INDUSTRIALIZATION AND ECONOMIC GROWTH IN NIGERIA

BY

FAVOUR OSEREWE ANETOR
SSC2003897

DEPARTMENT OF ECONOMICS
FACULTY OF SOCIAL SCIENCES
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CERTIFICATION

We certify that this work titled, "**INDUSTRIALIZATION AND ECONOMIC GROWTH IN NIGERIA** " was carried out by **FAVOUR OSEREWE ANETOR** with matriculation number **SSC2003897** in the Department of Economics, Faculty of Social Sciences, University of Benin, Benin City, Edo State.

____________________ ____________________

Prof. A.I. Monye-Emina **Date**
(Project Supervisor)

____________________ ____________________

Dr. S.O Igbinedion **Date**
(Project Coordinator)

____________________ ____________________

Dr. N.L. Arodoye **Date**
(Head of Department)

DEDICATION

This project is dedicated to God Almighty

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First and foremost, I give all glory and thanks to God for granting me wisdom, strength, and perseverance throughout this project. Without His guidance and blessings, this work would not have been possible.

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ANETOR FAVOUR OSEREWE

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ABSTRACT

This study investigates the role of industrialization in driving economic growth in Nigeria, focusing on key trends, relationships, and policy implications. The research is guided by four main objectives: to examine the trend in industrial production, assess the trend in economic growth, estimate the relationship between industrialization and economic growth, and provide appropriate policy recommendations. Through the analysis of historical data and the application of econometric techniques, the study uncovers the fluctuating nature of industrial output and its limited but positive impact on Nigeria's overall economic performance. Despite efforts to promote industrial development, challenges such as infrastructural deficits, policy inconsistencies, and weak institutional support have hindered the sector's potential to significantly boost economic growth. The findings suggest that a strategic and sustained industrialization agenda—complemented by targeted investments, policy coherence, and enhanced public-private collaboration—is essential to unlocking Nigeria's economic potential and achieving long-term growth.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Industrialization has been fundamental to economic development. Economic researchers recognize the importance of industrialization and manufacturing to the process of economic development. Rostow in particular theorized that economic development follows a transformation from a primitive agricultural economy into an industrialized economy where the industrial sector contributes a high proportion to overall economic growth. Historical evidence shows that most industrialized economies had adopted policies that supported economic transformation through structural change from low to high productive economic activities. Thus, industrial development is seen as the driver of structural change as well as the key to the process of economic development. Empirical evidence suggests that modern economic development requires structural change through growth in the industrial sector which remained the engine of growth in the development process. Szirmai (2009) argues that virtually all cases of high, rapid, and sustained economic growth in modern economies have been associated with industrialization, particularly growth in manufacturing production.

The structural change argument posits that there is higher productivity in the industrial sector than in the agricultural sector due to transfer of resources from agriculture to manufacturing and from manufacturing to services. The manufacturing sector in turn provides opportunities for capital accumulation and technological advancement in developing countries. This provides the reason why the growth of manufacturing sector has been so important in the process of growth and development. In fact, recent growth in China`s aggregate productivity and export has been linked to her manufacturing sector activities. Given the role played by industrialization in the overall economic development process, the quest to achieve economic transformation through industrial sector growth became a single global issue in which individual countries have followed different paths depending on their initial conditions and moment of their entry into the race (Pollard, 1990). However, developing countries have been very slow in achieving structural transformation from predominantly agrarian and extractive nature of production to a strong and virile industrial base. Even though developing Asian and South American countries have caught-up with highly industrialized countries in terms of industrialization, African economies, Nigeria inclusive, have comparatively remained backward in the rate and magnitude of industrial sector growth. Despite several policies targeted at expanding the industrial capacity of African economies, they have remained structurally unbalanced. Due largely to growing population and poor technology absorption capacity, there has been huge number of people entering the labour force without requisite human capital qualities and so their mode of production had remained labor-intensive. Manufacturing capacity have grossly remained under-utilized over time with the production of uncompetitive products. Critical investments required to drive the industrial development process is lacking with poor entrepreneurial initiatives.

In 1960 when Nigeria attained political independence, agricultural production dominated economic activities. Agricultural sector accounted for the highest proportion of our national income through primary agricultural products export. Empirical evidence show that the share of agriculture in Gross Domestic Product (GDP) stood at 63 percent and contributes about 80 percent of our export earnings. At that time, industrial activities was very low while foreign companies engaged in trade and commerce especially in the importation and distribution of (foreign) manufactured goods(Ekpo,2014).

According to Banjoko et al (2012), laying a solid foundation for the development of an industrial economy for Nigeria was not part of the colonial economic policy. Instead colonies were made perpetual producers of primary raw materials for foreign industries while manufactured goods were imported. This scenario coupled with experiences from other countries that industrialization promotes economic growth and development faster than agriculture, industrialization was made the highest priority area for the Nigeria state shortly after political independence (Roberts and Azubuike, 2005). Over the years, Nigerian government had formulated and implemented different industrial policies/ industrialization strategies in order to facilitate industrialization of the economy. Some of these policies include import substitution approach, export promotion strategy and foreign private investment led industrialization as well as policy reform measures like indigenization policy and structural adjustment programme. Huge public investment were made in the industrial sector with the establishment of industrial research and training institutes to provide the necessary foundation for growth of the industrial sector of the country by providing the basic engineering infrastructure for the production of raw materials, spare parts, equipment components and machinery needed in the various industrial establishments in Nigeria. These include Industrial Core Projects (ICPS), Federal Institute for Industrial Research (FIIR), Project Development

Agency (PRODA), and Raw Materials Research Development Centre (RMRDC). This article investigates the impact of industrialization and the growth of Nigeria’s economy as there exists a gap in the existing pool of knowledge regarding the role of industries in Nigeria. Industry is usually synonymous with manufacturing. However, industrialisation refers to the transformation of raw materials into finished goods or products of more valuable goods. Industry is often also seen as the organised human skills and efforts put into the production of more valuable goods from natural resources (Ndiaya & Lv 2018).

Developing countries such as Nigeria still need more industries, especially manufacturing to promote economic growth and development to an optimal level. Developing countries especially need adequate resources to promote the production and exportation of goods by industries to achieve the desired economic growth and development (Olusegun 2021). The overriding objective of industrial policy may also be to accelerate the pace of industrial development by radically increasing the value added at every stage of the value chain (Jelilov, Enwerem & Isik 2016). Djeudo (2013) suggested that in achieving industrialisation among developing economies such as Nigeria, the government must continue to create enabling environments that are conducive to the private sector and formulate good policies that enhance innovativeness. Industries are an important indicator of economic growth because the marginal revenue products of labour in industries are usually higher than that of the agricultural sector. Jelilov et al. (2016), for instance, asserted that labour force movement from agricultural to industrial sectors results in marginal product of labour appreciation in the agricultural sector with a consequential impact on the overall revenue and output of the country. That was also the fundamental assumption of the Lewis model (Todaro & Smith 2020). Given this, Kida and Angahar (2016) remarked that industrialisation sets the condition to achieve sustainable economic growth in all economies. It can also be stated that the dynamic benefits of the manufacturing sector are activating economic transformation in this modern-day economy. Industrialisation is also responsible for speeding up investment capital in the agricultural sector (Afolabi & Ogoh 2017).

Kida and Angahar (2016) and CBN (2020) found a 3.2% share of manufacturing value in total gross domestic product (GDP) in 1960. In 1977, the manufacturing share of GDP rose to 5.4% and grew to 13% in 1992. Manufacturing share in GDP fell, however, to 6.2% in 1993, while the manufacturing capacity utilisation (MCU) rate declined to 2.4% in 1998 and increased by 3.4% from 2001 to 2009. By 2020, value-added manufacturing as a percentage of the GDP reached 12.67% (World Bank 2022). To improve the growth of the Nigerian economy, the government implemented some industrial policies such as the Structural Adjustment Programme (SAP) in 1986. This policy structure was an alternative framework to address the weaknesses and ineffectiveness of previous development planning efforts. The motives of these policies were to achieve economic growth, full employment and balance of payment equilibrium. Economic growth is, however, a long-term expansion of the total productive potential of the economy (Kleynhans & Pradeep 2013). The growth of an economy implies the expansion of all sectors of the economy, high levels of productivity, high standards of living and overall achievement of all the macroeconomic objectives of an economy such as high levels of employment, reduced inflation and high outputs (Unugbro 2010).

Over the years, Nigeria experienced great improvements in GDP, but with a high rate of poverty, unemployment, illiteracy and low human development. Kida and Angahar (2016) refered to such growth as jobless growth; that is, growth without development. It also shows that a large percentage of the population does not benefit from the expenditures of the government, which also led to a decline in consumable goods. In 1981, Nigeria experienced a GDP per capita growth rate of 3.6%, which decreased to –15.4% in 1983, and this reduction continued until 1989 to –13%. Gross domestic product per capita growth rate kept fluctuating until 2006 when a very high increase of 30% GDP per capita growth rate occurred after which there was a drastic fall again to 4.9% in 2012 (World Bank 2022). The dwindling in the GDP of Nigeria within these periods can be attributed to the deterioration of the fiscal balances that were experienced in the Nigerian public sector and the policies designed to solve the issues concerning the economy proved abortive (Ahmed 1990). The drastic fall after 2006 can also be attributed to the impact of oil prices and the impact of the financial sector, which culminated in the global financial crisis of 2008. The country also experienced negative growth of 1.6% in 2016 and about 0.8% in 2017, which can be attributed to a collapse in the prices of oil after 2014, which resulted in a fall in the revenue of the federal government, a trade deficit and a recession. The economy of Nigeria started experiencing normal growth in 2018 after 2 years of abnormal growth (UNCTAD 2018).

Nigerian industrial sector is characterised by high importation of industrial inputs, declining output, high production costs, diminishing capacity utilisation, low value-added, low employment generation and inadequate linkages to various sectors in the economy (Ijaiya &

Akanbi 2009). The Nigerian government attempted to improve the growth of the economy by implementing some industrial policies like disinvestment, privatisation, commercialisation, devaluation and SAPs. The main aims of these policies were to address the problem of economic growth, unemployment, the balance of payment deficit, technical progress and technology transfer. After several attempts to stabilise the economy by different governments, the country experienced fluctuating growth. Kaldor's law of economic growth is relevant in explaining the fluctuations in the economic system and the incapability of the economic policies to achieve economic stability in Nigeria. Therefore, Kaldor's first law explains manufacturing as a condition or an engine of economic growth. The second law explains how output and labour influence each other positively in manufacturing (Libanio & Moro 2006). The relevance of the manufacturing sector towards achieving economic growth and development of the country has attracted several empirical investigations (Afolabi & Ogoh 2017; Iheoma & Jelilov 2017; Isiksal & Himesie 2016; Kida & Angahar 2016; Ndiaya & Lv 2018; Obioma, Anyanwu & Kalu 2015). The growth of the investigations concerning the manufacturing sector and economic growth and development in developed and developing countries have not been without divergence in the results. Some studies found the manufacturing sectors to have a positive impact on economic growth (Obioma et al., 2015; Sutikno & Sri-Wahyudi 2017). Whereas Iheoma and Jelilov (2017) found manufacturing to inhibit economic growth among the Economic Community of West African States (ECOWAS) countries. However, against the result of the investigation on ECOWAS countries, Nigeria and Senegal are part of the ECOWAS countries, but Obioma et al. (2015), Ndiaya and Lv (2018) found a positive relationship between manufacturing and economic growth for Nigeria and Ghana, respectively.

Based on the contradictory findings by these researchers, the present study raised an empirical question of what the causal relationship between industrialisation and economic growth in Nigeria is. The current study is consequently aimed at determining this causal relationship between industrialisation and economic growth in Nigeria. This study also intends to ascertain whether a long-term relationship exists between industrialisation and economic growth in Nigeria. Nigeria is taken as the laboratory in this study because of the characteristics of her industrial sector and the divergence in the results of the investigations conducted on Nigeria in comparison with other developing economies. The study shall adopt the Johansen co-integration techniques. This technique is preferred to others in this study as it has a well-defined asymptotic distribution or limiting distribution. It can be said that the test will be affected by parameter instability experienced with the use of techniques like the Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) tests. We also adopted the Granger causality test as it takes advantage of the data gathered at different levels of frequencies. Given all the laudable efforts put in place towards industrialization, one would expect that the industrial sector should have overcome earlier teething challenges and contribute greater proportion towards the overall economic development and structural change of Nigeria. But close observation shows otherwise.

1.2 Statement of the Problem

Enormous research has been devoted to the study of industrialization in Nigeria since independence. There is apparent consensus that the sector had recorded abysmal performance over the years. This is in spite of all the efforts of the government to kick-start and sustain rapid industrialization in Nigeria. The expected welfare and social benefits of industrialization has continued to elude Nigeria citizens while available data and economic indicators reveal that the level of industrialization in Nigeria had remained unimpressive.

Obioma and Ozughalu (2005) opined that Nigeria's industrial sector has been characterized by high import content of industrial inputs, dwindling capacity utilization, high cost of production, low value added, declining output growth, low employment generation and inadequate linkages with other sectors of the economy. In this study, the average annual growth rate of industrial output as a percentage of GDP is about 8 percent which is a far-cry to what obtains in many developing countries. In the same period, manufacturing sector output as a percentage of GDP stood at 7 percent while the agricultural sector output as a percentage of GDP stood at 22 percent which is higher than industrial and manufacturing sector contribution put together (CBN, 2015). Thus, the researcher is motivated to investigate into the nature of the relationship that exists between certain components of the industrial sector and economic growth in Nigeria. Earlier studies on this subject utilized both descriptive and econometric methodology to explore the industrialization-growth nexus but none of these studies was done using the rebased data. This study, therefore utilized the rebased time series data for the Nigerian economy based on the 2010 constant prices to ascertain the short and long run relationship between Nigeria`s economic growth variable proxies by GDP and industrial, manufacturing and agricultural sectors output. Other related variables are the labor force and the gross fixed capital formation. Nigeria, endowed with abundant natural resources and a youthful population, faces significant challenges in harnessing industrialization as a pathway to sustainable economic growth. Despite its potential, the country has experienced stagnation in industrial development, characterized by inadequate infrastructure, inconsistent policy implementation, and a lack of access to financing for small and medium-sized enterprises (SMEs).

Furthermore, the reliance on oil as the primary driver of the economy has resulted in a neglect of other industrial sectors, leading to vulnerability to global oil price fluctuations. This over-dependence hampers the diversification necessary for robust economic growth. Additionally, the regulatory environment is often complex and inconsistent, deterring both local and foreign investment in key industries. Issues such as bureaucratic inefficiencies, corruption, and inadequate technical skills among the workforce further exacerbate the challenges faced by the industrial sector. The current state of industrialization in Nigeria not only limits job creation but also stifles innovation and technological advancement, crucial elements for sustainable economic growth. This situation necessitates a comprehensive analysis to understand the barriers to industrialization and to identify strategic interventions that could facilitate economic diversification and resilience. Thus, this study aims to investigate the interrelationship between industrialization and economic growth in Nigeria, focusing on the key factors that impede industrial development and proposing viable solutions to enhance the industrial sector's contribution to the overall economy. The outcomes of this research are intended to inform policymakers and stakeholders on effective strategies for fostering industrial growth as a means to achieve sustainable economic development in Nigeria.

