Recessions are the result of adverse productivity shocks which reduce labour productivity consumption spending thereby reducing aggregate demand leading the economy to recession and eventually depression. Therefore according to real business cycle theorists, recessions are the results of adverse productivity shocks which reduce labour productivity.

It is observed that the growth of output per worker over a long period depends upon these productivity shocks which are smooth over time. However the real business cycle rejects this view and considers the erratic nature of technological change which causes major changes in output. This can be explained with the help of the figure 2.3.3.

Consider figure 2.3.3 a and 2.3.3 b, the X axis represents the number of labour employed and the Y axis in 2.3.3 a and 2.3.3 b

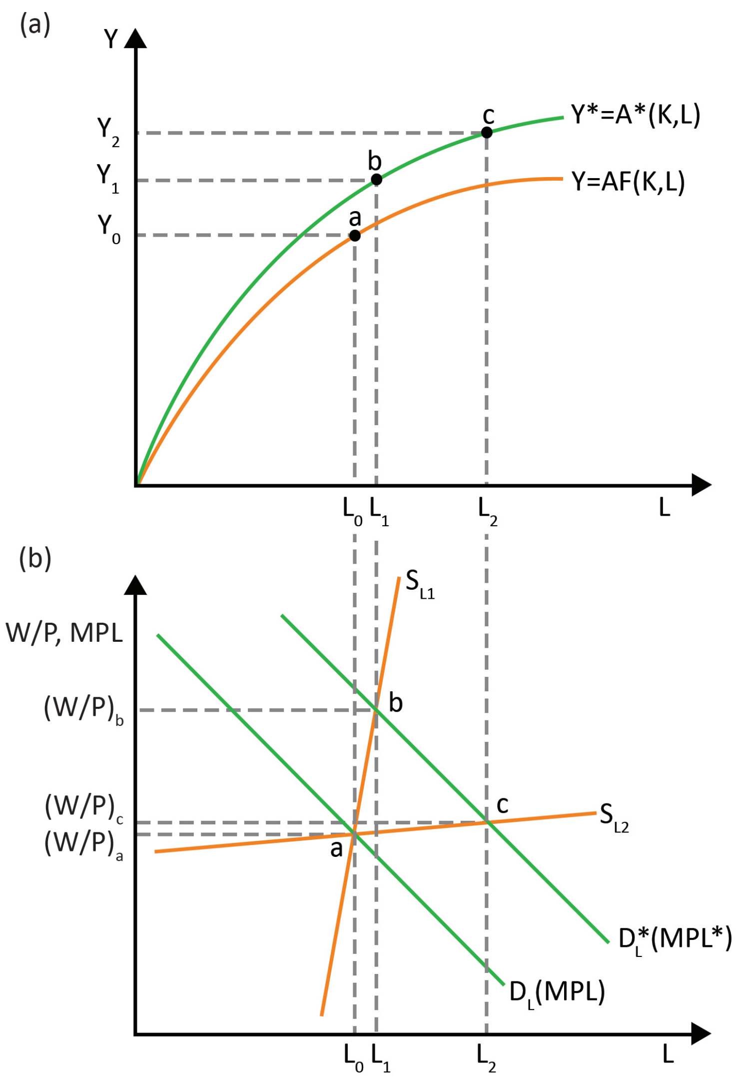

Fig 2.3.3 (a)Output and (b)Employment Fluctuations due to Technology Shock

represents output and real wage rate respectively. A beneficial technological shock shifts the production function from Y to Y*. The impact of the beneficial shock on real wage and the marginal product of labour and labour demand is shown in 2.3.3b. When there is a productivity shock the employment and output in the economy are shown by the rightward shift of the labour demand curve to D_L*(MPL*).

The range of expansion of employment depends upon the elasticity of labour supply concerning the real wage. The most suitable criterion regarding the elasticity of real wage is that the supply curve is highly elastic to the real wage, as indicated in panel (b) by S_{L2}. When there is a technology shock that causes output to expand from Y_0 to Y_2, the real wage increases from (W/P)a to (W/P)c, and employment increases from L_0 to L_2. If the supply of labour is relatively elastic, as represented by S_{L1}, a large variation in the real wage is observed to the tune of (W/P)b and a small variation in employment from L_0 to $L_{1.}$. However in order to find substantial variations in employment, there must be significant intertemporal substitution of leisure. As there is complete flexibility in wages and prices, the labour market is always in equilibrium.

2.3.1.4 A Real Business Cycle - Aggregate Demand and Supply Model

The section 2.3.1.3 which studies the impact of technological shock is incomplete due to the neglect of supply shock on rate of interest. The current section explains 'real aggregate demand and supply' which illustrates the impact of technology. In the real business cycle theory, the rational expectations is assumed, it also guarantees perfect price flexibility and perfect information.

- A technological improvement, will result in an increase in the output

The aggregate supply curve is determined by the willingness of workers to supply labour and production function. When there is a technological improvement, it will result in an increase in the output shown by an upward shift in the production function. This will cause the aggregate supply curve to shift to the right. It should be noted here that the aggregate supply curve is upward sloping and has a positive relationship with respect to interest rate. When interest rate increase, the labourers will supply their labour in the current period because their current relative wage is higher than the expected relative wage in future. The impact of real interest rate on labour supply is presented in the figure 2.3.4.

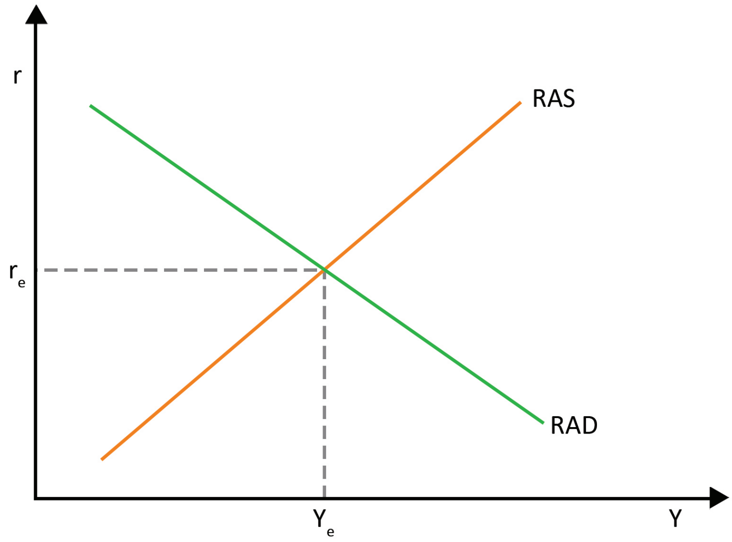

Fig 2.3.4 Real Business Cycle Aggregate Demand and Supply Model

In the figure 2.3.4 the real aggregate supply curve is upward sloping because when the rate of interest increase, the current wage increases, thereby increasing the supply of labour hence output. Whenever there is a favourable technological progress, this will increase the marginal productivity of

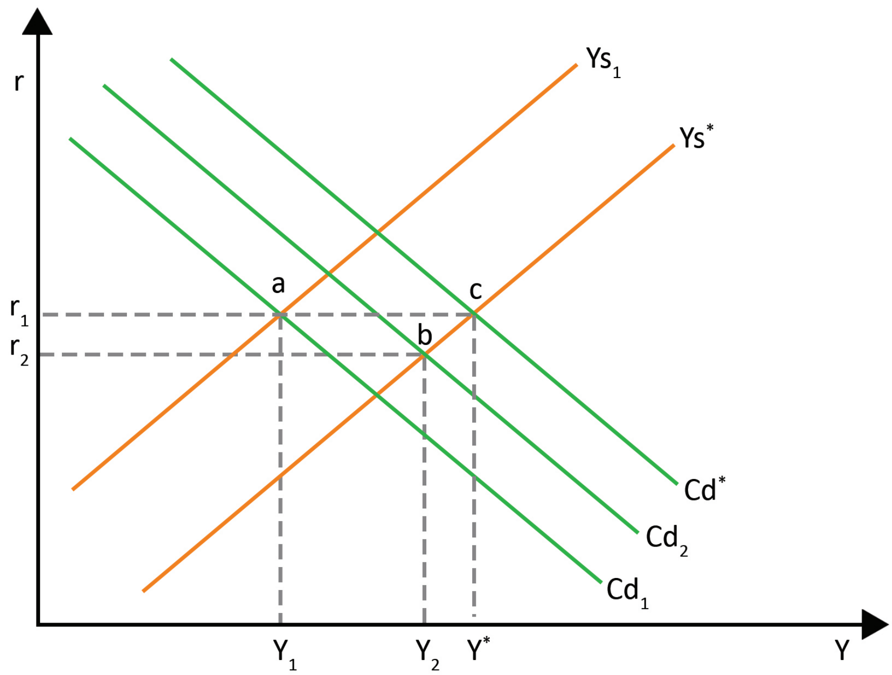

Fig 2.3.5 Impact of Technological Shocks in RBC Model

labourers. As the marginal productivity increases, the demand for labour increases. However, a fall in interest rate will result in the reduction of labour supply as the labourers will find the current relative wage to be cheaper than expected future wage. They make an inter-temporal choice by choosing leisure in the current period when relative interest is low and working in the future when interest rate is high. The impact of technological shock on the output is explained in the given figure 2.3.5.

- If the effect of technological shock is temporary, the change in demand will be less than change in supply

The figure 2.3.5, shows the Impact of technological shocks in Real Business Cycle model in which X axis represents output and Y axis represents rate of interest. Cd_1, Cd_2 and Cd^* are demand curves, while Ys_1 and Y_S* are supply curves. Consider the point a, where a beneficial technological shock take place. This beneficial technological shock will shift the supply of output from Y_{S1} to Y_S*. Now if the effect of technological shock is temporary, the change in demand will be less than change in supply. Therefore, in the figure, the demand curve shifts to right from Cd_1 to Cd_2 i.e., from a to b. At this new equilibrium point output rises from Y_1 to Y_2, but real interest falls from r_1 to r_2. If the technological shock is permanent, then the wealth effect on consumption will be more powerful and the shift in demand and supply will be on a similar magnitude, i.e., from Cd_1 to Cd* and Y_{S1} to Y_S* respectively and the economy moves from a to c.

Real Business Cycle and Neutrality of Money

- Although there were disagreements, monetary effects were found to have considerable effects on the business cycles

Money neutrality is an important concept of real business cycle theorists and the neutrality appeared in both the short run as well as long run. However, in the late 1970s prominent economists like Tobin, Friedman and Lucas recognised that the rate of growth of the money supply has real effects on the output fluctuations and the economy. Even though there were disagreements, monetary effects were found to have considerable effects on the business cycles. The real business cycle theorists considered that money expands during expansions and declines. Therefore money is considered to be endogenous.

The initial models of real business cycle theories were constructed without monetary variables. The Economists Kydland and Prescott after building their model concluded that the addition of a monetary variable is not necessary. King and Plosser explained the association between money and output and considered money as an endogenous variable.

2.3.1.5 Measuring Technology Shocks: The Solow Residual

An attempt to measure the productivity shocks was undertaken by the economist Robert Solow, who proposed a growth model based on capital formation. Robert Solow used technological progress to explain his production function. The technological parameter represented by 'A' can be both labour augmenting technological progress or capital augmenting technological progress. Consider a printing press which used typewriters to type its matter. The labourers who are experienced may complete their work fast whereas inexperienced labourers may take a longer period to complete the job. Since the mistakes that occur in typewriters are not rewritable, there will be a waste of time and resources. But when computers were extensively used, the number of mistakes, time and wastage of resources was minimised. This is an example of technical progress. If the employees gain knowledge to operate computers, it is a labour augmenting technical progress. This productivity shock will have a considerable impact on the production function of a firm. Therefore, in order to understand the intensity of productivity shock and to measure it, an empirical formula has been developed by Solow which is known as Solow Residual.

$$\textbf{Solow Residual} = \frac{Y}{K^{\alpha} N^{1-\alpha}} = A$$

- Solow Residual is that part of the output which cannot be explained by capital or labour

Where α is the elasticity of output for capital and 1-α is the elasticity of output with respect to labour. The weighted sum of these inputs equals unity indicating constant returns to scale of production. This means that an equal proportion of both inputs (labour and capital) will result in an equal proportion of output. It is observed that there is no direct way of measuring A as the data is not available, however, since the data on output and the inputs such as capital and labour are available, it can be obtained as a residual. The estimates of α and hence 1 – α can be acquired from historical data. Prescott has suggested the Solow residual to measure the technological shocks. Solow residual is the difference between the change in aggregate output and the weighted contributions of labour and capital. It is that part of the output which cannot be explained by capital or labour.

2.3.1.6 Criticisms

The real business cycle theory has been criticised on various grounds

1. According to critics, there is no evidence of any technological shock that will affect the business cycle in the economy. The real business cycle theory originated from classical theory, analyses only the supply side of the economy and ignores the demand side.

2. The concept of intertemporal substitution of labour, which means that when current wages and interest rates are high, the workers will choose to work more in the current period and choose leisure in the future is unrealistic. This is because, in reality, changes in real wages are negligibly small and therefore people do not respond to this change by reallocating current work and leisure.

3. In addition to this, it is argued that the real business cycle theory ignores the effect of change during cyclical changes. It does not give due importance to the external sector of the economy and therefore it is considered an incomplete theory.

4. The view of real business cycle theorists on the role of money has been criticised. The real business cycle theorists argue that money is neutral and has no role to play. However the changes in money supply can have a significant impact on the cyclical fluctuations in the economy.

5. The real business cycle theory also considers that the government has a limited role to play and that the stabilisation policy is ineffective. However, it should be noted that in the modern world, government and its interventionist policies like fiscal policy, labour policy, income policy etc play a significant role in stabilising the economy.

2.3.2 Kalecki's Theory of Cycles

In the year 1933, Kalecki explained his business cycle in terms of endogenous changes without any intervention from the external variables. It is more of an internal theory which focuses on the internal strengths and processes that emanate from within the economy.

i. Assumption

a. Perfect Competition is assumed

b. Balanced trade

c. The government follows a balanced budget

d. It is assumed that the workers consume all of their income

e. Capitalists save all of their profits

f. The investment decision undertaken by the capitalist depends upon anticipated aggregated profitability in the future period. The anticipated aggregate profitability or the rate of profitability expected from the new plants is calculated as the ratio of total gross profitability and the existing capital stock.

g. The investment Process as explained by Kalecki takes place in three different stages viz; the decision to invest, the production of capital goods and the actual investment of capital goods

i. Investment

- Trade cycle as a continuous process that arises as a result of the dual role of investment

Kalecki considers the trade cycle as a continuous process that arises as a result of the dual role of investment. For example, let us imagine a few firms which have made a considerable amount of profit or the capitalist's income and they start investing in its capital stock. This represents a prosperity or expansionary phase in the economy because with investment more capital is installed, more output and employment will be generated and there will be an increase in overall economic activity. Here, the investment can lead to two effects, One is that more machines are added to the existing capital stock, and secondly, it will increase the productive capacity that stimulates business. Let us assume that a firm can install a maximum of 20 machines. When the firm goes on adding machines every year the stock of machines installed will increase, and the demand for the machine in the subsequent years will diminish, once it reaches its full capacity of having installed 20 machines. Now as time goes by, the old machines will start experiencing depreciation and the firms will have to pay for the wear and tear and replacement of the machine which will reduce its profit. When profit reduces, firms do not have the income to initiate investment as a result the output will reduce. The demand for labour will reduced and the employment and income in the economy reduce leading to the contraction of economic activity. As explained in the example, An increase in investment is considered as the increase in a capitalist's income which is an indication of economic prosperity or boom. With every increase in investment, a new capital stock gets added to the existing stock and eventually, the demand for capital in the subsequent period decreases. This will lead to an increase in the existing capital stock, but since the capital stock experiences wear and tear of machines, it leads to depreciation which causes a significant reduction in profit rate. At this stage, investment falls significantly by landing the economy on the verge of a depression or low level of economic activity. This implies that addition to capital stock can have an adverse effect on demand for investment goods and profitability. The process of reducing investment and reduction continues for a certain time period and the economy hovers around the phase of depression for a certain time. However once the Capital stock has fallen significantly below the rate of depression, the decline in profitability will also come to a halt. This phase is an important turning point where the economy can initiate the recovery process by renewing investment spending.

- The trade cycle is a continuous process that arises as a result of the dual role of investment.

ii. Technical Progress

Kalecki also has given due importance to innovation, as he rightly points out that with innovations, investments have transformed into a more dynamic process than being limited as a mere addition to existing capital stock. For example, an Indian restaurant based in Kerala finds a new market in the European country can be considered as an innovation. The Indian restaurant can open its outlet in foreign markets and introduce its ethnic food to a new set of consumers. This can help the firm to widen its territory and make desirable changes to fit in the new market. This will enable them to prospect and lead to further expansion. This will increase the output and employment in its firms and also contribute to the growth of other industries that supply input to the Indian restaurants. The industries that supply fruits and vegetables, spices and tastemakers, and packaging industries will also face a huge hike in demand, output and employment, thereby leading to overall development. As explained in this example, the innovation may be in the form of the identification of a new market, the introduction of a new product, the improvement in the technique of production, or the discovery of a new source of raw material, which adds dynamism to the system. Kalecki considers innovation to be one of the major factors that contributes to economic development which does not allow the system to be restricted by static growth. The innovation will enable the system to pursue a long term growth that maintains the economy in the upswing or prosperity for a longer time period.

- The innovation leads to an upswing or prosperity

iii. Interest rate

Kalecki considers interest rate as a monetary phenomenon and not just a mechanism to bring about equality between saving and investment. It is a relatively less significant factor that influences profitability. Interest rate is only a secondary factor that affects investment decisions, the prime factor being the profitability of existing plants. Kalecki while explaining the Business Cycle make a distinction between short term and long term interest rates. The short term interest rates depend upon the transaction demand which treats money as a medium of exchange, the volume of transactions and the money supply from banks. The value of transaction indicates the amount payable for an import when sold for an export in a Union. While the velocity of money indicates, the number of times a currency changes hands, a higher velocity of money indicates, a highly active economy and vice versa.

- The short term interest rates depend upon the transaction demand

Bank money supply does not change in proportion to the change in the value of transactions and velocity of circulation, it changes less than proportionately to the change in value of transactions meaning, only a large change in the value of a transaction can bring about a small change in Bank money supply. Hence, the short term interest rate during the recovery phase increases and will decrease during depression. During the expansionary phase when there is growing demand for credit, banks may react to this by increasing the interest rate thereby putting an end to the upswing.

- During the expansionary phase, when demand for credit is high, banks will increase the interest rate thereby putting an end to the upswing

Regarding the long term interest rate, Kalecky uses the illustration of a security owner who compares the performances of short term and long term interest rates. The person who holds security will compare the short term and long term interest rates and find that short term interest rates have a negligibly smaller impact. Besides this, the devaluation of long term assets is also taken into consideration and identifies the superiority of long term interest rates over short term interest rates. The fluctuations in short term interest have a lesser impact and its effect on long term interest rates is negligibly small. The long term interest rate has a relatively higher effect on the economy and also acts as the most decisive factor based on which investment decisions are made. However, Kalecki considered a change in interest rate as one of many factors that influence Trade Cycles and not the prime factor. The effect of interest rates on consumption is also considered to be negligibly small leading to a relatively lesser effect on aggregate demand. It is clear from this evaluation that Kalecki viewed the effectiveness of monetary policy in a sceptical manner.

- The fluctuations in short term interest have a lesser impact

Summarised Overview

As per real business cycle theory, shocks influence the business cycle. They explain real shock, nominal shocks and productivity. Although the real business cycle theory explains real shocks and nominal shocks, it gives more importance to the effect of productivity shocks on the economy. Productivity shocks include the introduction of a new product, introduction of a new production methodology, source of new raw material, new market for the product, change in quality of labour and capital, favourable or unfavourable change in weather conditions, change in government regulations etc. Booms or prosperity are the results of beneficial productivity shock and depressions are the result of adverse productivity shock. An attempt to measure the productivity shocks was undertaken by Solow who used a technological parameter represented by 'A' which is known as Solow Residual. It is that part of the output which cannot be explained by capital or labour. The real business cycle theorists also explain the intertemporal substitution of labour. Real business cycle theory considers the fiscal policy to be less effective. Regarding money, they consider money as neutral and have no role to play. The real business cycle theory is criticised to be an incomplete theory because the assumptions of intertemporal substitution of labour, and the existence of productivity shock are unrealistic. It is also criticised that they study only the supply side of the economy. Kalecki's business cycle is endogenous without any intervention from the external variables. It is more of an internal theory which focuses on the internal strengths and processes that emanate from within the economy. According to him, the trade cycle is a continuous process that arises as a result of the dual role of investment. He gives importance to innovation and he argues that innovation leads to upswing or prosperity. Interest rate is only a secondary factor that affects investment decisions, the prime factor being the profitability of existing plants. During the expansionary phase when demand for credit is high, banks will increase the interest rate thereby putting an end to the upswing.

Self Assessments

1. Explain Real business cycle theory.
2. Give examples of productivity shocks.
3. Explain the trade cycle theory of Kalecki.

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Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

MASTER OF ARTS ECONOMICS

Frontier Theories and Concepts

Block 3

UNIT 1
Legacy of Keynesian Economics

Learning Outcomes

Upon completion of the unit, the learner will be able to:

- explore the evolution of Keynesian thought
- understand and apply Keynesian concepts
- evaluate the effectiveness of Keynesian policies

Background

The Great Depression of the 1930s stands as one of the most profound economic crises in modern history, characterised by widespread unemployment, declining output, and financial turmoil. In the aftermath of the stock market crash of 1929, economies around the world plunged into a deep and prolonged downturn, exposing the limitations of prevailing economic theories in understanding, and addressing the crisis. Classical economic thought, rooted in the belief in the self-regulating nature of markets and the efficacy of laissez-faire policies, proved inadequate in providing effective solutions to the unprecedented challenges of the Great Depression. Keynes argued that during periods of depression or recession, traditional market mechanisms might fail to restore full employment due to insufficient aggregate demand. He advocated for government intervention, particularly through fiscal policy, to stimulate demand and restore economic activity. The failure of classical economics to adequately explain and find a solution to the economic collapse paved the way for the emergence of new economic theories and policy approaches. The revolutionary ideas put forth by John Maynard Keynes in his seminal work, *The General Theory of Employment, Interest, and Money* laid the foundation of Keynesian Economics. Let us discuss into the legacy of Keynesian Economics in this unit.

Keywords

Great Depression, Aggregate demand, Government intervention, Liquidity trap, Inflation, Consumption, Investment

Discussion

3.1.1 Economic Ideas Before Keynes

- Classical economics promotes free markets

Classical economics, led by thinkers like Adam Smith and David Ricardo, believed strongly in letting markets operate freely with minimal government involvement. They thought that when people and businesses were left to make their own choices in competitive markets, the economy would naturally prosper and resources would be used efficiently. This concept, often referred to as the "invisible hand," suggested that market forces, driven by supply and demand dynamics, would guide economic activity without the need for a centralised direction. They supported the principle of laissez-faire, which emphasised that governments should avoid getting too involved in economic matters to prevent disruptions to this process. While Classical economics taught us a lot about how markets function, it struggled to explain problems like unemployment and economic downturns. This led to the development of new ideas, like Keynesian economics, which offered different ways to understand and address these issues.

3.1.2 Keynesian Evolution

- Keynesian economics : Demand - driven recovery

Keynesian economics emerged as a response to the Great Depression, which was a period of severe economic downturn that lasted throughout the 1930s. Before the Great Depression, Classical economics dominated economic thought. Classical economists believed in the efficiency of free markets and argued that economies would naturally tend towards full employment and equilibrium. However, the Great Depression challenged these ideas. Unemployment soared, production dropped, and financial markets collapsed. Classical economists struggled to explain these phenomena and provide effective policy solutions. It was in this context that John Maynard Keynes, a British economist, proposed his revolutionary theories. Keynes argued that in times of economic downturns, free markets could fail to achieve full employment due to a lack of aggregate demand. The core idea of Keynes's theory, often associated with his name, is that the aggregate demand which is the sum of consumption, Investment, and government expenditure—is the primary force that influences economic activity. He emphasised the role of government intervention to stimulate demand and restore economic activity. His ideas were outlined in his important work, *The General Theory of Employment, Interest, and Money*, published in 1936. Keynes advocated for increased government spending, tax cuts, and monetary policy measures to stimulate demand and boost economic activity. He believed that by injecting money into the economy, governments could create jobs, increase consumption, and lead to economic growth.

- Keynesians believed in government interventions

The Keynesian revolution had a profound impact on economic policy around the world. During the Great Depression, many governments adopted Keynesian policies, such as public works programs and deficit spending, to combat unemployment and stimulate economic recovery. Keynesian economics became the dominant model in the mid-20th century, particularly after World War II, as governments sought to manage their economies through fiscal and monetary policy. In the late 20th century, Keynesian economics faced challenges and criticism. The stagflation of the 1970s, which saw high inflation and high unemployment simultaneously, led to a reassessment of Keynesian policies. This led to the rise of monetarism and supply-side economics, which emphasised the role of monetary policy and advocated for tax cuts and deregulation to stimulate economic growth. Keynesian economics experienced a decline in influence during this period, although elements of Keynesian thought continued to influence economic policy. In the wake of the 2008 financial crisis, there was a renewed interest in Keynesian economics as governments once again turned to fiscal stimulus measures to combat recession.

3.1.3 Keynesian Legacy

- Keynes challenged market stability assumptions

The legacy of Keynesian economics is deep, stemming from the revolutionary ideas of British economist John Maynard Keynes in the early 20th century. Keynes challenged the prevailing economic orthodoxy of his time. He argued that free markets could fail to achieve full employment and economic stability on their own. His important work, *The General Theory of Employment, Interest, and Money*, published in

1936, provided a new framework for understanding economic fluctuations and advocating for government intervention to stabilise economies.

- Keynes prioritised demand over supply

Keynes introduced his important work, The General Theory, with a direct attack on Say's Law, which states that "supply creates its own demand." According to this idea, as long as goods and services are produced, there will always be enough demand to buy them. Therefore, under this notion, unemployment was deemed impossible, as the supply of workers or goods would naturally lead to corresponding demand. Keynes disagreed and argued that aggregate demand, or the total amount of spending in the economy, determines the level of output and employment. When demand for goods and services is strong, businesses prosper. They expand their operations, hire more workers, and the economy grows. This results in lower unemployment rates and overall prosperity. On the other hand, when demand is weak, businesses struggle to sell their products. As a result, they cut back on production and hiring, leading to higher unemployment rates and economic downturns. Keynes believed that ensuring adequate demand in the economy was crucial for maintaining full employment and economic stability.

