

IMPACT OF NON-OIL EXPORT ON ECONOMIC GROWTH IN NIGERIA (1994-2024)

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DEPARTMENT OF ECONOMICS

FACULTY OF SOCIAL SCIENCES

UNIVERSITY OF BENIN

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**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMICS,
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CERTIFICATION

This is to certify that the project titled "THE IMPACT OF NON OIL EXPORT ON ECONOMIC GROWTH IN NIGERIA" was carried out by IDAHOR CONFIDENCE OSAWONAMEN with the matriculation number SSC2105566 in the Department of Economics, faculty of social science, University of Benin.

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DEDICATION

This project is dedicated to Almighty God, whose grace, wisdom, and strength guided me through every stage of this work.

I also dedicate this work to my beloved parents, whose love, prayers, and sacrifices have been the foundation of all my achievements. Your encouragement and unwavering belief in me continue to inspire my journey.

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ABSTRACT

This study investigates the impact of non-oil exports on economic growth in Nigeria between 1995 and 2024. Using annual time series data and econometric techniques such as the Augmented Dickey-Fuller (ADF) unit root test, Johansen cointegration test, and the Error Correction Model (ECM), the study examines both short-run and long-run dynamics among key variables including non-oil exports (NOX), real gross domestic product (RGDP), foreign exchange earnings (FX), employment (EMP), inflation (INF), and exchange rate (EXR). The cointegration results confirm the existence of long-run relationships among the variables. Findings from the ECM indicate that non-oil exports have a positive but statistically insignificant effect on economic growth and employment, while they significantly enhance foreign exchange earnings. Exchange rate fluctuations exhibit a significant negative effect on RGDP but a positive effect on employment in the short run, whereas inflation remains insignificant across models. The results suggest that although non-oil exports contribute meaningfully to foreign exchange generation, their potential to stimulate broad-based economic growth and job creation has not been fully realized. The study recommends policies that promote export diversification, value addition, exchange rate stability, infrastructure development, and employment-oriented industrialization to strengthen the link between non-oil exports and sustainable economic growth in Nigeria.

Keywords: Non-oil exports, Economic growth, Exchange rate, Foreign exchange earnings, Employment, Nigeria.

CHAPTER ONE : INTRODUCTION

1.1 BACKGROUND OF THE STUDY.

Economic growth refers to an increase in the size of a country's economy over a period of time. The size of an economy is typically measured by the total production of goods and services in the economy, which is called gross domestic product (GDP).

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, policy-makers, public and private sectors work ceaselessly towards attaining economic growth by the use of development and growth models and policies. Among the policies used are trade policy (Import and export policies, monetary policy, exchange rate policy, fiscal policy, market etc). In this study, the non-oil exports and economic development in Nigeria will be examined.

Non-oil exports are the products, which are produced within the country in the agricultural, mining and quarrying and industrial sectors that are sent outside the country in order to generate revenue for the growth of the economy excluding oil products. These non-oil export products are coal, cotton, timber, groundnut, cocoa, beans etc.

Nigeria's economic landscape has undergone several transformations since its independence in 1960, shifting from an agrarian-based system to a crude oil-dominated economy. Prior to the discovery and commercial exploitation of oil in the late 1950s, agriculture and other non-oil

sectors such as solid minerals and manufacturing constituted the mainstay of Nigeria's economy. Export commodities like cocoa, palm produce, groundnuts, rubber, and tin were the principal foreign exchange earners, contributing significantly to national income, employment, and rural development (Adewuyi & Okodua, 2010).

However, the oil boom of the 1970s fundamentally altered Nigeria's economic structure. The newfound wealth from petroleum exports prompted a gradual shift in focus away from agriculture and other non-oil sectors. Government revenues became increasingly dependent on oil exports, resulting in a mono-product economy that is highly susceptible to fluctuations in global oil prices. This dependence has continued to define Nigeria's fiscal and external sectors, often leading to economic instability during periods of oil price collapse (CBN, 2020).

Over the years, various economic shocks such as the global oil price crash of 1986, the 2008 financial crisis, and the 2020 COVID-19 pandemic have exposed the dangers of overreliance on a single export commodity. These events have consistently highlighted the need for a more diversified and resilient economic base. Consequently, the Nigerian government and stakeholders in the private sector have intensified efforts to promote non-oil exports as a viable alternative for sustainable economic growth (NBS, 2023).

One of the landmark policy responses to Nigeria's overdependence on oil was the introduction of the Structural Adjustment Programme (SAP) in 1986. SAP aimed at liberalizing the economy, promoting private sector participation, and encouraging export diversification. It introduced

various reforms such as deregulation of exchange rates, reduction of tariffs, and incentive schemes for non-oil exporters. While SAP laid the foundation for a more open and export-oriented economy, its results were mixed due to poor policy implementation, corruption, and weak institutional capacity (Olayiwola & Okodua, 2013).

In subsequent years, Nigeria introduced other policy measures such as the National Economic Empowerment and Development Strategy (NEEDS) in 2003, the Export Expansion Grant (EEG) in 1986, and the Zero Oil Plan championed by the Nigerian Export Promotion Council (NEPC) in 2016. These initiatives were aimed at boosting non-oil export volumes, improving product competitiveness, and increasing value-added production. Despite these interventions, the non-oil export sector still contributes minimally to Nigeria's foreign exchange earnings compared to crude oil (NEPC, 2022).

Data from the Central Bank of Nigeria and the National Bureau of Statistics indicate that non-oil exports account for less than 15% of Nigeria's total export earnings, with major products being agricultural commodities (such as sesame seeds, cashew nuts, and cocoa) and semi-processed materials. The manufacturing sector, which has the potential to drive non-oil export diversification, remains weak due to infrastructural bottlenecks, high production costs, poor power supply, and limited access to financing. Furthermore, between 1981 and 1991 the average growth rate of Nigeria's real gross domestic product (GDP) stood at 2.2%, Within the same period, the growth rate of the country's total export stood at 38.3%, out of which oil export

contributed about 95.4% while non-oil export contributed 4.5%. Between 1992 and 2020, the average growth rate of Nigeria's real GDP increased from 2.2% to 3.8% while the average growth rate of the country's export increased to 48.6%, with oil export contributing about 97.4% against 95.4% previously recorded, and non-oil export contributed 2.5% against 4.5% previously recorded. Despite the relatively consistent increase in Nigeria's GDP over the years, the country recorded decrease in total export intermittently. Since oil export contributes about 95 percent of total export as against the paltry percent of the non-oil sector, it implies that earnings from oil are volatile when compared to those of the non-oil sector, it also indicates that the non-oil sector holds a lot of potentials. (CBN, 2021,2022; NBS, 2023).

In addition, Nigeria's non-oil exports face structural challenges such as poor logistics, inadequate trade financing mechanisms, and limited market access due to non-compliance with international quality standards. These problems have stifled export performance and prevented the country from fully benefiting from global trade opportunities under agreements like the African Continental Free Trade Area (AfCFTA).

Nonetheless, the importance of non-oil exports to Nigeria's economic future cannot be overstated. Countries that have successfully diversified their economies have experienced more stable growth, reduced vulnerability to external shocks, and improved living standards. For example, The UAE was once heavily dependent on oil exports, but through strategic investments in tourism, aviation, real estate, finance, and technology, it successfully diversified its economy.