1.3 Objective of the Study

The main objective of this study is to examine the role of industrialization on the growth of the Nigerian economy. The specific objectives of this study are to:

1. Examine trend in industrial production in Nigeria
2. Examine trend in economic growth in Nigeria
3. Estimate the relationship between industrialization and economic growth in Nigeria
4. Make recommendations on appropriate policies

1.4 Research Questions

1. What are the trend in industrial production in Nigeria?
2. What are the trend in economic growth in Nigeria?
3. What is the relationship between industrialization and economic growth in Nigeria?
4. What are recommendations on appropriate policies

1.5 Research Hypothesis

The following hypotheses were formulated to guide this work:

H_0: The impact of industrialization on economic growth in Nigeria is not significantly different from zero

H_1: The impact of industrialization on economic growth in Nigeria Is significantly different from zero

1.6 Significance of the Study

This study on "Industrialization and Economic Growth in Nigeria" holds significant importance due to the following reasons:

1. Policy Formulation: The findings will provide valuable insights for policymakers to formulate and refine industrial policies that effectively drive economic growth and development in Nigeria. By understanding the specific relationship between industrialization and economic growth, policymakers can prioritize sectors, allocate resources efficiently, and implement targeted interventions to accelerate industrial development.
2. Resource Allocation: The research will help identify critical sectors within the industrial landscape that require increased investment and support. This will enable maximizing the impact of government interventions and private investments.
3. Investment Decisions: The study will provide valuable information for both domestic and foreign investors. By highlighting the growth potential of specific industrial sectors and identifying potential risks, the research will guide investment decisions, attract capital, and stimulate economic activity.
4. Addressing Economic Challenges: The findings will contribute to addressing pressing economic challenges faced by Nigeria, such as high unemployment rates, poverty, and income inequality. By fostering industrial growth, the study aims to create more jobs, increase income levels, and improve overall living standards for the Nigerian population.
5. Academic Contribution: The study will contribute to the existing body of knowledge on

the relationship between industrialization and economic growth, particularly within the Nigerian context. By utilizing the latest data and employing rigorous econometric techniques, the research will provide valuable insights and contribute to a deeper understanding of this crucial economic relationship.

This significance statement emphasizes the practical implications of the study for policymakers, investors, and the broader Nigerian economy. It highlights the potential for the research to inform and guide decision-making processes that can lead to positive economic outcomes.

1.7 Limitations of the Study

This study on "Industrialization and Economic Growth in Nigeria" is subject to the limitation of time, this is because attention had to be given to other course work as required by the program

CHAPTER TWO

LITERATURE REVIEW

2.1 Industrialization: Conceptual Issues

Industrialization is a multifaceted process encompassing the shift from an agrarian-based economy to one dominated by manufacturing and industrial production. In other words Industrialization is a transformative process that shifts an economy from primarily agricultural production to a focus on manufacturing and industrial activities. It involves a significant shift in how goods are produced, often involving the introduction of machinery and technology to increase efficiency and output. Industrialization entails a fundamental transformation of an economy. Here is a breakdown:

Moving Away from Farms: It involves a significant transition away from an economy primarily based on agriculture and towards one focused on manufacturing and industrial production. Reduced Reliance on Farming: A smaller portion of the population is involved in farming activities.

Factories and Production: The establishment of factories and the use of machinery to produce goods on a large scale.

Mass Production: Increased output and efficiency through mechanized production processes.

Technological Advancements:

Innovation: Continuous development and adoption of new technologies, machinery, and production methods.

Automation: Increased use of machines and automation to replace human labor in various production processes.

Structural Transformation: Shift in the economic structure, with a decline in the share of agriculture and a rise in manufacturing and related service sectors.

Urbanization: Growth of cities and urban centers as a result of industrial activities and migration of people from rural areas.

Social and Cultural Shifts: Changes in social structures, work patterns, and cultural norms due to the rise of industrial society.

In essence, industrialization is a multifaceted process that involves a significant shift in how goods are produced, the structure of the economy, and the way people live and work.

Technological Advancements: Adoption and development of new technologies, machinery, and production processes.

Structural Transformation: Shift in economic structure, with a decline in the share of agriculture and a rise in manufacturing and services.

Urbanization: Growth of cities and urban centers as a result of industrial activities and migration.

Social and Cultural Changes: Alterations in social structures, work patterns, and cultural norms due to industrialization.

Theoretical Perspectives on Industrialization:

1. Rostow's Stages of Economic Growth: This linear model posits that societies progress through distinct stages, with industrialization being a crucial phase in the transition

from a traditional to a modern economy.

2. Dependency Theory: This perspective argues that industrialization in developing countries is hindered by their dependence on developed nations, leading to unequal terms of trade and limited economic growth.
3. Neoclassical Growth Theory: This framework emphasizes the role of capital accumulation, technological progress, and human capital in driving industrialization and economic growth.
4. Endogenous Growth Theory: This theory highlights the importance of innovation, research and development, and knowledge spillovers in fostering sustained industrial growth.

Types of Industrialization:

1. Import Substitution Industrialization (ISI): Focuses on replacing imports with domestically produced goods through protectionist measures.
2. Export-Oriented Industrialization (EOI): Emphasizes the development of export-competitive industries to drive economic growth.
3. Science and Technology-Driven Industrialization: Emphasizes innovation, research and development, and technological advancements as key drivers of industrial growth.

Challenges and Controversies:

1. Environmental Impact: Industrialization can lead to environmental degradation, pollution, and resource depletion.
2. Social Inequality: Industrialization can exacerbate social inequalities, leading to income

disparities and urban-rural divides.

3. Role of the State: The appropriate role of the government in promoting industrialization remains a subject of debate, with arguments for both interventionist and market-based approaches.
4. Measuring Industrialization: There is no single, universally accepted measure of industrialization, leading to challenges in comparing levels of industrial development across countries.

Contemporary Issues:

1. Globalization and Industrialization: The impact of globalization on industrialization patterns, including the rise of global value chains and the challenges faced by developing countries in competing in the global market.
2. Technological Change and the Future of Work: The impact of automation, artificial intelligence, and other technological advancements on industrial employment and the future of work.
3. Sustainable Industrialization: The need to integrate environmental sustainability and social equity into industrial development strategies.

Examples of industrialization:

1. The Industrial Revolution: A period of major industrialization that began in the late 18th century in Britain, characterized by the invention of new machinery (like the steam engine), the development of factories, and the shift from hand production to mechanized production.

2. Industrialization in developing countries: Many developing countries have undergone rapid industrialization in recent decades, often focusing on export-oriented manufacturing.

Impact of industrialization:

Industrialization can have significant positive impacts, such as economic growth, job creation, and increased productivity. However, it can also lead to negative consequences, including environmental pollution, social inequality, and the exploitation of workers.

Positive impact:

1. Economic Growth: Industrialization is often a major driver of economic growth, leading to increased production, higher incomes, and improved living standards.
2. Technological Advancement: It fosters innovation and the development of new technologies, which can improve productivity, efficiency, and quality of life.
3. Job Creation: Industrialization creates new jobs in manufacturing, transportation, and related sectors, leading to increased employment opportunities.
4. Increased Productivity: The use of machinery and technology significantly increases productivity, allowing for the production of more goods with fewer resources.

Improved Infrastructure: Industrialization often leads to the development of better infrastructure, such as transportation networks, communication systems, and energy grids.

Negative Impacts:

1. Environmental Degradation: Industrial processes can lead to pollution, resource depletion, and environmental damage, including air and water pollution, deforestation,

and climate change.

2. Social Inequality: Industrialization can exacerbate social inequalities, leading to income disparities, urban-rural divides, and the exploitation of workers.
3. Urbanization Challenges: Rapid urbanization can lead to overcrowding, inadequate infrastructure, and social problems in cities.
4. Health Issues: Industrialization can lead to health problems for workers and communities due to exposure to pollutants and hazardous working conditions.
5. Social Disruption: The rapid pace of industrialization can disrupt traditional social structures and lead to social unrest.
6. Industrialization is a complex and multifaceted process with significant implications for economic growth and development. Understanding the various conceptual issues surrounding industrialization is crucial for developing effective policies and strategies to promote sustainable and inclusive industrial growth

2.2 Determinants of Industrialization

Industrialization is a complex process with a multitude of factors driving its success. Here's a breakdown of some of the most crucial ones:

1. Technological Advancements:

i. Invention and Innovation: This is arguably the cornerstone. New technologies like the steam engine, the power loom, and later, electricity and computers, revolutionized production methods, increasing efficiency and output.

ii. Scientific Discovery: Underlying these technological breakthroughs is scientific progress. Understanding of physics, chemistry, and engineering principles fuels the development of new machines and processes.

2. Resource Availability:

i. Natural Resources: Access to raw materials like coal, iron ore, and water power is crucial. These resources provide the foundation for industrial production.

ii. Energy Sources: Reliable and affordable energy sources are essential to power factories and machinery.

3. Human Capital:

i. Skilled Labor: A skilled workforce is necessary to operate complex machinery, maintain equipment, and innovate within the industrial sector.

ii. Entrepreneurship: A culture that encourages entrepreneurship and risk-taking is vital for the development of new industries and businesses.

4. Economic Factors:

i. Capital Accumulation: The availability of capital for investment in factories, machinery, and infrastructure is crucial for industrial growth.

ii. Market Demand: A growing domestic and international market for manufactured goods provides the incentive for industrial expansion.

iii. Government Policies: Supportive government policies, such as investment in infrastructure, protectionist trade policies, and incentives for industrial development, can significantly accelerate industrialization.

5. Social and Cultural Factors:

i. Social Stability: A stable and peaceful society is essential for industrial development. Social unrest and political instability can disrupt production and discourage investment.

ii. Cultural Values: A culture that values hard work, innovation, and education can foster a more productive and dynamic industrial sector.

6. Global Context:

i. International Trade: Access to international markets for both raw materials and finished goods can significantly boost industrial growth.

ii. Technological Diffusion: The spread of technology and knowledge across borders can accelerate the pace of industrialization in developing countries.

It's important to note that these factors are interconnected and interact in complex ways. For example, technological advancements often require significant investment, while a skilled workforce relies on education and training systems. Furthermore, the specific factors that drive industrialization can vary depending on the historical context, the specific country or region, and the type of industrialization being pursued.

This comprehensive analysis highlights the multifaceted nature of industrialization and the importance of considering a range of factors when analyzing its development and impact.

2.3 Trend in Industrialization in Nigeria

The trend of industrialization in Nigeria has been a complex and multifaceted journey, marked by both progress and significant challenges.

Colonial Legacy: Nigeria's colonial past significantly shaped its industrial trajectory. The emphasis was on the extraction of raw materials for export to the colonizing powers, leaving little room for the development of domestic industries.

Post-Independence: After independence, the government actively pursued import substitution industrialization, aiming to reduce reliance on imported goods. This led to the establishment of various industries, particularly in manufacturing.

Mixed Progress: While there have been some positive developments, Nigeria's industrialization path has been slow and uneven.

Growth in Specific Sectors: Growth has been observed in certain sectors such as food processing, beverages, and construction.

Rise of SMEs: The Small and Medium Enterprises (SMEs) sector has shown significant growth, contributing to job creation and economic activity.

Government Initiatives: The government has implemented various initiatives to boost industrialization, such as the National Industrial Revolution Plan (NIRP) and the Economic Recovery and Growth Plan (ERGP). These plans aim to create an enabling environment for businesses, improve infrastructure, and attract foreign investment.

Inadequate Infrastructure: A significant bottleneck remains the inadequate infrastructure, including unreliable power supply, poor transportation networks, and limited access to quality logistics.

Security Concerns: The ongoing security challenges, such as insurgency and banditry, have disrupted industrial activities, deterred investment, and hindered the movement of goods and services.

Bureaucracy and Corruption: Bureaucratic bottlenecks, corruption, and an unfriendly regulatory environment continue to stifle business growth and discourage investment.

Dependence on Oil: The Nigerian economy remains heavily reliant on oil exports, which can overshadow the development of other sectors, including manufacturing. This "Dutch Disease" effect can lead to a neglect of other sectors and hinder diversification.

Competition: Nigerian industries face stiff competition from cheaper imports, particularly from Asia. This has impacted local production and limited the growth of certain sectors.

Government Initiatives:

Policy Efforts: The government has implemented various initiatives to boost industrialization, such as the National Industrial Revolution Plan (NIRP) and the Economic Recovery and Growth Plan (ERGP). These plans aim to:

i. Create an enabling environment for businesses.

ii. Improve infrastructure and access to finance.

iii. Attract foreign direct investment.

iv. Promote local content and support for domestic industries.

Focus on Diversification: There is a growing emphasis on diversifying the economy away from oil dependence and promoting non-oil sectors, including manufacturing, agriculture, and technology.

Emphasis on SMEs: Recognizing the crucial role of SMEs, the government is focusing on supporting their growth through access to finance, training, and market linkages.

Technological Innovation: There is a growing emphasis on leveraging technology, such as digital technologies and automation, to improve productivity and competitiveness in the manufacturing sector.

Overcoming Challenges: Addressing the challenges of infrastructure, security, and bureaucracy is crucial for accelerating industrial growth.

Leveraging Opportunities: Nigeria possesses significant potential for industrial development, including a large and growing population, abundant natural resources, and a young and dynamic workforce.

Sustainable Development: Promoting sustainable industrial practices that are environmentally friendly and socially responsible is crucial for long-term success.

The trend of industrialization in Nigeria is a work in progress. While challenges remain, the country has the potential to achieve significant industrial growth through strategic policy interventions, investment in infrastructure, and a focus on innovation and sustainable development. While there have been some positive developments, Nigeria's industrialization journey has been slow and uneven. Overcoming the challenges mentioned above is crucial for accelerating industrial growth and diversifying the economy. This includes improving infrastructure, addressing security concerns, enhancing the business environment, and promoting innovation and technological development.

2.4 Economic Growth: Conceptual Issues

Economic growth is a complex and multifaceted concept, central to the study of economics. It refers to the increase in the production of goods and services in an economy over a specific period, typically measured by the growth rate of Gross Domestic Product (GDP). However, understanding economic growth requires delving into various conceptual issues that shape its definition, measurement, and interpretation. Economic growth is the increase in the production of goods and services in an economy over a period of time. It's usually measured as the percentage increase in a country's real gross domestic product (GDP), which is GDP adjusted for inflation. GDP is the total market value of all final goods and services produced in an economy.