- Keynes explored factors influencing spending

Following his initial critique, Keynes shifted his focus to examining aggregate demand and its underlying causes. In separating the primary components of demand, he laid the groundwork for contemporary understandings of consumer expenditure and business investment. Keynes identified two broad determinants of consumer spending: subjective and objective factors. Among the subjective considerations were psychological elements such as uncertainty about the future, unforeseen contingencies, and the desire to enjoy freedom and power. Factors like anxiety regarding future financial stability, a strong desire to leave inheritances, or a desire for financial independence tended to result in increased savings and reduced spending. Conversely, feelings of economic security, absence of heirs, or a lack of concern for financial autonomy typically led to decreased saving and increased spending.

- Consumption influenced by economic factors

The objective factors influencing consumption included economic factors such as interest rates, taxes, income distribution, expected future income, and most importantly, current income. When interest rates increased, consumers tended to hesitate in borrowing money for purchases like homes and cars, leading to reduced spending on credit. Lower interest rates encouraged consumers to take on debt and spend more freely. Similarly, when wealth, current income, or expected future income rose, people tended to spend more and save less. When wealth decreased, current income was lower, or future income expectations were down, people tended to spend less and save more. Thus, there are many factors influencing consumption.

- Investment depends on investment vs interest

Unlike consumption, which is influenced by numerous factors, business investment, according to Keynes, depends on just two key factors: the expected rate of return on investment represented by MEC and the prevailing interest rate. The former refers to the expected profitability of investing in additional units of capital (such as machinery, equipment, or factories); while the latter represents the cost of obtaining funds for these investments. According to Keynesian theory, businesses will invest in new capital (such as machinery, equipment, or factories) when the expected rate of return on investment, represented by the MEC, exceeds the prevailing interest rate. This is because businesses will typically invest in projects that promise returns higher than the cost of borrowing funds to finance those investments. If the MEC falls below the interest rate, businesses may be less inclined to invest, as the expected return on investment is lower than the cost of borrowing.

- Expectations and interest rates impact investments

Changes in expectations and fluctuations in interest rates play significant roles in influencing business investment decisions. Optimistic outlooks about the economy, where business owners anticipate strong consumer demand and favourable prices for goods, lead to high expectations of returns on investments in new plants and equipment. During periods of pessimism, where businesses anticipate sluggish consumer spending and low demand, expectations of returns on new investments diminish, resulting in fewer new investments being made.

- Interest rate depends on money supply

Keynes subsequently explained the factors determining interest rate. The interest rate depends on the dynamics of money markets where people and businesses demand money and central banks control the amount of money circulating in the economy. The demand for money comes from portfolio decisions made by individuals and businesses. When people and businesses decide how to manage their money, they can either keep it as cash or invest it in things like stocks or bonds.

This decision-making process influences how much money is in circulation. Central banks, like the Federal Reserve, regulate the amount of money available. So, the interaction between people's preferences for holding money and the actions of central banks ultimately determines interest rates. The rate at which interest will be paid depends on the strength of the preference for liquidity in relation to the total quantity of money available to satisfy the desire for liquidity. Thus, it can be generally argued that the Keynesian theory of rate of interest is the result of the interaction between demand and supply of money.

- Keynes: Monetary and fiscal solutions

After criticising classical economic theory and examining the factors influencing total demand, Keynes surprisingly offered limited solutions for addressing unemployment and economic depressions, despite his focus on economic policy. Keynes supported two primary strategies: monetary policy, involving the creation of money, and fiscal policy, involving government spending and tax cuts. He emphasised the importance of investing in public works, although he acknowledged potential objections to what some might consider wasteful government spending. As an alternative, Keynes proposed a more unconventional approach involving money creation. He illustrated this idea by suggesting that if the treasury were to bury banknotes in old bottles deep in disused coal mines, private enterprises would be motivated to unearth them, effectively reducing unemployment.

- Government stabilises investment through intervention

Keynes's proposed government intervention in stabilising investment levels rather than controlling business decisions. Keynes observed that while consumer spending remained relatively stable, business investment was highly influenced by unpredictable factors. Changes in business confidence or expectations about the future economic outlook could significantly alter investment levels, exerting a substantial impact on the economy. He suggested that government spending policies could help stabilise investment levels, preventing drastic economic fluctuations and reducing unemployment during downturns. During periods of low private investment, the government should borrow money, run a budget deficit, and invest in public projects like infrastructure development and education. This would stimulate economic growth and boost confidence. During periods of high business investment driven by optimism, the government should reduce borrowing and scale back public investments.

During the 1940s i.e. the Second World War period, Keynes worked for the British government, focusing on war-related policies. Keynes strongly argued for profit inflation as an important measure to raise resources, especially for the war effort. These savings would be accessible after the war, stimulating post-war economic activity. After World War II, Keynes focused on shaping new international monetary systems. He believed that a significant factor contributing to the global Depression of the 1930s was countries attempting to shift unemployment to their trading partners. Governments aimed to achieve trade surpluses by devaluing their currencies, making foreign goods more expensive and domestic goods cheaper. However, this led to a cycle of currency devaluations among nations, ultimately failing to benefit any country.

- Keynes advocated profit inflation, stable currencies

To counteract the issue of competitive currency devaluations, Keynes proposed a fixed exchange rate system, which was adopted by the Allied powers at the Bretton Woods conference in 1944. The Bretton Woods system remained in place for approximately twenty-five years, during which time the global economy experienced remarkable growth, and unemployment rates in developed nations reached historic lows for the twentieth century. Despite initial success, the Bretton Woods system faced challenges. Concerns over the depletion of gold reserves led to its demise in 1971 when President Nixon abandoned the fixed exchange rates. Keynes proposed international mechanisms to address trade imbalances, including lending to deficit countries and penalising surplus ones, but the US, expecting surpluses, opposed such measures. Unfortunately, during negotiations for a compromise, Keynes passed away at his home in Cambridge.

- Keynes: Fixed rates, trade balances measures

Keynesian economics left a permanent mark on economic policymaking, particularly during times of economic crisis. Its emphasis on fiscal policy, including government spending and taxation, as well as the role of monetary policy in managing aggregate demand, reshaped the way governments approached economic management. The Keynesian legacy continues to influence debates surrounding economic policy, serving as a foundational framework for understanding the role of government in promoting macroeconomic stability and addressing unemployment and inflation.

- Keynesian economics shaped crisis policymaking

Let us now discuss the key Keynesian thoughts:

3.1.3.1 Consumption function

The relation between income and consumption or consumption expenditure at different levels of income represents the consumption function. The consumption function was initially formulated by John Maynard Keynes, in his important work *The General Theory of Employment, Interest, and Money*, published in 1936. The Keynesian consumption function is a key concept in Keynesian economics and it serves as a central component of aggregate demand. It shows the relationship between disposable income and consumer spending. According to Keynes, this function is rooted in what he termed the "Fundamental Psychological Law of Consumption." This law states that individuals generally tend to increase their consumption as their income rises, but not by the same proportion as the increase in their income.

- Income influences consumption behaviour

We can represent the Keynesian consumption function in the following manner:

- $C = a + bY_D$
- Where $a > 0$, $0 < b < 1$
- C represents consumption expenditure.
- Y_D denotes disposable income.
- a is the intercept of the consumption function, reflecting autonomous consumption. This signifies the level of consumption that persists even when disposable income is zero, incorporating essential expenditures and borrowing behaviour.
- b is the slope of the consumption function, denoted as the marginal propensity to consume (MPC). It indicates the proportion of additional income that households allocate to consumption rather than saving.

- $C = a + bY_D$

Figure 3.1.1 graphs the relationship between income and consumption. The variables 'a' and 'b' are parameters. Shifts in C are caused by these parameters. Here 'a' represents the autonomous consumption which is positive. Generally, the consumption function starts from the vertical axis which is represented by 'a' at its vertical intercept. The parameter 'b' which is termed the marginal propensity to consume (MPC) represents the slope of the consumption function. It shows the fraction of additional income that households choose to

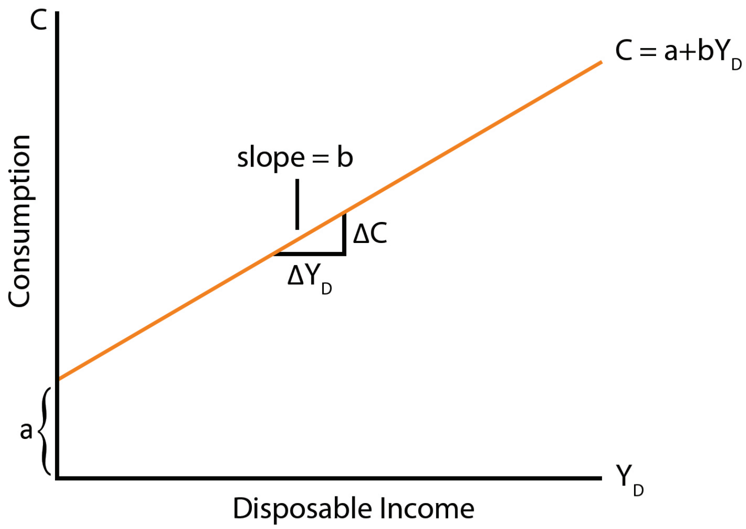

Fig 3.1.1 Keynesian Consumption function

spend on consumption goods and services rather than saving. In mathematical form it is represented as follows:

$$MPC = \frac{\Delta C}{\Delta Y_D}$$

Let us discuss the two parameters of the Keynesian consumption function:

- Consumption persists regardless of income level

1. Autonomous Consumption (*a*): When disposable income is zero, households still engage in consumption spending. The parameter '*a*' captures this level of autonomous consumption. An increase in '*a*' results in a parallel upward shift in the consumption function, indicating higher levels of consumption at all levels of disposable income.

- MPC measures consumption response to income

2. Marginal Propensity to Consume (*b*): The parameter '*b*' determines the slope of the consumption function, indicating how much consumption changes in response to changes in disposable income. The MPC (*b*) could be understood as the change in consumption divided by the change in disposable income. It reflects the fraction of each additional dollar of income that households allocate to consumption Thus, as disposable income escalates, households not only sustain their baseline consumption level (autonomous consumption) but also the additional

consumption spending that occurs as a result of increases in disposable income (induced consumption). Hence, MPC determines the magnitude of induced consumption. A higher MPC implies that a larger proportion of additional income is spent on consumption, leading to higher induced consumption. Conversely, a lower MPC indicates that a smaller proportion of additional income is spent, resulting in lower induced consumption.

- Consumption rises less than income

Based on the psychological law of consumption Keynes formulated his consumption theory known as the Absolute income hypothesis. According to this hypothesis, as individuals experience an increase in their income, their consumption expenditure also tends to rise. However, the relationship between consumption and income is not strictly proportional. Instead, Keynes observed that the increase in consumption is less than the increase in income. This non-proportional relationship emphasises the idea that factors beyond income level also play a role in shaping consumption decisions. Now let us delve into the multiplier effect is rooted in the concept of induced consumption.

Multiplier

- $\Delta Y = k\Delta I$

Following the Keynesian consumption function, another key concept in Keynesian economics is the multiplier effect. This effect plays a crucial role in understanding how changes in autonomous investment as well as induced spending, can have augmented effects on overall economic activity and income levels. It expresses the relationship between an initial increase in investment and the final increment in aggregate income. The multiplier effect operates on the premise that an initial injection of spending into the economy sets off a chain reaction of additional spending. This occurs as the initial spending stimulates demand, prompting businesses to increase production and hire more workers. These newly employed workers then have additional income to spend, further boosting demand and leading to additional rounds of spending and income generation. It indicates that when there is an increase in investment, income will increase by an amount which is 'k' times the increment of investment, i.e.

$\Delta Y = k \Delta I$

- Investment boosts income through multiplier

Here multiplier is represented by using 'k' or it can otherwise be written as:

$K = \Delta Y / \Delta I$

Where Y- Income

k- multiplier

I- Investment

Δ-Change

- MPC determines multiplier effect size

The multiplier effect is rooted in the concept of induced consumption, which suggests that an increase in income leads to higher consumption spending. Keynes identified the marginal propensity to consume (MPC) as a key determinant of the multiplier effect. The higher the MPC, the larger the multiplier effect, as each additional dollar of spending leads to a greater increase in aggregate demand and income. Th multiplier is equal to the reciprocal of 1-MPC. i.e. k= 1/1-MPC.

- Multiplier effect stimulates economic growth

The multiplier effect is crucial for policymakers because it helps them see how fiscal policies, like spending more on government projects or cutting taxes, can boost economic activity. By using the multiplier effect, policymakers can increase demand in the economy, which can lead to growth, especially during tough economic times. Moreover, during periods of economic downturn or recession, when consumer and business spending may be low, utilising the multiplier effect becomes even more significant. By injecting funds into the economy through fiscal measures, policymakers can help prevent or mitigate recessions by boosting consumer and business confidence and encouraging spending.

3.1.3.3 Effective Demand

Effective demand is a concept introduced by John Maynard Keynes in his General Theory. It refers to the level of aggregate demand that is sufficient to purchase the entire output produced by firms at a given price level. In other words, the point of the aggregate demand function, where it is intersected by the aggregate supply function, will be called the effec-

• Effective demand determines employment levels

tive demand. The principle of effective demand states that the total demand in an economy, comprising both consumption and investment demand, dictates the level of employment, output, and national income. In essence, the extent of employment centres on the aggregate demand, and unemployment arises from an inadequacy in total demand. The level of effective demand is determined at the point where aggregate demand equals aggregate supply price. If effective demand is below the level of aggregate supply, there will be unused capacity and unemployment. Conversely, if effective demand exceeds aggregate supply, there will be upward pressure on prices and potential inflation. Let us illustrate it with the help of the following figure:

Illustrated in Figure 3.1.2 is the concept of effective demand,

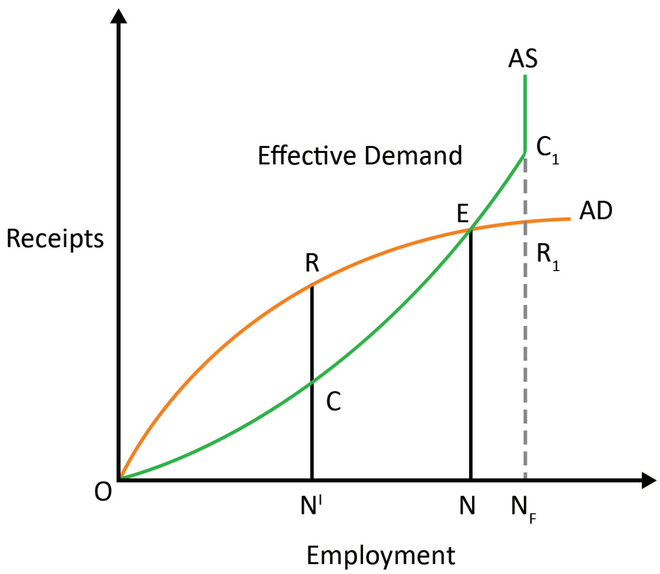

Fig 3.1.2 Determination of Effective demand

• Effective demand establishes employment equilibrium

where AD symbolises the aggregate demand function and AS represents the aggregate supply function. On the horizontal axis lies the economy's level of employment, while the vertical axis portrays both the expected proceeds (revenue) and necessary proceeds (costs). The intersection of these curves at point E signifies effective demand, indicating the employment of ON workers. At this point, entrepreneurs optimise their profit expectations. Any deviation from point E would lead entrepreneurs to either incur losses or earn subnormal profits. Operating at the ON′ level of employment suggests that the expected proceeds (revenue) exceed the necessary proceeds (costs), evident by RN′ surpassing CN′. This implies profitability in increasing employment until reaching the ON level, where expected and necessary proceeds equal at point E. However, extending employment beyond point E to level N would not be financially advantageous for entrepreneurs. This is due to the fact that at this stage, necessary proceeds (costs) exceed expected proceeds (revenue), as illustrated by $C_1N_F > R_1N_F$, resulting in incurred losses. Therefore, point E, denoting effective demand, delineates the actual employment level in the economy, indicative of an underemployment equilibrium.

- Keynes promotes demand for stability

Keynesian economics emphasises the importance of managing effective demand to achieve full employment and economic stability. Policies such as fiscal stimulus (increased government spending or tax cuts) aim to boost effective demand during economic downturns, while policies that dampen aggregate demand (e.g., fiscal austerity or monetary tightening) may be implemented to control inflation during periods of high demand.

3.1.3.4 Money in the Keynesian system

- Keynes emphasizes money's economic role

After exploring the multiplier effect and its implications for economic activity, we turn our attention to the Keynesian theory of money. In Keynesian economics, money plays a crucial role in facilitating transactions and influencing economic decisions. Unlike classical theories, which often view money solely as a medium of exchange, Keynesian economics considers the broader implications of money in determining aggregate demand and overall economic stability.

Demand for money

The demand for money stems from people's preference for liquidity, driven by three key motives:

- Demand money for transaction, precaution, speculation

1. Transaction Motive: This motive reflects the need for money to cover day-to-day expenses. It increases with income levels and remains relatively insensitive to changes in interest rates. Mathematically, the transaction motive (M_T^d) is represented as a function of income (Y): $M_T^d = f(Y)$.

2. Precautionary Motive: This motive relates to holding money to address unforeseen expenses like

emergencies or unexpected financial needs. Like the transaction motive, it grows with increasing income levels. Mathematically, the precautionary motive (M_P^d) is represented as a function of income (Y): $M_P^d = f(Y)$

Speculative Motive: Money held for speculative purposes aims to capitalise on anticipated future market developments, with the intention of profiting from superior insights compared to the broader market. This motive is influenced by the prevailing interest rate. At very low interest rates, the demand for money for speculative purposes becomes perfectly elastic. This portion of the curve is known as liquidity trap which is shown in figure 3.1.3. Mathematically, the speculative motive (M_{Sd}) is represented as a function of the interest rate (r): $M_{Sd} = f(r)$.

- Keynesian money motives explained

The total demand for money (Md) encompasses all three motives transactions, precautionary, and speculative. Hence, it can be expressed as a function of both income and the interest rate: Md = f(Y, r). This is represented by the LP curve in figure 3.1.3.

Determination of rate of interest

In Keynesian theory, the rate of interest could be viewed as the result of the interaction of money supply (Ms) and money

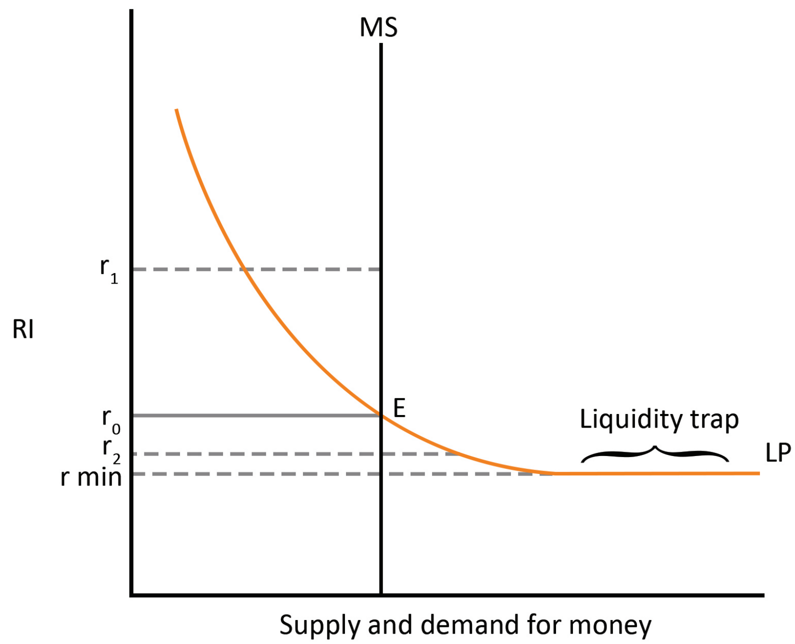

Fig 3.1.3 Determination of rate of interest

- Interest rate balances money supply

demand (Md). The money supply curve is represented by Ms, while the demand for money is depicted by the LP curve. The quantity of money in the economy is fixed by the monetary authorities. At the equilibrium interest rate denoted as R_0, the quantity of money demanded (Md) matches the quantity of money supplied (Ms), represented by point OM. If the interest rate exceeds R_0, indicating that Ms exceeds Md, individuals will utilise the surplus money to purchase bonds. This increased demand for bonds pushes their prices up, consequently forcing the interest rate back towards the equilibrium level. If the interest rate falls below R_0, indicating that Md exceeds Ms, individuals will sell bonds to compensate for the excess money supply. This surge in bond supply causes bond prices to drop, leading to an increase in the interest rate back to the equilibrium level. Again, this adjustment process persists until the interest rate returns to $R_{0.}$

Keynesian view on Inflation

- Inflation results from demand-pull

Inflation refers to the sustained increase in the general price level of goods and services in an economy over a period of time. It essentially means that, on average, prices are rising, leading to a decrease in the purchasing power of money. Inflation according to Keynes, arises from sustained increases in effective demand beyond the point of full employment. Put simply, inflation occurs when aggregate demand surpasses aggregate supply. According to Keynesian theory, demand-pull inflation stems from a surge in aggregate demand when an economy is already operating at its full employment output level. Increases in private consumption, private investment, or government expenditure contribute to this escalation in aggregate demand, leading to a rise in general price levels. This inflationary scenario occurs because, at the optimal or full employment output level (where resources are fully utilised), the economy struggles to expand its output or aggregate supply in response to increased demand. When the value of aggregate demand exceeds the value of aggregate supply at full employment, an inflationary gap emerges. Keynes identified this inflationary gap as the primary cause of inflation. It is defined as the planned expenditure exceeding the output available at full employment.

In his 1930 work "A Treatise on Money," Keynes distinguished between two types of inflation: income inflation and profit inflation. He defined inflation as an increase in the overall price level, which can stem from two components: rising profits per unit of output and increasing production costs. Keynes referred to inflation driven by rising profits as "profit inflation," while inflation caused by rising costs was termed "income inflation." Profit inflation occurs when prices increase more quickly than production costs, leading to higher profit margins. In contrast, income inflation arises when production costs rise in tandem with prices, preventing profits from growing. Profit inflation can create a self-reinforcing cycle: as firms raise prices, they are incentivised to increase output, which in turn raises the demand for labour and other production resources. This increased demand can lead to increased production costs, generating income inflation that ultimately reduces excess profits. As a result, profit inflation tends to boost economic growth and output, while income inflation is incapable of enhancing growth in the economy.

- Keynes distinguishes inflation types

Unemployment

After discussing effective demand and its importance in determining the level of employment, we turn our attention to the Keynesian view of unemployment. In Keynesian economics, unemployment is often attributed to a deficiency in aggregate demand, rather than structural or supply-side factors alone. According to Keynes, full employment means that everyone who wants a job can find one and that there is an absence of involuntary unemployment. Keynes is of the view that the primary cause of unemployment is a shortfall in effective demand, which results in firms reducing production and laying off workers. Inadequate consumer spending, business investment, or government expenditure can all contribute to deficient aggregate demand and the persistence of unemployment. Keynesian economics distinguishes between different types of unemployment, including cyclical, structural, and frictional unemployment. While structural and frictional unemployment may exist even at full employment, Keynesian analysis focuses primarily on cyclical unemployment, which arises from fluctuations in aggregate demand. To address unemployment, Keynesian economics advocates for active demand management policies, such as fiscal stimulus measures and monetary policy adjustments.

- Unemployment linked to demand deficiency

Government intervention

Keynesian economics focuses on using government policies to manage overall aggregate demand in the economy to prevent or address economic recessions. He recommended active government involvement through both fiscal and monetary policies to boost the economy and reduce unemployment. One key idea in Keynesian economics is the multiplier effect, which suggests that government spending can lead to more business activity and even more spending. This theory proposes that when the government spends money, it stimulates economic growth, leading to higher overall income. If people spend their additional income, it can further boost economic output, potentially exceeding the initial government stimulus. During the Great Depression, many people, including economists, recognised weaknesses in the market-based economic system. Keynes argued that when there are more people willing and able to work than there are jobs available, it is not because the market is not efficiently allocating workers—it is because there is not enough demand for goods and services to support all the jobs. He believed that the government should ensure there is enough overall demand in the economy to reach full employment. However, this does not mean the government should control prices, and wages, or manage entire industries directly.

- Government manages aggregate demand

Keynes effect

Keynesian economics postulates that an increase in investment and employment via a reduction in money wages and interest rates is called the Keynes effect. Keynes diverged from the Pigouvian perspective advocating for flexible prices and wages as the solution to achieving full employment. According to Keynes, The excess supply of labour results in a fall in money wages (W), which reduces firms' costs and causes a fall in prices (P). Consequently, the real value of monetary holdings increases, maintaining consumption at a relatively constant level due to the stable nature of the consumption function in the Keynesian model. This surplus of available funds leads to an upsurge in demand for bonds, consequently driving down interest rates. As interest rates decline, investment levels rise, boosting aggregate demand and output, thereby increasing levels of employment. However, Keynes argued that wage and price flexibility alone would not necessarily lead to full employment due to the presence of what he termed the liquidity trap. This occurs when interest rates, having already fallen significantly, reach extremely low levels. The degree of wage reduction plays a crucial role in determining the extent of the fall in interest rates and the subsequent increase

- Keynes effect boosts investment and employment in investment and employment. If wage cuts are moderate, the decrease in interest rates might not be sufficient to spur investment. Conversely, if wage reductions are too drastic, they may be met with resistance from trade unions, leading to social unrest. After discussing the key Keynesian thoughts let us now see how it worked in real work.

3.1.4 Keynesian Economics in Practice: Real-World Applications and Implications

- Global crisis triggered by mortgages

The 2007-2008 financial crisis, also known as the global financial crisis (GFC), was the most serious economic crisis the world had faced since the Great Depression. It was caused by a combination of factors. One major factor was predatory lending, where banks gave out mortgages (home loans) to people with low incomes who might not be able to repay them. These were called subprime mortgages. At the same time, global financial institutions were taking excessive risks with their investments. This included buying and selling complicated financial products that were linked to these risky mortgages. As a result, when the housing market in the United States started to decline and the value of these mortgages dropped, it caused a chain reaction. Mortgage-Backed Securities (MBS), which were investments tied to these mortgages, lost their value. This caused huge losses for financial institutions all around the world. The situation reached a critical point when Lehman Brothers, a major American bank, declared bankruptcy in September 2008. This sent shockwaves through the global financial system and generated a banking crisis.