Today, over 70% of its GDP comes from non-oil sectors, making the UAE a global hub for business and tourism with a more resilient and sustainable economy. For Nigeria to achieve similar outcomes, there is a pressing need to assess how non-oil exports have impacted economic performance over the years and whether current efforts are yielding tangible results.

This study, therefore, seeks to critically evaluate the impact of non-oil exports on Nigeria's economy between 1994 and 2024. The 30-year period is chosen to capture the long-term effects of major policy reforms, global economic trends, and domestic challenges that have shaped the country's export performance. By analyzing the relationship between non-oil exports and key macroeconomic indicators such as GDP growth, employment, and foreign exchange earnings, the study aims to provide evidence-based recommendations for improving Nigeria's non-oil strategy.

1.2 STATEMENT OF THE PROBLEM

Nigeria has, over the years, remained heavily dependent on crude oil as the dominant source of government revenue and foreign exchange earnings. This overdependence on a single commodity has not only made the economy vulnerable to external shocks but also discouraged the growth of other potentially productive sectors, especially the non-oil export segment. Despite decades of advocacy for economic diversification, the contribution of non-oil exports to national income and foreign exchange earnings remains significantly low compared to the oil sector (CBN, 2021).

The volatility of global oil prices has repeatedly exposed the fragile nature of Nigeria's mono-product economy. For example, during the global oil price collapse in 2014–2016 and the sharp decline in demand caused by the COVID-19 pandemic in 2020, the Nigerian economy suffered massive revenue shortfalls, foreign exchange scarcity, inflation, and currency devaluation. These incidents reaffirmed the dangers of a narrow export base and brought to the forefront the need to strengthen non-oil export sectors such as agriculture, manufacturing, and solid minerals (NBS, 2023).

Although various policy measures and institutional frameworks have been introduced to stimulate non-oil exports including the Export Expansion Grant (EEG), Nigerian Export-Import Bank (NEXIM) financing schemes, and the Zero Oil Plan by the Nigerian Export Promotion Council the sector continues to face major structural, infrastructural, and financial constraints. These include poor access to credit, high production costs, weak infrastructure, policy inconsistencies, and low product competitiveness in international markets (NEPC, 2022).

Furthermore, the non-oil export sector lacks the capacity to compete effectively in the global marketplace due to inadequate value addition, limited technology, and poor adherence to international standards. As a result, Nigeria mostly exports primary or semi-processed goods, which earn relatively low foreign exchange and contribute minimally to economic development. This situation hinders the country from achieving sustained growth, creating quality jobs, and improving its trade balance (Adewuyi & Okodua, 2010).

Despite the immense potential of the non-oil sectors particularly agriculture and manufacturing to drive inclusive growth and economic stability, the actual impact of non-oil exports on Nigeria's economy over the past three decades remains insufficiently explored in empirical literature. Existing studies have focused either on short-term export performance or have failed to account for the combined influence of policy changes, global trade dynamics, and domestic challenges across an extended time frame.

Given this gap, it becomes imperative to conduct a comprehensive analysis of how non-oil exports have influenced key macroeconomic variables such as GDP growth, employment, and foreign exchange reserves in Nigeria between 1994 and 2024. Doing so will provide insights into the effectiveness of past policies, identify persistent challenges, and suggest practical recommendations for enhancing the contribution of non-oil exports to national development. This research is therefore timely and relevant, especially as Nigeria seeks to reposition itself within a highly competitive and rapidly evolving global economic environment.

1.3 Research Questions

How do non-oil exports affect Nigeria's economic growth?

What is the relationship between non-oil exports and Nigeria's foreign exchange earnings between 1994 and 2024?

How does non-oil export performance affect employment generation in Nigeria from 1994 to 2024?

1.4 Objectives of the Study

The main objective of this study is to examine the impact of non-oil exports on Nigeria's economy between 1994 and 2024. The specific objectives are to:

Analyze the relationship between non-oil exports and economic growth in Nigeria.

To analyze the relationship between non-oil exports and Nigeria's foreign exchange earnings from 1994 to 2024.

To evaluate the impact of non-oil export performance on employment generation in Nigeria between 1994 and 2024.

1.5 Research Hypotheses

The study will test the following hypotheses:

$H_{0\ 1}$: Non-oil exports have no significant relationship on Nigeria's Economic growth.

$H_{1\ 1}$: Non-oil exports have a significant relationship on Nigeria's Economic growth.

$H_{0\ 2}$: Non-oil exports have no significant relationship with Nigeria's foreign exchange earnings.

$H_{1\ 2}$: Non-oil exports have a significant relationship with Nigeria's foreign exchange earnings.

H_{0 3} : Non-oil exports have no significant effect on employment generation in Nigeria.

H_{1 3} : Non-oil exports have a significant effect on employment generation in Nigeria.

1.6 Significance of the Study

This study contributes to the growing body of empirical research on economic diversification in resource-dependent economies, especially in sub-Saharan Africa. By focusing on a 30-year period, this study offers a comprehensive, long-term view of how non-oil exports have influenced Nigeria's economic performance, a perspective that is often lacking in existing literature.

This research is relevant as Nigeria continues to seek economic stability in the face of global oil market volatility, climate change pressures, and post-COVID-19 recovery efforts. A shift toward a non-oil export-driven economy is not just desirable but increasingly necessary for inclusive and sustainable development.

1.7 Scope of the Study

The study focuses on analyzing the impact of non-oil exports on Nigeria's economy. Key economic indicators considered include Gross Domestic Product (GDP) as a measure of economic growth, foreign exchange earnings, and possibly other variables like exchange rates and employment generation.

The study adopts a quantitative approach using time-series data and econometric analysis. It relies on secondary data obtained from credible sources such as the Central Bank of Nigeria

(CBN), National Bureau of Statistics (NBS), Nigerian Export Promotion Council (NEPC), and international databases like the World Bank. This study covers a 30-year period from 1994 to 2024.

CHAPTER 2

Literature Review

2.1 Conceptual framework

Non oil export

Non-oil exports can be defined as all goods and services that are sold outside a country, excluding crude oil and petroleum products, although the exact scope varies depending on the scholar or institution. For example, Kromtit, Kanadi, Ndangra and Lado (2017) define non-oil exports as agricultural, mining, quarry and industrial products such as cocoa, timber, beans, cotton and coal that are produced locally and exported to generate foreign revenue outside the oil sector.

The Nigerian Export Promotion Council (NEPC), established in 1976 through Decree No. 26 and amended in 1979, 1986, 1988 and 1992, implicitly defines non-oil exports as all exportable items other than petroleum, emphasizing agriculture, manufacturing and services as the main drivers of diversification. On a wider scale, the International Monetary Fund (IMF), in its Direction of Trade Statistics (DOTS), classifies countries' exports into "fuel" and "non-fuel," thereby describing non-oil exports as all merchandise and services not derived from crude oil.

Similarly, the Iran Customs Administration (IRICA, 2019) regards all commodities except crude oil as non-oil exports, which notably includes petrochemicals, condensates and processed

gas products (link). In another perspective, Olumuyiwa and Adebayo (2015) explain non-oil exports as foreign exchange earnings generated from the sale of non-petroleum goods such as solid minerals, manufactured goods and agricultural produce (link).

From these definitions, non-oil exports excluding crude oil shows that the precise coverage depends on national policies, institutional mandates and research focus.