Economic growth can be measured in 'nominal' or 'real' terms. Nominal economic growth refers to the increase in the dollar value of production over time. This includes changes in both the volume of production and the prices of goods and services produced. Economists normally talk about real economic growth – that is, increases in the volume produced only, which takes away the effect of prices changing. This is because it better reflects how much a country is producing at a given time, compared with other points in time.

Some factors that can drive economic growth include:

- **i.** Capital accumulation: The accumulation of capital stock
- **ii.** Labor inputs: Increases in the number of workers or the hours worked
- **iii.** Technological advancement: Advances in technology

Economic growth is an indicator of a country's economic health. Rapid economic growth over a number of years can help a developing country become developed. Economic development is a broader concept than economic growth. It includes economic growth, as well as social, cultural, and political changes that contribute to a society's material well-being.

Conceptual Issues in Economic Growth

GDP as a Measure: While GDP is the most widely used metric, it has limitations. It doesn't account for informal sectors, environmental degradation, or income inequality. Alternative measures like the Genuine Progress Indicator (GPI) and the Human Development Index (HDI) attempt to address these shortcomings.

Real vs. Nominal GDP: Real GDP adjusts for inflation, providing a more accurate picture of economic growth. Nominal GDP, on the other hand, reflects current market prices, which can be inflated.

2.5 Determinant of Economic Growth

Economic growth, the expansion of an economy's capacity to produce goods and services, is driven by a complex interplay of factors. These determinants can be broadly categorized into four key areas:

i. A well-educated and skilled workforce is crucial for economic growth. Investments in education at all levels, from primary to tertiary, enhance human capital by equipping individuals with the knowledge and skills necessary to innovate, adapt to new technologies, and increase productivity.

ii. A healthy population is more productive. Access to quality healthcare, proper nutrition, and a safe environment contribute to a healthier workforce, leading to increased labor productivity and economic growth.

iii. Investment in physical capital, such as machinery, equipment, infrastructure (roads, bridges, communication networks), and technology, is essential for economic growth. These investments enhance productivity and expand the economy's production capacity.

iv. Investment in R&D drives technological innovation, leading to the development of new products, services, and production processes. This fosters increased efficiency and productivity, ultimately boosting economic growth.

The availability and efficient exploitation of natural resources, such as minerals, energy sources, and fertile land, can significantly contribute to economic growth. However, sustainable resource management is crucial to avoid environmental degradation and ensure long-term economic sustainability. A healthy environment is essential for economic growth. Pollution and environmental degradation can negatively impact human health, productivity, and the overall quality of life, hindering economic progress.

A stable political environment, effective governance, and a strong rule of law are essential for economic growth. These factors create a conducive environment for businesses to thrive, attract investment, and foster innovation. Sound macroeconomic policies, including monetary and fiscal policies, are crucial for maintaining economic stability and promoting growth. These policies should aim to control inflation, maintain sustainable levels of government debt, and promote a favorable business environment.

International trade and foreign investment can significantly contribute to economic growth by providing access to new markets, technologies, and capital. Open trade policies and a welcoming environment for foreign investment can stimulate economic activity and accelerate growth. Technological progress, driven by research and development, is a key driver of economic growth. The adoption and diffusion of new technologies across sectors can lead to significant productivity gains and economic expansion.

It's important to note that these factors are interconnected and influence each other in complex ways. For example, investments in education and healthcare (human capital) can lead to increased productivity, which in turn can drive further investment and economic growth. Similarly, technological progress can enhance the productivity of both labor and capital, leading to a virtuous cycle of economic growth. Understanding these determinants of economic growth is crucial for policymakers and businesses alike. By focusing on policies that promote human capital development, encourage investment, foster innovation, and create a conducive environment for economic activity, governments and businesses can work together to achieve sustainable and inclusive economic growth.

One of the most fundamental economic issues that have received extensive attention in the economic literature to date centers on: what causes economic growth? Why do countries grow faster than the other? What are the causes of disproportionate rates of growth across countries? Are factors causing differential growth rates country-specific? Attempts at answering these questions have spawned an avalanche of reasons as factors, ranging from economic, social, cultural, political and more recently, institutional reasons have been included.

What can be inferred from the diverse causative factors as highlighted in the literature aptly accentuates lack of consensus and general inconclusiveness of growth causal factors. Despite these divergences, the impact of foreign direct investment (FDI, hereafter) on growth remains in large part an empirical regularity. The channel through which FDI impacts is transmitted has also stimulated another round of queries that has consequently added a new strand of literature into FDI-growth repository.

Examples of such mediating channels in the literature abound and they include: absorptive capacity of the receiving country (in terms of domestic economy"s trade policy, quality of human capital, physical capital accumulation, see Balasubramanyam et al. (1996); Borensztein et al. (1998) and De Mello(1997) for detail narratives and level of financial sector sophistication (see Alfaro et al., 2004; Durham, 2004; and Ang, 2008)). Amid the identified and various channels which mediate between FDI-growth nexus, the impact of economic freedom (a very key component of institutional quality variables) has so far been less recognized or at best receives limited consideration. Notwithstanding, it has been widely acknowledged among growth analysts that a country which enjoys more economic freedom tends to attract more FDI inflows and growth faster than country that is being denied enjoying the same freedom. Economic freedom, according to Heritage Foundation has been defined as „the absence of government coercion or constraint on the production, distribution, or consumption of goods and services beyond the extent necessary for citizens to protect and maintain liberty itself". Economists have long accorded greater importance to freedom to choose and supply resources, competition in business, free trade with others and secure property rights as representing important ingredients needed for achieving economic development. Several empirical works, however, have shown the importance of economic freedom in explaining cross-country differences in economic performance [see an excellent survey by de Haan et al. (2006).

Further, empirical studies have shown that countries vary in the ways and manners by which economic freedoms are exercised and implemented. Observably, in the developed nations, economic freedom is undeniably a public good as can be observed from unfettered enjoyment of it among and/or between the various economic agents, but contrariwise, lacking and even if exists, scarcely enjoy by various economic agents from the developing countries" counterpart. By implication, economic freedom as a bundle of goods or services in these countries is essentially luxurious in nature. Arguably, countries within sub-Saharan region in particular are seen operating on the negative and extreme end of economic freedom continuum thus raising pertinent issue about economic woes befalling the region.

Nigeria, like any other Africa countries has witnessed a series of violations in socio-politico-economic freedoms over the years. This is particularly the case during the military era which accounted greatly to the political annals of the country. With the emergence and enthronement of the democratic dispensation, a pocket of violations were still observed in virtually all facets of human lives in the country but with some signs of respite. With this background information about the backlog of violations, the paper is, therefore, interested in unraveling the extent to which economic freedom interacts with FDI to generate the desired economic growth. The novelty of the study stands out on a number of fronts. First, though voluminous works have been conducted on economic freedom and economic growth with foreign direct investment as an intervening variable, we are not aware of any study that has specifically examined the tripartite relationship involving FDI, economic freedom and economic growth for Nigeria

2.6 Theories of Economic Growth

Economic growth theories attempt to explain the process of long-term increases in a country's Gross Domestic Product (GDP). Here are some prominent theories:

Classical growth theory is an economic theory that focuses on the factors that drive long-term increases in a country's Gross Domestic Product (GDP). It was developed by prominent economists like Adam Smith, Thomas Malthus, and David Ricardo in the 18th and 19th centuries.

Classical growth theory was developed alongside the Industrial Revolution in Great Britain. Analysis of the process of economic growth was a central focus of these classical economists. Classical economists sought to provide an account of the broad forces that influenced economic growth and of the mechanisms underlying the growth process.

The division of labor, the gains from trade, and the accumulation of capital were seen as the main driving forces of economic growth. Productive investment and the reinvestment of profits were the mechanisms that produced continuous economic growth, so changes in the rate of profit were a decisive reference point for an analysis of the long-term evolution of the economy.

They argued that individual initiative, under freely competitive conditions to promote individual ends, would produce beneficial results to society as a whole. Their conclusions supported the adoption of free trade, respect for private property, and individual free enterprise. Meanwhile, conflicting economic interests could be reconciled by the operation of competitive market forces and the limited activity of responsible government.

These economists' ideas diverged from previous economic ways of thinking. Their critique of feudal society that came before them was based on the observation among others: that a large portion of the social product was not so well invested but was consumed unproductively by the ruling class. They followed the French physiocrats in studying the economic welfare of a nation as a whole, as opposed to the mercantilist focus on the accumulation of gold for the king. They split from the physiocrats by focusing on, and celebrating, industry and capital accumulation as a source of economic prosperity.

Classical economists believed that economic growth is primarily driven by the accumulation of capital, such as tools, machinery, and infrastructure. They argued that investment in capital goods leads to increased productivity and output.

Population growth was also seen as a key driver of economic growth. A larger workforce could produce more goods and services, leading to higher output.

Classical economists recognized the concept of diminishing returns, which states that as more and more resources are invested in a particular activity, the additional output generated from each additional unit of input will eventually decline. This implies that sustained economic growth cannot solely rely on increasing capital or labor inputs. Classical growth theory did not adequately account for technological progress, which plays a crucial role in modern economic growth.

The theory's emphasis on diminishing returns suggests that economic growth may eventually stagnate, which has not been the case in many developed economies. Classical growth theory did not fully consider the role of institutions, such as property rights, rule of law, and efficient markets, which are important for fostering economic growth. While classical growth theory provides valuable insights into the role of capital accumulation and labor growth in driving economic growth, it has limitations due to its neglect of technological progress and the role of institutions. Modern growth theories, such as neoclassical growth theory and endogenous growth theory, have built upon the foundations of classical growth theory to provide a more comprehensive understanding of the factors driving economic growth.

The Neoclassical Growth Theory is an economic model of growth that outlines how a steady economic growth rate results when three economic forces come into play: labor, capital, and technology. The simplest and most popular version of the Neoclassical Growth Model is the Solow-Swan Growth Model.

The theory postulates that short-term economic equilibrium is a result of varying amounts of labor and capital that play a vital role in the production process. The theory argues that technological change significantly influences the overall functioning of an economy. Neoclassical growth theory outlines the three factors necessary for a growing economy. However, the theory puts emphasis on its claim that temporary, or short-term equilibrium, is different from long-term equilibrium and does not require any of the three factors.

The Neoclassical Growth Model claims that capital accumulation in an economy, and how people make use of it, is important for determining economic growth. It further claims that the relationship between capital and labor in an economy determines its total output. Finally, the theory states that technology augments labor productivity, increasing the total output through increased efficiency of labor. Therefore, the production function of the neoclassical growth model is used to measure the economic growth and equilibrium of an economy. The general production function in the neoclassical growth model takes the following form:

Y = AF (K, L)

Where:

Y – Income, or the economy's Gross Domestic Product (GDP)

K – Capital

L – Amount of unskilled labor in the economy

A – Determinant level of technology

Also, because of the dynamic relationship between labor and technology, an economy's production function is often re-stated as Y = F (K, AL). This states that technology is labor augmenting and that workers' productivity depends on the level of technology.

The theory posits that economic growth depends on increasing the quantities and improving the quality of labor and capital. Labor represents the workforce, while capital includes machinery, equipment, and infrastructure.

Technological advancements play a crucial role in enhancing productivity and driving long-term growth. New inventions, innovations, and better production methods allow for more output with the same amount of resources.

The theory suggests that economies tend towards a "steady state," where output per worker and capital per worker remain constant. In this state, economic growth is primarily driven by technological progress.

A key prediction of the neoclassical model is that poorer countries tend to grow faster than richer countries, eventually "converging" in terms of income levels. This is because poorer countries can benefit from adopting existing technologies and have higher returns to capital investment.

The theory assumes that increasing capital or labor alone, while holding other factors constant, will eventually lead to smaller increases in output.

Markets are assumed to be competitive, with no single entity having significant market power.

Economic agents are assumed to be rational and make decisions to maximize their own well-being

The most influential model within the neoclassical growth theory is the **Solow-Swan model**, developed by Robert Solow and Trevor Swan. This model mathematically illustrates the relationships between capital accumulation, technological progress, and economic growth.

Below is a simplified representation of the Solow Model.

Assumptions:

1. The population grows at a constant rate g. Therefore, the current population (represented by N) and future population (represented by N') are linked through the population growth equation $N' = N(1+g)$. If the current population is 100 and its growth rate is 2%, the future population is 102.

2. All consumers in the economy save a constant proportion, 's', of their incomes and consume the rest. Therefore, consumption (represented by C) and output (represented by Y) are linked through the consumption equation $C= (1-s)Y$. If a consumer earns 100 units of output as income and the savings rate is 40%, then the consumer consumes 60 units and saves 40 units.

3. All firms in the economy produce output using the same production technology that takes in capital and labor as inputs. Therefore, the level of output (represented by Y), the level of capital (represented by K), and the level of labor (represented by L) are all linked through the production function equation $Y = aF (K,L)$.

The Solow Growth Model assumes that the production function exhibits constant-returns-to-scale (CRS). Under such an assumption, if we double the level of capital stock and double the level of labor, we exactly double the level of output. As a result, much of the mathematical analysis of the Solow model focuses on output per worker and capital per worker instead of aggregate output and aggregate capital stock.

4. Present capital stock (represented by K), future capital stock (represented by K'), the rate of capital depreciation (represented by d), and level of capital investment (represented by I) are linked through the capital accumulation equation $K'= K(1-d) + I$.

5. In our analysis, we assume that the production function takes the following form: $Y = aK^bL^{1-b}$ where $0 < b < 1$. The production function is known as the Cobb-Douglas Production function, which is the most widely used neoclassical production function. Together with the assumption that firms are competitive, i.e., they are price-taking firms, the coefficient b is the capital share (the share of income that capital receives).

6. Therefore, output per worker is given through the following equation: $y = ak^b$ where $y = Y/L$ (output per worker and $k = K/L$ (capital stock per worker)

7. Under the assumption of competitive equilibrium, we get the following:

The income-expenditure identity holds as an equilibrium condition: $Y = C + I$

Consumer's budget constraint: $Y = C + S$

Therefore, in equilibrium: $I = S = sY$.

8. The capital accumulation equation becomes: $K' = (1–d)K + sY$

The capital accumulation equation in per worker times is given through the following equation: $(1 + g)k' = (1 – d)k + sy = (1 – d)k + saf(k) = (1 – d)k + sak^b$

9. The solution concept used is that of a steady state. The steady state is a state where the level of capital per worker does not change.

10. The steady state is found by solving the following equation: $k' = k \Rightarrow (1 + g)k = (1 – d)k + sak^b$

11. Therefore, the steady state value of capital per worker and the steady state value of output per worker are the following:

$$k^* = \left(\frac{sa}{g+d}\right)^{\frac{1}{1-b}}$$

There is no growth in the long term. If countries have the same g (population growth rate), s (savings rate), and d (capital depreciation rate), then they have the same steady state, so they will converge, i.e., the Solow Growth Model predicts conditional convergence. Along this convergence path, a poorer country grows faster.