- Keynesian policies revived post-crisis

Keynes and his ideas became popular again after the 2007-2009 financial crisis. During the crisis, central banks acted first by making money more available through lowering interest rates and a process called quantitative easing. Keynes believed that governments should only turn to fiscal policy - raising public spending and cutting taxes - when all other options had been exhausted. Fiscal policy was deployed in 2008-09, but only as a supplement to monetary policy. By injecting substantial funds into the economy through bailouts, stimulus packages, and targeted spending, policymakers aimed to stimulate aggregate demand and counteract the severe downturn in economic activity. The bailouts of debt-ridden companies, such as banks, insurers, and automakers, aimed to stabilise key sectors of the economy and prevent a broader financial collapse. By stepping in to rescue these companies, the government sought to restore confidence in the financial system and prevent the effect of bankruptcies and job losses. The strategy worked, as there was no second Great Depression and within six to nine months output had steadied across most of the global economy.

- Keynesian response to Great Recession

The measures undertaken by the U.S. government in response to the Great Recession reflected a Keynesian approach to economic policymaking. The American Recovery and Reinvestment Act of 2009, with its emphasis on government spending and tax incentives, represented a Keynesian-inspired fiscal stimulus package. By injecting funds into infrastructure projects, healthcare, education, and other areas, the government aimed to create jobs, support struggling households and stimulate overall economic activity. Tax cuts and credits provided additional support to households and businesses, further boosting consumer spending and investment. In the UK, the government, under George Osborne, used a mix of low interest rates and quantitative easing to boost growth, while also cutting spending and raising taxes to reduce the budget deficit.

Summarised Overview

The Keynesian legacy incorporates the evolution of economic thought from the failures of Classical economics. At the heart of this legacy lies John Maynard Keynes's critique of Classical economic theory in his influential work, *The General Theory of Employment, Interest, and Money*.Emerging in response to the Great Depression, John Maynard Keynes's theories fundamentally reshaped how governments approach economic management. Keynes advocated for active government intervention to stabilise economies, particularly during times of recession or unemployment. His emphasis on the importance of aggregate demand in driving economic activity led to the adoption of policies such as fiscal stimulus and monetary easing. Keynesian principles laid the groundwork for the welfare state and influenced the development of macroeconomic policy frameworks worldwide. Despite criticisms and challenges from other schools of economic thought, Keynesian ideas continue to shape policy responses to economic crises. The Keynesian legacy highlights the ongoing debate over the appropriate role of government in managing economic fluctuations and promoting stability. While the extent of government intervention remains a point of contention, Keynesian economics remains a foundation of macroeconomic theory and policy, offering understanding on how governments can handle complex economic challenges and pursue objectives such as full employment and economic growth.

Assignments

1. Explore the evolution of Keynesian economics since its inception, including the modifications and adaptations made by subsequent economists and policymakers.
2. Examine the influence of Keynesian economics on fiscal policy decisions during significant historical events, such as the Great Depression, post-World War II reconstruction, and the 2008 financial crisis.
3. Discuss the concept of the "Keynesian Revolution" and its impact on mainstream economic thought. How did Keynes challenge the prevailing economic system of his time?
4. Compare and contrast Keynesian economics with other schools of economic thought, such as monetarism and supply-side economics. How do these perspectives differ in their approach to economic policy?
5. Evaluate the effectiveness of Keynesian policies in addressing unemployment and economic downturns. Provide examples from historical events or economic crises.

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Suggested Readings

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2. Snowdown B, H.R Vane and F. Wynarczyk, A Modern Guide to Macro Economics: An introduction to competing schools of though
3. https://www.theguardian.com/business/economics-blog/2016/feb/07
4. Keynes on Inflation (richmondfed.org)

Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

UNIT 2
Monetarist Counter Revolution

Learning Outcomes

After reading this unit, the learner will be able to:

- understand the postulates of monetarism
- comprehend the Quantity Theory of Money
- explain the monetarist's views

Background

Keynesian policies were widely adopted during the post-World War II era, especially by the Western countries. Governments adopted Keynesian policies to address economic challenges, leading to an era of fiscal activism and the expansion of the welfare state. However, by the late 1960s and early 1970s, Keynesian Economics faced mounting criticisms and challenges. Some economists argued that Keynesian policies had unintended consequences, such as inflation and inefficiency. Additionally, the stagflation phenomenon- a combination of high inflation and high unemployment—challenged the ability of traditional Keynesian policies to effectively manage the economy. In the 1970s, the Keynesian approach faced mounting criticism and encountered three significant counter-revolutionary movements: monetarism, new classical macroeconomics, and supply-side economics. These counter-revolutionary movements began with a common message that government intervention would bring harm to the economy in the form of inflation, inefficiency, instability, and declining productivity.

One significant challenge to Keynesian Economics came from monetarist economists, notably Milton Friedman. Monetarism emphasised the importance of controlling the money supply to stabilise the economy, advocating for a rules-based approach to monetary policy rather than discretionary interventions. In response to the limitations of Keynesian policies, many governments began to adopt alternative approaches influenced by monetarist ideas. This included greater emphasis on controlling inflation through tighter monetary policy, reducing government intervention in the economy, and promoting market-oriented reforms. In this unit, we explore the significant challenge to Keynesian orthodoxy presented by monetarist analysis. Subsequently, in the next unit, we delve into the emergence of the new classical school, which initiated a more profound critique of Keynesianism in the 1970s.

Keywords

Counter-Revolution, Money Supply, Quantity theory, Expectations-Augmented Philips Curve, Balance of Payment

Discussion

3.2.1 Keynesian Counter-Revolutions

- Keynesianism challenged by competing theories

Starting from the late 1960s, the Keynesian approach faced mounting criticism and encountered three significant counter-revolutionary movements: monetarism, and new classical macroeconomics. Modern macroeconomics is characterised by different theoretical perspectives, including, monetarism, new classical economics, the disequilibrium approach, and the new Keynesian approach. Among these, three significant approaches (mentioned above) compete with each other as well as the basic Keynesian Macroeconomics.

- Counter-revolution shifts economic theories

The Keynesian ideas of demand management through government intervention entrusted in "The general theory" also called "Keynesian revolution" had played an important role in reviving the economy from the Great Depression in the 1930s. However, the economic challenges experienced during the decades of the seventies and eighties, including issues like inflation, low productivity, stagflation, and unemployment, led to a reconsideration of prevailing economic theories. In response, there was a revival of ideas preceding the Keynesian revolution. These included concepts such as Say's Law of markets and the classical quantity theory of money, indicating a shift towards earlier economic frameworks in the search for new solutions. Let us have an insight into how each of these schools contributes to the counter-revolution in a nutshell.

The first challenge to Keynesian Economics came from Milton Friedman and the Chicago school of Monetary experts. His theories are described as Monetarism or the modern Quantity theory. Monetarism emerged as a direct challenge to the dominant Keynesian orthodoxy, particularly in the post-World War II era. Monetarists argued that changes in the money supply, rather than discretionary fiscal policy, were the primary cause of economic fluctuations. They emphasised the role of monetary policy and the importance of controlling the money supply to stabilise the economy. They argue that changes in the money supply have a direct and predictable impact on inflation and economic activity. Monetarists advocate for central banks to target a specific rate of growth in the money supply as a means of achieving long-term price stability and sustainable economic growth. Although monetarism attacks the fundamental principles of Keynesianism, it advocates the role played by aggregate demand in determining output, employment, and price-level. Thus, their ideas influenced economic policy in the 1970s and early 1980s, particularly during the period of stagflation when Keynesian policies appeared to be ineffective in combating both inflation and unemployment.

- Monetarism challenges Keynesian principles

New Classical economics challenged the Keynesian assumption of adaptive expectations by emphasising rational expectations and market efficiency. They argued that individuals and firms optimise their decisions based on all available information, leading to efficient market outcomes. They were doubtful about the effectiveness of government policies in influencing the economy, believing that markets would correct themselves without intervention.

- New Classical economics emphasizes rational expectations

The thought of monetarism, and New Classical Economics collectively formed a Keynesian counter-revolution by challenging the dominant Keynesian economic foundation and offering alternative explanations. These schools of thought contributed to a broader reconsideration of economic theory and policies, leading to significant shifts in economic policy-making away from Keynesian demand management towards a more market-oriented approach. Both these schools believed that there was no need for activist stabilisation policies. Let us now discuss in detail the first Keynesian counter-revolution-Monetarism.

- Monetarism initiates Keynesian counter-revolution

3.2.2 Monetarism

The modern monetarism has its roots in the classical monetary theory. Classical economists held the view that monetary policy was a powerful tool for achieving economic growth and full employment. This view is called "Classical Monetarism". Classical Monetarism was formalised in the early quantity theory of money as developed by Irving Fischer and later by the Cambridge economists. However, the advent of the Keynesian revolution in the late 1930s pushed the Classical economics into the background. The Keynesian economic thoughts had global appeal and application during the period between the second world war and the early 1960's. During the 1950s and 1960s, Milton Friedman played a pivotal role in revitalising the quantity theory of money more than any other economist. In 1968, Karl Brunner famously labelled the ideas of Friedman and his contemporaries as "monetarism." The quantity theory of money serves as the foundation of monetarism.

- Monetarism revitalises quantity theory

3.2.2.1 Advent of Modern Monetarism

It was Milton Friedman of Chicago University, a Nobel Laureate in Economics who revived the classical theory of money. Milton Friedman and his associate Anna Schwartz carried out in the 1950s a monumental study of the monetary history of the United States. Contrary to the Keynesian orthodoxy, they found a strong relationship between economic fluctuations and money supply. Further evidence collected by the monetarists confirmed a strong link between money supply, GNP, and price behaviour.

- Friedman revives classical monetary theory

He says "Inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than output". Monetarists believed that "Only money matters". In support of their view, monetarists have produced a tremendous amount of empirical evidence. Modern monetarism received so extensive support over the past several years that it is often considered as a counter-revolution counter to the Keynesian revolution. Monetarism had gained widespread popularity and was accepted as the basis of economic stabilisation policy in the late 1970s in many developed countries.

- Monetarism counters Keynesian revolution

The essence of modern monetarism can be stated as follows:

a. The importance of money supply: Monetarists assert that the supply of money plays a central role in influencing the level of nominal Gross National Product (GNP) in the short term and the price level in the long term. They argue that an increase in the money supply leads to a corresponding increase in nominal GNP in the short term and contributes to inflationary pressures in the long term. This emphasises the significant impact of monetary policy on economic outcomes.

- Money supply influences economic outcomes

b. Money supply fluctuations and economic fluctuations: Monetarists argue that fluctuations in the money supply are the primary drivers of fluctuations in nominal GNP and prices within the economy. They argue that changes in the money supply can lead to changes in aggregate demand, affecting output and prices. Central banks should focus primarily on controlling the money supply rather than manipulating interest rates. This can be achieved through open market operations, reserve requirements, and discount rates. Therefore, they advocate for careful management of the money supply to maintain economic stability and control inflationary pressures.

- Money supply drives economic fluctuations

c. Critique of fiscal policy and emphasis on monetary measures: Monetarists attribute economic fluctuations primarily to wrong fiscal policies followed by governments. They argue that excessive government spending, taxation, or deficits can disrupt economic stability and lead to inflation or recession. Consequently, they advocate for monetary policy as the primary tool for correcting and stabilising the economy. Monetarists believe that central banks should focus on controlling the money supply to achieve macroeconomic objectives such as price stability and full employment, rather than relying heavily on fiscal interventions.

- Monetarists favour monetary over fiscal policy

Now let us go through the historical development of orthodox monetarism under three stages. The process of monetarism begins with the Quantity Theory of Money approach which evolved in the -mid-1950's-1960's after -mid-1960s. It paved the way for the expectations augmented Philips curve and finally the monetary approach to Balance of Payment in the early 1970's.

3.2.2.2 Friedman's Restatement of Quantity Theory of Money

The Quantity Theory of Money stands as one of the oldest theories in Economics, according to the esteemed economist Mark Blaug. The initial phase of orthodox monetarism, spanning from the mid-1950s to the mid-1960s, aimed to revive the Quantity Theory of Money as the primary framework for macroeconomic analysis, countering the dominance of Keynesian Economics. In this approach, changes in the money stock are viewed as the primary, though not the only, driver of fluctuations in nominal income or overall economic activity. Milton Friedman's essay "The Quantity Theory of Money: A Restatement," published in 1956, revived interest in the quantity theory of money and laid the groundwork for the monetarist school of thought. In this essay, Friedman reformulated the Quantity Theory of Money, which had its roots in the works of Classical Economists like David Hume and John Stuart Mill. The traditional quantity theory of money postulates a direct relationship between the quantity of money in an economy and the price level. According to this theory, an increase in the money supply leads to a proportionate increase in the price level, assuming that other factors remain constant.

- Quantity theory revives money's importance

Friedman through his Restatement brought money back to the central stage. According to Friedman, "the quantity theory is in the first instance a theory of demand for money.it is not a theory of output or of money income or of price level." He treats money as one type of asset in which wealth holders can keep a part of their wealth. According to him, individuals' demand for money depends on the total wealth or the total resources. Friedman suggested that people's desire to hold money is similar to their desire to hold any other asset. This desire depends on three key factors

- Friedman's demand theory redefines money

1. **Wealth Constraint**: This determines the maximum amount of money an individual can hold. Think of it as the limit on how much cash someone can comfortably keep on hand.
2. **Return on Money Compared to Other Assets**: People consider how much they can gain from holding money versus investing it in other assets like stocks, bonds, or even physical goods like real estate. If other investments offer better returns, they might prefer those over holding cash.

- Wealth limits, returns, preferences

3. **Individual Preferences**: Different people have different tastes and preferences when it comes to managing their wealth. Some might prioritise safety and prefer keeping more cash, while others might seek higher returns and invest more aggressively.

Friedman's demand function for real money balances can be expressed as:

$$\frac{M_d}{P} = f(Y^p, r, \pi^e, u)$$

Where:

- Y^P represents permanent income
- r denotes the return on financial assets.
- π^e signifies the expected rate of inflation.
- u represents individuals' tastes and preferences.

- Money demand, portfolio adjustment

According to this analysis, assuming all else remains constant (ceteris paribus), the demand for money tends to increase: as wealth levels rise, when the returns on alternative assets decrease, when expectations for future inflation decline, and vice versa. Individuals, aiming to maximise their utility, will shift their wealth allocation between different assets whenever the marginal rates of return are not equal. This adjustment process, known as portfolio adjustment, plays a central role in how changes in the money supply influence the real economy. For instance, let us consider the effects of increasing the money supply through open market operations by the central bank. Initially, there is an equilibrium where wealth is evenly spread between financial and real assets, with equal marginal rates of return. However, when the central bank buys bonds, increasing the money in circulation, people hold more cash. Since the marginal return on any asset decreases as its holdings increase, the marginal rate of return on money falls. Consequently, people start exchanging their excess cash for financial and real assets, causing their prices to rise until a new balance is reached. This process restores portfolio equilibrium, where all assets are willingly held, and marginal rates of return are once again equal. As against the orthodox Keynesian analysis, monetarists argue that money serves as a substitute for a wide range of real and financial assets. They emphasise that no single asset or group of assets can fully replace money. Monetarists believe that changes in the money supply have a more direct and effective impact on aggregate spending, influencing a broader range of assets and associated expenditures.

3.2.2.3 The Expectations-Augmented Philips Curve

- Wages, unemployment, expected inflation

During the 1960s and 1970s, new ideas emerged that challenged the prevailing Keynesian view of the Phillips curve. A key figure in this shift was Milton Friedman, whose critique of the traditional interpretation of the Phillips curve played a central role. Friedman challenged the original Phillips curve, which showed the relationship between changes in wages and unemployment. He pointed out that wages are typically negotiated in terms of real purchasing power, not just nominal money wages. This means that both workers and employers are more concerned about how much they can buy with their wages rather than just the number of currency they receive. Moreover, since wage agreements are made for specific time periods, what really matters is the expected rate of inflation over that time. Friedman suggested that the Phillips curve should instead focus on changes in real wages adjusted for expected inflation. He proposed adding the expected rate of inflation as a variable to the Phillips curve equation. This led to the development of what is called the "expectations-augmented Phillips curve." The mathematical form of Phillips can be expressed as follows

$$W = f(U) + P^e$$

- Wages influenced by expectations, unemployment

The above equation shows how changes in wages relate to both unemployment and expected inflation. It indicates that the rate of increase in wages depends on the level of unemployment and what people expect prices to do in the future. When we add expected inflation to the equation, we realise that there is not just one Phillips curve, but rather a group of them, each associated with a different expected inflation rate. Imagine it like this: if people expect prices to rise faster, they will demand higher wages to keep up. This creates different curves showing how wages respond to unemployment depending on what people think prices will do.

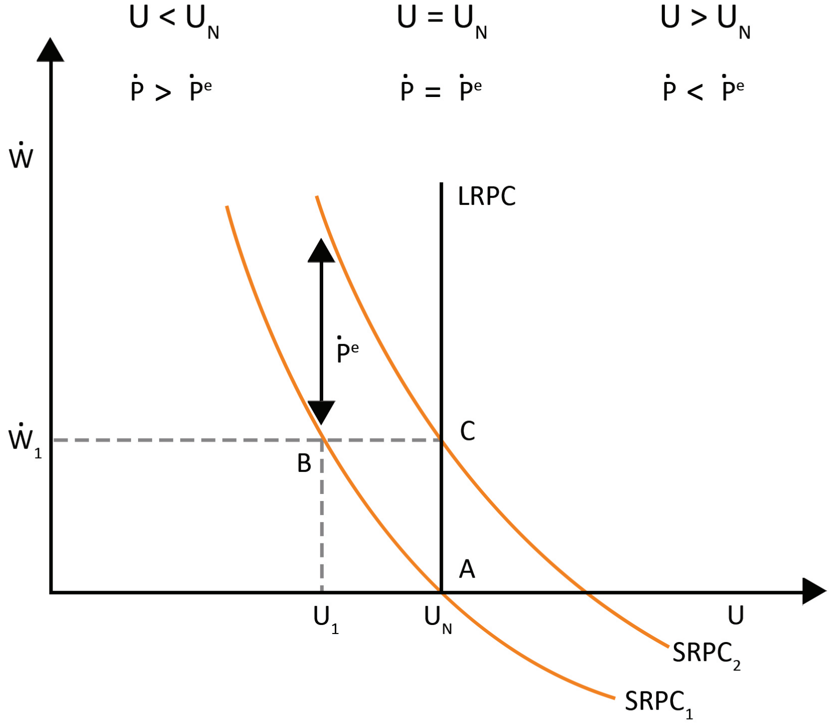

Fig 3.2.1 Expectations Augmented Phillips Curve

Now, let us explain this with a graph. Say we start the economy at point A on the short-run Phillips curve (SPC_1), where unemployment is at its natural level (U_N), and money wages are not increasing. To keep things simple for our analysis, we will assume there is no growth in productivity. This means that if wages are not increasing, prices remain constant, and we expect zero inflation.

i.e. $W=P=P^e = 0$ per cent.

Where

W – money wage

P- prices

P^e - inflation

Now, if the government takes action to lower unemployment from U_N to U_1 by boosting demand through monetary policies. As demand for goods and labour increases, prices and wages go up, although prices rise faster than wages. Workers might think they are getting a raise because they have recently seen stable prices. However, their wages are not keeping up with the actual cost of living, leading to what we call the "temporary money illusion." Real wages, which account for inflation, decrease. This prompts firms to hire more workers, reducing unemployment and pushing wages up slightly (to point B on SPC_1). Over time, workers adjust their expectations as they realise their wages are not rising as far as they thought due to inflation. They demand higher wages to compensate, shifting the Phillips curve up to SPC_2. Wages then increase at a rate that includes both the actual increase and the expected inflation rate. Firms respond by laying off workers to maintain profitability, increasing unemployment until wages and unemployment return to their original levels at point C. This means that in the long run, there is no trade-off between unemployment and wage increases. At the natural rate of unemployment, wages rise at the same rate as prices, keeping real wages constant. This keeps the labour market stable, and inflation stays under control because everyone knows what to expect. This is what we call the long-run vertical Phillips curve, and it shows that when the economy is at its natural rate of unemployment, there is no need to worry about inflation or unemployment.

- Temporary illusion impacts wage dynamics

3.2.2.3 Monetary Approach to Balance of Payment

In the 1970s, orthodox monetarism evolved further by integrating the monetary approach to balance of payments theory and exchange rate determination into its analysis. Prior to the breakdown of the Bretton Woods system of fixed exchange rates against the United States dollar in 1971, the US economy was typically viewed as relatively closed. However, the emergence of the monetary approach became crucial as it allowed monetarist analysis, previously designed for closed economies, to become applicable to open economies like the UK.

- Monetarism integrates global factors

Monetary Approach To Balance of Payment Under Fixed Exchange Rate

During the 1970s, numerous monetary models for the balance of payments emerged in academic literature. However, they all shared the fundamental belief that the balance of payments is fundamentally due to monetary factors. These models primarily focus on the money market, where the interaction between the demand for and supply of money is seen as the primary element of the balance of payments flows. Despite their differences, most monetary models of the balance of payments generally rely on four key assumptions. First, they assume that the demand for money remains relatively stable

- Monetary models emphasize stability

and is influenced by only a few factors. Second, they postulate that in the long run, output and employment move towards their full employment or natural levels. Third, these models assume that authorities cannot completely offset the monetary effects of balance of payments deficits or surpluses on the domestic money supply in the long run. Fourth, they suggest that accounting for tariffs and transportation costs, arbitrage will lead to the long-run equalisation of prices for similar traded goods.

- Excess credit causes imbalance

Now let us consider a basic monetary model of the balance of payments for a small open economy. In this model, we assume that: (i) real income remains constant at its full employment or natural level; (ii) the law of one price applies in both commodity and financial markets, and (iii) both the domestic price level and interest rate are linked to global levels.

The demand for real balances depends on real income and the interest rate:

$$Md = Pf(Y, r)$$

The money supply consists of domestic credit (money created domestically) plus money associated with changes in international reserves:

$$Ms = D + R$$

For the money market to be in equilibrium, the demand for money (Md) must equal the supply of money (Ms), leading to the equation:

$$Md = D + R$$

or

$$R = Md - D$$

Assuming the system starts in equilibrium, let us examine what happens when there is a one-time increase in domestic credit (D) by the authorities. Since the factors affecting the demand for money are externally determined, the demand for money cannot adjust to the increase in domestic credit. Individuals will use their excess money to purchase foreign goods and securities, resulting in a balance of payments deficit. Under a fixed exchange rate system, the authorities are obligated to exchange foreign currency for domestic currency to cover the deficit, leading to a depletion of international reserves (R). This reduction in international reserves reverses the initial increase in the money supply caused by the rise in domestic credit, causing the money supply to decrease until the balance of payments deficit is eliminated. The system returns to equilibrium when the money supply returns to its original level, with the increase in domestic credit being offset by a corresponding reduction in foreign exchange reserves. Thus, any discrepancy between actual and desired money balances leads to a balance of payments deficit or surplus, which in turn corrects the imbalance. In equilibrium, actual and desired money balances are once again in balance, resulting in no changes in international reserves. This demonstrates the self-correcting nature of the balance of payments.

Monetary Approach To Balance of Payment Under Flexible Exchange Rate

- Exchange rate adjusts automatically

Under a system of perfectly flexible exchange rates, the exchange rate adjusts to balance the foreign exchange market, ensuring that the balance of payments remains zero. When the balance of payments is zero, there is no change in foreign exchange reserves. However, when there is a BOP deficit or surplus, adjustments occur primarily through changes in the demand for money and the exchange rate, without any direct inflow or outflow of foreign exchange reserves. Consider a situation where the monetary authority increases the money supply ($Ms > M_D$) and there is a BOP deficit. The increase in money supply leads to individuals holding more cash, which they use to purchase more goods, thus pushing up the prices of both domestic and imported goods. This results in the depreciation of the domestic currency and an increase in the exchange rate. As prices rise, the demand for money also increases, eventually restoring the equality of money demand and money supply ($M_D = Ms$) without any outflow of foreign exchange reserves. On the other hand, if money demand exceeds the money supply ($MD > Ms$), prices will fall, leading to an appreciation of the domestic currency and a decrease in the exchange rate. This depreciation encourages spending and investment, ultimately reducing the excess demand for money until M_D equals Ms and the BOP is in equilibrium. Throughout this process, there is no need for any inflow or outflow of foreign exchange reserves to achieve BOP equilibrium. Thus, under flexible exchange rates, adjustments in the money supply, prices, and exchange rates facilitate the equilibrium of the balance of payments without the necessity of direct intervention in foreign exchange markets.

3.2.2.5 Criticisms

Nicholas Kaldor, James Tobin, and Minsky criticised modern monetarism strongly.

- Money supply influenced internally

a. **Endogeneity of Money Supply:** Monetarists, such as Milton Friedman and Anna Schwartz, argue that the central bank can directly control the money supply and that changes in the money supply have a direct and predictable impact on economic activity. However, Kaldor and Tobin disagree with this view. They argue that the money supply is not solely determined by the actions of the central bank but is instead influenced by the broader dynamics of the economy. Factors such as interest rates, credit conditions, and economic activity itself affect the demand for money. Therefore, changes in the money supply are not exogenous but rather endogenous, meaning they are largely determined by internal economic factors.

- Economic growth drives money demand

b. **Reverse Causation:** Kaldor introduced the concept of reverse causation to challenge the monetarist view. He suggests that changes in economic conditions, particularly during periods of economic expansion or boom, can lead to changes in the demand for money. For example, as businesses expand and engage in more transactions, they require more cash for various purposes such as investment, wage payments, and transactions. This increased demand for money arises from economic growth rather than changes in the money supply initiated by the central bank. If the central bank fails to adjust the money supply to accommodate this increased demand, alternative forms of credit and exchange may emerge outside the control of the official monetary authorities. Minsky introduced the idea that financial market dynamics, especially the accumulation of debt, are central to understanding business cycles. He argued that periods of economic stability lead to complacency, increasing risk-taking behaviour, and eventually to financial crises- an aspect that monetarism overlooks.

c. **Lags in Adjustment:** Tobin points out that there are significant lags in the adjustment process between changes in the money supply and their impact on economic activity, especially during short-run recessions. Monetarists often

- Adjustment lags weaken monetarist claims

argue for the direct and immediate effects of changes in the money supply on output. However, Tobin suggests that businesses and economic agents do not adjust their behaviour instantaneously in response to changes in the money supply. Instead, it takes time for businesses to adjust their demand for cash to meet their immediate needs, such as wage payments and retail transactions. During this adjustment period, the direct link between changes in the money supply and fluctuations in output may not hold as strongly as monetarists suggest.