Economic growth

Economic growth refers to the sustained increase in a nation's capacity to produce goods and services, usually measured by changes in real Gross Domestic Product (GDP) or GDP per capita. The World Bank (2023) defines it as the annual percentage change in the constant-price value of domestic production, making it a key indicator of economic performance.

Similarly, the International Monetary Fund (IMF, 2024) views economic growth as the inflation-adjusted expansion of the market value of goods and services over time, noting in its April 2024 World Economic Outlook that global growth is projected at 3.2% in both 2024 and 2025 slower than the 3.8% average between 2000 and 2019.

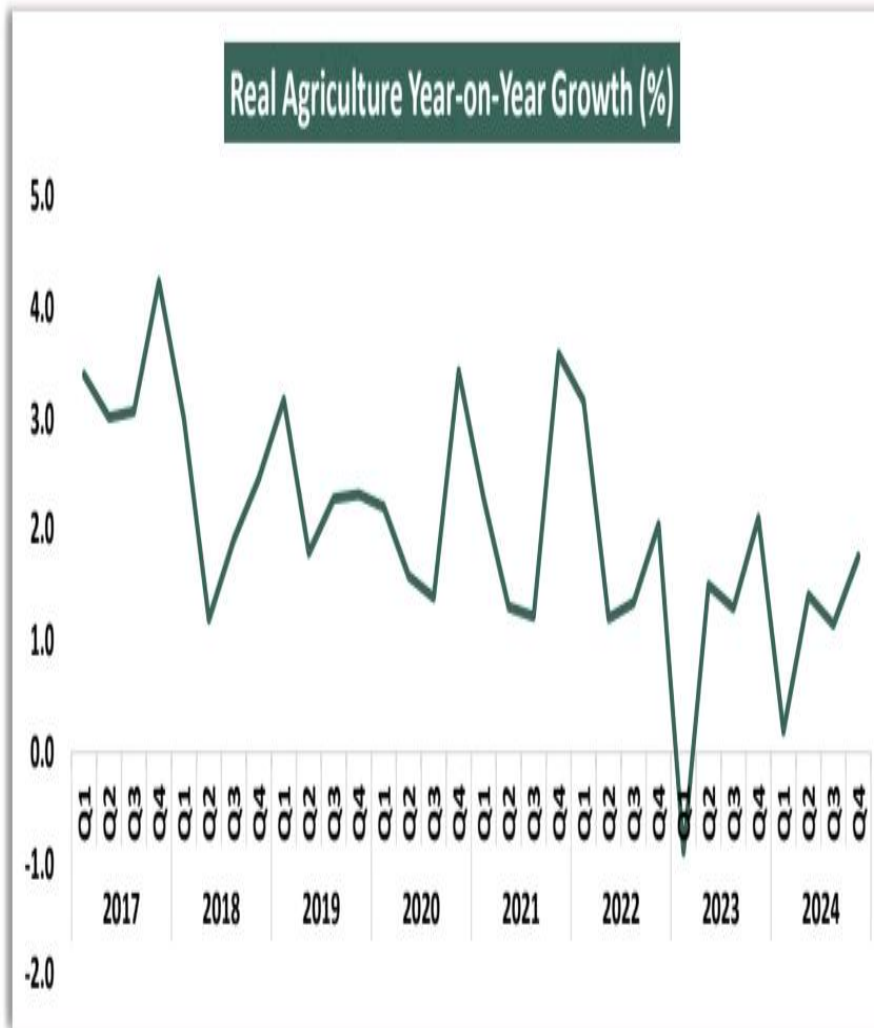
The Solow–Swan model (1956) explains growth as the result of capital accumulation, labor expansion, and technological progress, while more recent endogenous growth theory (Romer, 1986) emphasizes internal drivers such as human capital development, innovation, and government policies. In today's policy debates, the concept of inclusive growth has gained prominence, stressing that economic progress should not only raise output but also ensure that

the benefits are widely shared across society (Inclusive Growth). These varying definitions and perspectives highlight that while economic growth is commonly tracked through GDP, it also encompasses structural transformation, innovation, and equitable development.

2.1.1 Non-Oil Exports in Nigeria

Nigeria's export structure has been historically dominated by crude oil, which accounts for over 80% of export revenues and more than 50% of government income (CBN, 2023). However, the vulnerability of this oil dependence became evident during periods of global oil price volatility, particularly in 2008, 2014, and 2020, when declines in oil prices severely constrained Nigeria's fiscal space and foreign reserves. This reality has reinforced the need to promote non-oil exports as a sustainable strategy for economic diversification and resilience (World Bank, 2022).

Non-oil exports in Nigeria include a wide variety of products across agriculture, solid minerals, and manufactured goods. The agricultural sector remains the backbone of non-oil exports, contributing commodities such as cocoa, sesame seeds, cashew nuts, ginger, hibiscus, palm oil, and rubber. For instance, Nigeria ranks among the world's largest producers of cocoa and sesame, with these commodities earning significant foreign exchange in recent years (NEPC, 2023). Cocoa alone accounts for nearly 30% of agricultural export earnings, while sesame seed exports have expanded rapidly due to growing demand in Asia and Europe (FAO, 2021).



Agricultural Real Growth(source : NBS,2024)

Four sub-activities make up the Agricultural sector: Crop Production, Livestock, Forestry and Fishing. The sector grew by 6.22% year-on-year in nominal terms in Q4 2024, showing a decrease of 8.72% points from the same quarter of 2023. Looking at the preceding quarter's growth rate of 11.29%, there was a decrease of 5.07% points. Crop production remained the major driver of the sector. This is evident as it accounts for 90.70% of the overall nominal value of the sector in the fourth quarter of 2024. Overall, growth rate in 2024 stood at 6.02%, relative to 11.12% in 2023.

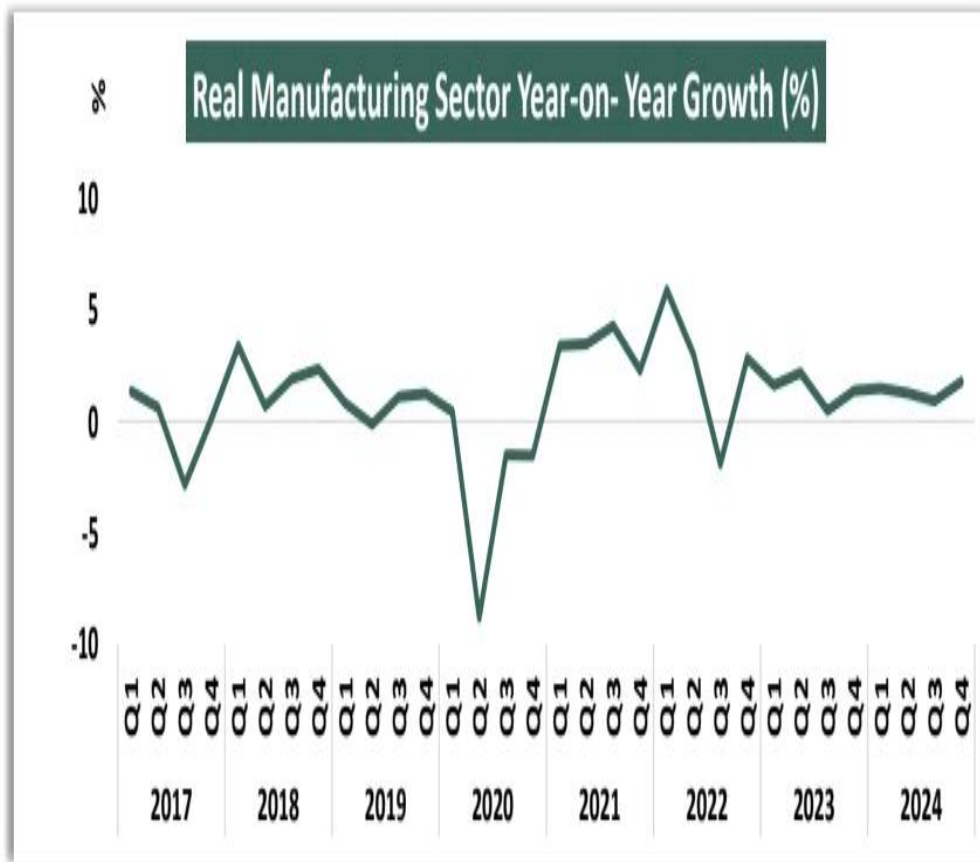
Quarter-on-quarter growth stood at -3.01% in the fourth quarter of 2024. Agriculture contributed 22.02% to nominal GDP in the fourth quarter of 2024, This figure was lower than the rate recorded in the fourth quarter of 2023 and lower than the third quarter of 2024 which recorded 24.65% and 25.01% respectively. Overall, the sector contributed 20.97% to the aggregate GDP in 2024.