Countries with different saving rates have different steady states, and they will not converge, i.e. the Solow Growth Model does not predict absolute convergence. When saving rates are different, growth is not always higher in a country with lower initial capital stock.

The model highlights the importance of savings and investment in driving capital accumulation and short-term economic growth. Long-term economic growth is primarily determined by the rate of technological progress.

Governments can promote growth by fostering an environment conducive to savings, investment, and technological innovation.

The theory has been criticized for suggesting a limited role for government intervention in promoting long-term growth. Empirical evidence on the convergence of income levels across countries is mixed. The model makes several simplifying assumptions that may not always hold in the real world.

Key Conclusions of the Neoclassical Model of Growth

- The neoclassical growth model explicates that total output is a function of economic growth in factor inputs, capital, labor, and technological progress.

- The growth rate of total output in a steady-state equilibrium is equal to the growth rate of the population or labor force and is never influenced by the rate of savings.
- While the rate of savings does not influence the steady-state economy growth rate of total output, it does result in an increase in the steady-state level of per capita income and, therefore, total income as well, as it raises the total capital per head.
- The long-term growth rate of an economy is solely determined by technological progress or regress.

Endogenous growth theory is an economic theory which argues that economic growth is generated from within a system as a direct result of internal processes. More specifically, the theory notes that the enhancement of a nation's human capital will lead to economic growth by means of the development of new forms of technology and efficient and effective means of production.

The endogenous growth theory offered a fresh perspective on what engineers economic growth. It argued that a persistent rate of prosperity is influenced by internal processes such as human capital, innovation, and investment capital, rather than external, uncontrollable forces, challenging the view of neoclassical economics.

Endogenous growth economists believe that improvements in productivity can be tied directly to faster innovation and more investments in human capital. As such, they advocate for government and private sector institutions to nurture innovation initiatives and offer incentives for individuals and businesses to be more creative, such as research and development (R&D) funding and intellectual property rights.

The idea is that in a knowledge-based economy, the spillover effects from investment in technology and people keep generating returns. Influential knowledge-based sectors, such as telecommunications, software, and other high-tech industries, play a particularly important role here.

Endogenous growth theory is a relatively new approach to explaining long-run economic growth. It emerged in the 1980s as a response to some shortcomings of the neoclassical growth theory. Here's a breakdown of the key aspects of endogenous growth theory:

Unlike the neoclassical theory, which treats technological progress as an external factor, endogenous growth theory emphasizes that technological advancements are driven by factors *internal* to the economy. These factors include:

- Investments in education, training, and skills development enhance the quality of the labor force and contribute to innovation.
- Investments in R&D activities by firms and governments lead to new knowledge, inventions, and innovations.
- The diffusion of knowledge and ideas across individuals and firms can generate positive externalities, benefiting the economy as a whole.
- Endogenous growth theory suggests that investments in human capital and knowledge can lead to increasing returns to scale. This means that as more resources are devoted to these areas, the marginal productivity of these investments may increase, leading to faster economic growth.

- The theory emphasizes the importance of institutions and policies in fostering innovation and knowledge accumulation. Strong property rights, efficient legal systems, and supportive government policies can create an environment conducive to economic growth.

Endogenous growth theory highlights the crucial role of human capital in driving long-term economic growth. Investments in education and training can have lasting effects on productivity and innovation. The theory underscores the significance of R&D activities in generating new technologies and promoting economic growth. Governments and firms should invest in R&D to enhance innovation and competitiveness. Recognizing the positive externalities associated with knowledge creation, the theory suggests that policies should encourage the diffusion of knowledge and ideas. Governments can play an active role in promoting long-term growth by investing in education, R&D, and infrastructure, as well as by creating a stable and supportive institutional environment.

Endogenous growth models can be complex, and it can be challenging to empirically measure some of the key variables, such as knowledge spillovers. Some critics argue that the empirical evidence supporting endogenous growth theory is not as strong as that for neoclassical growth theory. While the theory suggests a more active role for government intervention, there is debate about the specific policies that are most effective in promoting endogenous growth

The Schumpeterian growth theory, named after the influential economist Joseph Schumpeter, offers a dynamic perspective on economic growth, emphasizing the role of **innovation,**

entrepreneurship, and "creative destruction." It stands apart from both neoclassical and endogenous growth theories by focusing on the process of how new ideas and technologies displace old ones, driving economic progress.

The Schumpeterian growth model is based on three main ideas: (a) Long-run growth results from innovations; (b) innovations result from entrepreneurial investments that are themselves motivated by the prospects of monopoly rents; and (c) new innovations replace old technologies. In other words, growth involves creative destruction.

Schumpeter's theory comes in many respects close to rationalizing what is observed in a complex reality. It is the theory of a great visionary, full of subtleties and intricate relationships. Yet, for reasons unknown to us, Schumpeter never formalized it. He did not leave us with an explicit mathematical model. The consequence is that in many places it is not clear how a model, based on his theory, would work. In the construction of such a model, a number of problems arise. The first one is how the various variables entering the model have to interact to generate a feasible, innovation-driven growth path. Then comes the difficult requirement of intertemporal maximization of profits and capital accumulation. This must be achieved in an intermittent adjustment process, and ideally with a distinction being made between real capital and financial capital. Because the Schumpeter growth process is a discontinuous, adaptive one, sensors, feedbacks and response mechanisms are evidently necessary to keep it rolling along, until some increasing cost variables and (or) random changes in productivity and prices ultimately stops it. The Schumpetarian innovation-growth process is a finite and bounded one. It does not possess an equilibrium. There is no steady state towards which it would converge.

In order to study all of this, a model which brings together the diverse elements in Schumpeter's theory, is therefore desirable. Such a model should be cast into the form of a computer model and thus be operative. With its aid one should be able to simulate, given suitable parameter values, optimal timepaths for the introduction of innovations, for profits and capital accumulation. To the knowledge of this author, a model of this type has not yet been constructed.

Schumpeterian theory posits that economic growth is primarily driven by innovation, which encompasses new products, processes, markets, and organizational forms. These innovations are not simply incremental improvements but rather radical breakthroughs that disrupt existing economic structures. Entrepreneurs play a crucial role in the Schumpeterian framework. They are the agents of change, taking risks to introduce new innovations and challenging the status quo. Their motivation is the pursuit of profit and the desire to create something new. This is the hallmark of Schumpeterian theory. It describes the process by which new innovations render old technologies, products, and industries obsolete. This destruction, while potentially painful in the short term, is necessary for long-term economic growth as resources are reallocated to more productive uses. Schumpeter argued that economic growth occurs in waves, driven by clusters of innovations. These waves lead to periods of expansion followed by contractions as the economy adjusts to the new technologies and industries.

Schumpeterian theory highlights the importance of dynamic competition, where firms constantly strive to innovate and outcompete each other. This contrasts with the static competition assumed in some other economic models. The theory emphasizes the crucial role of entrepreneurs in driving innovation and economic growth. Policies that foster entrepreneurship and risk-taking can be beneficial. Schumpeterian growth theory suggests that institutions that protect intellectual property rights, encourage competition, and facilitate the reallocation of resources are essential for fostering innovation and growth. The theory acknowledges that economic progress involves disruption and job losses as old industries decline. However, it argues that these short-term costs are outweighed by the long-term benefits of innovation and growth.

Some critics argue that the Schumpeterian theory oversimplifies the complex factors that drive economic growth. It can be challenging to empirically test some aspects of the theory, such as the precise relationship between innovation and economic growth. The theory has been criticized for focusing primarily on innovation and neglecting other factors that can contribute to economic growth, such as human capital and infrastructure.

2.7 Trends in Economic Growth in Nigeria

Nigeria's economic aspirations have remained that of altering the structure of production and consumption patterns, diversifying the economic base and reducing dependence on oil, with the aim of putting the economy on a path of sustainable, all-inclusive and non-inflationary growth. The implication of this is that while rapid growth in output, as measured by the real gross domestic product (GDP), is important, the transformation of the various sectors of the economy is even more critical. This is consistent with the growth aspirations of most developing countries, as the structure of the economy is expected to change as growth progresses (Sanusi, 2010). In the first decade of independence, primary agricultural produce were the main exports. In fact, Nigeria was the world's largest exporter of groundnut, the second largest exporter of cocoa and palm produce and an important exporter of rubber, cotton, and hides and skin (World Bank 1975).

In real terms, in 1970, the country produced 305,000 tonnes of cocoa, 800,000 tonnes of palm oil and Kernel and over one million tonnes of groundnut CBN (2000). The contribution of the sector to total GDP has fallen over the decades, from a very dominant position of 55.8 % of the GDP in 1960-70 to 28.4 per cent in 1971-80, before rising to 32.3, 34.2 and 40.3 per cent during the decades 1981-90, 1991-2000 and 2001 – 2009, respectively. However, it is noted that the agricultural sector has not been able to accomplish its main role of meeting the raw material needs of industries, feeding the population, and providing substantial surplus for export. Undeniably, the fall is not because a strong industrial sector is displacing agriculture but largely as a result of low productivity, owing to the dominance of peasant farmers and their reliance on rudimentary farm equipment and low technology. Another inhibiting feature in this sector is under-capitalization which results in low yield and declining output, among others.

As a result of increased liberalization in economic management and deregulation, the economy of Nigeria witnessed some economic gains. It was not quite long before these gains came to a halt as a result of policy reversals and inconsistencies. Generally, frequent policy inconsistencies and reversals that characterized the1986- 1999 period created distortions in the economy and were further exacerbated by external shocks, including the external debt overhang. Whether or not SAP was able to achieve its goals remains an open question as most of the policies were terminated prematurely or reversed out-rightly. This “start-stop” approach to policies by the government is reflected in the volatile movement of some economic indicators overtime. From this, we notice that the real exchange rate remained unchanged over the period before the introduction of the free floating regime. To be specific, this trend changed in 1986 and has remained a rising curve. Sequel to this is the sharp jumps witnessed in the inflation rate. Of all the periods captured in the figure, 1975 and 1995 had the most jumps. The figure also shows that inflation rate begun to fall after the year 2000 until about the third quarter of 2007 when it resumed a rising trend. The percentage contribution of the current account balance to the GDP as captured in the figure is striking. Notice that its trend was a rising one until after 1990 when it suddenly assumed a downward trend. A very noticeable fact about the current account balances is that its contribution to the GDP in 1995 dropped by 9%. However, it recovered and contributed a high value of 33 % in 2005 before decreasing gradually to 13% in 2009. The percentage contribution of Foreign Direct Investment (FDI) to the Nigeria’s GDP has been abysmally low. Its highest contribution was in 2006 when it contributed at 6%. Although the FDI’s contribution slightly increased from 2.65 in 2008 to 3.34 in 2009, a lot still needs to be done by the government to restore confidence and put the economy back on the path of sustained growth. The unpredictable socio-economic and political environment of Nigeria which scares foreign investors away could have been responsible for this.

Following elections in 1999, the first administration of President Olusegun Obasanjo (1999-2003) focused on ensuring political stability, strengthening democratic practices, and tackling corruption. The second Obasanjo administration (2003-2007) embarked on a comprehensive economic reform program based on a home grown strategy, the National Economic Empowerment and Development Strategy (NEEDS). The development of NEEDS at the federal level was complemented by individual State Economic Empowerment and Development Strategies (SEEDS), which were prepared by all 36 Nigerian states and the Federal Capital Territory (FCT). The NEEDS program emphasized the importance of private sector development to support wealth creation and poverty reduction in the country. The objectives of NEEDS were addressed in four main areas: macroeconomic reform, structural reform, public sector reform and institutional and governance reform. Although there have been notable achievements under the program, significant challenges exist, particularly in translating the benefits of reforms into welfare improvements for citizens, in improving the domestic business environment, and in extending reform policies to states and local governments (Iweala and Kwaako, 2007). While identifying binding constraints such as physical infrastructure, low access to finance, the poor investment climate, and labour skills as major structural challenges to the economy, the World Bank (2003) stresses the need to address the critical challenge of employment-creation if growth is to become meaningful to the average citizen. It is hoped that the Bank Group's areas of focus, which include the stimulation of private sector-led growth in the non-oil sector through enhanced infrastructure, will contribute towards addressing this constraint. The global financial meltdown (2009-2010) had a diminishing impact on macroeconomic growth of Nigeria. It contributed to the challenges facing the banking and financial sector. The Nigerian capital market was before March 2008 adjudged the most attractive in the world, by virtue of its high returns on investment. With the worsening shortage of credit around the globe, numerous major foreign investors made a call on their investments, resulting to billions of US Dollars been taken out of the capital markets and the commercial banks over the last two years. This has obviously compounded the credit squeeze and worsened the capital adequacy ratios of some of the commercial banks. Figure 3 below further reveals that the macroeconomic growth of Nigeria has been stochastic. It is very clear from the figure that in Nigeria, total federal collected revenue is just a mirror image of oil revenue, suggesting monotonic structure of the economy. The truth embedded in this is that the oil sector remains indispensable in the economic survival of the Nigerian nation. Also, it can be observed that government expenditure followed almost the same trend with the oil revenue. The figure further suggests that the real GDP has been crawling (somewhat trending) over the years. The amnesty programme of the federal government in the Niger Delta led to resumption in growth of the oil and gas sector. However, the activities of the dreaded Islamic set popularly referred to as Boko Haram has posed serious security threats in the country, and thus discouraging FDI inflow.

2.8 Industrialization and Economic Growth: Theory and Empirical Evidence

The relationship between industrialization and economic growth has been a central theme in economic theory and empirical research. Industrialization is often seen as a key driver of economic development, with scholars and policymakers arguing that it plays a critical role in boosting productivity, creating employment, and fostering technological advancements. Here's a discussion on how economic theory explains the relationship and a summary of earlier studies on the topic.

Economic Theories on the Relationship Between Industrialization and Economic Growth:

Classical Economic Theory (Adam Smith and David Ricardo):

Adam Smith argued that the division of labor and specialization, key aspects of industrialization, increase productivity and efficiency. This, in turn, leads to economic growth by creating surplus goods that can be traded, contributing to national income growth.

David Ricardo focused on comparative advantage, suggesting that industrialization leads to specialization and trade, which improves the allocation of resources and fosters economic growth. Industrialization enables nations to focus on industries in which they have a comparative advantage, increasing overall productivity.

Schumpeter's Theory of Innovation viewed industrialization as a catalyst for innovation, with technological advancements driving economic growth. He proposed that "creative destruction" — the process by which outdated industries are replaced by new ones — is a key feature of capitalism. Industrialization, through the development of new technologies, facilitates productivity growth and long-term economic growth. According to Schumpeter, the entrepreneurial spirit within industrialized economies leads to constant reinvention, which drives economic expansion.