Summarised Overview

In the early 1970s, people started doubting Keynesian Economics because it did not always work in practice, and other economists, like the monetarists and new classicals, were gaining popularity with their criticisms. The unit examined the monetarists views and the importance given to money. Monetarists, headed by Economists like Milton Friedman, prioritise the role of the money supply in shaping economic outcomes. They argue that changes in the money supply have a direct impact on inflation and economic activity. Embracing the quantity theory of money, they argue that controlling the growth rate of the money supply is essential for achieving long-term price stability and sustainable economic growth. Monetarists advocate for rule-based monetary policy, favouring a steady increase in the money supply over time to avoid unpredictable fluctuations and maintain macroeconomic stability. Their distrust towards discretionary fiscal policy and emphasis on the long-term effects of monetary policy have significantly influenced economic thought and policy-making.

However, critics such as Nicholas Kaldor and James Tobin challenge monetarist theories. They argue that the money supply is endogenous, shaped by economic factors beyond central bank control and that the relationship between money supply and economic activity is more complex than suggested by monetarist models. Kaldor introduces the concept of reverse causation, suggesting that economic booms can drive changes in the demand for money, while Tobin highlights the delays in adjustment between changes in the money supply and their impact on output, particularly during short-run recessions. These criticisms highlight the need for a more refined understanding of monetary dynamics and their interaction with broader economic conditions. There criticisms have contributed to the evolution of a new refined school of thought in the 1970s, criticising the Keynesian orthodoxy- The New Classical Macroeconomics. Let us discuss it in detail in the following unit.

Assignments

1. Define monetarism and its key principles. How does it differ from Keynesian economics in its approach to understanding and managing the economy?
2. Discuss the role of money supply in monetarist theory. How does the quantity theory of money serve as a foundation for monetarist views on inflation and economic stability?
3. Evaluate the contributions of Milton Friedman to the development of monetarist theory. How did Friedman's ideas challenge prevailing Keynesian orthodoxy, particularly in the context of macroeconomic policy?

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2. Richard T Froyen, *Macro Economics; Theory and Policy*, Macmillan Publishing Co., New York, 1990

Suggested Reading

1. Rosalind Levacic and Alexander Rebmann, *Macro Economics: An Introduction to Keynesian-Neoclassical Controversies,* The Macmillan Press Ltd, London
2. Snowdown B, H.R Vane and F. Wynarczyk, *A Modern Guide to Macro Economics: An introduction to competing schools of thought*

Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

UNIT 3
New Classical Macroeconomics views of Muth, Wallas, R. E. T. Sargent, and Lucas

Learning Outcomes

After completing this unit, the learner will be able to:

- understand rational expectations hypotheses
- analyse how markets clear continuously
- compare new classical views

Background

In the previous unit, we discussed monetarism, the first counter-revolution against Keynesianism. In this unit, we focus on new classical macroeconomics- a second counter-revolution during the 1970's. The new classical economics developed against the background of high inflation and unemployment of the 1970s and accompanying dissatisfaction with the prevailing Keynesian orthodoxy. In line with the Monetarist school, the new Classical school believes that Keynes and the Keynesians had failed to explore the full implications of endogenously formed expectations on the behaviour of economic agents. We will also examine the development of new classical ideas by Muth, Wallace, Sargent, and Lucas.

Keywords

Rational Expectations, Market clearing, Microeconomics, Macroeconomics, Aggregate Supply Hypothesis

Discussion

3.3.1 New Classical Macroeconomics

Keynesian demand management policies failed to stabilise the economy during the 1970s, leading to stagflation, which is a combination of inflation and unemployment. In response to the dominance of Keynesian economics and as an evolution from Monetarist macroeconomics, the New Classical approach to macroeconomics emerged during the same period. While sharing certain tenets with Monetarism, such as the emphasis on the monetary explanation of inflation, New Classical macroeconomics distinguishes itself as a separate school of thought. Rooted in classical economics, which advocated for noninterventionist policy rules, both Monetarism and New Classical economics challenge Keynesian orthodoxy. However, the New Classical perspective represents a more profound critique of the Keynesian theoretical framework. Keynes asserted that a private-enterprise economy could be stabilised through active government management of aggregate demand, but New Classical economists argue otherwise. Central to New Classical economics is the proposition that the stabilisation of real variables like output and employment cannot be achieved through aggregate demand management alone. They contend that systematic monetary and fiscal policy adjustments will have a limited impact on output and employment, even in the short term. New Classical macroeconomics builds on Monetarism and Classical economics, representing a paradigm shift in economic thought. It challenges the efficacy of traditional demand-side policies and paves the way for a restructuring of macroeconomic policy frameworks.

- New Classical critiques Keynesian economics

The New Classical macroeconomic approach is often closely associated with the work of prominent American economists, notably R.E. Lucas of Chicago University and T.J. Sargent of Stanford University. Other influential figures include R.J. Barro, B.T. McCallum, and N. Wallace from Harvard University. In the UK, the approach is mainly associated with the work of A.P.L Minford, Professor of Economics at Liverpool University. For their radical opinion, they are called 'Radicals' and their macro-economic propositions came to be recognised as the 'New Classical Macroeconomics'(NCME). The NCME is primarily radicals' attack on the Keynesian macroeconomics. Following Thomas Sargent's 1979 contribution, rational expectationists who embraced equilibrium theorising came to be collectively

- New Classical economists emphasise equilibrium known as the new classical school. As the name suggests, the new classical school aimed to revive classical approaches to equilibrium analysis by assuming continuous market clearing within a competitive framework. The idea of market clearing, which means prices can adjust perfectly and instantly, is one of the most debated parts of new classical economics. Supporters of this view argue that macroeconomics should be rooted in a complete understanding of general equilibrium based on microeconomic principles. Let us now look into the key features of the new classical school:

The new classical approach, which developed in the early 1970s, featured several key elements:

1. A strong focus on establishing macroeconomic theories with micro foundations based on neoclassical choice theory, all within a Walrasian general equilibrium framework.

- Rational agents, market clearing

2. The acceptance of the central neoclassical idea that all economic agents are rational, meaning they continuously optimise given their constraints- firms aim to maximise profits, while labour and households seek to maximise utility.

3. Agents are not influenced by money illusion, so only real values (such as relative prices) are relevant to their decision-making.

4. Complete and continuous flexibility in wages and prices ensures that markets clear consistently, allowing agents to fully exploit all mutually beneficial trading opportunities, with no unexploited profits remaining.

- Money supply impacts real variables

Under these assumptions, changes in the money supply should be neutral, meaning that real variables would not depend on nominal ones. However, empirical evidence reveals positive correlations, at least in the short term, between real GDP and the nominal price level (indicating an upward-sloping aggregate supply curve), as well as between changes in the nominal money supply and real GDP. Additionally, there are negative correlations between inflation and unemployment (illustrated by the Phillips curve). This suggests that, in practice, money does not appear to be neutral in the short run.

Let us now sum up the main elements of the New Classical approach to macroeconomics into three sub-hypotheses, forming the foundation of their theoretical framework. These propositions are:

1. Rational Expectations
2. Continuous market clearing
3. The nature of the aggregate supply curve

3.3.2 New Classical Macroeconomics Views of Muth

- Rational expectations use available information

One of the central tenets underlying new classical macro-economics is the Rational Expectations Hypothesis (REH) associated with the work of John Muth (1961). The Rational Expectations Hypothesis comes in two versions: weak and strong. The main idea behind the weak version of the hypothesis is that in forming forecasts or expectations about the future value of variable, rational economic agents will make the best (most efficient) use of all publicly available information.

- Expectations perfectly align with outcomes

The strong version, often associated with Muth's work, takes it a step further. In the Muthian 'strong' version, economic agents' subjective expectations of economic variables will coincide with the true or objective mathematical conditional expectations of those variables.. It suggests that people's predictions perfectly match the actual outcomes. So, if we are talking about inflation forecasts, it means that people's expectations about future inflation rates perfectly align with the actual inflation rates, based on all the information available up to the previous period. Mathematically, it is expressed like this:

$P_t^{\,e} = E(\ P_t(\Omega_{t-1})$.

P_t is the actual rate of inflation and $P_t^{\,e}$ is the expected rate of inflation; $E(\ P_t(\Omega_{t-1})$ is the rational expectation of the rate of inflation subject to the information available up to the previous period (Ω_{t-1}).

Now let us discuss the views of Wallace, Sargent, and Lucas on New Classical Economics. Thomas Sargent and Neil Wallace, along with Robert Lucas, are prominent figures in New Classical macroeconomics. Their contributions revolve around rational expectations, market clearing, and the implications for macroeconomic policy.

3.3.3 New Classical Macroeconomics Views of Wallace and Sargent

- Rational expectations shape economic outcomes

Sargent and Wallace emphasised the importance of rational expectations in shaping economic outcomes. They argued that individuals form their expectations about future economic variables based on all available information, including past data and economic theory. Rational expectations imply that individuals do not systematically make forecasting errors and incorporate all available information into their decision-making processes. The ideas of this school of thought initially referred to as 'rational expectations macroeconomics', were labelled by Thomas Sargent, as 'the new classical macroeconomics'

- Market clearing ensures economic equilibrium

Sargent and Wallace stressed the idea of market clearing in the long run. They postulated that markets tend to clear over time, meaning that prices and wages adjust to ensure that the quantity supplied equals the quantity demanded in all markets, including the labour market. In their view, market clearing is essential for understanding how the economy reaches equilibrium and how it responds to shocks. Their work also focused on the implications of rational expectations and market clearing for macroeconomic policy. They argued that traditional Keynesian policies, such as fiscal and monetary stimulus, may not be effective in stabilising the economy in the long run. Instead, they advocated for policy rules that are transparent, credible, and consistent with rational expectations. This approach, known as "rational expectations policy," emphasises the importance of setting expectations and avoiding policy actions that could lead to distortions or misallocations in the economy.

The combination of rational expectations, continuous market clearing, and Aggregate Supply Hypotheses leads to several significant policy implications. Central to this framework is the new classical policy ineffectiveness proposition, which was initially articulated in two key papers by Sargent and Wallace in 1975 and 1976. It asserts that systematic monetary policy cannot have lasting effects on real economic variables, like output and employment if individuals possess rational expectations. In this framework, individuals and firms use all available information to form accurate predictions about the

- Policy effectiveness centers on expectations

future, adjusting their behaviour based on anticipated policies. For example, if the authorities decide to grow the money supply at a fixed rate of 6% per year, rational economic agents will anticipate this growth when they form their expectations about inflation. Since everyone expects the money supply to increase by 6%, this systematic part of the policy will not affect real economic variables like output and employment. However, if the authorities unexpectedly increase the money supply to 8% instead of 6%, this extra 2% growth is unanticipated. This surprise can temporarily boost output and employment because agents will misjudge inflation expectations based on the unexpected increase. Thus, only unexpected changes to the monetary policy, whether through mistakes by the authorities or unpredicted adjustments, can influence real economic activity.

3.3.4 New Classical Macroeconomics Views of Lucas

Robert E. Lucas Jr., the 1995 Nobel Memorial Laureate, played a central role in the development of new classical macroeconomics. Lucas's first idea is that markets are mostly clear. His next idea is that people form their expectations based on Muth's rational expectations theory. These are the main ideas of the New Classical School, according to Lucas.

- Equilibrium eliminates involuntary unemployment

The emergence of New Classical Macroeconomics marked a significant departure from traditional Keynesian theory. Robert E. Lucas and Leonard Rapping at the lead of this intellectual revolution, attempted to provide micro foundations for the Keynesian labour market. They applied the fundamental economic principle that equilibrium in a market occurs when the quantity supplied equals the quantity demanded. By extending this principle to the labour market, they sought to establish a foundation for macroeconomic theory. In applying the equilibrium condition to the labour market, Lucas and Rapping's analysis left no room for involuntary unemployment. According to their framework, involuntary unemployment arises when the amount of labour supplied exceeds the amount demanded. However, by assuming rational expectations and perfect market clearing, they concluded that involuntary unemployment cannot persist in equilibrium. Lucas and other New Classical economists argued that markets tend to clear in the long run, meaning that prices and wages adjust to ensure that the quantity supplied equals the quantity demanded in all markets, including the labour market.

Robert Lucas is well-known for developing and popularising the hypothesis of rational expectations. This concept suggests that individuals form expectations about future economic variables based on all available information, including past experiences and government policies. Unlike traditional economic models, which often assume that people make systematic forecasting errors, rational expectations theory postulates that individuals make predictions that are, on average, accurate. Lucas's work transformed macroeconomic analysis by incorporating rational expectations into economic models. This shift led to more strong and realistic frameworks for understanding how individuals and firms make economic decisions. Moreover, by integrating rational expectations into macroeconomic theory, Lucas deepened our understanding of economic policy. Policy makers must now consider how their actions will influence individuals' expectations and behaviour.

- Rational expectations transform economic analysis

In terms of Lucas's contributions and the New Classical perspective, the aggregate supply curve is often understood through the lens of rational expectations and market clearing. Let us explain Lucas's aggregate supply curve in terms of short run and long run. In the long run, when prices and wages fully adjust, the economy operates at its potential output level. This means the aggregate supply curve is vertical because changes in the price level don't affect the economy's long-run output. In the short run, the aggregate supply curve might slope upward. This suggests that temporary factors, like changes in resource prices, can affect output temporarily. However, in the long run, the curve returns to being vertical.

- Short-run aggregate supply upward sloping

3.3.5 Critical Assessment of the New Classical Approach

During the 1970s, leading new classical economists like Lucas, Barro, Sargent, and Wallace significantly influenced macroeconomic discourse, particularly in the United States. Lucas's business cycle research had a profound methodological impact on how macroeconomists approached their work. For instance, while the notion that all unemployment is voluntary remains contentious, economists following the 'Lucasian revolution' became increasingly uncertain of Keynes's concept of 'involuntary unemployment'. By the end of the 1970s, the new classical equilibrium framework began to reveal several limitations. These shortcomings primarily stemmed from the reliance on two key assumptions: continuous market clearing and imperfect information. By 1982, monetary versions of

- New classical models faced theoretical limitations new classical equilibrium models reached a theoretical and empirical standstill. On the theoretical side, the assumption regarding information confusion was increasingly viewed as implausible. With sticky prices dismissed on methodological grounds, new classical models struggled to provide a credible explanation for business cycles related to money-output causality. Additionally, Sims (1980) raised doubts about the causal relationship between money and output, further questioning the monetary explanations of business cycles.

- Monetary surprise model became unsuitable

The early 1980s saw a decline in the monetary surprise version of the new classical approach, largely due to the implausibility of the information gaps related to aggregate price levels and money supply data, along with the lack of strong empirical support for the policy ineffectiveness proposition. The severity of the recessions in both the US and the UK during 1980–82, following the Reagan and Thatcher deflations, provided critics with additional arguments against the model. As a result, the monetary surprise model is now widely considered unsuitable for modern, information-rich industrial economies.

Summarised Overview

New Classical Macroeconomics represents a significant shift from traditional Keynesian theory by emphasising equilibrium theorising rooted in microeconomic foundations. Central to this framework is the concept of rational expectations, which postulates that individuals form their expectations about future economic variables based on all available information. This implies that agents do not systematically make forecasting errors and effectively incorporate relevant data into their decision-making processes. A crucial aspect of New Classical thought is its focus on market clearing. New Classical economists argue that markets naturally tend toward equilibrium in the long run, with prices and wages adjusting to ensure that supply matches demand across all markets, including the labour market. This view challenges the Keynesian notion of persistent disequilibria, suggesting instead that any deviations from full employment are temporary and self-correcting.

In terms of policy implications, New Classical Macroeconomics questions the effectiveness of discretionary government interventions for stabilising the economy. Instead, it advocates for policy rules that are transparent, reliable, and consistent with the rational expectations of agents. This emphasis on predictability and consistency in policy aligns with the belief that individuals respond to incentives based on their expectations about future economic conditions. The contributions of economists like Wallace, Sargent, and Lucas are fundamental to this school of thought. They highlighted the importance of rational expectations and market clearing in determining economic outcomes, advocating for policy approaches that reflect these principles.

Assignments

1. Evaluate the enduring influence of Muth, Wallace, Sargent, and Lucas on contemporary macroeconomic theory and policy. To what extent have their ideas shaped the evolution of macroeconomic thought since the 1970s?
2. Analyse the role of Robert E. T. Sargent in advancing rational expectations theory and its application to macroeconomic modelling.
3. Compare and contrast the foundational principles of New Classical Macroeconomics as outlined by Muth, Wallace, Sargent, and Lucas with those of traditional Keynesian macroeconomics. What are the key differences in their approaches to understanding economic phenomena?

Reference

1. Mankiw, N. G., (9th Edition), *Macroeconomics*, Worth Publishers, USA
2. Richard T Froyen, *Macro Economics; Theory and Policy*, Macmillan Publishing Co., New York, 1990
3. Rosalind Levacic and Alexander Rebmann, *Macro Economics: An Introduction to Keynesian-Neoclassical Controversies*, The Macmillan Press Ltd, London
4. Snowdon, B., H. R. Vane, (2005), *Modern Macroeconomics Its Origins, Development and Current State*, Edward Elgar Publishing Limited UK, Edward Elgar Publishing, Inc. USA

Suggested Reading

1. Abel, A. B., B.S. Bernanke, D. Croushore (7th Edition), Macroeconomics, Pearson

Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

MASTER OF ARTS ECONOMICS

Post Modern Economic Discourse

Block 4

UNIT 1
New Classical School of Thought and Supply Side Economics

Learning Outcomes

After completing this unit, the learner will be able to:

- understand the major foundations of New Classical school of thought
- comprehend the policy implications of New Classical School of thought
- get an idea about the applications of Supply Side economics like tax wedge and Laffer curve

Background

The school of thought in economics were broadly divided into classical and Keynesian. You have learned in earlier classes about the features of classical system. They follow a policy of laissez faire or a non interventionist policy. It believed in the invisible hand of economic system and considered that the market will self adjust to restore equilibrium. In addition to this classicals believed in the supply side management of the economy. The classical school was in its full fledged glory until the Great Depression of the 1930s hit the United States of America. The Classical theories became ineffective during this period and a new branch of economics known as the Keynesian School of thought came into being. Keynesian economics contradicted the teaching of classical and set new forms of policies. Although the Great Depression was contained for a brief period of time, a new evil called stagflation emerged which proved the Keynesian system ineffective. This opportunity was utilised by the Classical schools to critically analyse the Keynesian system and formulate their own hypothesis. The result was the emergence of the New Classical school of thought, Real Business Cycle theory which is already studied in the previous unit and supply-side economics.

Keywords

Adaptive Expectation, Rational Expectations, Signal Extraction Problem, Intertemporal Substitution, Sacrifice Ratio, Laffer Curve

Discussion

4.1.1 New Classical Economics

New classical economics emerged as a reaction to the failure of Keynesian economics to find a solution to the problem of stagflation that emerged during the 1970s. It was originally Milton Friedman who started his monetarist counter revolution against Keynes in the 1960s, but later Robert Lucas and other Economists who became popularly known as New Classical economics came up with an argument against Keynes and the Keynesians that they had failed to explore the full implications of endogenously formed expectations on the behaviour of economic agents. The subject matter of New Classical economics can be understood using the three main tenets viz. Rational expectation hypothesis, Continuous market clearing, and Lucas aggregate supply Hypothesis. The Rational Expectation hypothesis is explained in the following section.

4.1.1.1 Rational Expectation Hypothesis

- Adaptive Expectation means use of past value to forecast future value

Expectations play a very important role in economic analysis to forecast the future values of variables such as inflation, unemployment etc. that influence demand and supply decisions. The methodology followed by the economists to predict future values are adaptive expectations and Rational Expectations. According to adaptive expectation, the economic agents predict the future value of a variable based on the past values only. The Adaptive Expectation hypothesis came under serious attack because it considers only lagged variables or the past values to predict the future value. This form of backward looking analysis which ignores all other information available may lead to systematic error. In addition to this, adaptive expectation has a possibility to repeat the past errors that are already included in the past values. Besides this, another problem with the past value is that it will take a specific period for the variable in consideration to become stable. If the variable under consideration is proved unstable overtime, the expectations and prediction of future values may go wrong. Adaptive Expectations were replaced by rational expectations in the 1970s.

The Rational Expectation hypothesis (or RATEX hypothesis or REH) was put forward by John Muth, in his seminal paper published in 1961. According to him, people formulate expectations and make decisions based on the information available to them. This expectation is informed information about the events that occur in future. For example, in the gold market, people make use of information available to them like, the price of gold, global events like war or economical issues, or political tensions to demand gold. If people see the price of gold rising, they may form the expectation that it will continue to increase and become more expensive in the near future, leading to higher demand for gold. Similarly in the labour market, workers compare the current wage rate of all the firms, examine the inflation rate and use it to negotiate wages. Expectations are subjective and can influence both demand and supply decisions.

- Rational Expectations means People fully utilise all the available information to them to predict future value

Over the years rational expectations have undergone several transformations, one of which is the distinction between a weak and a strong version of Rational Expectation hypothesis. According to the weak version, people maximise utility, by making full utilisation of all the information available to them in public and formulate expectations based on that. For example, if the Central Bank implements an expansionary monetary expansion that increases the money supply, the rational agents will make the best use of all information available to them to make inflation expectations in future. In a strong version of Rational Expectation, subjective expectations are transformed into objective mathematical models. The future expectations can be algebraically calculated using this method.

- Weak version, means people use of all publically available information to maximise utility
- Strong version uses mathematical models and it means the expectations of the agents coincide with the true model of the economy $\dot{P}_t^e = \dot{P}_t + \varepsilon_t$

$$\mathbf{P_t^e = E(\dot{P}_t / \Omega_{t-1})} \qquad \textbf{(eq 4.1.1)}$$

where $\dot{P}_t$ is the actual rate of inflation, Ω_{t-1}, **is** the information available up to the previous period, $E(\dot{P}_t / \Omega_{t-1})$ is the rational expectation of the rate of inflation in the previous time period. It may be noted that the predictions made by the rational agent may not always be accurate and are prone to errors. Therefore the strong version of the Rational Expectation hypothesis can be rewritten as

$$\mathbf{\dot{P}_t^e = \dot{P}_t + \varepsilon_t} \qquad \textbf{(eq 4.1.2)}$$

Where $\dot{P}^e_t$ is expected rate of inflation from time period t to t+1, $\dot{P}_t$ is actual rate of information and ε_t is error term.

Although there are several positives, rational expectations are not free from criticism. One of the major criticisms of Rational Expectations theory is that obtaining all publicly available information can be costly and expensive. Another important criticism regarding this model is the accessibility and credibility of information available to agents in decentralised markets. There is a possibility of making systematic errors in the expectations. The Rational Expectation hypothesis is also criticised in the context of uncertainty and risk involved in the real life scenario. As per the Post Keynesian critics, historical events are not repetitive and unique, and therefore it is not possible to attain accurate results. The Rational Expectation is considered to be useless in an uncertain world.

4.1.1.2 Continuous Market Clearing

The second feature of the New Classical model is the Continuous Clearing of the Market. According to this assumption, the demand and supply always intersect with each other and are in equilibrium. As per this feature, both the product market and labour market clear instantaneously in both the long run as well as short run. The markets exhibit a perfectly competitive market structure where there is a perfect flow of information and the variables self adjust instantaneously to clear the market in both the short run and long run. As the market is assumed to be a perfectly competitive market, the firms are price takers, and accept the price fixed by the market. It is also noted that since perfect competition prevails, there are no market externalities or asymmetric information. We know that market externalities are the effect of one's production and consumption on the other. This can lead to market failure. Similarly, the asymmetric information which means that one part has more information than the other, also creates a situation which fails to clear the market.

4.1.1.3 The Lucas Supply Curve

Lucas aggreagate supply curve in the New Classical model is two ways, first is the rational decision taken by workers and firms reflect the optimising behaviour and secondly, the supply of labour by workers and output by the firms is based on relative prices. The first case can be explained with the help of an illustration. Let us consider that Mr. Lucas, who is working in a factory is getting a real wage of Rs 25,000. He gathers all the available information and understands that his expected average real wage will be Rs 35,000 in future. Now he will tend to choose leisure at present in the form of taking leave, going for a movie or a vacation and working in the future when the wage is as high as Rs 35,000. On the contrary, if he finds out from all the publically available information that, his expected average real wage is going to reduce in future, he will choose to work hard in the current period. This means that the labour compares the current real wage with their notion of normal wage (the expected average real wage). If the former is higher than the latter, they will prefer work for leisure in future and vice versa. In other words, workers will substitute current leisure for future leisure or work more in the current period and less in future. This idea is called as inter temporal substitution.

- When current real wage is greater than future real wage, workers prefer work over leisure and vice versa

Lucas aggregate supply hypothesis also studies the behaviour of the firm. Let us consider an example. Assume that there is a firm which is producing cookies. The firm expects the inflation to be 10%, however, if the individual prices increase by 12 %, the producers consider that the relative price has increased and hence the firm decides to increase the production of cookies. Here, the general price level has increased (12%) more than what the firm expected (10%) and a firm is fooled into thinking that the relative price has increased and they increase production. This is the idea of misconceptions theory or Lucas Surprise model.

As per this problem whenever there is a general increase in price level, firms will be 'surprised' to notice a rise in the price of their product. Here, it should be noticed that firms have information only regarding their own price level and not about other firms. Hence when the general price level is higher than the expected price level, the firms will mistakenly assume that the relative price of their own good has risen. The firms at this juncture, fail to receive market signals and the signals will be available only with a time lag. This signal extraction problem will lead the firm to increase the production of its commodity inorder to increase profit. This will reduce unemployment temporarily for a short period of time.