The agricultural sector in the fourth quarter of 2024 grew by 1.76% (year-on-year) in real terms, a decrease of 0.35% points from the corresponding period of 2023, and an increase of 0.61% points from the preceding quarter which recorded a growth rate of 1.14%. It grew on a quarter-on-quarter basis at 0.38%. Overall, annual growth of the sector stood at 1.19% in 2024 compared to 1.13% in 2023,

However, the sector contributed 25.59% to aggregate GDP in real terms in Q4 2024, lower than the contribution in the fourth quarter of 2023 and lower than the third quarter of 2024

which stood at 26.11% and 28.65% respectively. The overall contribution in 2024 was 24.64% from 25.18% in 2023.(NBS,2024)

The manufacturing sector also contributes to non-oil exports, though at a limited scale compared to agriculture. Nigerian manufacturers export processed food products, textiles, leather goods, cement, and chemicals. Manufacturing exports not only diversify Nigeria's trade structure but also create higher value addition compared to raw commodity exports. For instance, processed cocoa, cashew kernels, and leather products generate substantially higher revenues than unprocessed equivalents (Adewuyi, 2020).



Manufacturing Real Growth(source : NBS,2024)

The Manufacturing sector is comprised of thirteen activities: Oil Refining: Cement; Food, Beverages and Tobacco; Textile, Apparel, and Footwear, Wood and Wood products: Pulp Paper and Paper products; Chemical and Pharmaceutical products; Non-metallic: Products, Plastic and Rubber products: Electrical and Electronic: Basic Metal and Iron and Steel: Motor Vehicles and Assembly: and Other Manufacturing.

Nominal GDP growth of the Manufacturing sector in the fourth quarter of 2024 was 2.92% (year-on-year), 35.14% points lower than the figure recorded in the corresponding period of 2023 (38.06%) and 0.70% points lower than the preceding quarter figure of 3.62%. Quarter-on-quarter, growth of the sector was recorded at 6.97% during the quarter. Overall, the manufacturing sector grew by 4.08% in 2024 relative to 30.93% in 2023. The contribution of Manufacturing to Nominal GDP in the fourth quarter of 2024 was 13.88%, lower than the figure recorded in the corresponding period of 2023 at 16.04% and lower than the third quarter of 2024 at 14.30%, in 2024, the sector contributed 13.92% compared to 15.67% recorded in 2023.

Real GDP growth in the manufacturing sector in the fourth quarter of 2024 was 1.79% (year-on-year), higher than the same quarter of 2023 and higher than the preceding quarter by 0.41% points and 0.86% points respectively. The growth rate of the sector on a quarter-on-quarter basis stood at 10.48%. Overall, the sector grew by 1.38% in 2024, lower than the 1.40% recorded in 2023. The Real contribution to GDP in the 2024 fourth quarter was 8.07%, lower than the 8.23% recorded in the fourth quarter of 2023 and lower than the 8.21% recorded in the third quarter of 2024. In total, the sector contributed 8.64% in 2024, lower than the 8.81% contributed in 2023.(NBS,2024)

Over the years, government initiatives have sought to promote non-oil exports through various policy frameworks. The Nigerian Export Promotion Council (NEPC) has championed programs such as the Zero Oil Plan (2016), which targets the expansion of agricultural and manufactured exports to generate at least \$150 billion in non-oil revenues by 2030. Similarly, the Export Expansion Grant (EEG) has been used to provide incentives to exporters by offsetting high production and logistics costs (NEPC, 2023). Despite these efforts, challenges such as poor infrastructure, limited access to finance, weak trade logistics, and policy inconsistency continue to constrain the full potential of Nigeria's non-oil export sector (Aremu, 2021).

Recent trade statistics highlight both progress and challenges. According to the National Bureau of Statistics (2023), non-oil exports accounted for less than 15% of Nigeria's total exports between 2019 and 2022, with agricultural exports leading the way. While this figure shows some improvement compared to earlier decades, it still falls short of the levels required to significantly reduce dependence on oil. Comparatively, emerging economies such as Malaysia and Indonesia, once resource-dependent, now record more than 40% of export revenues from diversified non-oil sectors (UNCTAD, 2022). This highlights the need for Nigeria to intensify efforts in expanding and modernizing its non-oil export base.

2.1.2 Economic Growth In Nigeria

Economic growth refers to the sustained increase in a country's productive capacity, measured mainly through the rise in Gross Domestic Product (GDP) or Gross National Income

(GNI). It is widely seen as an indicator of improved living standards, higher income, and greater national development (Todaro & Smith, 2020). For developing countries like Nigeria, economic growth plays a critical role in reducing poverty, generating employment, and expanding opportunities for investment.