Modern Endogenous Growth Theory (Paul Romer):

Endogenous growth theory, particularly **Paul Romer's** work, emphasizes the role of technology, human capital, and innovation in driving long-term economic growth. Industrialization promotes technological advancements, which are integral to improving productivity. Moreover, as industries grow, they generate knowledge and human capital that further accelerate growth, creating a positive feedback loop. The theory suggests that investment in industries that promote knowledge and technology is essential for sustaining economic growth.

Structural Change Theory (Arthur Lewis):

Arthur Lewis proposed a dual-sector model of development, where economic growth is driven by the movement of labor from the traditional agricultural sector to the more productive industrial sector. In his model, industrialization is seen as a process that leads to greater productivity and higher incomes. As labor moves to industrial sectors, output increases, leading to economic growth. The structural transformation from agriculture to industry is central to economic development in many developing countries.

Neoclassical Growth Theory (Solow Model):

In the **Solow Growth Model**, economic growth is driven by capital accumulation, labor force growth, and technological progress. Industrialization is often linked to capital accumulation (both physical and human), which raises productivity. While the Solow model emphasizes the importance of capital and technological progress in driving growth, it assumes that industrialization is part of a broader process of technological change that enhances overall productivity

According to Oyebanji J. Ibitoye, Aderounmu A. Ogunoye and Ewert P.J. Kleynhans research work on the impact of industrialization on economic growth in Nigeria (2022), Developing countries such as Nigeria still need more industries, especially manufacturing to promote economic growth and development to an optimal level. Developing countries especially need adequate resources to promote the production and exportation of goods by industries to achieve the desired economic growth and development (Olusegun 2021). The overriding objective of industrial policy may also be to accelerate the pace of industrial development by radically increasing the value added at every stage of the value chain (Jelilov, Enwerem & Isik 2016). Djeudo (2016) suggested that in achieving industrialisation among developing economies such as Nigeria, the government must continue to create enabling environments that are conducive to the private sector and formulate good policies that enhance innovativeness. Industries are an important indicator of economic growth because the marginal revenue products of labour in industries are usually higher than that of the agricultural sector. Jelilov et al. (2016), for instance, asserted that labour force movement from agricultural to industrial sectors results in marginal product of labour appreciation in the agricultural sector with a consequential impact on the overall revenue and output of the country. That was also the fundamental assumption of the Lewis model (Todaro & Smith 2020). Given this, Kida and Angahar (2016) remarked that industrialisation sets the condition to achieve sustainable economic growth in all economies. It can also be stated that the dynamic benefits of the manufacturing sector are activating economic transformation in this modern-day economy.

Industrialisation is also responsible for speeding up investment capital in the agricultural sector (Afolabi & Ogoh 2017).

Kida and Angahar (2016) and CBN (2020) found a 3.2% share of manufacturing value in total gross domestic product (GDP) in 1960. In 1977, the manufacturing share of GDP rose to 5.4% and grew to 13% in 1992. Manufacturing share in GDP fell, however, to 6.2% in 1993, while the manufacturing capacity utilisation (MCU) rate declined to 2.4% in 1998 and increased by 3.4% from 2001 to 2009. By 2020, value-added manufacturing as a percentage of the GDP reached 12.67% (World Bank 2022). To improve the growth of the Nigerian economy, the government implemented some industrial policies such as the Structural Adjustment Programme (SAP) in 1986. This policy structure was an alternative framework to address the weaknesses and ineffectiveness of previous development planning efforts. The motives of these policies were to achieve economic growth, full employment and balance of payment equilibrium. Economic growth is, however, a long-term expansion of the total productive potential of the economy (Kleynhans & Pradeep 2013). The growth of an economy implies the expansion of all sectors of the economy, high levels of productivity, high standards of living and overall achievement of all the macroeconomic objectives of an economy such as high levels of employment, reduced inflation and high outputs (Unugbro 2010).

Over the years, Nigeria experienced great improvements in GDP, but with a high rate of poverty, unemployment, illiteracy and low human development. Kida and Angahar (2016) referred to such growth as jobless growth; that is, growth without development. It also shows that a large percentage of the population does not benefit from the expenditures of the government, which also led to a decline in consumable goods. In 1981, Nigeria experienced a GDP per capita growth rate of 3.6%, which decreased to –15.4% in 1983, and this reduction continued until 1989 to –13%. Gross domestic product per capita growth rate kept fluctuating until 2006 when a very high increase of 30% GDP per capita growth rate occurred after which there was a drastic fall again to 4.9% in 2012 (World Bank 2022).

The dwindling in the GDP of Nigeria within these periods can be attributed to the deterioration of the fiscal balances that were experienced in the Nigerian public sector and the policies designed to solve the issues concerning the economy proved abortive (Ahmed 1990). The drastic fall after 2006 can also be attributed to the impact of oil prices and the impact of the financial sector, which culminated in the global financial crisis of 2008. The country also experienced negative growth of 1.6% in 2016 and about 0.8% in 2017, which can be attributed to a collapse in the prices of oil after 2014, which resulted in a fall in the revenue of the federal government, a trade deficit and a recession. The economy of Nigeria started experiencing normal growth in 2018 after 2 years of abnormal growth (UNCTAD 2018).

Nigerian industrial sector is characterised by high importation of industrial inputs, declining output, high production costs, diminishing capacity utilisation, low value-added, low employment generation and inadequate linkages to various sectors in the economy (Ijaiya & Akanbi 2009). The Nigerian government attempted to improve the growth of the economy by implementing some industrial policies like disinvestment, privatisation, commercialisation, devaluation and SAPs. The main aims of these policies were to address the problem of economic growth, unemployment, the balance of payment deficit, technical progress and technology transfer. After several attempts to stabilise the economy by different governments, the country experienced fluctuating growth.

Kaldor's law of economic growth is relevant in explaining the fluctuations in the economic system and the incapability of the economic policies to achieve economic stability in Nigeria. Therefore, Kaldor's first law explains manufacturing as a condition or an engine of economic growth. The second law explains how output and labour influence each other positively in manufacturing (Libanio & Moro 2006).

The relevance of the manufacturing sector towards achieving economic growth and development of the country has attracted several empirical investigations (Afolabi & Ogoh 2017; Iheoma & Jelilov 2017; Isiksal & Himesie 2016; Kida & Angahar 2016; Ndiaya & Lv 2018; Obioma, Anyanwu & Kalu 2015). The growth of the investigations concerning the manufacturing sector and economic growth and development in developed and developing countries have not been without divergence in the results. Some studies found the manufacturing sectors to have a positive impact on economic growth (Obioma et al., 2015; Sutikno & Sri-Wahyudi 2017). Whereas Iheoma and Jelilov (2017) found manufacturing to inhibit economic growth among the Economic Community of West African States (ECOWAS) countries. However, against the result of the investigation on ECOWAS countries, Nigeria and Senegal are part of the ECOWAS countries, but Obioma et al. (2015), Ndiaya and Lv (2018) found a positive relationship between manufacturing and economic growth for Nigeria and Ghana, respectively.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Sources of Data and Method of Analyses

This study primarily relied on secondary data from the Central Bank of Nigeria (CBN). The data collected was used to analyze the impact of industrialization on economic growth in Nigeria. This study employed a variety of analytical methods which include, descriptive statistics, correlation analysis, unit root testing for stationarity of variables, cointegration test for long-run relationships, and the ARDL-ECM approach. This study will employ the use of descriptive statistics to analyze the variable's central tendency (mean and median), dispersion (standard deviation), and shape (skewness and kurtosis). The mean provided a measure of the average value, while the standard deviation quantified the variability around the mean. Skewness indicated the asymmetry of the data distribution, with positive values suggesting a right-skewed distribution and negative values indicating a left-skewed distribution. Kurtosis measured the peakedness of the distribution, with higher values indicating a more peaked distribution. The Jarque-Bera test assessed the normality of the data, determining whether the skewness and kurtosis were consistent with a normal distribution. A probability value greater than 5% indicates that the variables were normally distributed.

This study employed unit root tests to determine the stationarity of the time series data. At this stage, we verify the sequence of integration within each series and determine whether or not they are stationary. Researchers have devised many techniques for ensuring the right order of integration. Dickey and Fuller 1983 created the Augmented Dickey-Fuller (ADF) test, currently the gold standard. The augmented Dickey-Fuller test is predicated on rejecting the unit root null hypothesis (that the series are not stable) in favor of the alternative hypothesis of no unit root (the series are stationary). Each series is analyzed in both the presence and absence of a deterministic trend (t).

The Augmented Dicker Fuller model (for each variable under this study), for intercept without trend is thus specified below:

Ho: There is a unit root (the time series data is non-stationary)

H3..1: There is no unit root (the time series data is stationary)

Cointegration is a statistical concept suggesting a long-term relationship between non-stationary variables that become stationary when differenced once. This means that even though the variables may fluctuate independently in the short term, they tend to move together in the long run. Cointegration analysis is typically applied to time series data. If a linear combination of two or more non-stationary time series is stationary, then the series is said to be cointegrated. The Bounds test will be used to examine the long-run relationship of the variables.

The study shall utilize Autoregressive Distributed Lag (ARDL) bound testing framework to estimate the long-run equilibrium relationship. ARDL model is a model that includes lagged values of the dependent variables (autoregressive) and lagged values of the independent variables (distributed lag) as one of the explanatory variables. The ARDL cointegration is used to establish whether there is a long-run equilibrium relationship among the variables, when the variables are integrated of both order zero I(0) and order one I(1). In addition, the ARDL method avoids configuring a larger number of specifications in the standard cointegration test. These include decisions regarding the number of endogenous and exogenous variables to be included and the treatment of deterministic elements. Furthermore, the ARDL approach allows the use of different optimal lags for the different variables, which is not possible in the standard cointegration test. Since time series data could be vulnerable to unit root problems, Augmented Dickey– Fuller (ADF) unit root test is implemented on the series to avoid spurious regressions. Unit root tests are first conducted to determine the stationarity of the variables, which must be a combination of I(0) and I(1) series.

Error Correction Mechanism (ECM) is a statistical technique used to correct deviations from long-run equilibrium relationships between economic variables. It is based on the idea that economic variables tend to return to their equilibrium values over time. In ECM, the error term represents the deviation from the long-run equilibrium relationship. The ECM model estimates the speed at which the variables return to their equilibrium values, known as the error correction term. The ECM model consists of two parts: the short-run dynamics and the long-run equilibrium relationship. The short-run dynamics capture the temporary deviations from the equilibrium relationship, while the long-run equilibrium relationship represents the underlying structural relationship between the variables. The ECM can be specified below;

$\Delta yt = \gamma + I = 1 \sum p \beta i \Delta xt - i + \alpha (yt - 1 - \beta 0 - \beta 1 xt - 1) + \nu t$ (3.1)

Where:

Δyt and Δxt are the first differences of the variables.

α is the error correction term coefficient.

νt is the white noise error term.

It can further be specified as;

$$\Delta GDP = \phi 0 + \phi 1\Sigma\Delta MVAt + \phi 2\Sigma\Delta EMPIt + \phi 3\Sigma\Delta IOt + \phi 4\Sigma\Delta GFCFt + \phi 5\Sigma\Delta INFt ++ \psi \; ecm(-1) + vt \qquad (3.2)$$

The justification for the use of ARDL-ECM approaches is that the endogeneity problems and inability to test hypotheses on the limited coefficients in the long run are avoided. That is, it has superior statistical properties in small samples as it is relatively more efficient in small sample data sizes found mostly in studies on developing countries. More so, the long run and short run parameters of the model are estimated simultaneously; and it can be applied irrespective of whether the variables in the model are endogenous. Lastly, applying ARDL-ECM is helpful in data generating process through taking sufficient number of lags general-to-specific modelling framework.

This study aims to ascertain whether the variables are significant or otherwise, the result of the model will be evaluated on the basis of three (3) criteria namely: econometric a priori expectation, statistical test of significance and econometric test.

The Econometric Criteria: The economic a priori expectation will evaluate the parameter in terms of their meeting the standard economic theory expectations.

A priori Expectations: $\beta 1 > 0$ $\beta 2 > 0$ $\beta 3 > 0$ $\beta 4 > 0$ $\beta 5 > 0$ $\beta 6 > 0$

The Statistical Criteria: Statistical test is done to evaluate reliability of the estimated parameter in accordance with statistical theory and expectation. The statistical test to be carried out includes:

The T-test: this is used to test the significance of the individual parameters of the regression model. The decision to accept the null hypothesis is based on the value of the test statistics from the data.

The F-test: this would be carried out to ascertain the overall significance of the model

Co-efficient of determination (R2): This explains the percentage in total variation of the dependent variable being explained by the independent variable. It measures the extent to which the explanatory variables are responsive for judging the explanatory power of the regression.

The test will be performed on the regression result in order to evaluate the model. These tests are discussed briefly below:

Test for Multi collinearity: This will be used to test the linear collinearity among the explanatory variables. When two or more explanatory variable in a regression model are highly correlated, it distorts the estimation of coefficients. Multicollinearity undermines the reliability of the regression coefficients, making it difficult to identify the true effect of each variable. The Variance Inflation Factor (VIF) is used to detect multicollinearity in the model. If the VIF value exceed 10, then multicollinearity exist within the model. This study will use a simple correlation matrix for this test.

Autocorrelation Test: This is used to test if the errors corresponding to different observation are correlated, testing for randomness of error term. The Durbin Watson (DW) statistic would be employed for this test. The closer D.W statistic is to 2 indicates absence of autocorrelation.

Heteroskedasticity Test: This is used to know whether the error term of the explanatory variable of the estimated model have equal variance.

Normality Test: This will be used to know whether the error term of the estimated model is normally distributed.

3.2 Model Specification

The aim of this section is to specify a regression model in order to test the main hypothesis of the theory of industrialization as it affects economy growth in Nigeria.

The multiple linear regression model is specified below;

GDP = F(FDI, EX_RATE, EMPI, AO, IO, MVA) (3.3)

Where GDP is the dependent variable, with MVA, EMPI, IO, GFCF and AO being the independent variables (proxy for economic growth), this study also introduced control variable like inflation rate. The above model can be stated in an econometric form below;

$GDP = \beta0 + \beta1FDI + \beta2EX\_RATE + \beta3EMPI + \beta4AO + \beta5IO + \beta6MVA + Ut$ (3.4)

Where GDP = Gross domestic product (proxy for economic growth)

FDI = Foreign direct investment

EX_RATE = Exchange Rate

EMPI = Employment in industry

AO = Agricultural output

IO = Industry output

MVA = Manufacturing value added

$\beta0$, $\beta1$, $\beta2$, $\beta3$, $\beta4$, $\beta5$ and $\beta6$ are the parameters to be estimated

U_t = Error term

$\beta_1 > 0$ $\beta_2 > 0$ $\beta_3 > 0$ $\beta_4 > 0$ $\beta_5 > 0$ $\beta_6 > 0$

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.1 Introduction

This chapter presents the descriptive statistics of the model, a correlation analysis to determine the relationship between the variables of the model as well as a preliminary check of the problem of multicollinearity i.e. relationship between the explanatory variables in the model, the unit root test to determine the stationarity of the individual variables.