- Signal Extraction problem is when firm fails to extract signals from the market

Similar to this situation, when there is a general increase in price, the labourers may also compare their real wages to the inflation level and ask for more wages. This may lead to an upward revision of wages. But it should be noted that the wages adjust at a slower rate than the price level. The labour market situation is explained with the help of aggregate demand and aggregate supply. In figure 4.1.1, the X axis shows the level of Employment, Y axis shows the real wage rate. AD and AD_1 are aggregate demand curve, SRAS and $SRAS_1$ show short run aggregate supply curves, LRAS represents long run aggregate supply curve. The initial equilibrium point is at A where short run Aggregate Supply Curve, SRAS and Aggregate demand, AD intersects. W/P, W/P_1, and W/P_2 are the real wage rates. The real wage is W/P this fully anticipated or predicted by the labour. At W/P wage rate, OL labourers are employed.

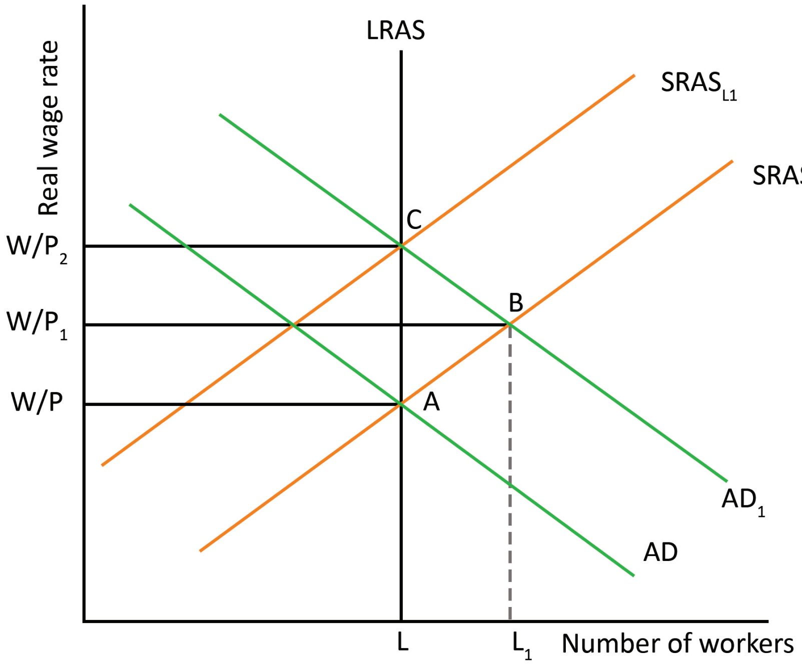

Fig 4.1.1 Labour Market Situation

- Expansionary monetary policy increases money supply

Let us assume that monetary authority, announces an expansionary monetary policy through which they increase the money supply. Here, there are two situations i. An anticpated monetary policy and ii. An unanticipated monetary policy. First, let us consider anticipatory monetary policy.

i. Anticipated Monetary Policy

When there is an expansion of the money supply, financial institutions like banks and credit facilitating institutions will increase the credit facilities. This money is used by firms and other institutions to increase investment. Therefore the aggregate demand increases, this increase in aggregate demand is illustrated in the figure through a shift in the aggregate demand curve the right side. This will increase the price level to $P_{1.}$ If this increase in money supply is fully anticipated, the people will rightly predict the expected price level as P_1. As the price increases, the labourers may mistake the general increase in price level as their own relative increase in price level and they bargain for a higher real wage. As a result of this, the real wages will increase from W/P to $W/P_{1.}$ The firm will raise real wages to W/P_2 by reducing the employment OL. The economy moves from point A to C. There is no change in the employment rate and it is on the long run Aggregate supply curve LRAS.

- Anticipated monetary policy has no effect on unemployment

ii. Unanticpated Monetary policy

When there is an unanticipated increase in money supply, there will be an expansion of credit and investment will increase. This will shift the demand curve to the right from AD to $AD_{1,}$ the general price will increase to P_1. But the firms will mistake the overall increase in the price level as their relative increase in the price level, or they may think that the price of their products only has risen. The new equilibrium is at point B where the AD curve intersects $SRAS_{L}$. Here the employment rises from OL to OL_1 and the wage rate rises from W/P toW/P_1.

- Unanticipated increase in money supply affects employment level

4.1.1.4 Policy Prescriptions

The New Classical school of thought has many policy implications. This is described in this section.

i. Policy Ineffective Proposition and Impotent Monetary Policy

It is discussed in the earlier section that the anticipated policy will have no effect on output and employment. When a monetary authority implements an expansionary monetary policy by increasing money supply, if the increase in money supply is fully anticipated, firms will recongnise that the general price level in the economy has increased and not their relative price level. Therefore, they will not increase the output and employment rather they adjust wages and maintain output at the same level. However, when a policy is unanticipated, an increase in money supply will lead to an increase in the general price level, which the firms mistake as the increase in price of their own product. Therefore they employ more workers

- Only unanticipated monetary policy is effective and produce more output. This implies that only unanticipated growth in the money supply is effective, while anticipatory growth in the money supply has no significant effect. It is also added that rational agents form expectations based on the information available to them. But they form expectations only if the policy is credible. The works of Barro published in 1977 and 1978 support the proposition of policy ineffectiveness. Barro studied the anticipated and unanticipated money growth in the US economy over a period of 1941-76 and learned that unanticpated money growth has a significant effect on output and employment while anticipated money growth has no real effect. Mishkin and Gordon conducted their study in 1982 and found that both unanticipated and anticipated monetary policy affect output and employment.

ii. Real Cost of Disinflation

When a monetary authority of a country formulates a disinflation policy or a policy to reduce inflation, there is a cost that is involved. This cost of output lost in the economy creates is called the sacrifice ratio which is measured as a percentage of GDP lost. The studies show that for every 1 per cent of the reduction in inflation, 5 per cent of GDP must be sacrificed. This is the sacrifice ratio. As per the Keynesians, the sacrifice ratios will be larger even if the economic agents form rational expectations. The deflationary policy can lead to hysteresis or long term unemployment. Keynesians therefore prescribed income policies for stabilising prices. Contrary to this approach, the new classical economists argued for an unanticipated monetary policy to stabilise the price. As discussed in the earlier section, New Classicals argue that a credible policy is the only effective way to curb inflation.

- Sacrifice ratio means for every 1 per cent of reduction in inflation 5 per cent of GDP must be sacrificed

iii. Dynamic Time Inconsistency

Policy making is an important job that must be undertaken after a series of discussions and deliberations. A policy is formulated by first fixing and specifying the targets and goals that are to be achieved. Then, the government will publish a series of instructions which are to be followed to achieve these targets. Lastly, economic agents should follow an economic model to set the policy instruments to achieve the optimal values. However, in the economy, there are some intelligent economic agents who accurately make predictions of future values which will fail the policy to derive the desired results. As per Kydland and Prescott, there is a game involved between the monetary authorities and the economic agents to achieve the desired results. Let us explain this with the help of an example. Suppose the monetary authority announces to pursue a zero inflation policy. In response, agents will lower their inflation expectations. However, after that, the authorities could deceive the agents by increasing the inflation rate. Then it becomes time inconsistent. Therefore, here the government move from the previously announced policy, due to which output and employment rise for a short period of time. Here the government is not consistent with its behaviour, there is an inconsistency in the policy announced and implemented. This difference between ex-ante and ex-post policy is called time inconsistency.

- Dynamic time inconsistency is the tendency of government to move from previously announced policy

iv. Microeconomic Policies to Increase Aggregate Supply

Policymakers, inorder to increase output and reduce unemployment, should adopt microeconomic policies to increase aggregate supply. The policymakers, intend to keep inflation low and stable at the same time maintaining a low unemployment level. As per the New Classical economists, the market is continuously clear and the unemployment that exists is voluntary unemployment, in which people choose to remain unemployed at the current wage rate. Therefore, an appropriate policy measure is to attain an increase in output and reduction in unemployment by providing incentives to the firms and workers so that the firm supplies more output and workers supply more labour. These reforms are proposed by Lucas. Let us consider the example of Mr. Robert who compares the current and future real wages. It is assumed that the market continuously clear, therefore anybody who wants to find work will find work. If the worker, says Mr. Robert chooses to remain unemployed, it is because he finds the current real wage less than the future real wage. This can be avoided by incentivising Mr. Robert with bonuses for festivals. Overtime charges, paid leave etc which facilitates him to supply more of his labour. This will increase the firm's output.

- To increase output and reduce unemployment, policymakers should adopt microeconomic policies that increase Aggregate Supply

v. Lucas Critique

Robert Lucas criticised, the use of macroeconomic variables while formulating and evaluating macroeconomic policy. According to him, constructing a macroeconomic model is not a feasible option as the parameters may not remain the same. It may change because the rational agents may behave randomly and adjust to their new ecosystem. Expectations form a major part of the economy. When policy changes expectations also change and the rational agents will adjust their economic decisions based on this change in policy. It is also assumed that if the government keep on changing policies, there comes a stage where the rational agents rightly predict the policy and the agents can't be fooled again. At this point, the policy implemented by the government becomes ineffective and therefore constructing a macroeconomic model is not a feasible option.

The new classical school of thought and its policy prescriptions which emerged as a result of the Keynesian crisis continue to dominate the policy making sphere even in the present economic condition. President George W. Bush, President Barack Obama and even President Donald Trump of the United States of America have applied Supply-Side policies to combat inflation and unemployment.

4.1.2 Supply-Side Economics

The classical economists in the 19^{th} and 20^{th} centuries did not give much importance to the supply-side effects of income taxes. During this time time, marginal income taxes were considerably low and limited to only high income groups. The income tax during 1920 was only percent as only 15 percent of the US households were brought under the tax bracket. However, since the Second World War more US households had high incomes and were brought under the income tax. The social security payments such as Medicare came into effect, which necessitated the rise in tax rates. In addition to this, political events such as the Yom-Kippur War among Egypt, Syria, and Israel along with the support of Arab countries which were prominent members of the Oil and Petroleum Exporting Countries (OPEC) and the Iranian Revolution of 1979 resulted in a significant reduction in Oil supply and subsequent crisis. During this phase of a crisis, the Keynesian policies found it difficult to manage the stagflation. This led to the emergence of schools of thought that prescribed Supply-Side management as the panacea for the economic crisis. It comprises a body of theories contributed by economists Arthur Laffer, Robert Mundell, Martin Feldstein, Bruce Barlett, and Norman B. Ture. Economists such as Robert Mundell of Columbia University and Arthur B. Laffer, then at the University of Southern California, had popularised the idea that tax cuts would have strongly favourable supply-side effects. Following the lines of supply-side, then Representative Jack Kemp and Senator William Roth introduced a bill in 1977 which intended to cut the tax rate by 10 percent. Ronald Reagan, the President of the United States of America from 1981-1989, endorsed the Kemp–Roth proposal, and in 1981 the Reagan–Kemp–Roth tax bill, calling for a 23 percent tax cut. The lowest overall tax rates occurred in 2002–08 following the tax cuts during the presidency of George W. Bush. It can be viewed that the Supply-Side policies have been especially influential among Republicans in the U.S. House of Representatives.

- Supply-Side economists focus on Supply-Side management

Supply-Side policies consist of elements of classical views such as the faith in free enterprises, the real variable being the prime determinant of output and adhering to a classical view of the saving-investment process, in which the interest rate is the crucial variable.

4.1.2.1 Features of Supply-Side Economics

Let us consider an economy where a food processing industry operates, here the business enterprise is the major player. If the entrepreneur of this industry, Mr. Bruce, is given adequate incentives in the form of cheap loans and raw materials at subsidised rates, he will have surplus financial resources which can be invested or used for conducting Research and Development. Besides these incentives, the government follows a policy of deregulation and does not intervene in the activities of the company. This will give the industry the autonomy to explore new areas like developing a new experimental product, exploring a new raw material source or enhancing the creative freedom to follow a new recipe. This will eventually increase output and employment. This is the major notion of supply-side economists. They considered producers, entrepreneurs, investors etc. as the most significant economic agents and opined that incentivising these players will produce desirable effects upon output and employment.

- Supply-Side policy initiated significant deregulation and reduction in taxes such as Capital gain tax to encourage the investment in Capital assets

This shift in policy took place in the late 1970s with significant deregulation in the transport industry and a reduction in capital gain tax. The reduction in capital gain tax is intended to encourage the investment in capital assets. Likewise, partial taxation on employment compensation was also imposed. Later a tax bill was enacted in the US in the year 1981 which introduced several tax reforms. The emphasis of tax legislation was given to encourage work save and invest. The US President Ronald Reagan followed an anti-inflationary policy and later there was a steep fall in inflation rates in 1980 and 1982 which resulted in the reduction of corporate tax rates.

It also maintained that there should be minimal intervention or a policy of deregulation that must be followed by the governing body. Only then, according to the theorists, provide a wider scope for the producers to explore new areas. In addition to this, they also propounded policies that maintain inflation at a lower level which will eventually lead to increased output and full employment level of equilibrium. They believed that whenever there is an excess of demand or supply or any other kind of disequilibrium, the economic forces, with the help of the invisible hand self adjust to maintain equilibrium.

Let us consider the food processing company mentioned earlier and its owner Bruce, its employee/manager, Martin and an investor Arthur. Assume that the monetary authority has imposed a tax cut which has increased the disposable income. Disposable income is the money income left with the taxpayer after the payment of taxes. Now since taxes have been reduced all the three individuals mentioned will reap the benefit of additional disposable income. The employee/manager Mr. Martin who earlier paid Rs 10,000 as tax now has to pay only Rs 4000. He has an addition Rs. 6000 at his disposal which he can use for additional consumption savings or investment. The surplus income may also inspire Mr. Martin to work more. Now owner of the company Mr. Bruce, will also benefit from a tax cut. With a reduction in corporate taxes, he needs to pay only Rs, 35,000 as tax as opposed to Rs. 1,00,000 paid earlier. He gets to use this additional income either in consumption or as an investment in his own company to expand his business. Lastly, in the case of Mr. Arthur, who is an investor, who used to pay taxes equal to Rs. 65,000. With a capital gain tax cut he needs to pay 15,000 as tax so that he can reinvest this money or use it for an additional consumption. The increase in consumption and investment goods by all three people will lead to an overall increase in the output and employment in the economy. This was a major policy prescription by Supply-Side Economists.

- Tax cuts will increase the desire to work, save, invest, and consume

The policy shifts which involved the deregulation of the transport industry and reduction in taxes such as capital gain taxes facilitated saving and investment which increased real income and improved the standard of living. The new Supply-Siders projected rapid growth, increase in tax revenue rise in saving and a relatively easy reduction in inflation. As per the new supply-side economists, a tax cut did not lead to a budget deficit and did not reduce the investment. It is also claimed that the tax cut would encourage the workers to supply their labour and would result in increased output. The resultant rise in nominal demand will be met by the increase in the supply of goods and services will be absorbed by the increase in nominal demand. However, it is noted that favourable effects became noticeable after a considerable amount of time period.

- Tax cuts are a major policy prescription

4.1.2.2 Prepositions of Supply-Side Economists

Major propositions of Supply-Side economists by considering classical roots are the following

- Output growth is predominantly determined by supply factors
- The rate of growth of capital input is determined primarily by incentives for saving and investment. The incentives are the after-tax returns to saving and investment.
- Growth in labour input is affected by incentives, here the changes in the after-tax real wage is the incentive.
- Excessive government regulation of business leads to economic slowdown

i. Importance of Supply-Side Determinants

According to supply-side economists, economic growth depends upon supply factors in the long run. This agrees with the classical economists view that the supply factors are predominant in the short run. This is illustrated in the figure 4.1.2

In the figure, output is depicted on the X axis and price is shown on the Y axis, Y_0^S, Y_1^S and Y_2^S are the supply schedules, and Y_0^d, Y_1^d and Y_2^d are the demand schedules. As the supply factors or technological factors improve the supply curves shift to the right from Y_0^S to Y_1^S and Y_2^S, and the output shifts from Y_0 to Y_1 and Y_2. If the demand remains unchanged at, Y_0^d the price will fall from P_0, to P_1 and P_2. However if the demand changes, due to an increase in the quantity of money, the price remains the same at P_0. In either case, output is determined by supply factors.

- Output growth is predominantly determined by supply factors

It should be noted that most supply-side economists recognise the role played by the demand in the short-run determination of income. Therefore they prescribed a policy to increase demand sufficiently to avoid any deflationary pressures. Yet, the supply-side economists gave due importance to supply-side factors in determining output.

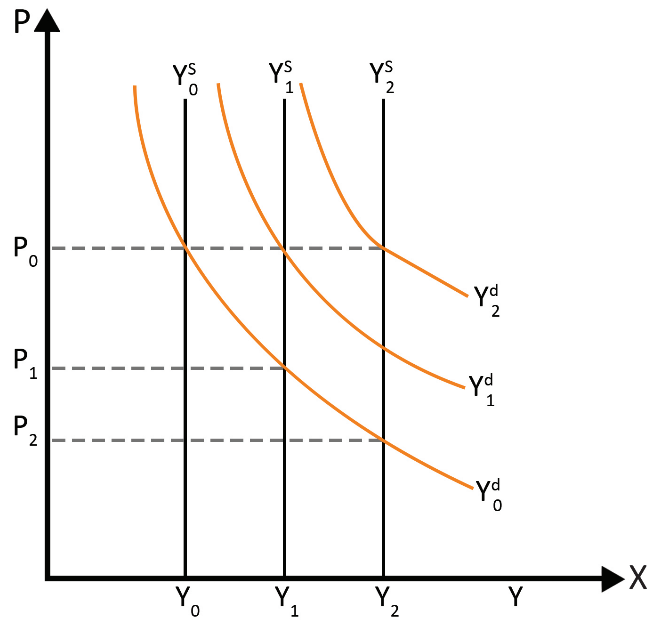

Fig 4.1.2 Supply Side Determinants and Growth in Classical System

ii. Saving and Investment and after-Tax Rates of Return

Supply-side economics consider the after-tax rate of return on investment as a major determinant of investment and capital formation. The equilibrium (real) interest rate is determined by the intersection of the saving and investment schedules. Consider figure 4.1.3 where the saving function is $S\,t_0^{wh}$ and S_{t1}^{wh} which indicates that Saving depends upon tax for income and wealth. Likewise, Investment functions $I\,(cp_{t0}^{cp})$ and $I\,(cp_{t1}^{cp})$ depend upon the corporate profit (cp).

Consider a situation when the economy is facing inflation. This will increase the corporate tax which discourages the investment in capital assets. This reduction in investment is indicated by a leftward shift in the Investment function from $I\,(cp_{t0}^{cp})$ to $I\,(cp_{t1}^{cp})$. Likewise, an inflation-induced tax will reduce saving from $S\,t_0^{wh}$ to S_{t1}^{wh}. A corporate tax cut acts as an incentive for firms to expand their existing business and

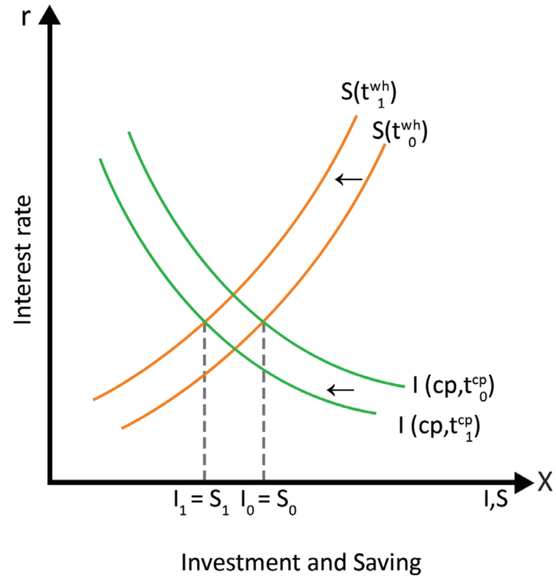

Figure 4.1.3 Investment and Saving Response to After-tax

initiate new business ventures through investment and capital accumulation.

iii. **Labour Supply and the after-Tax Real Wage Response**

Supply-Side economists argue that workers are responsive to real wages. When the taxes are imposed there arises a wedge between the income earned by the taxpayer and the income after deducting tax rates. When tax rates are reduced, the wedge is reduced and this will in turn increase the desire to work.

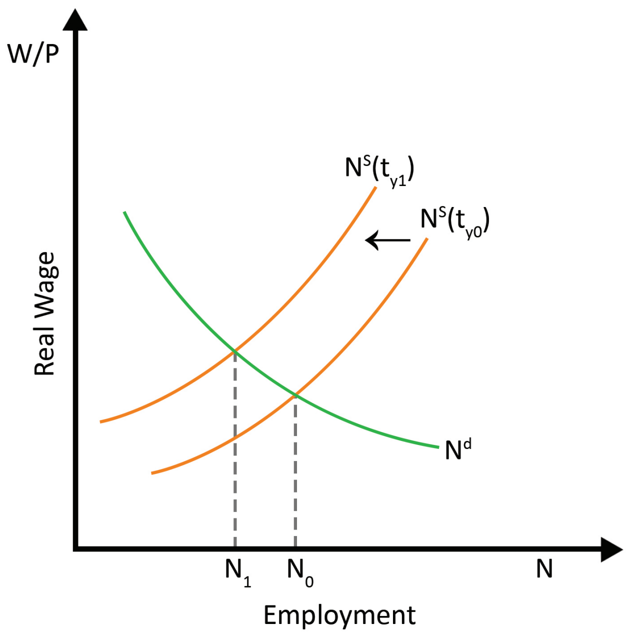

Fig 4.1.4 Effects of Taxes on Labour Supply

Similarly, the employers who also enjoy the tax deduction will be able to employ more workers. The tax will also provide certain surplus income which is further used for additional consumption, saving and investment. Consider figure 4.1.4, X-axis represents employment and Y-axis represents real wages.

The Supply-Side policies are intended to reduce the size of wedge. It proposes, Tax deductions of various forms such as, Reduction in Income tax, Corporate tax, Capital Gain tax etc. Besides the policy also include incentivising producers to encourage, production, ouput and employment. Initially assume that the tax rate is zero, then the labour supply is $N^s(t_{y0})$ which intersects labour demand curve N^d. At this equilibrium, N^0 labourers are employed and the real wage rate paid by the employer is $\frac{W}{P}$.

When a tax is imposed, the wage inclusive of tax rate is t_y multiplied by $\frac{W}{P}$, i.e., $t_y \times \frac{W}{P}$ where t_y is tax rate. An increase in tax rate from t_{y0} to t_{y1} will reduce the desire to work and as a result labour supply curve will shift left to $N^S(t_{y1})$ and employment declines to N_1. As the wedge between the income earned by the tax payer and the income after deducting tax rates increases, the desire to work decreases. The wedge between the income earned by the tax payer and the income after deducting tax rates can be calculated using the following equation.

$$\text{Tax wedge} = \frac{W}{P} - \left(t_y \times \frac{W}{P}\right)$$

- An Income tax cut will increase the desire to work, save and invest

The tax wedge is therefore the difference between the wage paid by the employer, $\frac{W}{P}$, and the wage received by the worker inclusive of tax rate. Therefore an income tax cut incorporated through a supply side policy will increase the desire to work, save and invest which means that when people has to pay less taxes, they will be left with more disposable income which can be used for consumption. In addition to this surplus income can also be channelised to make profitable investments. The income tax cut that that facilitates an increase in aggregate consumption and investment will in turn increase the desire to work of the people and their productivity.

iv. Government Regulation and Capital Formation

Supply-side economists argue that government regulation of business will slow down the economic growth. The increase in government regulation such as the laws on pollution control, protection of workers, social security measures etc. increases production costs. In addition to the increased production costs, it will retard the capital formation. The Supply-siders considered producers, entrepreneurs, investors etc. as the most significant economic agents and opined that incentivising these players will produce desirable effects upon output and employment. It also maintained that there should be minimal intervention or a policy of deregulation that must be followed by the governing body. Only then, according to the theorists, provide a wider scope for the producers to explore new areas.

- There should be minimal intervention or a policy of deregulation followed by the governing body

4.1.2.3 Policy Prescriptions

Laffer Curve

This was one of the major Supply-Side theories and policy prescriptions popularised by Arthur B. Laffer. This is called the Laffer Curve, named after Arthur B. Laffer, which shows the relationship between tax rate and tax revenue.

Let us suppose that the government levies 0 % tax or no tax. This will have a positive impact on the workers and the desire to work, save and invest will increase, whereas tax revenue will be zero. When the government imposes tax say 2 %, the tax revenue will increase. If the government goes on increasing the tax rate, the tax revenue received from the subsequent taxes goes on increasing. This process may continue up to a certain point when at a particular tax rate say 20 % tax where government revenue is maximum. The tax rate at which tax revenue is maximum is called as optimum tax. At this point, people may not necessarily save and invest but pay taxes without evading them.

- At tax rate ‘0%’ and ‘100%’ no tax revenue earned

However, after this point, if the government further increases the tax rate, people may stop working and start shirking their jobs and a few others may evade paying taxes so that government revenue starts falling. If the government continue this and impose 100% tax, there will be massive evasion of tax on the part of taxpayers and the government revenue will become 0. Laffer Curve is drawn in figure 4.1.5.

The laffer curve has a dome-like shape or an inverted U shape.