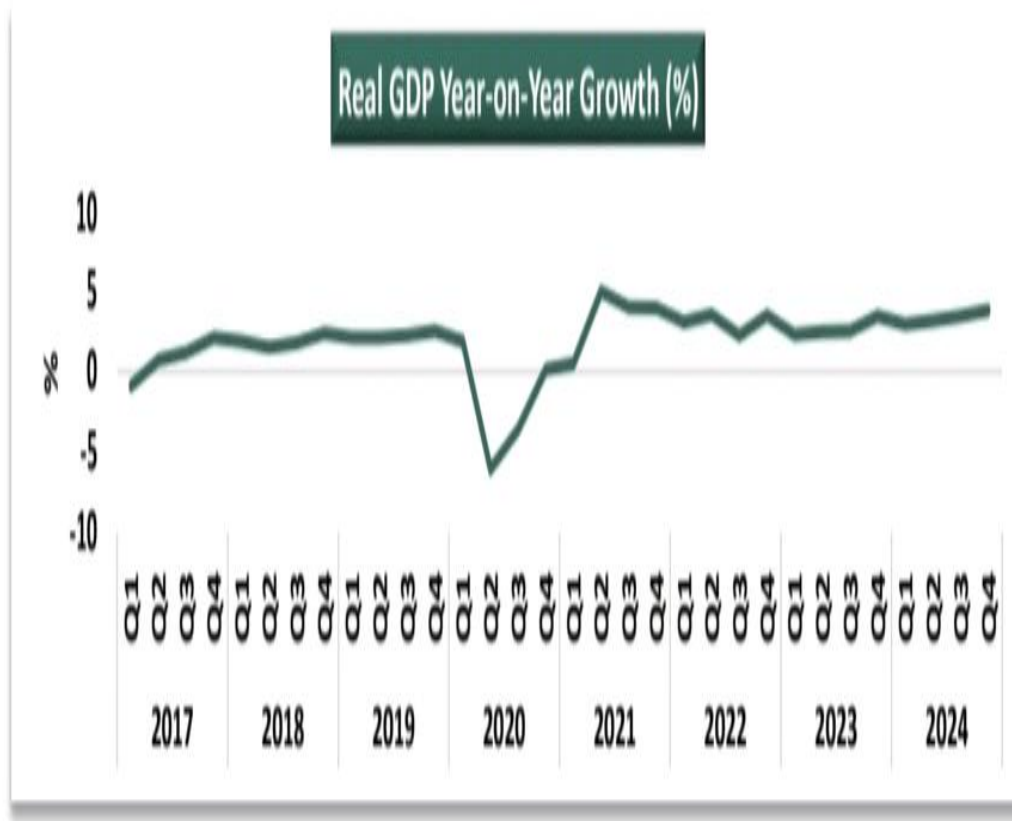
Nigeria's economic growth has historically been shaped by its natural resource endowment, particularly crude oil. Since the 1970s, oil has dominated national revenue, contributing over 50% of government income and more than 80% of export earnings (CBN, 2023). While oil brought periods of rapid growth, it also exposed the economy to boom-and-bust cycles, where fluctuations in global oil prices directly translated into instability in government revenues, foreign reserves, and growth performance (World Bank, 2022). For instance, during the oil price crash of 2014–2016, Nigeria slipped into a recession, highlighting the vulnerability of an oil-dependent growth structure (NBS, 2017).

Despite this dependence, the Nigerian economy is diverse in potential, with agriculture, manufacturing, services, and solid minerals providing alternative growth drivers. The agricultural sector, which employs over 35% of the labor force, has been a steady contributor to GDP, particularly in rural livelihoods and non-oil exports such as cocoa, sesame, and cashew (FAO, 2021). The services sector including telecommunications, banking, and trade has also expanded significantly since the early 2000s, accounting for more than 50% of GDP by 2020 (NBS, 2021). Manufacturing, however, has struggled due to infrastructure deficits, inconsistent

policies, and limited industrialization, contributing less than 10% of GDP over the past two decades (Adewuyi, 2020).

Recent trends in Nigeria's growth performance reflect both progress and challenges. Between 2000 and 2014, Nigeria recorded an average growth rate of about 6% annually, driven by high oil prices, expansion in telecommunications, and banking reforms (CBN, 2015). However, the 2016 recession and the 2020 COVID-19 pandemic disrupted this trajectory, leading to GDP contractions of -1.6% and -1.8% respectively (NBS, 2020). Post-pandemic recovery has been slow but steady, with GDP growth averaging around 3% between 2021 and 2023, supported by non-oil sectors such as agriculture, trade, ICT, and financial services (World Bank, 2023).

Economic growth in Nigeria is also influenced by structural challenges. Widespread unemployment, estimated at 33.3% in 2020, limits the inclusiveness of growth (NBS, 2020). High inflation, exchange rate volatility, and infrastructure deficits further constrain long-term economic performance. Moreover, weak institutions, corruption, and policy inconsistencies hinder effective resource management and economic diversification (Aremu, 2021). These structural bottlenecks underscore the importance of strengthening non-oil exports as an alternative engine of growth.

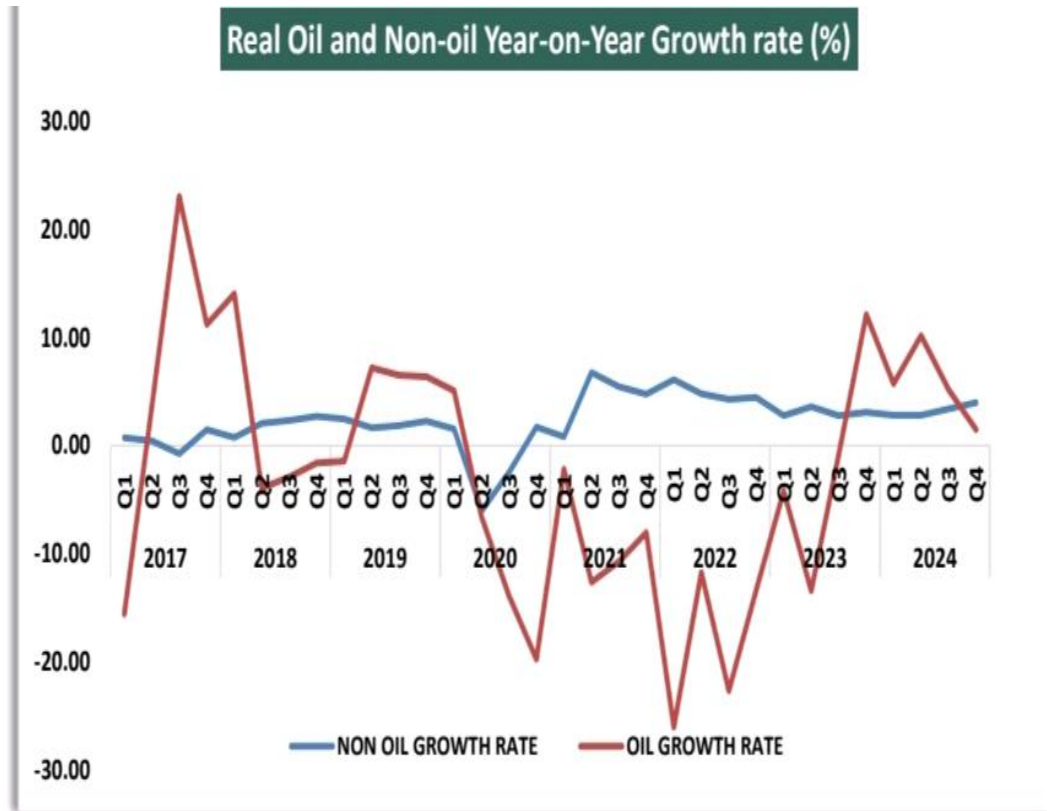


Real Gross Domestic Product Growth 2024 (source : NBS)

Nigeria's Gross Domestic Product (GDP) grew 3.84% (year-on-year) in real terms in the fourth quarter of 2024. This growth rate is higher than the 3.46% recorded in the fourth quarter of 2023 and the third quarter of 2024 growth rate (approximately 3.46%). The performance of the GDP in the fourth quarter of 2024 was driven mainly by the Services sector, which recorded a growth of 5.37% and contributed 57.38% to the aggregate GDP. The agriculture sector grew by 1.76%, from the growth of 2.10% recorded in the fourth quarter of 2023. The growth of the

industry sector was 2.00%, a decline from 3.86% recorded in the fourth quarter of 2023. In terms of share of the GDP, the services sector contributed more to the aggregate GDP in the fourth quarter of 2024 compared to the corresponding quarter of 2023. Overall, the annual GDP growth in 2024 stood at 3.40%, an increase from 2.74% in 2023,

In the quarter under review, aggregate GDP at basic price stood at N78,374, 120.95 million in nominal terms. This performance is higher when compared to the fourth quarter of 2023 which recorded aggregate GDP of N65,908,258.59 million, indicating a year-on-year nominal growth of 18.91%. For better clarity, the Nigerian economy has been classified broadly into the oil and non-oil sectors



Crude oil And Non-Oil Growth(Source : NBS,2024)

The Oil Sector

The nation in the fourth quarter of 2024 recorded an average daily oil production of 1.54 million barrels per day (mbpd), lower than the daily average production of 1.56 mbpd recorded in the same quarter of 2023 by 0.03 mopd and higher than the third quarter of 2024 production volume of 1.4/ mbpd by 0.06mbpd.