The bound co-integration test was then performed to check out the long-run equilibrium relationship between the variables and to determine if the variables satisfy the convergence property. The ECM was used to analyse the short run dynamics of the variables in the long run. Finally, residual and stability diagnostics were carried out to validate the empirical findings.

4.2 Descriptive Statistics

In this section, the variables employed in this study are tested, the parameters are estimated and presented, and the results are interpreted in line with economic theorizing as it relates to their policy implications. The section start with descriptive statistics, followed by the unit root test, bounds test, the short run regression estimates of the models, the long run estimates and the residual diagnostics. Finally, the chapter ends with a summary of the results and its policy implications. The summary statistics of all the series employed in this study are presented and discussed below. Specifically, we have Measures of Central tendencies and

Variability. The mean of each of the series is a pointer to the average of the respective variable. The standard deviation shows how distributed the variable is from the mean. The maximum value shows the highest value for each variable, while the minimum value shows the lowest value for the entire period under study.

Table 4.1:

	GDP_GROWTH	FDI	EX_RATE	EMP	AGRICULTURE	IO	MVA
Mean	3.042141	1.123920	178.6414	12.16192	23.67464	29.74831	14.32730
Median	3.251681	0.817478	155.5871	11.43539	9.993554	29.36369	13.93340
Maximum	15.32916	2.900249	425.9792	17.87884	87.68955	39.24509	21.09825
Minimum	-13.12788	-0.039127	8.038285	10.14651	0.012770	18.17313	6.552817
Std. Dev.	5.255826	0.824852	124.6795	1.891383	27.43922	5.164484	4.918663
Skewness	-0.839215	0.518648	0.457831	1.821736	0.898305	-0.18172	-0.03338
Kurtosis	4.845801	2.111294	2.193212	5.622045	2.496705	2.254129	1.472729
Jarque-Bera	11.15153	3.342856	2.730464	27.70626	6.236994	1.233409	4.187153
Probability	0.003789	0.187978	0.255321	0.000001	0.044224	0.539720	0.123246
Sum	130.8121	48.32858	7860.222	401.3435	1018.009	1279.177	616.0738
Sum Sq. Dev.	1160.196	28.57599	668434.5	114.4745	31622.26	1120.220	1016.116
Observations	43	43	44	33	43	43	43

From the table 4.1 the mean of GDP is 3.04, while the median is 3.25. The data ranges from -13.12 to 15.32 and the Jarque Bera probability value of 0.0037 shows that gdp per capita is not normally distributed. The mean of foreign direct investment is 1.12, while the median is 0.817. The data ranges from -0.03 to 2.9 and the Jarque Bera probability value of 0.18 shows that foreign direct investment is normally distributed. The mean of exchange rate is 178.64, while the median is 155.5. The data ranges from 8.03 to 425.9 and the Jarque Bera probability value of 0.255 shows that exchange rate is normally distributed. The mean of employment in industry is 12.161, while the median is 11.435. The data ranges from 10.148 to 17.878 and the

Jarque Bera probability value of 0.000001 shows that employment in industry is not normally distributed. The mean of agricultural output 23.67, while the median is 9.99. The data ranges from 0.012 to 87.68 and the Jarque Bera probability value of 0.044 shows that agricultural output is not normally distributed. The mean of the industry output rate is 29.748, while the median is 29.364. The data ranges from 18.173 to 39.245 and the Jarque Bera probability value of 0.539 shows that the monetary policy rate is normally distributed. lastly, the mean of the manufacturing value added is 14.327, the median is 13.933. The data ranges from 6.55 to 21.098 and the Jarque Bera probability value of 0.123 shows that manufacturing value added is normally distributed.

4.3 Correlation Analysis

Table 4.2: Correlation matrix

	GDP_	FDI	EX_RATE	EMP	AO	IO	MVA
GDP	1	-0.2053	0.1518	-0.2791	-0.1594	-0.2850	-0.4587
FDI	-0.2053	1	-0.7344	-0.3429	-0.6000	0.5505	0.7481
EXR	0.15181	-0.7344	1	0.38569222	0.6989	-0.2624	-0.5394
EMP	-0.2791	-0.3429	0.3856	1	0.7094	0.0839	0.1118
AO	-0.1594	-0.6000	0.6989	0.7094	1	-0.3075	-0.3845
IO	-0.2850	0.5505	-0.2624	0.0839	-0.3075	1	0.8193
MVA	-0.4587	0.7481	-0.5394	0.1118	-0.3845	0.8193	1

Table 4.2 presents the results of a correlation analysis, which measures the strength and direction of the relationship between pairs of variables. . The correlation between gross domestic product and foreign direct investment is -0.20, indicating a weak negative relationship. The correlation between gross domestic product and exchange rate is 0.15, indicating a weak positive relationship. The correlation between gross domestic product and employment in

industry is -0.279, indicating a weak negative relationship. As the employment in industry increases, gdp per capita tends to decrease slightly. The correlation between gross domestic product and agricultural output is -0.159, indicating a weak negative relationship. The correlation between gross domestic product and industry output is -0.285 showing a weak negative relationship between them. Finally, the correlation between gross domestic product and manufacturing value added is -0.458, indicating a negative correlation, where an increase in MVA results in a decrease in economic growth. This does not conform to theory.

4.4 Pre-Test Assessments

Pre-test assessments involve evaluating and verifying certain conditions or assumptions before estimating the model to ensure it yields valid and reliable results. This step is essential in econometric and statistical modeling, as it helps identify potential issues that could impact the accuracy of the model's estimates. The assessments include a unit root test to examine the stationarity of the model and the ARDL bounds co-integration test to determine whether two or more time series variables share a long-run equilibrium relationship.

4.5 Unit Root Test

The unit root test is divided into unit root tests at levels and first difference

Null hypothesis (H_0): There is no unit root

Decision rule: If the probability of the ADF test statistics is lesser than the critical value at 5% we fail to reject the null hypothesis.

Table 4.2: Unit root

Variables	Levels ADF Test	Probability at 5% level of	First Difference ADF Test Statistics	Probability at 5% level of	Remarks

	Statistic	significance		significance	
GDP	-2.0152	0.0432	-10.7396	0.0000	Stationary
FDI	-2.0201	0.2774	-8.1775	0.0000	Stationary
EXR	-0.8809	0.7848	-5.8554	0.0000	Stationary
EMP	0.2498	0.9715	-2.0628	0.0093	Stationary
AO	0.5248	0.9856	-7.2113	0.0000	Stationary
IO	-1.6670	0.4398	-6.2125	0.0000	Stationary
MVA	-1.3417	0.6012	-7.6025	0.0000	Stationary

Source: Authors' computation using E-views 10

The unit root test result shows that at 5% level of significance, GDP is stationary at level while the other variables are not stationary. At first difference all the variables are stationary which indicates the absence of unit root**.**

4.6 Co-Integration Tests

Since we've shown that our data exhibits a unit root and is integrated of order one, we proceed to conduct a co-integration test using the ARDL Bound Test. Given that the variables become stationary after differencing once, we can investigate the presence of a significant co-integrating relationship among the variables.

Co-integration tests are used to determine if there's a stable, long-run equilibrium relationship among the variables in a multivariate model. If co-integration is established, it signifies the existence of a long-run relationship between the variables hence the ECM will have to be specified. The co-integration tables are presented below.

TABLE 4.4: BOUNDS TEST

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)

F-statistic	4.277991	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Author's Computation using E-views 2024).

From the analysis in table 3 the study finds out that the computed F-statistics value (4.277) is greater than the critical value at 5% (3.38) meaning that we reject the null hypothesis of no co-integration (No long-run relationships exist) that is; there is a presence of co-integration, meaning the variables have a long-term equilibrium relationship. Since the variables are cointegrated using bounds test, both short run and long run models have to be specified.

4.7 Error-Correction Estimation

Table 4.5: ARDL ECM

ARDL Error Correction Regression
Dependent Variable: D(GDP_GROWTH)
Selected Model: ARDL(1, 2, 1, 1, 1, 0, 2)
Case 2: Restricted Constant and No Trend
Date: 02/28/25 Time: 06:41
Sample: 1 44
Included observations: 32

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI)	0.338181	1.000128	0.338138	0.7394
D(FDI(-1))	-2.780020	1.068496	-2.601806	0.0186
D(EX_RATE)	0.017836	0.007594	2.348755	0.0312
D(EMP)	-5.895987	1.224522	-4.814929	0.0002
D(AGRICULTURE)	-0.069874	0.023257	-3.004386	0.0080
D(MVA)	-1.226612	0.329360	-3.724224	0.0017
D(MVA(-1))	2.189058	0.414756	5.277941	0.0001

CointEq(-1)*	-0.764981	0.110054	-6.950981	0.0000

R-squared	0.734901	Mean dependent var	0.078183
Adjusted R-squared	0.657580	S.D. dependent var	3.478629
S.E. of regression	2.035578	Akaike info criterion	4.471754
Sum squared resid	99.44585	Schwarz criterion	4.838188
Log likelihood	-63.54807	Hannan-Quinn criter.	4.593217
Durbin-Watson stat	2.054531		

Source: Authors' computation using E-views 10

INTERPRETATION OF ARDL ECM

The one-period lag of Foreign Direct Investment has a statistically significant negative impact on GDP growth, with a coefficient of -2.780020 and a p-value of 0.0186. This suggests that a 1% increase in FDI in the previous period leads to a 2.78% decrease in GDP growth in the current period. This result implies that past FDI inflows may have short-term contractionary effects on GDP growth, potentially due to capital outflows, structural adjustments, or inefficiencies in investment utilization.

Exchange rate is also statistically significant, with a coefficient of 0.017836 and a p-value of 0.0312. This indicates that a 1% increase in the exchange rate leads to a 0.018% increase in GDP growth. The positive relationship suggests that currency depreciation might be beneficial to economic growth, possibly by improving export competitiveness and stimulating production. Employment in industries [D(EMP)] has a significant negative impact on GDP growth, with a coefficient of -5.895987 and a p-value of 0.0002. This implies that a 1% increase in industrial employment results in a 5.90% decline in GDP growth. This counterintuitive result could indicate inefficiencies in labor absorption, skill mismatches, or labor-intensive industries with lower productivity levels.

Agricultural output is another significant variable, with a coefficient of -0.069874 and a p-value of 0.0087. This suggests that a 1% increase in agricultural output reduces GDP growth by 0.07%. This finding could reflect the structural transformation of the economy, where excessive dependence on agriculture might be limiting the transition to higher value-added industrial activities. The one-period lag of manufacturing value added has a significant positive impact on GDP growth, with a coefficient of 2.189058 and a p-value of 0.0001. This implies that a 1% increase in manufacturing value added in the previous period results in a 2.19% increase in GDP growth in the current period. This highlights the importance of manufacturing in driving long-term economic growth and industrialization.

Lastly, the error correction term is highly significant, with a coefficient of -0.764981 and a p-value of 0.0000. This negative and significant coefficient confirms the presence of a long-run equilibrium relationship, indicating that deviations from the long-run GDP growth path are corrected at a speed of approximately 76% per period.

Model fit

In terms of model fit, the R-squared value of 0.7349 suggests that approximately 73.49% of the variations in GDP are explained by the independent variables in the short run. The adjusted R-squared value of 0.65 further confirms the model's explanatory power, indicating that it performs well in explaining variations in the long run. The D.W statistic of 2.05 indicates the absence of serial correlation.

In conclusion, the results emphasize the complex dynamics of industrialization and economic growth. While lagged manufacturing value added fosters growth, past FDI and industrial employment appear to have contractionary effects. The positive impact of exchange rate depreciation suggests benefits for export-driven growth, while the negative impact of agricultural output might indicate a need for economic diversification. These findings provide crucial insights for policymakers aiming to optimize industrialization strategies for sustainable economic growth.

4.8 ARDL Long Run Form

The ARDL long-run form is often used to derive recommendations because it captures the equilibrium relationship between the dependent variable and independent variable over time. Policymakers are generally interested in how variables relate in the long run rather than focusing solely on short-run fluctuations; by focusing on the long-run coefficients, policymakers can understand the enduring effects or structural changes, making the ARDL long-run model a popular choice in policy-oriented research.

TABLE 4.6: LONG RUN ARDL FOR INTERPRETATION

ARDL LONG RUN

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	11.71813	5.912434	1.981946	0.0639
EX_RATE	0.063991	0.021430	2.986012	0.0083
EMP	3.678094	1.581425	2.325810	0.0327
AGRICULTURE	-0.195870	0.076659	-2.555092	0.0205
IO	0.048632	0.243129	0.200026	0.8438
MVA	-1.917576	0.932499	-2.056384	0.0554
C	-36.53557	17.34167	-2.106808	0.0503

EC = GDP_GROWTH - (11.7181*FDI + 0.0640*EX_RATE + 3.6781*EMP

-0.1959*AGRICULTURE + 0.0486*IO -1.9176*MVA -36.5356)

Source: Authors' computation using E-views 10

Interpretation of ARDL long run form

The exchange rate has a positive and statistically significant effect on GDP growth, with a coefficient of 0.063991 and a p-value of 0.0083. This indicates that a 1% increase in the exchange rate leads to a 0.064% increase in GDP in the long run. The positive relationship suggests that exchange rate depreciation may enhance economic growth by making exports more competitive and stimulating industrial output. Employment in industries is another significant variable, with a coefficient of 3.678094 and a p-value of 0.0327. This implies that a 1% increase in employment in industries results in a 3.68% increase in GDP in the long run. This result highlights the importance of industrial employment in driving economic expansion, as more jobs in the sector contribute to increased productivity and aggregate demand.

Agricultural output has a negative and statistically significant impact on GDP, with a coefficient of -0.195870 and a p-value of 0.0205. This suggests that a 1% increase in agricultural output leads to a 0.20% decline in GDP. This finding aligns with the structural transformation hypothesis, where an overreliance on agriculture may hinder industrialization and economic diversification. It underscores the need for policies that support the transition from agriculture to higher-value industrial activities. The other variables are not statistically significant in the long run suggesting that they do not have significant impact on economic growth In conclusion, the results indicate that industrial employment and exchange rate movements are crucial drivers of economic growth in the long run. The positive impact of industrial employment emphasizes the need for job creation in productive sectors, while the favorable effect of exchange rate depreciation suggests the importance of maintaining a competitive currency. However, the negative impact of agricultural output highlights the necessity of structural economic transformation, where resources are reallocated toward more productive industrial activities. These insights provide valuable guidance for policymakers in shaping industrialization strategies to foster sustainable economic growth.