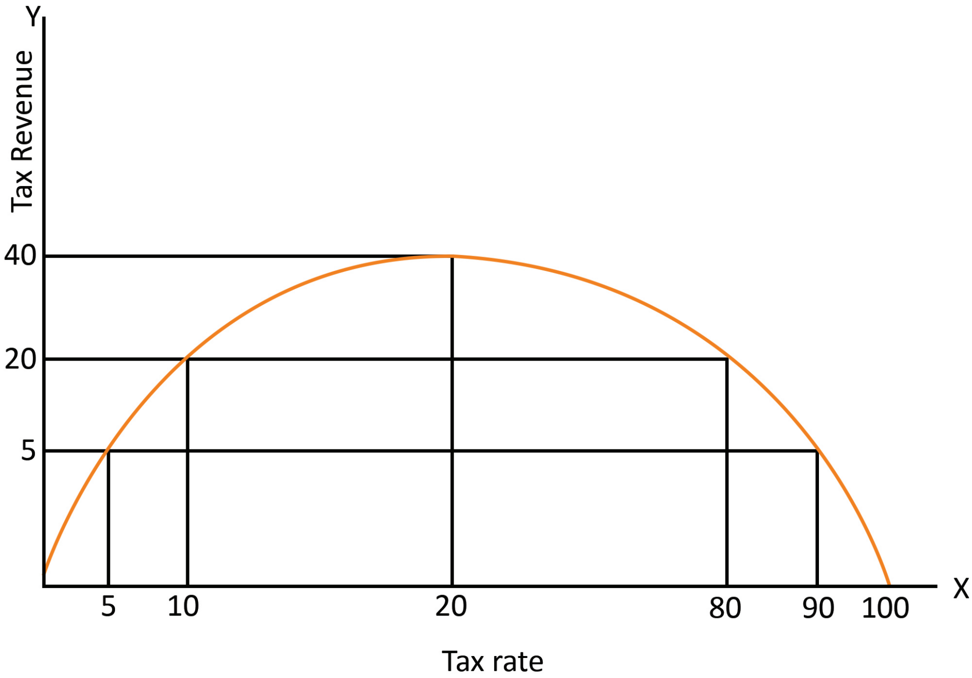

Fig 4.1.5 Laffer Curve

- Optimum tax is the tax rate at which tax revenue is maximum

The X axis shows tax rate and the Y axis shows tax revenue. When the tax rate is 0 tax revenue is also 0, but when the government increases tax rate increases to 5%, tax revenue increases to 5 when it increases to 10%, the tax revenue increases to 20. However, when the tax rate is 20% then tax revenue becomes maximum. This tax rate at which tax revenue is maximum is called Optimum tax. After the optimum tax rate, the tax revenue starts falling, the tax revenue falls to 20 when the tax rate is 80%. It should be noted here the tax revenue is the same for two tax rates. i.e. for tax rates of 10% and 80%, tax revenue is the same. Similarly, for tax rates of 0% and 100%, tax revenue is zero.

i. Contractionary Fiscal Policy and Restrained Monetary Policy

- Contractionary fiscal policy and restrained monetary policy is recommended

Supply-side economists have recommended a contractionary fiscal policy which includes not only a reduction in taxation but also a reduction in government expenditure which is in contradiction to the Keynesian recommendation to budget monetisation. However it is based on the condition that the reduction in government expenditure must be greater than or should be equal to the tax cuts, so there will be surplus income to finance larger investments that will eventually lead to an increase in output and employment. Besides this the supply-side economists, also restrained the monetary in the economy to keep check on inflation.

ii. Non-intervention, Deregulation and Privatisation

- Non-intervention, deregulation and free goods and capital movements are recommended

The Supply side recommended a policy of deregulation and non-intervention policy of the government. The government does not interfere in the functioning of the economy and also reduces its spending. This will lead to a reduction in welfare benefits such as unemployment benefits which encourage workers to work even at lower wages. In addition to this, the Supply-Siders recommend that the public sector companies, it will pave the way for private sector companies to increase efficiency, productivity etc. In addition to this, the intervention of the trade union is also restricted through legislation. The trade unions usually recommend a rise in wages, but since the trade union intervention is limited, inflation and unemployment will be under control. There is also free capital movement and goods movement and there are no restrictions.

Summarised Overview

New Classical Economics emerged as a reaction to the failure of Keynesian Economics to find a solution to the problem of stagflation that emerged during the 1970s. There are mainly three tenets of New Classical economics viz, rational expectation hypothesis, continuous market clearing and lucas aggregate supply hypothesis. The Rational Expectation hypothesis (or RATEX hypothesis or REH) put forward by John Muth can be both weak and strong. The main idea behind the weak version of the hypothesis is that in forming forecasts or expectations about the "future value of variable, rational economic agents will make the best (most efficient) use of all publicly available information about the factors which they believe determine that variable." In other words, expectations are assumed to be formed 'rationally' in line with utility-maximising behaviour on the part of individual economic agents. For example, if economic agents believe that the rate of inflation is determined by the rate of monetary expansion, they will make the best use of all publicly available information on rates of monetary expansion in forming their expectations of future rates of inflation. The second feature of the New Classical model is the continuous clearing of the market. According to this assumption, the demand and supply always intersect with each other and are in equilibrium. As per this feature, both the product market and labour market clear instantaneously in both the long run as well as short run. Lucas aggreagate supply curve in the New Classical model is of two ways, first is the rational decision taken by workers and firms reflect the optimising behaviour and second, the supply of labour by workers and output by the firms is based on relative prices. The rational decision taken by the workers is explained with the help of a concept called intertemporal substitution of labour according to which, labour uses all the publically available information about his real wage and if he finds that his current real wage is higher than future real wage, he will substitute work for leisure. Likewise, the signal extraction problem is another concept explained in the aggregate supply hypothesis. According to this, whenever there is a general increase in the price level, firms will be 'surprised' to notice a rise in the price of their product and will mistakenly assume that the relative price of their goods has risen. The firms will fail to receive market signals and will be available only with a time lag. This signal extraction will lead the firm to increase the production of its commodity in order to increase profit. This will reduce unemployment temporarily for a short period of time. It's assumed in the New Classical model that only unanticipated monetary policy is effective. It describes the cost of reducing inflation called the sacrifice ratio which is the cost of output lost that the economy creates, measured as a percentage of GDP lost. It describes dynamic time inconsistency which is the tendency of the government to cheat on previously announced policy. Besides this the chapter also explains a school of thought, called the supply-side economist which focuses on supply-side management of the economy and carries the essence of Classical and New Classical doctrines. According to the Supply-siders, the tax cut has a miraculous effect on the economy. An income tax cut will increase the desire to work, save and invest which means that when people have to pay less taxes, they will be left with more disposable income which can be used for consumption. An important policy prescription is the Laffer Curve, which shows the relationship between tax rate and tax revenue. It also recommends non-intervention deregulation and privatisation.

Self Assessments

1. What are the major features of the New School of thought ?
2. Explain the policy's ineffective preposition in New Classical school.
3. What are the policy prescriptions given by the New Classical school?
4. What are the features of Supply-Side Economics?
5. Explain the real-life application of Supply-Side policies.

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UNIT 2
New Keynesian Economics

Learning Outcomes

After completing this unit, learner will be able to:

- apply the New Keynesian principles in the modern world
- undertand the difference between Keynesian and New Keynesian schools of thought
- comprehend the nominal price and wage rigidity with the help of real life examples

Background

In the previous Unit 1 of Block 4 we discussed how the Keynesian system was replaced by a New School of thought and other schools such as Real Business Cycle theory and Supply-Side School of thought. They believed in a full employment economy and a free market economy with a flexible wage and price that continuously clear in the short run and long run. However, these theories could not explain the existence of involuntary unemployment and this paved way for the resurgence of Keynesian economics in the form of a new school of thought known as the New Keynesian School. As we know Keynesian theory focuses on the demand side management of the economy and emphasises the role of government in the management of macroeconomic problems. It also assumes that wages and prices are rigid or sticky and the system is not self-adjusting. The equilibrium in the system can be achieved only through the fine-tuning of the economy with appropriate fiscal and monetary policy. It should also be noted that the Classical and Keynesian systems assumed a perfectly competitive market. The New Keynesian School carried the essence of Keynesian Economics and incorporated the necessary elements that are relevant in the contemporary world, to substantiate the Keynesian theory. This unit explains wage rigidity using wage contracts and staggered wage contracts theory and explains price rigidity using menu costs theory.

Keywords

Imperfect Competition, Wage Rigidity, Wage Contracts, Menu Price

Discussion

4.2.1 New Keynesian

Macroeconomics is the study of the economy as a whole and is concerned with the structural dynamism among various institutions, trends and patterns of economic indicators on the performance of economic indicators such as economic growth, employment, inflation etc. Macroeconomic theories seek to understand the macroeconomic problems, identify the variables that cause fluctuations in the smooth economic activity and prescribe policy instruments for the same to achieve macroeconomic goals. In particular, there existed several macroeconomic schools of thought that attempted to analyse the impact of variables and study the factors that determine growth. Based on the extent of the role played by major institutions on economic problems and the use of policy instruments to correct the instability, there were conflicts of opinion among the economists, as a result of which several schools of thought emerged.

- Classicals and Keynesians are the major schools of thought in economics

Major schools of thought in macroeconomics can be broadly divided into two viz, Classicals and Keynesians. The Classical school led by Adam Smith encouraged the invisible hand in the market and followed a Laissez Faire Policy involving no government intervention. Keynesian economics recommended an active intervention by the government to increase the aggregate demand and mentioned the possibility of market failure. Despite the differences, there were several common ground among these schools of thought. For instance, both the Classical and Keynesian schools assumed a perfectly competitive economy and assumed a capitalist economy. Although Keynes was a defender of capitalism, he found inherent elements of instability in the capitalist system. This became more evident during the Great Depression of 1930s. The Capitalist system not only resulted in an inequitable distribution of income but also led to soaring unemployment. The elimination of involuntary unemployment and the expansion of aggregate demand required the application of

Keynesian ideologies and government intervention in the economy.

Keynesian economics and its policy instrument had its supremacy until the 1970s when the world experienced a period of stagflation and the Keynesian policies of wage and price adjustments failed to stabilise the economy. Keynesian system came under attack by the New Classical School of thought and the Monetraist School. Both schools of thought considered that active intervention was not needed to stabilise the economy. The New Classical criticised the fact that monetary policy had only short run real effects and could not be anticipated in the long run. They also suggested that the monetary policy will stabilise the economy only if the discretionary powers are taken away from the authorities and are implemented based on rules. In their view, Keynesian economics were beyond repair and had several problems such as

(i) inadequate microeconomic foundation regarding clearing of markets,

(ii) use of adaptive expectation rather than rational expectations which was inconsistent with maximising behaviour.

- New Keynesian school of thought Incorporated microeconomic foundations into macroeconomics

The works of Keynesian economists such as Gordon, Phelps and Blinder in the year 1980s contributed effectively to laying the theoretical foundations for the Keynesian tradition to make its resurgence by adapting to the monetarist influences. In the meantime, the New Classical School of thought were strongly criticised on the background of the existence of involuntary unemployment. The persistent unemployment in Europe and stagflation questioned the New Classical policy prescriptions, creating increasing credibility for the Keynesian theory. This revitalised a group called the New Keynesian School which although agreed with most of the propositions of 'Old Keynesians,'differed in several aspects. It recognised the importance of real-world imperfections and established a research programme to rectify the flaws in the 'Old Keynesian Model.' It is noticed that one of the major criticisms of New Classical school about Keynesian is that the Keynesian models lacked theoretical foundations and that economists must focus on the microeconomic foundations of the Keynesian models. As a response to this criticism, the New Keynesians incorporated microeconomic foundations into macroeconomic models and also explained the causes of price and wage rigidities.

4.2.1.1 Features of New Keynesian Economics

New Keynesian economists are a heterogeneous group of economists who have formulated theories on price and wage stickiness. Major New Keynesian economists are Gregory Mankiw, and Lawrence Summers of Harvard University, Bruce Greenwald, Edmund Phelps, and Joseph Stiglitz from Columbia University, Ben Bernanke from Princeton University. David Romer, George Akerlof, Janet Yellen from Berkeley, Robert Hall and John Taylor from Stanford University, Stanley Fischer, and Olivier Blanchard from Massachusetts Institute of Technology (MIT), and Assar Lindbeck from Stockholm. Laurence Ball from Johns Hopkins University and Dennis Snower from Birkbeck, University of London.

- New Keynesian theories assume an imperfectly competitive market and distinguish between nominal and real wage rigidities

The New Keynesians carry the essence of Keynesian ideologies yet rectify the limitations pointed out by the New Classicals and the Monetarists. The central difference between Keynesian economists is that they incorporate rational expectations and adopt a few monetarist elements. Likewise, it is noted that Keynesians were not concerned about the nominal demand shock but about the real demand shocks in the economy, whereas the New Keynesians considered both real and nominal demand shocks in the economy. The wage and price rigidity is explained by New Keynesians by using nominal and real wage rigidities. Nominal wages are the actual wages, 'w' received by the workers whereas real wages (w/p) are the current wages adjusted with the inflation rate or the prevailing price level. Therefore nominal wage rigidity explains those factors that prevent nominal wages from changing and real wage rigidity implies the factors that prevent real wages from changing and impart stickiness.

The New Keynesian model is an improvised version of Keynesian economics, as it is intended to rectify the theoretical flaws pointed out by the New Classicals and the Monetarists that the Keynesian models lack theoretical foundations. New Keynesians initiated several research programmes to rectify these flaws and incorporated microeconomic foundations into macroeconomic theories. They explain the price and wage rigidities in the light of an Imperfectly competitive market set in the background of asymmetric information, coordination failures that arise due to imperfect information, externalities and incomplete markets. This assumption of an imperfectly competitive market is a major deviation from the Keynesian School of thought which assumed perfect competition.

4.2.2 Imperfect Competition and Price Settings

- Products sold in Imperfectly competitive markets are less standardised and differentiated

New Keynesian Models operate in an imperfectly competitive market where there are more buyers than monopoly market structure, but fewer sellers than perfectly competitive market. The products in a competitive market are characterised by standardisation which means that the same standards and guidelines are followed in the production methodology of a commodity and the same product is sold everywhere so that one cannot distinguish between the product sold by each buyer. On the contrary, products in an imperfectly competitive market may be the same but are differentiated or there is less standardisation. In addition to this, there is imperfect knowledge about the labour market and product market and also the firm is a price setter. The perfectly competitive market consists of a large number of sellers who are Price takers, whereas each seller in an imperfectly competitive market has a small niche of regular customers who enable them with a certain degree of autonomy to set prices.

- In imperfectly competitive firms act as price setters

Along side this, the keen competition among sellers to capture the market and less standardised products make the firm act as price setters. Whenever there is a downward revision of price, these competitors will account for the additional costs involved in reducing the prices. If they find their profit lost less than the cost involved in changing the price, there is a downward revision of prices. On the other hand, if the profit lost is greater than the cost involved in changing the price, the nominal price remains unchanged.

4.2.3 Sticky Nominal Wages

According to the New Keynesian economists wages and prices are not flexible and adjust rather slowly to the change in the system. They have substantiated this argument with models that represent the real-world scenario. The entities such as firms and labourers are assumed to be rational, with firms trying to maximise their profit from their capital, and labourers maximising their utility from wages. The New Keynesian economists assume that the firm enters into a wage contract with the labourers so that the wages remain unchanged during

- The wage contract maintains the wage rate rigid

the period of the contract. For example, consider a firm which is intending to hire workers, but before recruiting them, the labourers sign a legal contract with the firm. The contract includes the period of the contract, the stipulated wages to be paid to the labourers during the period of the contract and the rules and regulations that are to be abided by them.

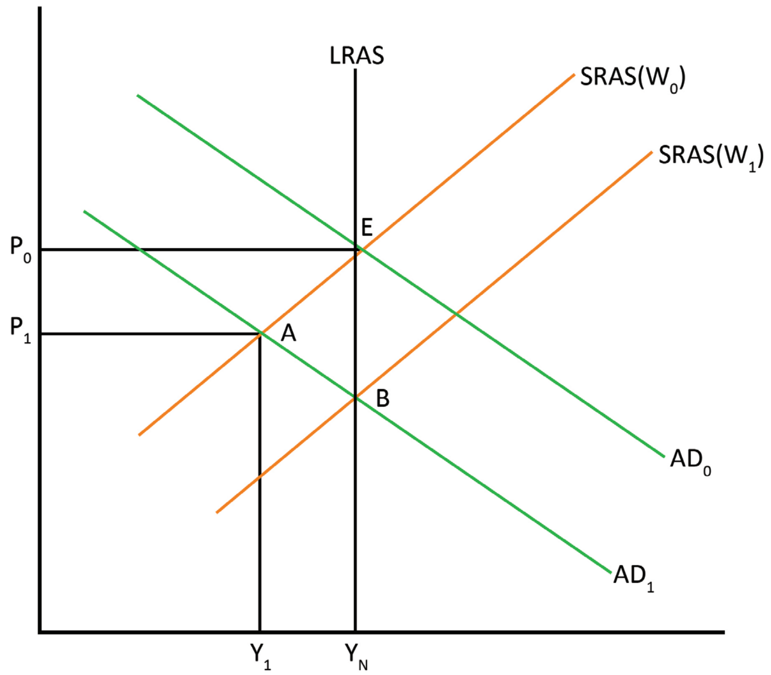

Fig 4.2.1 Nominal wage Contract model

In the above figure the economy is initially operating at point E where aggregate demand AD_0 and short run aggregate supply, SRAS (W_0) are at equilibrium. At E, OP_0 is the price level and W_0 is the wage rate. Let us assume that there is an unexpected reduction in demand or there is a demand shock. The demand shock can be both positive as well as negative. A positive demand shock is caused due to the factors that lead to an increase in demand. Likewise, negative demand shock results in a demand reduction. Let us assume that there is a negative demand shock and as a result, the demand falls. This is shown by a shift in the demand curve to the left from AD_0 to $AD_{1.}$ The prices quickly adjust to the change in demand and are relatively more flexible than wages. But the wages remain rigid due to the wage contract and the economy will reach A. At A price falls to P_1 due to a fall in demand, and output also falls from Y_N to Y_1. If the wages and prices were flexible, the aggregate supply curve would have shifted down to the right from SRAS (W_0) to SRAS (W_1) which would have brought the economy back to the natural level of output at B. However this is not possible as the wage contract will remain valid for a stipulated period of time and this also leads monetary authority to increase the money supply. This increase in money supply lead to an expansion of credit facilities at the bank, which enable the firms to increase investment thereby creating more employment opportunities. With an increase in employment, aggregate income rises and aggregate demand also rises. This increase in aggregate demand is shown by a shift in the aggregate demand curve to the right from AD_1 to AD_0 thereby restoring the initial equilibrium an E. It is observed from the illustration that it is the wage contract, that is responsible for keeping the wages rigid.

- Wages remain rigid during the period of contract

4.2.3.1 Wage Contract Theory

The wage contract is an important explanation of rigidity in nominal wages by the New Keynesians. It is one of the major attributes of the modern industrial economy. Let us take an example of a labourer, Paul who is newly recruited in the Tata industry and signs a legal contract with the company for a period of two years or more starting in June. The contract contains the details regarding wages to be paid and the rules to be followed by the labourer. Consider a change in the wage rate in the nearby Hyundai company where his friend, Richard is working. When Richard gets a pay hike, Paul may aspire to get a hike but is unable to do so, as his contract with his current wage is extending up to two years. It is only after two years that there is a possibility of a wage hike. His wage remains rigid till the contract period is exhausted.

- Wage rigidity is a major attribute of modern economy

4.2.3.2 Staggered Wage Contract Theory

Besides this wage contract theory, there also exists a staggered wage contract theory, in which the wage contract exists in a non-synchronised pattern which makes it costly for the negotiation. Let us take the previous example of Paul, Richard and their friend Harry who work in three different companies. Wage contract of Paul starts from June onwards for a period of two years. The contract period for Richard starts from September to a period of three years while that of Harry begins from February to exactly a year. In this case, all three contracts commence and end at two different time periods. Even if these two labourers happen to be strong Labour Union leaders at their respective companies, they may not be able

- The wage contract existing in a non-synchronised pattern makes the wages rigid

to coordinate their activities. If Paul had bargained with his manager and made a change in his wage rate in the year 2023 June, he would be able to make further changes in his wage only after June 2025. Likewise, Richard has to wait for three years to make the necessary revision in his wages. Of the three of them, Harry renewed his contract the succeeding year. Therefore these employees who act as union leaders in their respective firms are unable to coordinate with each other due to differences in their period of contract as a result of which the wages remain rigid.

4.2.4 Sticky Price Model

- Menu Costs are the costs involved during price adjustments

The price rigidity in imperfectly competitive markets is explained by the economists such as Parkin Akerlof Yellen, and Mankiw which was popularly known as 'PAYM insight'. According to their observation, when there is a price change, say a price fall, it will lead to a fall in profit earned by the firms. Its because, when the price falls, firstly the revenue will not be sufficient to cover the cost involved in the production of the commodity and secondly, it was noticed that even if the price falls to zero, the sales will not fall and also there is a cost involved for the price adjustment and sales maximisation. The costs involved in price adjustments are known as Menu Costs.

4.2.4.1 Menu Costs

- The menu costs include the cost involved in printing catalogues, the cost involved in negotiating with the suppliers etc

The menu costs include the cost involved in printing catalogues, costs involved in phone calls, meeting with the agents, costs involved in negotiating with the suppliers etc. This can be explained with the help of an illustration. Let us consider a bakery where catalogues are printed on a high quality paper. When the price of the cakes and pastries falls, the baker needs to reprint the catalogue which involves certain costs that are included in the baker's cost of production. Now the baker is facing a situation where he has to compare the new additional cost which is called the menu cost with the reduced price of the product. If the menu cost is very high firm may not be in a position to change the price of the product as it would lead to a reduction in profit. On the other hand, if the menu cost faced by the Baker is negligible, he will be able to reduce the price of the product.

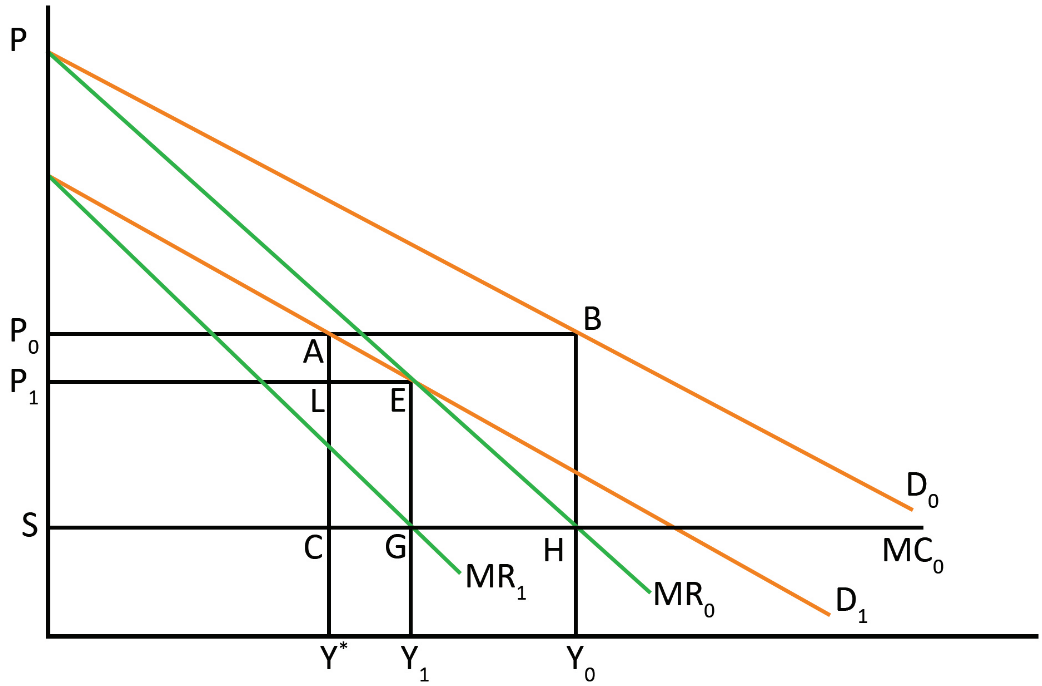

Fig 4.2.2 Menu Cost Pricing under Monopolistic Competition

- Profit is F-D, the loss of output is F+K, when menu cost, z is greater than profit F-D, the price remains rigid

Let us consider a firm in an imperfectly competitive market with a demand curve D_0. Its Marginal Revenue curve is MR_0 and Marginal Cost is MC_0. The firm is in equilibrium at point H where the MC curve and MR curves intersect each other and produce Y_0 amount of output sold at a profit-maximising price P_0. The profit earned by the firm is equal to area SP_0BH.

Now assume that the demand for the product has fallen and the demand curve shifts to the left to D_1 with its corresponding MR curve MR_1 . As the market is assumed to be an imperfectly competitive market, the firm is a price maker who has the autonomy to decide the price to be charged and quantity to be sold. If there are no additional costs involved, the firm will be in equilibrium at point G where the new MR curve MR_1 intersects MC. Here the firm decides to sell Y_1 amount of output which is lower than the previous output at a lower price P_1. It may be noted that, when the demand and the price fall, the the firm suffers from a reduction in profit equal to area SP_1EG. However if the firm faces a small amount of menu costs, the firm may have to stay at price P_0 and produce Y^* amount of output. The effect of menu costs can be better understood with the following figure.

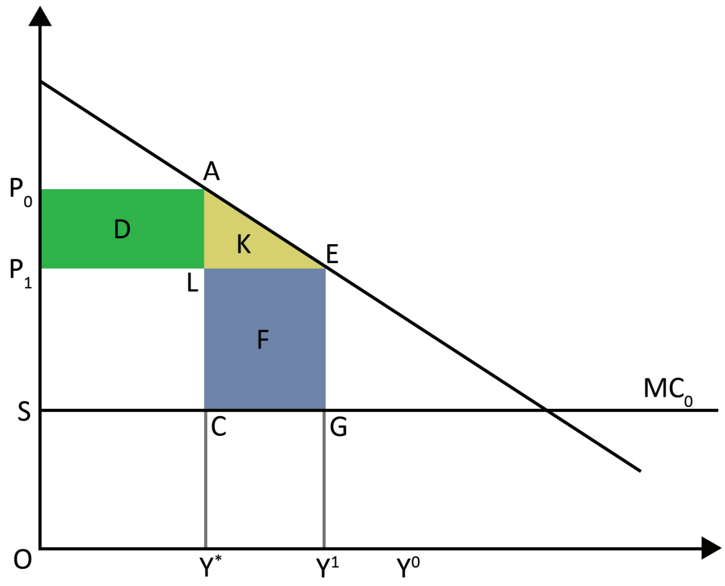

Fig 4.2.3 Effect of Menu Cost Pricing

The firm will reduce the price from P_0 to P_1 only if the menu cost is greater than the profit. As the menu cost is included in the cost of production, firms will compare its cost of production and revenue. If the cost is more than the revenue, the cost will be included in the prices to minimise loss and maximise profits and hence the price remains rigid. Let us assume that the menu cost denoted as 'z' is higher than its extra profit. In the figure extra profit is represented by F and D. If menu cost, 'z' is higher than profit F and D, the firm will be reluctant to reduce price and hence price remain the same or rigid. Now since the price is rigid at P_0 there is a loss of output by Y^* -Y^1 or the area F+K. The firm will not reduce the price if the menu cost is greater.