The real growth of the oil sector was 1.48% (year-on-year) in Q4 2024, indicating a decrease of 10.64% points to the rate recorded in the corresponding quarter of 2023 (12.11%), Growth decreased by 3.70% points when compared to Q3 2024 which was 5.17%. On a quarter-on-quarter basis, the oil sector recorded a growth rate of -7.19% in Q4 2024. The annual growth rate of oil stood at 5.54%, higher than the -2.22% recorded in 2023. The Oil sector contributed 4.60% to the total real GDP in Q4 2024. down from the figure recorded in the corresponding period of 2023 and down from the preceding quarter, where it contributed 4,70% and 5.57% respectively. Overall, it contributed 5.51% in 2024, higher than its of 5.40% in 2023.

The Non-Oil Sector

The non-oil sector grew by 3.96% in real terms during the reference quarter (Q4 2024). This rate was higher by 0.89% points compared to the rate recorded in the same quarter of 2023 which was 3.07% and higher than the 3.37% recorded in the third quarter of 2024. This sector was driven in the fourth quarter of 2024 mainly by Financial and Insurance (Financial Institutions); Information and Communication (Telecommunications); Agriculture (Crop production): Transportation and Storage (Road Transport); Trade; and Manufacturing, accounting for positive GDP growth.

In real terms, the non-oil sector contributed 95.40% to the nation's GDP in the fourth quarter of 2024, higher than the share recorded in the fourth quarter of 2023 which was 95.30% and higher

than the third quarter of 2024 recorded as 94.43%. Moreover, on aggregate of 94,49% was contributed in 2024, lower than the 94.60% reported in 2023.

2.2 Theoretical literature

2.2.1 Export-Led Growth Hypothesis (ELGH)

The Export-Led Growth Hypothesis (ELGH) is a widely discussed economic theory which posits that a nation's long-term economic growth can be significantly enhanced by expanding its exports. The central idea is that when a country produces goods and services for international markets, it benefits from larger demand, economies of scale, foreign exchange earnings, and improved productivity, all of which stimulate overall economic performance (Awokuse, 2007; Siliverstovs & Herzer, 2019).

The theoretical foundation of ELGH can be traced to classical trade theories such as Adam Smith's theory of absolute advantage and David Ricardo's theory of comparative advantage, which suggest that countries benefit from specializing in the production of goods in which they have relative efficiency. Later, the hypothesis was refined in the context of modern globalization, emphasizing that export expansion is a key driver of GDP growth, industrial development, and employment creation (Feder, 1983; Balassa, 1978).

For Nigeria, the ELGH provides a strong justification for diversifying exports away from crude oil into non-oil sectors such as agriculture, solid minerals, and manufacturing. The hypothesis suggests that if Nigeria increases the production and export of these goods, the

economy will grow more sustainably by reducing dependence on oil revenues and mitigating the effects of oil price volatility (Ekesiobi & Nwokoye, 2022).

Oziengbe Aigheyisi's 2020 study examines whether the export-led growth (ELG) hypothesis applies to services exports in Nigeria (1981–2018) using ARDL, FMOLS, DOLS, VECM, and Granger causality methods. The findings show that while services exports exert a positive but statistically insignificant effect on economic growth—both in the short and long run—and no causal relationship is found, suggesting the ELG hypothesis does not hold for Nigerian services exports . In contrast, empirical studies of non-oil goods exports (i.e., agriculture and manufacturing) show more mixed and conditional outcomes. For instance, Igwe (2025) reports that non-oil exports do significantly determine economic growth in both the short and long runs, though no causality is detected . Similarly, Ojide (2014) finds that Nigeria's non-oil export-led growth hypothesis holds and is sustainable, based on ARDL and cointegration analysis . However, other studies (e.g., Adesoji & Sotubo 2013, Onodugo et al. 2013) reveal that non-oil exports underperform or have a weak impact on growth, leaving oil exports dominant and undermining effective diversification .

Medina-Smith (2001) explains that the Export-Led Growth Hypothesis (ELGH) suggests export expansion is a key driver of economic growth. It argues that a country's development is not solely dependent on increases in labor and capital, but can also be stimulated through the growth of exports, which act as an engine of growth. Similarly, Hassan (2011), in his discussion

of the hypothesis, acknowledges that a rise in a nation's exports can significantly contribute to its economic progress, emphasizing that economic growth results not only from labor and capital accumulation but also from export expansion.

2.2.2 Comparative Advantage Theory

The theory of comparative advantage, originally advanced by David Ricardo in 1817, is one of the most enduring frameworks in international trade. It argues that countries stand to gain more from trade if they specialize in the production of goods and services where they possess a relative efficiency, or lower opportunity cost, and exchange them for goods where they are relatively less efficient. Unlike absolute advantage, which is concerned with overall productivity differences, comparative advantage emphasizes relative costs and the benefits of specialization. Over time, the theory has been extended by modern economists. For example, Krugman (1979; 1980) in his "new trade theory" highlighted how economies of scale and product differentiation could shape trade patterns even among countries with similar resource endowments, while Balassa (1965) introduced the concept of Revealed Comparative Advantage (RCA) as a way of empirically testing whether countries export products in which they are relatively more competitive. Similarly, Edwards (1993) showed that developing countries which align their production and export structures to their comparative advantage tend to achieve higher growth rates under conditions of openness and liberalization.

The Comparative Advantage Theory explains that Nigeria can achieve greater economic growth by specializing in and exporting goods and services for which it has a comparative advantage, such as agricultural products and solid minerals, rather than relying heavily on oil exports. By focusing on these sectors, Nigeria can improve resource allocation, stimulate productivity, and generate increased export revenues, leading to overall economic development and diversification away from its oil-dependent economy. Nigeria's evidence on comparative advantage is mixed but instructive. A classic baseline by Ukeje (2000) in the CBN's Bullion reviewed Nigeria's production and trade structure and argued that the country's inherent strengths lie largely in agricultural commodities—implying potential gains from specializing in non-oil exports if structural bottlenecks are addressed.

Verter (2020) in *Agricultural Economics (Czech Republic)* mapped Nigeria EU28 agri-food trade using Balassa/Lafay indices and found that Nigeria's revealed comparative advantages declined over 1995–2017, though pockets of strength (e.g., cocoa) persist signaling that competitiveness has eroded without sustained upgrading. Focusing on the AfCFTA context, Eze (2022) in *SOBIDER / Journal of Social Sciences* computed RCA for 2008–2019 and showed Nigeria has comparative advantage mainly in raw materials, but comparative disadvantage in intermediate, consumer, and capital goods evidence that specialization remains stuck upstream rather than in value-added exports. In bilateral trade, Ibrahim & Iorember (2018) (working paper later appearing in *DUJEDS*) used RCA and trade-complementarity indices for Nigeria China and

found Nigeria's advantage concentrated in primary/raw products with limited edge in manufactures.