4.9 Diagnostics Test

4.9.1 Heteroskedasticity Test

This test evaluates whether the variance of the error terms is constant (homoskedastic) or varies across observations. Heteroskedasticity, if present, can lead to inefficient estimates and unreliable hypothesis tests. This study will utilize the use of the Breusch-Pagan-Godfrey heteroscedasticity test to detect the presence of heteroskedasticity.

TABLE 4.7: Breush-pagan heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.977720	Prob. F(14,17)	0.5107
Obs*R-squared	14.27324	Prob. Chi-Square(14)	0.4296
Scaled explained SS	4.283458	Prob. Chi-Square(14)	0.9935

Source: Author's computation using E-views.

The result in Table 4.7 shows that the probability of f-statistics is 0.5107, greater than 0.05 at a 5% significant level, and therefore, the null hypothesis is accepted. This, therefore, confirms the absence of heteroscedasticity in the model.

4.9.2 Autocorrelation Test

This examines whether residuals from the model are serially correlated. The presence of autocorrelation may indicate that the model fails to capture important dynamics, leading to biased standard errors and unreliable inferences. This study will utilize the Breusch-Godfrey Serial Correlation LM Test to check for the presence of autocorrelation.

TABLE 4.8: Serial correlation test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.224335	Prob. F(2,15)	0.8017
Obs*R-squared	0.929363	Prob. Chi-Square(2)	0.6283

Source: Author's computation using E-views 10.

From the result in table 4.8, the probability of f-statistics is 0.8017, which is greater than 0.05 at a 5% significant level, and therefore, the null hypothesis is accepted. This, therefore, confirms the absence of serial correlation in the model.

4.9.3 Ramsey RESET Test

This test investigates whether the functional form of the model is correctly specified. It identifies potential omitted variables or incorrect model structures that could distort the estimation results. Ramsey RESET Test is used to check for model stability.

TABLE 4.9: Ramsey reset test

Ramsey RESET Test
Equation: UNTITLED
Specification: GDP_GROWTH GDP_GROWTH(-1) FDI FDI(-1) FDI(
-2) EX_RATE EX_RATE(-1) EMP EMP(-1)
AGRICULTURE(-1) IO MVA MVA(-1) MVA(-2) C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.245765	16	0.2308
F-statistic	1.551930	(1, 16)	0.2308

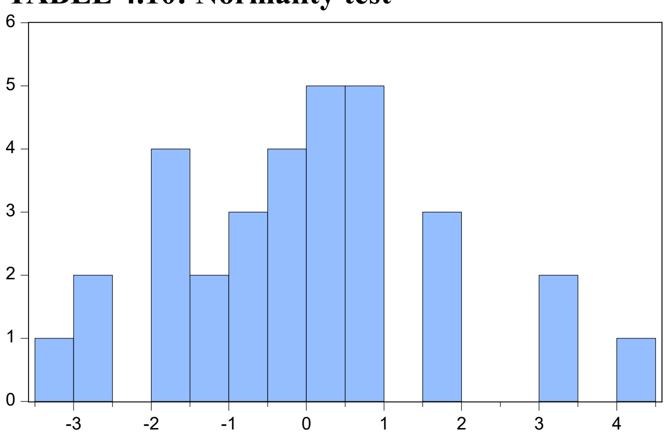
Source: Author's computation using E-views (2024).

From the result in table 4.9, the probability of f-statistics is 0.2308 which is greater than 0.05 at a 5% significant level, and therefore, the null hypothesis is accepted. This therefore confirms that the model is not mis-specified.

4.8.4 Normality Test

This assesses whether the residuals follow a normal distribution, a critical assumption for many econometric methods to ensure the validity of t-tests and confidence intervals.

TABLE 4.10: Normality test



Series: Residuals	
Sample 12 43	
Observations 32	
Mean	-4.20e-15
Median	-0.003983
Maximum	4.347865
Minimum	-3.394259
Std. Dev.	1.791070
Skewness	0.407192
Kurtosis	3.126689
Jarque-Bera	0.905697
Probability	0.635814

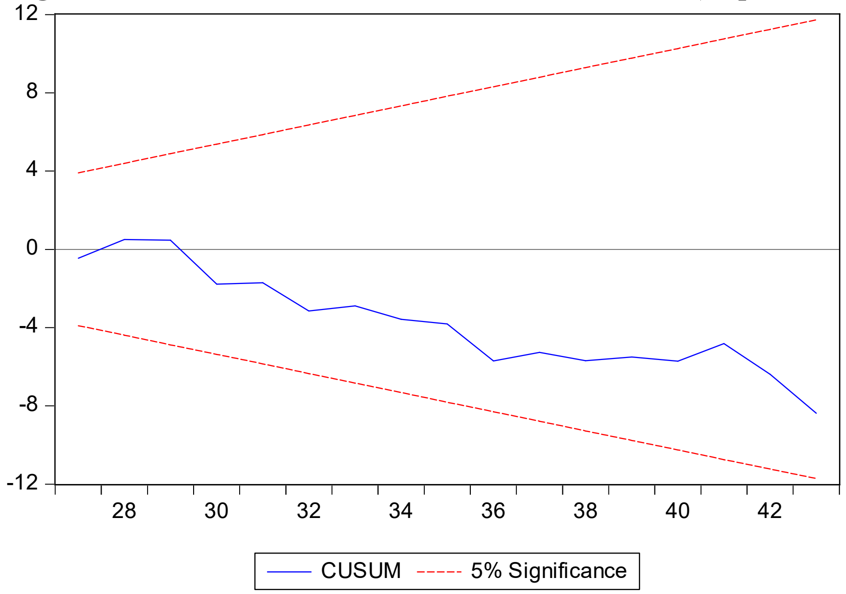
Source: Author's computation using E-views.

From the result in the table, the p-value is 0.6358 which is greater than 0.05 at a 5% significant level, and therefore, the null hypothesis is accepted. This, therefore, confirms that the residuals are normally distributed.

4.10 Stability Tests

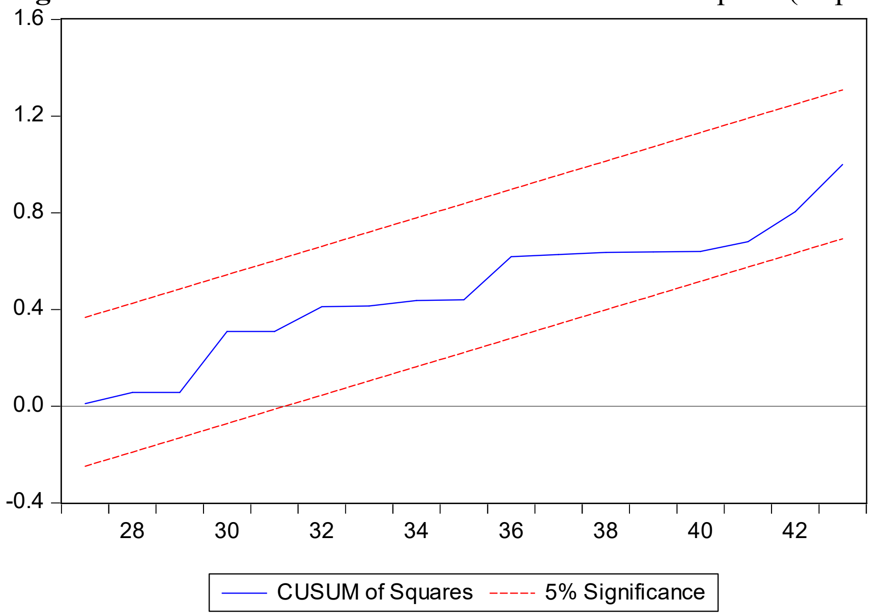
The Cumulative Sum of Recursive Residuals (CUSUM) is used in testing the stability of the parameters of the model, by plotting the recursive estimation of the model. This indicates stability in the coefficients of the model over the sample period, as the plot of the CUSUM statistic falls inside the critical bounds of the 5 percent confidence interval of parameter stability. This is shown in Figures 4.1 and 4.2.

Figure 4.1: Cumulative Sum of Recursive Residuals (Dependent Variable: GDP)



Source: Author's Computation from Estimations using Eviews 10

Figure 4.2: Cumulative Sum of Recursive Residuals Square (Dependent Variable: GDP)



CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Summary of Findings

This study examined the impact of industrialization on economic growth in Nigeria, using GDP as the dependent variable and key industrialization indicators such as foreign direct investment, exchange rate, employment in industries, agricultural output, industrial output, and manufacturing value added as independent variables. The study employed the Autoregressive Distributed Lag (ARDL) model to analyze the long-run relationship between these variables.

The empirical findings revealed that exchange rate, employment in industries, and agricultural output were statistically significant in explaining GDP growth. Exchange rate fluctuations were found to have a positive impact on economic growth, suggesting that a competitive exchange rate can enhance industrial productivity and export performance. Industrial employment also contributed positively to GDP, emphasizing the importance of job creation in the industrial sector for economic expansion. However, agricultural output had a negative effect on GDP, indicating the need for structural transformation to shift economic focus from agriculture to industrial activities with higher value-added production.

The study highlights the necessity of industrial policies that encourage job creation, foreign investment in productive sectors, and infrastructure development to support industrial growth. It also underscores the role of exchange rate management in maintaining economic stability and competitiveness. Given these findings, policy recommendations were provided to enhance industrialization and ensure sustainable economic growth in Nigeria.

5.2 Conclusion

The study concludes that industrialization plays a vital role in promoting economic growth in Nigeria. The positive impact of industrial employment suggests that creating more jobs in the industrial sector can significantly enhance national income. Additionally, exchange rate depreciation appears to favor economic growth by making domestic industries more competitive in global markets. However, the negative relationship between agricultural output and GDP underscores the need for economic diversification and a shift towards more industrial activities. These findings suggest that a well-structured industrialization policy is essential for sustainable economic development in Nigeria.

5.3 Recommendations

Based on the findings, the following policy recommendations are proposed:

1. Enhancing Industrial Employment: The government should implement policies that encourage industrial job creation through investment incentives, skill development programs, and support for small and medium-sized enterprises (SMEs) in the manufacturing sector. Expanding employment opportunities in industries can significantly contribute to economic growth.
2. Exchange Rate Management: Policymakers should adopt exchange rate policies that maintain a competitive currency while ensuring price stability. A favorable exchange rate can boost exports and enhance industrial output, leading to sustained economic growth.

3. Diversification from Agriculture to Industry: While agriculture remains an important sector, the government should focus on policies that facilitate industrialization. This includes investing in industrial infrastructure, providing incentives for manufacturing industries, and promoting research and development to enhance industrial productivity.
4. Foreign Investment in Industrialization: Policies should encourage foreign direct investment (FDI) in industries that generate employment and technological advancement. Special economic zones, tax incentives, and public-private partnerships can help attract productive FDI into the industrial sector.
5. Infrastructure Development: Industrialization requires adequate infrastructure such as electricity, transportation networks, and digital connectivity. The government should prioritize infrastructure development to create a conducive environment for industrial growth and economic transformation.

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APPENDIX 1

Null Hypothesis: EMP has a unit root
Exogenous: None
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.126520	0.9290
Test critical values:	1% level	-2.641672	
	5% level	-1.952066	
	10% level	-1.610400	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(EMP) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.062819	0.0393
Test critical values:	1% level	-2.641672	
	5% level	-1.952066	
	10% level	-1.610400	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: AGRICULTURE has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.524834	0.9856
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

Null Hypothesis: D(AGRICULTURE) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.211386	0.0000
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

Null Hypothesis: EX_RATE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.880915	0.7848
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

Null Hypothesis: D(EX_RATE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.855401	0.0000
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

Null Hypothesis: FDI has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.020156	0.2774
Test critical values:	1% level	-3.600987	

5% level	-2.935001	
10% level	-2.605836	

Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.177524	0.0000
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

Null Hypothesis: GDP_GROWTH has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.244560	0.0244
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

Null Hypothesis: D(GDP_GROWTH) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.68051	0.0000
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

Null Hypothesis: IO has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-1.667093	0.4398
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(IO) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.212578	0.0000
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: MVA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.341795	0.6012
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

*MacKinnon (1996) one-sided p-values.

APPENDIX 2

ARDL

Dependent Variable: GDP_GROWTH
Method: ARDL
Date: 02/28/25 Time: 06:41
Sample (adjusted): 12 43
Included observations: 32 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): FDI EX_RATE EMP AGRICULTURE IO MVA
Fixed regressors: C
Number of models evaluated: 1458
Selected Model: ARDL(1, 2, 1, 1, 1, 0, 2)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP_GROWTH(-1)	0.235019	0.205704	1.142513	0.2691
FDI	0.338181	1.837012	0.184093	0.8561
FDI(-1)	5.845944	2.014529	2.901891	0.0099
FDI(-2)	2.780020	1.344028	2.068424	0.0542
EX_RATE	0.017836	0.012816	1.391665	0.1820
EX_RATE(-1)	0.031116	0.012688	2.452441	0.0253
EMP	-5.895987	2.079373	-2.835463	0.0114
EMP(-1)	8.709659	2.635892	3.304254	0.0042
AGRICULTURE	-0.069874	0.038686	-1.806159	0.0886
AGRICULTURE(-1)	-0.079963	0.039772	-2.010549	0.0605
IO	0.037203	0.184664	0.201461	0.8427
MVA	-1.226612	0.516692	-2.373970	0.0296
MVA(-1)	1.948760	0.655890	2.971169	0.0086
MVA(-2)	-2.189058	0.866153	-2.527333	0.0217
C	-27.94902	9.371256	-2.982420	0.0084

R-squared	0.769328	Mean dependent var	4.131885
Adjusted R-squared	0.579363	S.D. dependent var	3.729195
S.E. of regression	2.418627	Akaike info criterion	4.909254
Sum squared resid	99.44585	Schwarz criterion	5.596318
Log likelihood	-63.54807	Hannan-Quinn criter.	5.136997
F-statistic	4.049839	Durbin-Watson stat	2.054531
Prob(F-statistic)	0.003795		

ECM

ARDL Error Correction Regression
Dependent Variable: D(GDP_GROWTH)
Selected Model: ARDL(1, 2, 1, 1, 1, 0, 2)
Case 2: Restricted Constant and No Trend
Date: 02/28/25 Time: 07:12
Sample: 1 44
Included observations: 32

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI)	0.338181	1.000128	0.338138	0.7394
D(FDI(-1))	-2.780020	1.068496	-2.601806	0.0186
D(EX_RATE)	0.017836	0.007594	2.348755	0.0312
D(EMP)	-5.895987	1.224522	-4.814929	0.0002
D(AGRICULTURE)	-0.069874	0.023257	-3.004386	0.0080
D(MVA)	-1.226612	0.329360	-3.724224	0.0017
D(MVA(-1))	2.189058	0.414756	5.277941	0.0001
CointEq(-1)*	-0.764981	0.110054	-6.950981	0.0000