Menu Costs and Demand Externality

- Demand externality explains the effect on demand of a second party due to an action taken by the first party

The effect of production and consumption by one entity on another is known as externality. Externality can be both positive and negative. For example, when a person plants a fruit tree on the road side, it gives shade, fruits and fresh air to the passer by it has a positive externality. On the other hand, if one firm emits pollutants into the air or deposits wastes in the nearby river it is a form of negative externality. In addition to this, there is demand externality which explains the effect on demand of a second party due to an action taken by the first party. As per the menu costs theory if there is a downward revision of the price of a commodity, this will increase the disposable income of the consumer and result in the aggregate demand in the economy. Let us assume that price of bread has fallen. While calculating the cost, the baker finds his profit higher than the Menu cost involved, he reduces the price of bread. This will leave the consumer with an increase in disposable income, which they use to buy vegetables, fruits or diary products. This price adjustment which has increased the aggregate demand of all other firms is known as aggregate demand externality.

Summarised Overview

The new Keynesian school of thought emerged during the period of stagflation in the 1970s when New Classical theories and its related school of thought went into crisis as they failed to explain the phenomenon of stagflation. New Keynesian models assume an imperfectly competitive market which is a major deviation from the Keynesian school of thought which assumed perfect competition. In such a market, products sold are less standardised and differentiated. So, each seller has a small niche of regular customers who enable them with a certain degree of autonomy to set prices. Another feature of New Keynesian analysis is the distinction made between nominal and real wage rigidities. The New Keynesian economists assume that the firm enters into a wage contract with the labourers so that the wages remain unchanged during the period of the contract. The staggered wage contract theory explains that the wage contract exists in a non-synchronised pattern or in different time periods which makes it costly for the negotiation. Therefore the price remains the same during the life of the contract. New Keynesian argument to nominal price rigidity is substantiated by a concept called menu costs which restricts the price from a fall or rise. The menu costs include the cost involved in printing menus, catalogues, costs involved in phone calls, meeting with the agents etc. When there is a price change and requires a certain amount of menu costs, firms will compare their cost of production and revenue. If the cost is more than the revenue, the cost will be included in the prices to minimise loss and maximise profits and hence the price remains rigid.

Self Assessments

1. What are the major features of New Keynesian Models?
2. How do you explain nominal wage rigidity in the New Keynesian model?
3. Explain the concept of the Menu Cost model.
4. What are the points of commonalities and differences between Keynesian and New Keynesian Model?
5. Critically analyse the New Keynesian model with the help of examples.

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UNIT 3
New Keynesian Models

Learning Outcomes

After completing this unit, the learner will be able to:

- understand implicit wage contract model
- identify wage rigidity in Labour market
- apply the concept of Non - Accelerating Inflation Rate of Unemployment (NAIRU)

Background

In the earlier classes, you have studied the Classical and Keynesian Schools of thought. Both Classical and Keynesians distinguished themselves on the idea of government intervention and regarding the range of flexibility of wages and prices. The Classical theory recommended a Laissez Faire policy of non-governmental interference and wage-price flexibility, while Keynesian models recommended state intervention in stabilising the economy and wage-price rigidity. The emergence of Keynesian ideas as a major school of thought was realised during the Great Depression of the 1930s, when classical ideas failed to achieve their macroeconomic goal. However, during the 1970s, the whole world witnessed stagnation and the stabilising policy as recommended by Keynes became less effective in containing the crisis. As you have learnt in the previous chapters, the New Classical School of thought and the Monetarist School identified several theoretical flaws in Keynesian models and how the Keynesians tried to rebuild their theory. A new school of economists known as new Keynesians emerged during this time as a response to these criticisms by rebuilding the theoretical foundations of Keynesian macroeconomics. Keynes has formulated the price and wage rigidity, but the New Keynesians explain the wage price rigidity in terms of nominal and real shocks in the economy. They have improvised Keynesian models by bridging the theoretical gaps in Keynesian models.

Keywords

Efficiency Wage, Adverse Selection, Turnover Costs, Shirking, Insider-Outsider, Hysteresis Effect

Discussion

- Implicit wage contract model and efficiency wage models explain real wage rigidity

New Keynesian models evolved as a response to the crisis that emerged in the New Classical School of thought. According to the New Keynesians, prices and wages are not flexible but rigid. Price rigidity is explained with menu cost price theory and Nominal wage rigidity is explained with wage contract and staggered wage contract theory which explains that the wage remains rigid during the period of contract. Likewise, they also formulated models such as the Implicit wage contract model, efficiency wage models etc to explain real wage rigidity. The Implicit wage contract model is explained in the next section.

4.3.1 Implicit Wage Contract Model

- Implicit contracts are unwritten contracts between firms and workers

The New Keynesians have put forward theories explaining real wage rigidity in the labour market. Bailey, D.F. Gordon and Azariadis have developed the Implicit Contract model to explain real wage rigidity. Let us consider an economy which is going through a high level of economic activity known as Prosperity or boom where there is a high level of production, consumption and investment on one hand and increasing income on the other. Let us assume that a firm has entered into an unwritten or implicit contract with its workers to pay a wage equal to Rs 5000. Now, even though the economy is going through a boom period, the firm need not pay a wage higher than Rs 5000 nor the Union can bargain a wage higher than Rs 5000, the firm is in an advantageous position. Consider another situation where the economy experiences a recession. The firm has no autonomy to lay off workers nor pay wages lower than Rs 5000. It is clear from this example that the contract maintains the wage rate unchanged. Thus the Implicit Contract model is also known as a non-union contract, a form of contract, where the firm and the workers enter into an unwritten agreement regarding wages. In such an institutional arrangement, wages remain fixed over the period of the contract. This forms an economic glue that keeps the workers and firm in a long run relationship and limits the downward revision of wages. The model proposed by Bailey and Azariadis explains the wage stickiness in the context of Risk Averse and Risk Neutral firms. As we know the agents in various sectors of the economy can be categorised based on their sensitivity towards risk management. If an agent is said to attract more risk in order to acquire profit, he/she is known as a risk lover. Similarly, the agents who do not encourage risk or rather try to avoid risk are risk averse and finally the agents who are neutral towards risk are called risk neutral. In this model, the risk neutral and risk averse firms who have no affinity towards risk will try to avoid the risk of losing wages and entering into 'unwritten' or implicit contracts with their employees. This type of contract will set the real wages rigid and keep the wages unaffected by all the macroeconomic fluctuations that prevail during the life of the contract. This means that when there is an increase in the demand for the product of the firm, naturally it will lead to an increase in the wage of the workers. However if the firms had entered into an implicit contract, it may enjoy a temporary gain in the form of keeping the wage rate constant and thereby experience a rise in their profit. On the other hand, during times of low levels of economic activity when demand for the products and wages are falling, the unwritten or implicit contract will favour the workers as they will be paid the same wages as fixed in the implicit contract. Thus Implicit Contracts act as insurance or an invisible handshake between workers and the employer firm that ensures a fixed wage. This enables workers to be in a better position during economic fluctuations and follow a smooth consumption pattern throughout their work life.

- Implicit contracts acts as insurance

4.3.2 Efficiency Wage

Have you noticed any difference in wage rates among various companies that operate in the same industry? If you analyse the wage rates paid by American Multi National Companies such as Amazon and Walmart, you will understand that they are paying wages higher than the market-clearing wages to increase the productivity of workers. Similarly, the popular automobile company Ford owned by Henry Ford practised efficiency wages in 1914 and he opined that such wage hikes had increased the productivity of workers and reduced the incidence of absenteeism. This wage rate, which a firm pays its labour over and above its equilibrium wage rate as a form of incentive given to them for not shirking their job is called the efficiency wage rate.

- Efficiency wages are wages above their market-clearing wage rate

- Efficiency wages increase productivity and are an incentive to work

Efficiency wages are intended to raise the productivity of workers in two ways, the first being the increase in nutritional intake. When the wages are higher than the market clearing wages, this will increase the nutritional intake of the labourers which would decrease the incidence of diseases. This improved nutritional profile of the labourers has an indirect benefit on productivity as it reduces the chances of absenteeism, and loss of working days of the labourers in addition to this, it enables them to work more efficiently and productively. Secondly, the efficiency wage models will influence the work effort of labour and result in increasing returns. When labourers are paid a wage higher than the market clearing wages, they will tend to put in more work effort than usual which results in increased output.

However, one of the major problems that arises during the fixing of efficiency wage is involuntary unemployment. This is explained using an illustration.

Employment is depicted on the X axis and wage on the Y axis, D_{L1} and D_{L2} represent demand for labour, S_L represents the supply curve of labour, and wage rate W is fixed at the point of intersection of the demand and supply curve of Labour. The efficiency wage fixed by the firm W^{*}, is higher than the market

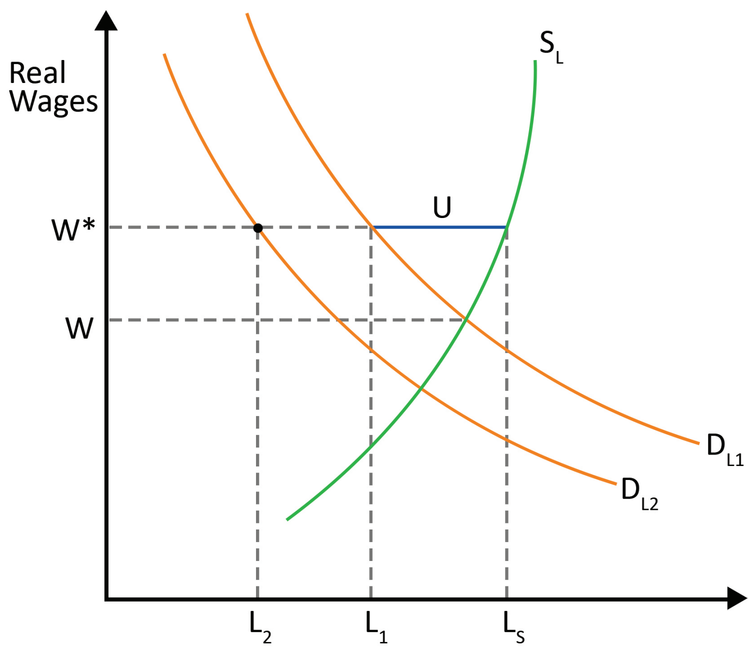

Fig 4.3.1 Involuntary Unemployment

clearing wage W. When a higher wage is fixed by a firm, the firm may face a constraint of financial resources or an increase in the cost of production, in order to strike a balance between this, the firm may sometimes lay off some workers or may become reluctant to employ new labourer. In figure 4.3.1, D_{L1}, the market clearing wage is W and the efficiency wage is W^*. At this wage rate, the demand for labour is less than the supply of labour, an amount equal to L_1L_S (or "U") of labour may be laid off by the firm or may be unemployed. This is involuntary unemployment. If there is a demand shock in the economy which leads to a reduction in the demand curve to D_{L2}, then the involuntary unemployment rises further to $L_2L_{S.}$ New Keynesians have used several models to explain efficiency wage models and wage stickiness. Modern theories comprise four major efficiency wage theories viz, Adverse Selection Model, Turn Over Cost model, The Gift Exchange Model, The Shirking Model.

- The higher the Efficiency wage, the higher will be involuntary unemployment

i. Adverse Selection Model

New Keynesian theories are based on an imperfectly competitive market in which there is imperfect knowledge about the labour and product market. One of the major attributes of such a market structure is the imperfect knowledge or the asymmetry of information. In the labour market, labourers have more information about their qualifications, abilities and productivity. This may result in the selection of a mix low quality workers leading to the problem of Adverse selection. The propounders of Efficiency theory models hold that highly qualified workers are interested in high paying jobs, whereas the less qualified workers do not prefer high paying jobs due to their inefficiency. Therefore, the firms can send signals to the market by offering a higher wage or an efficiency wage which will attract only high quality workers, on the contrary, if the firm charges a lower wage, it will lead to the withering of high qualify workers. Let us take the case of a firm that charges wages below the efficiency wage. The good quality worker who is confident about his/her abilities and skill sets and is completely aware of the fact that they will be easily employed at a high paying firm, tend to leave the current job. Now with the high quality workers leaving their current job in search of a high paying job, the firm will be left only with low quality workers. To avoid such instances of adverse selection, and to maintain its production quality, the firm pays an efficiency wage rate which is higher than the equilibrium wage rate.

- To avoid Adverse selection firms pay efficiency wages

ii Turnover Cost Model

The Turnover Cost Model explains the reason why certain firms pay efficiency wages. As per this model, there is a cost involved in hiring labour, such as a cost involved in issuing notifications, administering the selection procedure, conducting meetings and discussions with the board, the cost involved in phone calls, negotiations with suppliers, training of the freshly appointed employees etc. Likewise, there is a cost involved in hiring labour till a new appointment is made, overtime charges for the existing labour, loss of productivity of existing workers due to excessive workload etc. These costs undertaken by a firm while hiring and firing labourers are called turnover costs. When the employees are paid a wage rate higher than market clearing wage or efficiency wages, it will have a significant impact on the workers who are planning to quit their jobs. They will compare the wage rates of other firms and decide to stay with their current employer.

- Turnover costs are the cost that is needed for hiring and firing labourers, efficiency wages are paid by the firms to avoid turnover costs

iii. The Shirking Model

According to the Shirking Model of efficiency wage theory, workers have a tendency to shirk their job if they are paid lower wages. The employment contracts usually have several gaps, with very little or sometimes zero information given regarding the effort level that should be undertaken by the workers. This may lead to a Principal–Agent problem which is an agency relationship between principal and the agent. In this case, the firm is considered as the principal who has less information about the work effort level of workers and their overall productivity: whereas the managers and workers are considered as 'Agents' who have more information about their effort level and working mechanism of the firm. The workers can manipulate such situations of asymmetric information by becoming passive and shirking their jobs. This will create additional costs for the firm either in the form of loss of output or in the form of monitoring cost that has to be paid to the supervising agency. Faced with such a situation, a relatively better option for the firm is to pay the workers an efficiency wage which is higher than the market clearing wage. When a higher wage is paid to the worker, it will act as an incentive to work hard and not to shirk their job. In addition to this, the worker will consider the real cost of unemployment, which is the risk of not getting higher wages elsewhere also prevents them from shirking their job.

- Efficiency wages will inspire the workers not to shirk their job

The figure shows the level of employment on the X axis and real wages on the Y axis. D_L is the demand for labour. NSC_1 and NSC_0 are no shirking constraint that shows the minimum wage level below which the labourers tends to shirk their job. Market clearing wage is W. If the firm wants labourers not to shirk their job, it should pay a wage higher than W or the market clearing wage. Wage is not the only factor that influences shirking but factors such as monitoring, government schemes such as unemployment benefits, and wages charged by other firms. When the monitoring of the job is undertaken by the firm, job shirking is reduced. However, if the government introduces schemes such as unemployment benefits, this may lead to job shirking. Suppose the labourers get a wage rate of Rs 2000 while the unemployment benefit offered by the government is Rs 2100, then people choose the unemployment benefit over employment.

- Labourers shirk their jobs when the government implements unemployment benefits

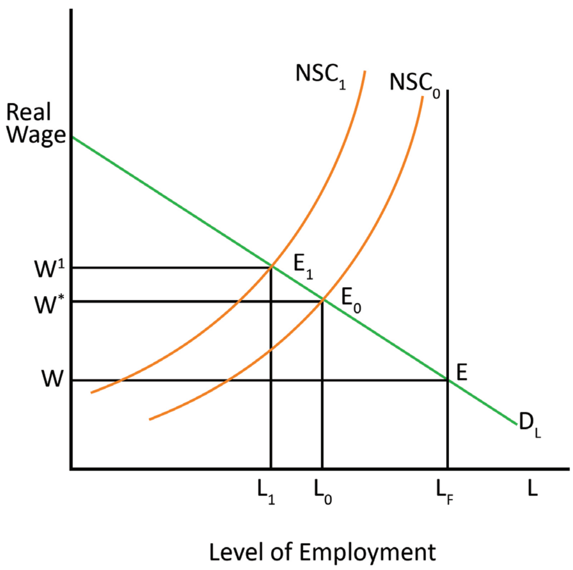

Fig 4.3.2 The Shirking Model

In figure 4.3.2, the equilibrium wage rate is w, where there is L_F level of employment which is full employment equilibrium. Whatever unemployment that exists at L_F is voluntary unemployment, which is deliberately opted by the labourers when they consider the market wage to be lesser than their desired wage or when they find their current job not matching their skills. For example let wage rate w be Rs 1000, where there is full employment, however, a group of 10 workers consider this wage as a considerably lower wage and decide to quit their job. Likewise another 5 consider that they have higher qualifications and deserve a better job and choose not to work. In both cases, people choose not to work and remain unemployed. This is voluntary unemployment.

Now consider wage rate w^* that is above efficiency wages. When all the firms start offering the efficiency wage w^*, people will be reluctant to shirk their jobs as the cost of being unemployed is higher. The employment level at the efficiency wage rate is L_0 where L_0L_F labourers remain unemployed. It may be noticed that the L_0L_F unemployment is involuntary unemployment. The shift in NSC_0 curve will take place when the intensity of monitoring becomes less or the Government increases unemployment benefits. The equilibrium also shifts from E_0 to E_1 at higher wages w^1 and L_0L_F workers remain unemployed. It means that at wage rate w^1 , the labourers are not under strict monitoring and they have a tendency to shirk their job. Secondly, the shift in NSC may be due to a higher unemployment benefit in the form of an unemployment pension offered by the Government which the labourers consider profitable than the market wages. In either case, there is voluntary unemployment and involuntary unemployment.

- Unemployment pensions by the Government will lead the workers to shirk their job

iv. The Gift Exchange Theory

The Gift Exchange Theory or 'Carrot and Stick' model is introduced by George Akerlof by studying the social and psychological behaviour of people. Let us consider an example where a worker says Mr. George is an employer and Mr. David and Mr. Ben are his employees. Let us suppose that Mr. Ben works hard, is, accountable and is dedicated to his work, while Mr. David is lazy and unaccountable towards his work. Now the employer Mr. George will provide incentives in the form of extra money for overtime work, grant leave and offer gift cards to Ben in return for his good work, whereas he may cut the salary and give warnings to the Mr David for his unaccountability. The incentives given to Mr Ben will encourage him to perform even better in his job and increase productivity. Likewise, the warnings and other punishments given to Mr. David may act as a nudge to improve his work thereby increasing the overall productivity of the firm.

This Efficiency Wage Theory model is based on the simple psychological behaviour that, a person is giving gifts to another person, for his good work, and in return he continues to do his best. According to Akerlof, when people feel that they are treated fairly, they will gift you with their accountability and honesty. The workers' effort is considered to vary positively with the wages they receive. The higher the remuneration higher will be the work effort. The 'carrot' is the positive incentives given to the labourers in the labour market in the form of allowances, bonuses, fair treatment etc. The wage above the market clearing wage or the efficiency wage is also a positive incentive that will make the labourers work hard for their employer as a form of return gift. This will result in an exchange gift of high productivity and work effort for the part of labourers. 'Stick' on the other hand is the punishment in the form of wage cuts and warnings given to labourers when they fail to perform their task.

- High productive labour is the gift in exchange for positive incentives to labourers

4.3.3 Insider-Outsider Model

An early version of the Insider- Outsider model was proposed by Blanchard and Summers, and later in the late 1980s, a series of studies was conducted by Lindbeck and Snower who improvised this theory of real wage rigidity. This model considers a group of people called 'Insider,' mainly union members who work inside the firm with a strong bargaining power. They derive these powers from the turnover costs of the firm which is the cost of hiring and firing labourers. There is a cost involved in firing these members and hiring new members for example let us consider a company manufacturing laptops that wants to fire a few labourers. When they fire these labourers, there is a reduction in the number of laptops manufactured in the following season. This might pave the way for its rival companies manufacturing laptops to capture the market. Here the firm not only incurs the cost of loss in output but also faces the cost of loss of market space. It has to adopt a sales maximising process and marketing strategy like advertisement, offers etc to reclaim the market which involves an amount of selling cost. The firm now hires new labourers who are novices in this field and require ample amount of training to acquire the technical knowledge. This also involves cost. The most feasible option in this situation is to maintain the existing employees or the insiders by paying them efficient wages.

- Insiders are the people working inside the firms who stop Outsiders from entering the firm

Lindbeck and Snower have identified a second group of people called 'Outsiders' who remain outside the firm as unemployed workers. Insiders use their bargaining power to keep wages above the market clearing level restricting the outsiders from entering into the firm. When the insiders bargain for a wage level, it makes sure that the wages are neither high nor low, because if they fix very high wages, the firm with limited financial resources may be forced to fire a few insiders and they will become outsiders. On the other hand, if the wages are kept very low the firm will have excess cash to recruit Outsiders. Insiders will take all the action in its capacity to stop the employment of Outsiders. In addition to this, as the Outsiders remain unemployed for a longer period of time, it will deteriorate their skill sets and eventually become less eligible for employment. This type of unemployment which continues to persist for a longer period and shows no tendency to return to the initial level is called the hysteresis effect. This will lead the system further away from the initial equilibrium. Let us assume that a country is going through a recession and the firms are laying off their labourers, that means some of the insiders have become outsiders with no more bargaining power. Some of them may be permanently laid off. Now once the economy starts its recovery process, the Unions/insiders will bargain for higher wages than pre-recessionary phase. If the firm grants the plea for higher wages, unemployment may continue to persist for a longer time period. The hysteresis effect in the labour market is explained in the context of Non Accelerating Inflation Rate of Unemployment (NAIRU).

- Insider-Outsider model is an explanation for the hysteresis effect

4.3.4 Non Accelerating Inflation Rate of Unemployment (NAIRU)

As per the New Keynesians, capitalist economics are prone to demand and supply shocks and require stabilisation policy. The capitalist economy not only fails to be in equilibrium but also experiences an actual unemployment rate which is higher than the natural rate of unemployment for a prolonged period. The concept of Non Accelerating Inflation Rate of Unemployment was first conceived by Franco Modigliani and Lucas Papademos while the acronym NAIRU was introduced by James Tobin. Non Accelerating Inflation Rate of Unemployment or NAIRU is the unemployment rate at which inflation does not tend to increase or decrease. It is said that inflation remains in a state of inertia a concept explained in physical science in the laws of motion. According to this, inertia is the tendency of an object to stay in a state of rest or motion unless an external force acts upon it and changes its direction.

The problem of inflation during the 1970s and 1980s is explained by this phenomenon known as NAIRU. The

Organisation for Economic Cooperation and Development (OECD) countries is an intergovernmental organisation deals with global issues and trade policies experienced a few oil price shocks during the 1970s. This resulted in a reduced supply of oil and decline in employment rates. It was observed that the repercussions of the crisis eventually spread across the world and the countries across the world faced a persistent increase in price level and unemployment. The NAIRU values of the US were very high during the 1980s but were stable in the UK. The unemployment rate is observed to be higher in the Euro area than the US. In the US there was a steady rise in Unemployment by the 1980s and 1990s from 1.7 to 11 percent. The NAIRU estimates for a few selected countries are shown in Table 4.3.1.

Table 4.3.1 NAIRU Estimates of Countries

Country/ Area	**1980**	**1985**	**1990**	**1995**	**1999**
Canada	8.9	10.1	9.0	8.8	7.7
France	5.8	6.5	9.3	10.3	9.5
Germany	3.3	4.4	5.3	6.7	6.9
Italy	6.8	7.8	9.1	10.0	10.4
Japan	1.9	2.7	2.2	2.9	4.0
UK	4.4	8.1	8.6	6.9	7.0
USA	6.1	5.6	5.4	5.3	5.2
Euro area	5.5	7.1	8.8	9.2	8.8

'Revised OECD Measures of Structural Unemployment', OECD, December 2000.

When the Unemployment rate in the economy is below NAIRU, inflation keeps on increasing and beyond it, the inflationary pressure goes on decreasing. At NAIRU, Inflation remains stable and acts as an object in the air that neither speeds up nor slows down unless a force in the form of an external shock acts upon it. Take the case of aggregate supply and aggregate demand. Let us suppose that there is a consistent rise in prices and as a result, producers increase the supply of the commodity consistently. The aggregate supply curve continues to shift until a supply shock takes place and the supply of commodities reduces. Likewise, in the case of aggregate demand, the demand may continue to increase if there is a continuous increase in money supply, this will cause a continuous shift in Aggregate Demand upwards until, an external force in the form of an intervention by the Central Bank through monetary policy stabilize the economy. As the inflation adjusts the economy returns to the natural rate. This can be explained with the help of an illustration.

- NAIRU, inflation remain stable

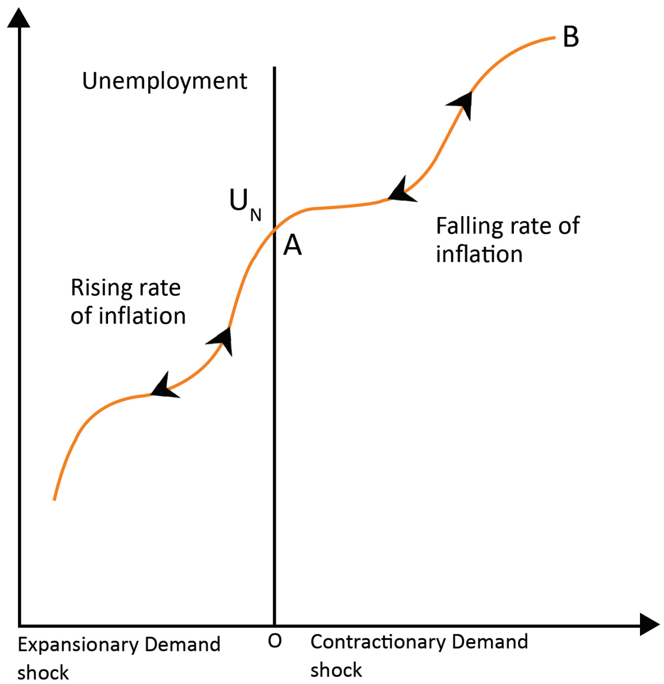

Fig 4.3.3 Relationship between Actual Unemployment and Natural Rate of Unemployment

In the figure natural rate of unemployment is at A, when there is a decrease in aggregate demand or contraction of demand, the actual unemployment increases to point B. The fall in aggregate demand may be due to a fall in the inflation rate and money supply. An increase in Aggregate demand will decrease the actual unemployment to C. But in the long run, the system will return to the natural rate of unemployment at A.