Alawode (2020) in the International Journal of Innovative Development and Policy Studies reported a sustained $RCA > 1$ for cashew, confirming strong though volatile comparative advantage that could be leveraged with better value-addition and market development. Taken together, the literature shows Nigeria does exhibit comparative advantage outside oil (a positive), but it is still concentrated in raw/primary goods and has weakened over time in several agri-food lines (a negative), implying that policy needs to shift from merely exporting what Nigeria grows/mines to upgrading into processed and manufactured varieties where durable advantages can be built.

In conclusion, the theory of comparative advantage provides a useful framework for understanding Nigeria's trade performance and the role of non-oil exports in driving growth. The reviewed evidence shows that Nigeria possesses clear comparative advantage in several primary and agricultural commodities such as cocoa, cashew, sesame, and some raw materials. However, this advantage is often limited to low-value, unprocessed exports, while the country continues to experience comparative disadvantage in manufactured and industrial goods. This pattern has restricted the capacity of non-oil exports to significantly transform the economy.

2.2.3 Structural Change Theory

This theory emphasizes economic transformation from primary reliance on one sector (oil) to a diversified structure involving manufacturing, agriculture, and services. For Nigeria, promoting non-oil exports aligns with the need for structural change to achieve sustainable development. A prominent model within structural change theory is W. Arthur Lewis's two-sector model, which explores the transfer of surplus labor from the agricultural sector to the industrial sector, driven by higher wages in the latter. According to Lewis (1954), often regarded as the pioneer of the structuralist approach, underdeveloped economies are characterized by dualism, where a large subsistence sector coexists with a smaller modern sector. Growth occurs when surplus labor from the traditional sector is absorbed into the industrial sector, leading to higher productivity, rising incomes, and structural transformation. Later refinements of this theory by Chenery and Syrquin (1975) extended the analysis by linking structural change to patterns of international trade and capital accumulation, stressing that structural transformation is both a cause and consequence of sustained growth.

In relation to Nigeria, the structural change theory provides an important lens for analyzing the role of non-oil exports in diversifying the economy. Nigeria's heavy reliance on oil since the 1970s has resulted in a mono-product export structure, limiting structural transformation and leaving the economy vulnerable to external shocks. Studies such as Ekeke and Uprasen (2020) found a significant long-run positive relationship using ARDL modeling. Abere

et al. (2022) employed error correction models to confirm this linkage. Uzonwanne (2024) observed that specific non-oil export categories (like textiles, hides, and rubber) positively influence GDP, though effects sometimes lack statistical significance, hinting at structural constraints. Importantly, a detailed sectoral study in the Nigerian Journal of Social Psychology (2025) shows that agricultural and service exports significantly boost growth, while manufacturing exports remain underperforming. Finally, Obhiosa et al. (2024) found that non-oil export promotion can enhance manufacturing capacity utilization, underscoring a structural shift toward industrialization.

The Structural Change Theory emphasizes that for sustained economic growth, countries must transition from a reliance on primary products (like crude oil) to more productive sectors such as agriculture, manufacturing, and services. Evidence from Nigeria largely supports this theoretical claim but highlights mixed results.

2.3 Empirical literature

The relationship between non-oil exports and economic growth has been widely investigated in both developed and developing countries, with mixed results. For Nigeria, where oil dominates the export structure, empirical studies have tried to determine whether diversification through non-oil exports could foster sustainable growth, improve foreign exchange earnings, and generate employment.

2.3.1 Non-Oil Exports and Economic Growth

Several studies show that non-oil exports contribute positively to Nigeria's economic performance. The study of Zoramawa, Machief & Umar (2020) examined the impact of non-oil exports on Nigeria's economic growth from 1981–2019 using the ARDL bound test. The findings showed that non-oil exports had a negative and statistically significant effect on economic growth in the long run for manufacturing and solid minerals, while agricultural exports contributed positively. The study also found a bidirectional causal relationship between non-oil exports and GDP. It recommended that Nigeria make its non-oil export commodities more competitive and attractive in the international market to stimulate demand and enhance growth.

The paper by Kromtit et al. (2017) investigates the role of non-oil exports in Nigeria's economic growth between 1985–2015. Motivated by the adverse effects of falling international oil prices (such as declining GDP, depleted reserves, forex scarcity, and rising costs), the study tested the relationship between non-oil exports and GDP. Using ADF tests, the authors found that non-oil exports were stationary at level, while GDP and exchange rate were stationary at first difference. An ARDL model and Bounds test confirmed a long-run relationship among the variables. Results showed that non-oil exports have a positive and significant impact on GDP, while exchange rate had a negative but insignificant effect. The study recommends policies to boost non-oil sectors through legislation, affordable credit, and government involvement in agriculture, solid minerals, and manufacturing.

Kawai Vincent (2017) examined the impact of non-oil exports on Nigeria's economic growth from 1980–2016, using the Phillips-Perron test and the Engel-Granger cointegration model. The study found strong evidence of a long-run relationship between non-oil exports and economic growth, showing that non-oil exports influence changes in Nigeria's growth rate. However, it did not provide strong support for the recent claims of non-oil export-led growth. The study recommended that government should strengthen the industrial revolution plan, develop clear sectoral strategies, and invest in non-oil sectors to diversify the economy away from oil dependence and create a more supportive environment for non-oil exports.

2.3.2 Non-Oil Exports and Foreign Exchange Earnings

Imoughele & Ismaila (2015) investigated the impact of exchange rate on Nigeria's non-oil exports using data from 1986–2013. Employing ADF unit root tests, Johansen cointegration, and OLS regression, the study found a long-run relationship between non-oil exports and key macroeconomic variables. Results showed that effective exchange rate, money supply, credit to the private sector, and overall economic performance significantly influenced non-oil export growth. However, exchange rate appreciation negatively affected non-oil exports, aligning with economic theory. The study recommended maintaining exchange rate stability to reduce inflation and support non-oil export growth.

Akinlo and Adejumo (2014) investigated the relationship between exchange rate volatility and non-oil exports in Nigeria between 1986 and 2008. Their findings indicate that, in

the long run, exchange rate, exchange rate volatility, and foreign income exert significant positive effects on non-oil exports, while imports have a negative impact. In the short run, exchange rate volatility was found to be statistically insignificant, though exchange rate depreciation tended to promote exports. The study further supports the import compression hypothesis, as imports exhibited a positive short-run effect. Overall, the study concludes that exchange rate volatility influences non-oil exports in Nigeria mainly in the long run rather than the short run.