R-squared	0.734901	Mean dependent var	0.078183
Adjusted R-squared	0.657580	S.D. dependent var	3.478629
S.E. of regression	2.035578	Akaike info criterion	4.471754
Sum squared resid	99.44585	Schwarz criterion	4.838188
Log likelihood	-63.54807	Hannan-Quinn criter.	4.593217
Durbin-Watson stat	2.054531		

ARDL LONG RUN

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	11.71813	5.912434	1.981946	0.0639
EX_RATE	0.063991	0.021430	2.986012	0.0083
EMP	3.678094	1.581425	2.325810	0.0327
AGRICULTURE	-0.195870	0.076659	-2.555092	0.0205
IO	0.048632	0.243129	0.200026	0.8438
MVA	-1.917576	0.932499	-2.056384	0.0554
C	-36.53557	17.34167	-2.106808	0.0503

EC = GDP_GROWTH - (11.7181*FDI + 0.0640*EX_RATE + 3.6781*EMP -0.1959*AGRICULTURE + 0.0486*IO -1.9176*MVA -36.5356)

BOUNDS TEST

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.277991	10%	1.99	2.94
k	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99
Actual Sample Size	32		Finite Sample: n=35	
		10%	2.254	3.388
		5%	2.685	3.96
		1%	3.713	5.326
			Finite Sample: n=30	
		10%	2.334	3.515
		5%	2.794	4.148
		1%	3.976	5.691

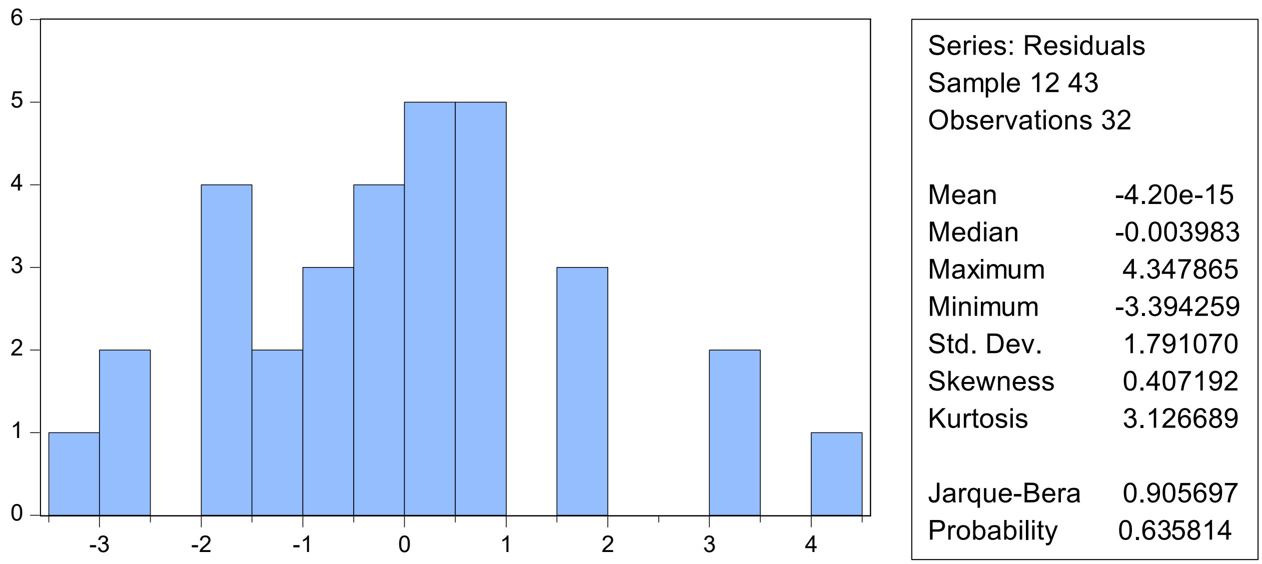
APPENDIX 3
RESIDUAL DIAGNOSTICS

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.224335	Prob. F(2,15)	0.8017
Obs*R-squared	0.929363	Prob. Chi-Square(2)	0.6283

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.977720	Prob. F(14,17)	0.5107
Obs*R-squared	14.27324	Prob. Chi-Square(14)	0.4296
Scaled explained SS	4.283458	Prob. Chi-Square(14)	0.9935

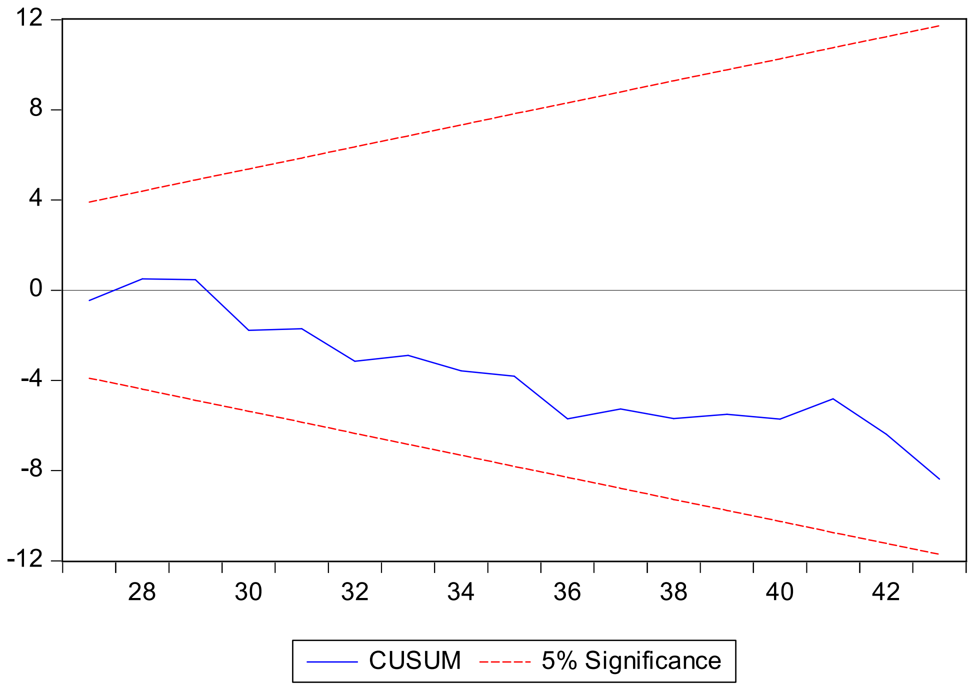


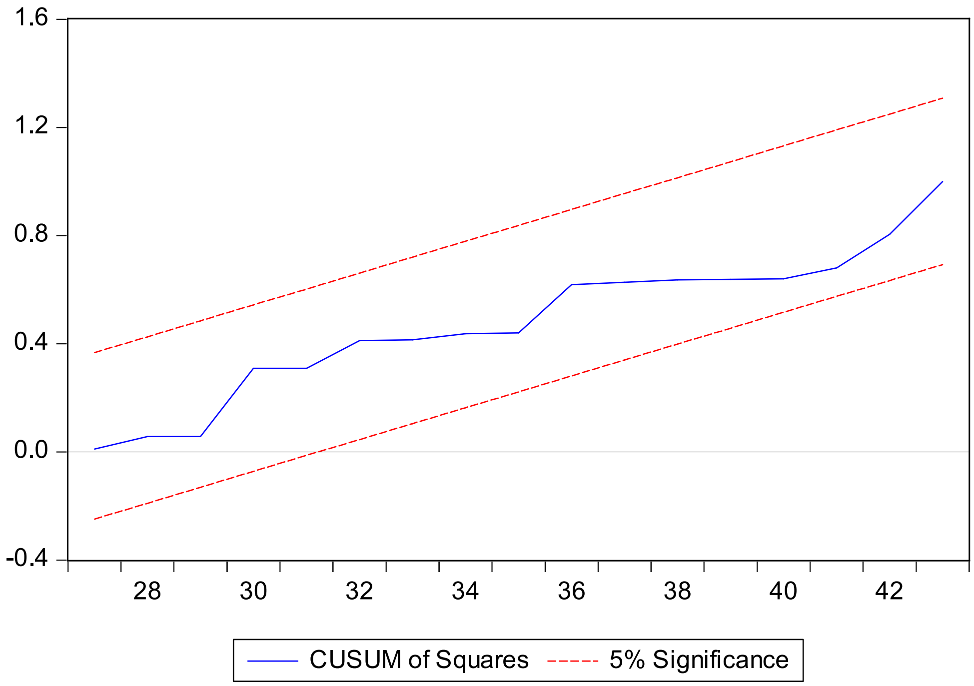
Ramsey RESET Test
Equation: UNTITLED

	Value	df	Probability
t-statistic	1.245765	16	0.2308
F-statistic	1.551930	(1, 16)	0.2308

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	8.792938	1	8.792938
Restricted SSR	99.44585	17	5.849756
Unrestricted SSR	90.65291	16	5.665807


12
8
4
0
-4
-8
-12
28
30
32
34
36
38
40
42
CUSUM
5% Significance


1.6
1.2
0.8
0.4
0.0
-0.4
28
30
32
34
36
38
40
42
CUSUM of Squares
5% Significance

CORRELATION

	GDP_GROWTH	FDI	EX_RATE	EMP	AGRICULTURE	MVA
GDP_GROWTH	1	-0.2053753824897584	0.151817293015978	-0.2791971258335154	-0.1594162912684761	-0.4587533948700572
FDI	-0.2053753824897584	1	-0.734415009252851	-0.3429367024152116	-0.6000187032761455	0.7481678727122955
EX_RATE	0.151817293015978	-0.7344150096252851	1	0.3856922288787446	0.6989004770941167	-0.5394476633868072
EMP	-0.2791971258335154	-0.3429367024152116	0.3856922288787446	1	0.7094175834402562	0.1118202146458891
AGRICULTURE	-0.1594162912684761	-0.6000187032761455	0.69890047709411167	0.7094175834402562	1	-0.3845992940546396
MVA	-0.4587533948700572	0.7481678727122955	-0.53944766338680 72	0.1118202146458891	-0.3845992940546396	1

DESCRIPTIVE STATISTICS

	GDP_GROWTH	FDI	EX_RATE	EMP	AGRICULTURE	MVA
Mean	3.042141	1.123920	178.6414	12.16192	23.67464	14.32730
Median	3.251681	0.817478	155.5871	11.43539	9.993554	13.93340
Maximum	15.32916	2.900249	425.9792	17.87884	87.68955	21.09825
Minimum	-13.12788	-0.039127	8.038285	10.14651	0.012770	6.552817
Std. Dev.	5.255826	0.824852	124.6795	1.891383	27.43922	4.918663
Skewness	-0.839215	0.518648	0.457831	1.821736	0.898305	-0.033387
Kurtosis	4.845801	2.111294	2.193212	5.622045	2.496705	1.472729
Jarque-Bera	11.15153	3.342856	2.730464	27.70626	6.236994	4.187153
Probability	0.003789	0.187978	0.255321	0.000001	0.044224	0.123246
Sum	130.8121	48.32858	7860.222	401.3435	1018.009	616.0738
Sum Sq. Dev.	1160.196	28.57599	668434.5	114.4745	31622.26	1016.116
Observations	43	43	44	33	43	43

Year	MVA	IO	EMP	GDP Growth	Agriculture	FDI	EX Rate
1981	20.26371	39.24509		-13.1279	0.013028	1.20	9.91
1982	20.33225	34.80921		-6.80339	0.0148	1.72	17.30
1983	21.09825	34.11844		-10.9241	0.01277	2.37	22.07
1984	17.73636	30.34592		-1.11562	0.015664	2.44	22.00
1985	21.0545	33.4666		5.913027	0.020365	0.24	21.90
1986	21.01	32.83078		0.060945	0.020689	0.27	21.88
1987	18.78351	32.8869		3.200125	0.046145	0.23	21.89
1988	21.01964	32.61487		7.334025	0.083	0.14	21.89
1989	18.35403	35.39181		1.919381	0.1518	1.70	92.34
1990	17.7826	35.41033		11.77689	0.258	1.65	101.70
1991	19.49459	36.96557	11.43539	0.358353	0.2087	1.62	111.23
1992	17.65449	37.70961	11.43123	4.631193	0.455975	1.97	120.58
1993	18.37625	33.17434	11.39471	-2.03512	1.803806	1.91	129.22
1994	20.92708	31.31839	11.3809	-1.81492	1.183291	1.38	132.89
1995	19.99372	36.54049	11.35159	-0.07266	1.5104	2.84	131.27
1996	19.10108	37.44548	11.34625	4.195924	1.8184	2.04	128.65
1997	19.19853	35.24885	11.34426	2.937099	2.058885	2.17	125.81
1998	17.45057	28.70244	11.3057	2.581254	2.891705	2.41	118.57
1999	16.25737	29.36369	11.29982	0.584127	59.31617	2.90	148.88
2000	13.9334	33.823	11.36655	5.015935	6.335779	1.64	150.30
2001	13.92536	28.27627	11.45527	5.917685	7.064546	2.13	153.86
2002	11.81181	23.04084	11.5418	15.32916	9.993554	1.52	157.50
2003	12.06061	26.00241	11.67577	7.347195	7.537355	1.07	157.31
2004	10.86157	28.39004	11.79096	9.250558	11.3	0.82	158.55
2005	10.06108	28.20158	11.45742	6.438517	16.3	0.62	192.44
2006	8.852873	25.75164	11.12792	6.059428	17.91903	0.85	253.49
2007	8.40138	24.34472	10.85592	6.59113	32.48423	0.64	305.79
2008	8.168913	24.71425	10.61965	6.764473	65.39901	0.18	306.08
2009	7.838412	21.23676	10.41641	8.036925	22.4352	0.49	306.92
2010	6.552817	25.31745	10.25895	8.005656	28.21795	0.55	358.81
2011	7.171084	28.2778	10.14651	5.307924	41.2	0.75	401.15
2012	7.724547	27.07302	10.89416	4.230061	33.3	-0.04	425.98
2013	8.928929	25.74232	11.71184	6.671335	39.43101	0.51	157.50
2014	9.635812	24.64361	12.14635	6.309719	36.7	0.82	157.31
2015	9.428437	20.16078	12.45488	2.652693	41.27	0.62	158.55
2016	8.679698	18.17313	12.68068	-1.61687	36.30453	0.85	192.44
2017	8.741993	22.31512	13.01738	0.805887	50.26068	0.64	253.49

2018	9.648947	25.73331	13.37866	1.922757	53.98759	0.18	305.79
2019	11.52236	27.38254	13.77007	2.208429	70.25017	0.49	306.08
2020	12.66727	28.22051	14.94437	-1.79425	76.60632	0.55	306.92
2021	14.6107	31.40753	15.91812	3.647187	72.27226	0.75	358.81
2022	13.59351	30.77557	17.54517	3.251681	81.86696	-0.04	401.15
2023	15.3638	32.58441	17.87884	2.860215	87.68955	0.51	425.98

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