Hysteresis

Hysteresis is a situation where the variable, that deviates away from equilibrium shows no tendency to return to its initial position even after the effects of shock are over. The hysteresis effect is considered as one of the explanations for the prolonged unemployment in Europe during the 1970s and 1980s. The models concerned with hysteresis are called hysteresis theories. In this phenomenon, the current value of a variable is influenced by the previous values and also shows no tendency to return to its initial value. For example, a recession in a country can lead to the emergence of large scale unemployment. If the recession continues to persist for a long time workers may lose their job skills, diminishing their ability to find a new jobs.

- Hysteresis is a phenomenon by which the current value of a variable is influenced by the previous values and also shows no tendency to return to its initial value

Some economists tend to believe that the hysteresis effect persisted in Europe even after the period of unemployment and inflation in the 1980s. It is observed that when the stabilisation policies contained inflation, it resulted in disinflation that coincided with the unemployment issue. It was felt in countries like Ireland, Italy and Spain where the sacrifice ratio (which is the loss of output sustained by the economy for a reduction in inflation) is higher. This is because long term unemployment will deteriorate the skills and remain unemployed for a longer time period. This phenomenon was observed during the Great Recession of 2008–2009, where unemployment continued to persist till 2014 as many people stopped looking for work.

There is widespread disagreement on the relevance of effect hysteresis effect. However, several economists view that economic fluctuations like recession will leave permanent scars on the economy altering the natural rate of unemployment. According to Phelps, the natural rate of unemployment is influenced by past actual rate of unemployment. The path followed by the natural rate of unemployment is called path dependency hysteresis.

The initial equilibrium is at point A when there is a falling rate of inflation, or a demand shock, the aggregate demand declines and the actual unemployment rises. This shifts the economy from point A to B. When the economy starts recovering from this negative demand shock, the economy will return to its natural rate of unemployment, but it will not return to the past natural rate of A but to a new NAIRU at C. This is due to the Hysteresis effect. Similarly, a positive demand shock, such as a technological improvement and a rising rate of inflation will increase aggregate demand and a fall in unemployment and the economy reaches point D. The inflation in the economy

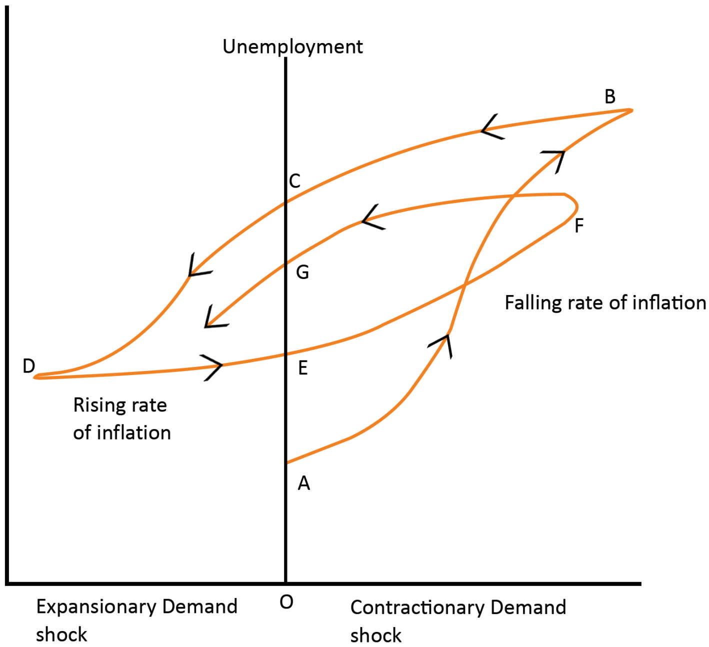

Fig 4.3.4 Path Dependence Hysteresis and NAIRU

now gradually rises and the economy reaches a new NAIRU at point E and not the previous rate of NAIRU at C. It is clear from the figure that the natural rate follows an equilibrium path. This path of equilibrium is called path dependency hysteresis.

4.3.5 Policy Prescription

- Market is filled with uncertainty according to New Keynesians

The New Keynesians believed that the market is filled with uncertainty as the firms fix their prices and wages in an uncoordinated way and that these actions have uncertain consequences. In such an economy the intervention of government is indispensable for correcting the instability. Although New Keynesians agreed with the demand side management of the economy, some of them considered the supply side management as equally important. This is because the New Keynesian economics focussed on the response of the economy to shocks rather than the source of the shocks.

Most of the New Keynesians such as Gregory Mankiw, accepted the criticisms raised by the Monetarist and New Classicals, especially the model of Dynamic inconsistency and hence, they did not formulate any fiscal policy instruments as a tool to stabilise the economy. Other New Keynesians such as Taylor necessitates of an active government intervention during instances of market failure and in unusual situations when the nominal interest approaches zero. Therefore, the New Keynesians were not big supporters of 'fine tuning' the economy. The New Keynesian model recommends appropriate monetary and fiscal policies to coarse or rough tuning of the economy during the period of low level of economic activity such as recession and depression. It is different from the Keynesian policy which recommends fine-tuning. The coarse tuning means the fiscal and monetary policy must be used only when there is a considerably large deviation from the normal value.

- New Keynesians did not support fixed rule monetary policy

The New Keynesians did not support fixed rule monetary policy which is a policy that automatically operates on predetermined criteria. This is because of the existence of uncertainty and the market imperfections in the market economy. This is substantiated by Leijonhufvud in his study about the stability corridor according to Leijonhufvud, there are two types of growth i.e, Stable and Unstable equilibrium. During a crisis, when the growth rate falls, the economy leaves its stable equilibrium path which is a stability corridor, outside of which the automatic stabilisers are weaker and the system is prone to effective demand failures. If the market operates within the limits, it operates well and the predetermined policy will work. By considering this concern, the economists are actively involved in creating what Goodfriend and King have called the 'New Neoclassical Synthesis'. Major elements of the synthesis are:-

1. The need for macroeconomic models to take into account intertemporal optimisation;
2. The widespread use of the rational expectations hypothesis;
3. Recognition of the importance of imperfect competition in goods, labour and credit markets;
4. Incorporating costly price adjustments into macroeconomic models.

This model is referred to by Gali as either New Keynesian or 'New Neoclassical Synthesis' models as this integrates both nominal rigidities and imperfect competition into the Real Business Cycle framework.

- Avoid the incidence of strikes and also liberalise the mechanism of hiring and firing of workers

The new Keynesian also recommends that the power of insiders should be controlled by granting the government more autonomy. It should initiate strict monitoring to avoid the incidence of strikes and also liberalise the mechanism of hiring and firing of workers. As far as the organisational reform is concerned, the firms should make appropriate changes to give more access to outsiders through profit sharing and other measures.

Summarised Overview

The Real wage rigidity which is one of the major features of the New Keynesian School of thought is explained using several theories propounded by various Economists. Implicit contracts are unwritten contract between firms and workers which imparts stickiness to wages until the life of the contract. Similarly, the Efficiency wage model comprises a series of models which explain wage stickiness in the context of efficiency wages. Efficiency wages are those wages paid to the workers over and above their market clearing wage rate. New Keynesian Economists use efficiency models to explain the existence of involuntary unemployment in the economy. It is explained that when the firms pay efficiency wages, they have to lay off certain workers and this results in involuntary unemployment. Major efficiency models are adverse selection models, turnover costs, The gift exchange model and Insider- Outsider model.

Adverse selection is prevalent in the labour market where labourers have more information about themselves than the firm and therefore firm may end up choosing low quality along with good quality workers. Turnover costs are the costs that are needed for hiring and firing labourers, efficiency wages are paid by the firms to avoid turnover costs. The shirking model explains the possibility of the labourers shirk their job. When efficiency wages are paid, people's productivity increases, and they will not shirk their jobs whereas when the government implements unemployment benefit, labourers will tend to shirk their job. The gift exchange model explains that the efficiency wage acts as a positive incentive and will make the labourers work hard for their employer as a form of return gift. The Insider Outsider model explains the dynamics between insiders who work inside the firm and have bargaining power and outsiders who are unemployed. Insiders will bargain for an efficient wage and stop the outsiders from entering the firm. This unemployment which persists for a longer time period is called the Hysteresis effect.

The Capitalist economy experiences a rate of actual unemployment which is higher than the natural rate of unemployment for a prolonged period. This is called by New Keynesians as Non-Accelerating Inflation Rate of Unemployment or NAIRU. It is the unemployment rate at which inflation has no tendency to increase or decrease. Hysteresis is a phenomenon by which the current value of a variable is influenced by the previous values and also shows no tendency to return to its initial value.

Self Assessments

1. What are the various theories used to explain wage stickiness in the New Keynesian Model?
2. Explain how efficiency wage models lead to involuntary unemployment.
3. What do you mean by adverse selection? Explain how adverse selection can be avoided.
4. Explain Insider-Outsider Model.
5. What is Non Accelerating Inflation Rate of Unemployment?
6. What do you mean by Hysteresis effect and Path dependency?
7. The following types of unemployment with suitable examples

    i. Structural unemployment
    ii. Frictional unemployment
    iii. Voluntary unemployment
    iv. Involuntary unemployment
    v. Cyclical unemployment
8. Compare and contrast the natural rate of unemployment and non accelerating rate of inflation.

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Suggested Reading

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Space for Learner Engagement for Objective Questions

Learners are encouraged to develop objective questions based on the content in the paragraph as a sign of their comprehension of the content. The Learners may reflect on the recap bullets and relate their understanding with the narrative in order to frame objective questions from the given text. The University expects that 1 - 2 questions are developed for each paragraph. The space given below can be used for listing the questions.

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Time: 3 Hours Max Marks: 70

Section A Objective Type Questions

Answer any 10 questions. Each question carries 1 mark (10x1=10 marks)

1. What does micro theories of distribution refer to?
2. Give mathematical representation of MRP.
3. Define Monopsony.
4. What are the sources of supply of loanable funds?
5. What are the components of 2 * 2* 2 model?
6. Write any two marginal conditions of Pareto Optimality.
7. How are value judgements used under Bergson's social welfare function?
8. What is theory of second best refer to?
9. Who introduced the capability approach?
10. Define Externality.
11. Write any two examples for Positive Externalities in Production
12. What does the Coase Theorem propose about addressing externalities?
13. What is asymmetric information?

14. Define risk.
15. What does George Akerlof mean by the term “Lemons” in an asymmetric information situation?

Section B Very Short Questions

Answer any five questions. Each carries two marks (5x2=10 marks)

16. What is Marginal Physical Product? Give mathematical representation.
17. Differentiate between scarcity and differential rent.
18. Write a brief note on speculative motive.
19. List any four dynamic changes identified under Dynamic Theory of profit.
20. Give the equilibrium condition for production or efficiency in factor allocation under 2*2*2 model.
21. What is the condition for efficiency in factor allocation among commodities under Pareto optimality?
22. Describe Point of bliss.
23. Distinguish between positive and negative externality.
24. Explain the individual attitudes towards risk in decision-making in the context of risk aversion.
25. Give mathematical representation for utility maximisation.

Section C Short Answer

Answer any 5 questions. Each question carries 4 marks (4x5=20 marks)

26. Explain Schumpeter Theory of Profit.
27. Discuss Quasi-rent.
28. Explain Kaldor-Hicks Compensation Criterion.
29. Write a note on the relation between welfare maximisation and perfect competition?
30. How is Pareto efficiency related to the efficient provision of public goods? Use a diagram to illustrate your explanation.
31. Describe Coase Theorem and its significance in addressing externalities with a suitable example.
32. Explain the role of advertising in providing information about products.
33. Briefly explain the three methods of reducing risk in decision-making.

Section D Long Answer/Essay Question

Answer any 3 questions. Each question carries 10 marks. (3X10=30 Marks)

34. Elucidate on Marginal Productivity Theory.
35. Graphically explain marginal conditions of Pareto Optimality criterion.
36. Discuss the positive and negative externalities in both consumption and production with relevant examples.
37. Graphically illustrate the concept of Lindahl pricing, and its role in the provision of public goods.
38. Elucidate the concept of asymmetric information, and discuss how it relates to moral hazard and the principal-agent problem.
39. Explain the individual's attitude towards risk with the help of diagrams and provide examples for each category of risk attitude.

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MODEL QUESTION PAPER Set-II

SECOND SEMESTER - MA ECONOMICS EXAMINATION

DISCIPLINE CORE – 05

M23ECO5DC- MICROECONOMICS II

(CBCS - UG)

2023-24 - Admission Onwards

Time: 3 Hours | Max Marks: 70

Section A Objective Type Questions

Answer any 10 questions. Each question carries 1 mark (10x1=10 marks)

1. What is the basis for Schumpeter theory of profit?
2. What are insurable risks?
3. What is organic composition of capital?
4. Give the mathematical form for equilibrium of consumption under 2*2*2 model.
5. Define social indifference contours?
6. Give any two assumptions of Bergson's social welfare function.
7. Write any two examples for negative externalities in production.
8. What is meant by Common property resources?
9. What does Lindahl pricing propose regarding the funding of public goods?
10. Write any two examples for public goods.
11. Define search cost.
12. Who was awarded the Nobel Prize in Economics in 2001 for their work on the theory of asymmetric information?

13. What is the primary difference between risk pooling and risk spreading in insurance companies?

14. What are moral hazards?

15. Write any two results of asymmetric information in markets.

Section B Very Short Questions

Answer any five questions. Each carries two marks (5x2=10 marks)

16. What does marginal productivity theory propose?

17. Define transitivity condition.

18. Define market failure.

19. What is meant by Tragedy of Commons ?

20. What are the characteristics of public goods ?

21. Briefly explain the concept of the free rider problem.

22. What is risk aversion?

23. What is the difference between risk and uncertainty in decision-making?

24. What is principal-agent problem?

25. What are the three primary reasons identified by Kenneth Arrow that limit risk shifting in insurance, and what solution did he suggest?

Section C Short Answer

Answer any 5 questions. Each question carries 4 marks (4x5=20 marks)

26. Explain Euler's theorem.

27. Discuss Classical Theory of Interest.

28. Explain Scitovsky's double criterion

29. Graphically explain equilibrium of consumption under $2\times2\times2$ model.

30. Graphically illustrate the concept of Negative Externalities in Consumption.

31. What are the possible solutions to the free rider problem?

32. How can the principal-agent problem be mitigated in a company?

33. What are the suggestions of Akerlof in mitigating the problems of asymmetric information?

Section D Long Answer/Essay Question

Answer any 3 questions. Each question carries 10 marks. (3X10=30 Marks)

34. Explain Ricardian Theory of rent.
35. Elucidate on Kaldor's macro theory of distribution.
36. Discuss social welfare function under Bergson Samuelson model. Explain how the point of bliss is determined under the model.
37. Explain the graphical treatment of general equilibrium $2\times2\times2$ model.
38. Graphically illustrate the concept of Common Property Resources and how they lead to inefficiencies.
39. Differentiate between risk and uncertainty. Discuss various methods for measuring risk in decision-making.

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MODEL QUESTION PAPER Set-I

SECOND SEMESTER - MA ECONOMICS EXAMINATION

DISCIPLINE CORE – 06

M23ECO6DC- MACROECONOMICS II

(CBCS - UG)

2023-24 - Admission Onwards

Time: 3 Hours | Max Marks: 70

Section A Objective Type Questions

Answer any 10 questions. Each question carries 1 mark **(10x1=10 marks)**

1. According to Supply-Side Economics, what effect do tax cuts have on disposable income?
2. Define GDP.
3. Define Okun's Law.
4. What does the term random walk mean?
5. Define Rational Expectations.
6. Who developed the implicit wage contract model?
7. Define fiscal policy.
8. Define a countercyclical variable.
9. What is meant by temporary money illusion.
10. What is budgetary balance policy?
11. Define money neutrality.
12. What problem does the adverse selection model address?

13. Define Budget deficit.
14. What is Stagflation?
15. Define the term Investment Multiplier

Section B Very Short Questions

Answer any five questions. Each carries two marks (5x2=10 marks)

16. What is the difference between GNP & GDP.
17. Define macroeconomic policy.
18. Write a short note on capital-output ratio.
19. Distinguish between Rule and Discretion based policy.
20. Explain the concept of the multiplier effect.
21. Write a short note on debt-to-GDP ratio.
22. What does the concept of stable equilibrium mean in Kaldor's trade cycle model?
23. Write a short note on policy lags.
24. What role does nutrition play in efficiency wage theory?
25. According to Real Business Cycle Theory, what primarily causes fluctuations in the business cycle?

Section C Short Answer

Answer any 5 questions. Each question carries 4 marks (4x5=20 marks)

26. What are the main features of Supply-Side Economics?
27. Describe the key objectives of macroeconomics.
28. How does New Keynesian economics differ from Keynesian economics?
29. Compare and contrast the inside lag and outside lag.
30. Briefly explain the difference between real shocks and nominal shocks.
31. Discuss the key features of the New Classical macroeconomic approach.
32. Discuss the various components of GDP.
33. Explain the relationship between the multiplier effect and effective demand.

Section D Long Answer/Essay Question

Answer any 3 questions. Each question carries 10 marks. (3X10=30 Marks)

34. Elucidate on Marginal Productivity Theory.
35. Graphically explain marginal conditions of Pareto Optimality criterion.
36. Discuss the positive and negative externalities in both consumption and production with relevant examples.
37. Graphically illustrate the concept of Lindahl pricing, and its role in the provision of public goods.
38. Elucidate the concept of asymmetric information, and discuss how it relates to moral hazard and the principal-agent problem.
39. Explain the individual's attitude towards risk with the help of diagrams and provide examples for each category of risk attitude.

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MODEL QUESTION PAPER Set-II

SECOND SEMESTER - MA ECONOMICS EXAMINATION

DISCIPLINE CORE – 06

M23ECO6DC- MACROECONOMICS II

(CBCS - UG)

2023-24 - Admission Onwards

Time: 3 Hours Max Marks: 70

Section A Objective Type Questions

Answer any 10 questions. Each question carries 1 mark (10x1=10 marks)

1. Define inside lag.
2. What is the difference between real wages and nominal wages?
3. Define the term business cycle.
4. What is time inconsistency in monetary policy?
5. According to Keynes, what are the two key factors that influence business investment?
6. In the Lucas Supply model, what does intertemporal substitution refer to?
7. What is the primary goal of efficiency wages?
8. Describe the principle of effective demand.
9. Define inflation targeting.
10. What is nominal wage rigidity?
11. Define reverse causation.
12. List out the three methods of measuring national income.
13. What does NAIRU stand for?

14. What did Milton Friedman assert regarding inflation?
15. Define the concept of Accelerator.

Section B Very Short Questions

Answer any five questions. Each carries two marks (5x2=10 marks)

16. Write a short note on hysteresis.
17. What is the significance of the Lucas surprise supply function in New Classical macroeconomics?
18. Write a brief note on Signal Extraction Problem.
19. Describe the concept of continuous market clearing.
20. Define principal-agent problem.
21. What is the significance of aggregate demand in Keynesian economics?
22. Describe the relationship between actual unemployment and the natural rate of unemployment.
23. Differentiate between Autonomous Investment and Induced Investment?
24. Define the term fiscal instrument' and provide two examples.
25. What does the long-run vertical Phillips curve indicate about the relationship between unemployment and wage rate at the natural rate of unemployment?

Section C Short Answer

Answer any 5 questions. Each question carries 4 marks (4x5=20 marks)

26. Assess the effectiveness of monetary targeting compared to inflation targeting in controlling inflation.
27. Discuss the characteristics of the expansion phase of the business cycle.
28. Explain the significance of the expectations-augmented Phillips curve.
29. Discuss the concept of real wage rigidity.
30. Explain how the determination of the interest rate occurs in the Keynesian framework.
31. Explain in detail the Shirking model of efficiency wage theory?
32. Compare and contrast procyclical, countercyclical, and acyclical variables in the context of economic fluctuations.
33. Explain the debate between rules and discretion in monetary policy.

Section D Long Answer/Essay Question

Answer any 3 questions. Each question carries 10 marks. (3X10=30 Marks)

34. Explain the three methods of measuring national income. Discuss the advantages and limitations of each method.

35. Critically evaluate the fiscal management strategies employed by the Indian government in the fiscal year 2024-25. Discuss the potential economic outcomes of these strategies.

36. Evaluate the legacy of Keynesian economics in shaping modern economic policy. Discuss the factors influencing interest rates according to Keynesian economics.

37. Evaluate the impact of policy lags on the effectiveness of fiscal and monetary policy in stabilising the economy.

38. Discuss the propositions of Supply-Side economists regarding savings, investment, and economic growth.

39. Evaluate the significance of Friedman's Restatement of the Quantity Theory of Money in the context of modern macroeconomic theory.

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MODEL QUESTION PAPER Set-I

SECOND SEMESTER - MA ECONOMICS EXAMINATION

DISCIPLINE CORE – 08

M23ECO8DC- INTERNATIONAL ECONOMICS

(CBCS - UG)

2023-24 - Admission Onwards

Time: 3 Hours

Max Marks: 70

Section A Objective Type Questions

Answer any 10 questions. Each question carries 1 mark **(10x1=10 marks)**

1. Define autarky.
2. What is protectionism?
3. What do terms of trade represent?
4. What is the purpose of anti-dumping duties?
5. Define free trade.
6. What is a foreign exchange market?
7. Define trade diversion.
8. What is a spot rate?
9. Define Import substitution.
10. What is the primary conclusion of the Leontief Paradox?
11. Define dumping.
12. What does opportunity cost represent?
13. What is devaluation?

14. Define countervailing duty.
15. What is economic integration?

Section B Very Short Questions

Answer any five questions. Each carries two marks **(5x2=10 marks)**

16. Briefly describe Sunset Industries argument.
17. What is the marginal rate of substitution?
18. What are voluntary export restraints?
19. Explain factor intensity in the context of the H-O model.
20. What is the credit function of the foreign exchange market?
21. Define the term elasticity of substitution.
22. Explain the term trade creation.
23. What is Gross Barter Terms of Trade?
24. Explain the concept of export promotion.
25. Define non-tariff barriers.

Section C Short Answer

Answer any 5 questions. Each question carries 4 marks **(4x5=20 marks)**

26. Explain the concept of Dutch disease.
27. Discuss the limitations of the absolute advantage theory.
28. Explain how the World Trade Organisation (WTO) regulates dumping practices among member countries.
29. How do forward transactions differ from spot transactions?
30. What are the various forms of economic integration?
31. Explain the J-Curve effect with a diagram.
32. Explain any four types of terms of trade.
33. Discuss the redistribution effect of an import quota.

Section D Long Answer/Essay Question

Answer any 3 questions. Each question carries 10 marks. **(3X10=30 Marks)**

34. Critically assess the various new protectionist measures adopted by economies across the world.

35. Elucidate on the impact of currency devaluation on a country's economy.
36. Critically evaluate the advantages and disadvantages of international trade in the context of open economies.
37. Explain the automatic adjustment mechanism of the monetary approach under a flexible exchange rate system.
38. Analyse the Stolper-Samuelson theorem with a graphical explanation. How does the theorem explain the effects of tariffs on factor returns?
39. Elucidate the concept of dumping and its implications on global trade.Discuss the positive and negative externalities in both consumption and production with relevant examples.

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MODEL QUESTION PAPER Set-II

SECOND SEMESTER - MA ECONOMICS EXAMINATION

DISCIPLINE CORE – 08

M23ECO8DC- INTERNATIONAL ECONOMICS

(CBCS - UG)

2023-24 - Admission Onwards

Time: 3 Hours | Max Marks: 70

Section A Objective Type Questions

Answer any 10 questions. Each question carries 1 mark **(10x1=10 marks)**

1. What is the primary purpose of balance of payments?
2. Define redistribution effect under the partial equilibrium approach.
3. What is marginal rate of transformation?
4. Define Cartels.
5. Define devaluation.
6. What is speculation?
7. Define Technical Barriers to Trade.
8. What does the term exchange rate overshooting refer to?
9. Define tariff.
10. What does international trade primarily involve?
11. Define Immiserising growth.
12. What does factor intensity reversal refer to?
13. What is exchange rate?

14. Define Ad-valorem tariff.
15. What is the effect of tariffs on the prices of imported goods?

Section B Very Short Questions

Answer any five questions. Each carries two marks **(5x2=10 marks)**

16. What is the purpose of hedging in the foreign exchange market?
17. Briefly discuss the effects of anti-dumping duties on domestic consumers.
18. Define a flexible exchange rate system.
19. Describe the balance of payments effect of an import quota.
20. Define the automatic adjustment mechanism.
21. Discuss export subsidies.
22. Explain Marginal propensity to Absorb (A)?
23. Explain the concept of absolute advantage.
24. Write a note on specific tariffs with an example.
25. Explain Import Quotas.

Section C Short Answer

Answer any 5 questions. Each question carries 4 marks **(4x5=20 marks)**

26. Discuss the impact of non-tariff barriers on international trade.
27. Explain the implications of unfavourable terms of trade for a country's economy.
28. Discuss the advantages and disadvantages of protectionism for domestic industries.
29. Write a note on the significance of the double-entry bookkeeping system in the balance of payments.
30. Discuss the benefits of a Customs Union.
31. Explain Marshall-Lerner condition.
32. Discuss the relationship between factor endowments and the H-O theorem.
33. Explain how non-tariff barriers can discriminate against foreign suppliers.

Section D Long Answer/Essay Question

Answer any 3 questions. Each question carries 10 marks. **(3X10=30 Marks)**

34. Critically discuss the Metzler Paradox and how it contradicts the Stolper-Samuelson theorem.

35. Analyse the major functions of the foreign exchange market and its importance in the global economy.
36. Elucidate on the different types of terms of trade.
37. Explain in detail about Non-tariff Barriers.
38. Compare and contrast the Infant Industry argument and the Sunset Industry argument in support of protectionism.
39. Explain in detail the general equilibrium framework of the Heckscher-Ohlin theorem. Critically assess the implications of the Leontief Paradox. Discuss the positive and negative externalities in both consumption and production with relevant examples.

സർവ്വകലാശാലാഗീതം

വിദ്യയാൽ സ്വതന്ത്രരാകണം
വിശ്വപൗരരായി മാറണം
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ഗുരുപ്രകാശമേ നയിക്കണേ

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ബോധരശ്മിയിൽ തിളങ്ങുവാൻ
ജ്ഞാനകേന്ദ്രമേ ജ്വലിക്കണേ

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MACROECONOMICS II

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