Kwajaffa (2022), in his study titled *Exchange Rate Influencers and Non-Oil Exports: Fresh Insights from Nigeria*, investigated the relationship between exchange rate determinants and non-oil exports in Nigeria using time series data sourced from the World Development Index (WDI) and the CBN Statistical Bulletin (2022) covering the period 1981–2022. Employing the Autoregressive Distributed Lag (ARDL) model, the study established the existence of a long-run relationship between exchange rate and non-oil exports. Specifically, the exchange rate was found to exert a positive but weak influence on non-oil exports, suggesting that depreciation of the naira did not significantly enhance non-oil export growth. Furthermore, the results indicated a detrimental effect of trade openness on non-oil exports, while inflation had a marginal but favorable long-run impact. Interestingly, money supply was shown to have a significant positive long-run effect on non-oil exports. The study therefore recommended that the government, through monetary authorities, design a comprehensive and stable exchange rate policy that will

serve as an incentive for investors in the non-oil sector, thereby boosting non-oil GDP and enhancing Nigeria's overall economic development.

2.3.3 Non Oil Exports And Employment generation

Studies examining the employment effects of non-oil exports in Nigeria present mixed but insightful results. Uwazie, Ogbonnaya, Anyanwu, and Nkem (2024), using a disaggregated model, found that while manufacturing exports significantly reduced unemployment, suggesting that industrial exports have higher labor absorption capacity, increases in agricultural and service exports were paradoxically associated with rising unemployment, possibly due to mechanization, informality, or overdependence on primary commodities with low value-addition.

In contrast, Obayori, Otto, and Inaton (2022) emphasized the long-run benefits of non-oil exports, showing that value-added sectors such as textiles and hides/skins positively contribute to economic growth, which indirectly fosters job creation through expanded production and trade linkages. Taken together, these findings indicate that the employment impact of non-oil exports in Nigeria is highly sector-dependent manufacturing and processed exports tend to generate sustainable jobs, while raw commodity exports may not adequately address unemployment challenges.

CHAPTER THREE

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 Theoretical Framework

Theoretical foundations provide substantial evidence that international trade and export diversification significantly influence economic growth, foreign exchange stability, and employment generation. This influence occurs through increased foreign revenue, improved industrial capacity, and job creation, which together enhance economic performance. The Export-Led Growth Hypothesis (ELGH) serves as the theoretical framework for this study. The ELGH posits that an expansion of exports acts as the main driver of economic growth by generating foreign exchange, enabling economies of scale, and fostering structural transformation.

According to Balassa (1978) and Feder (1983), countries that expand and diversify their exports, especially beyond primary commodities, experience higher growth because export earnings relax foreign exchange constraints, finance imports of capital goods, and stimulate domestic production. In this context, non-oil exports such as agricultural products, manufactured goods, and solid minerals contribute directly to GDP, improve foreign exchange earnings, and support employment generation in Nigeria.

It can be expressed as follows:

$$Y_t = F(Y_{t-1}, NOX_t, Z_t) \dots\dots\dots (3.1)$$

Where:

Y_t represents economic growth at time t ,

Y_{t-1} is the lagged value of economic growth,

NOX_t represents non-oil exports,

Z_t represents other control variables

For the purpose of this research, three specific functional relationships are defined in line with the study objectives:

$$RGDP_t = f(NOX_t, EXR_t, INF_t) \tag{3.2}$$

$$FX_t = f(NOX_t, EXR_t, INF_t) \tag{3.3}$$

$$EMP_t = f(NOX_t, RGDP_t, EXR_t, INF_t) \tag{3.4}$$

Where:

RGDP = Real Gross Domestic Product

NOX = Non-oil exports

FX = Foreign exchange earnings

EMP = Employment generation

EXR = Exchange rate

INF = Inflation rate.

3.2 Model Specification

The empirical models for evaluating the impact of non-oil exports on Nigeria's economy are specified as follows:

$$\ln\text{RGDP}_t = \alpha_0 + \beta_1 \ln\text{NOX}_t + \beta_2 \ln\text{EXR}_t + \beta_3 \ln\text{INF}_t + \varepsilon_{1t} \quad (3.5)$$

$$\ln\text{FX}_t = \delta_0 + \delta_1 \ln\text{NOX}_t + \delta_2 \ln\text{EXR}_t + \delta_3 \ln\text{INF}_t + \varepsilon_{2t} \quad (3.6)$$

$$\ln\text{EMP}_t = \phi_0 + \phi_1 \ln\text{NOX}_t + \phi_2 \ln\text{RGDP}_t + \phi_3 \ln\text{EXR}_t + \phi_4 \ln\text{INF}_t + \varepsilon_{3t} \quad (3.7)$$

Finally, the major estimation technique for this study is the Error Correction Mechanism (ECM), which allows for distinguishing between short-run adjustments and long-run equilibrium. The ECM corresponding to each equation is presented below.

$$\Delta \ln\text{RGDP}_t = \alpha_0 + \beta_1 \Delta \ln\text{NOX}_{t-1} + \beta_2 \Delta \ln\text{EXR}_{t-1} + \beta_3 \Delta \ln\text{INF}_{t-1} + \gamma_1 \text{ECM}_{1,t-1} + \mu_{1t} \quad (3.8)$$

$$\Delta \ln\text{FX}_t = \delta_0 + \delta_1 \Delta \ln\text{NOX}_{t-1} + \delta_2 \Delta \ln\text{EXR}_{t-1} + \delta_3 \Delta \ln\text{INF}_{t-1} + \gamma_2 \text{ECM}_{2,t-1} + \mu_{2t} \quad (3.9)$$

$$\Delta \ln\text{EMP}_t = \phi_0 + \phi_1 \Delta \ln\text{NOX}_{t-1} + \phi_2 \Delta \ln\text{RGDP}_{t-1} + \phi_3 \Delta \ln\text{EXR}_{t-1} + \phi_4 \Delta \ln\text{INF}_{t-1} + \gamma_3 \text{ECM}_{3,t-1} + \mu_{3t} \quad (3.10)$$

Where:

$\text{ECM}_{1,t-1}$, $\text{ECM}_{2,t-1}$, and $\text{ECM}_{3,t-1}$ are the error-correction terms

γ_i indicates the speed at which each dependent variable adjusts toward its long-run equilibrium after a short-run disturbance.

3.3 Estimation Technique

Prior to estimation, the descriptive statistics was carried out. After which the unit root test and cointegration test were conducted.

3.3.1 Unit Root Test:

The first step involved testing the stationarity of the variables and determining their order of integration. The Augmented Dickey-Fuller (ADF) test was used, which is a popular test for unit roots in time series data. The test determines whether a series is stationary or non-stationary. A series is considered to be integrated of order $I(1)$ if it needs to be differenced once to become stationary.

3.3.2. Cointegration Test:

The second step aimed to test the presence of cointegration, which indicates a long-run relationship between variables. Cointegration analysis is used to study the interrelationships between non-stationary time series variables. The study employed the maximum-likelihood test procedure developed by Johansen and Juselius to determine the number of cointegration vectors. The test determines whether the variables have a long-run relationship by examining if the difference between them remains constant over time.

3.3.3. Error Correction Model (ECM):

Once the presence of cointegration was established, an Error Correction Model (ECM) was utilized to correct any short-run disequilibrium. The ECM simultaneously models the dynamics

of short-run and long-run adjustments, providing insights into both the immediate and long-term relationships between variables. The ECM is based on the idea that if variables are co-integrated, any deviation from the long-run equilibrium will be corrected in the short run.

By employing these methods, the study aimed to gain a comprehensive understanding of the relationships between the variables, considering both short-run dynamics and long-run equilibrium. The unit root test helped identify the order of integration, the cointegration test examined the long-run relationship, and the ECM corrected for any short-run imbalances, providing a more robust analysis of the data.

3.4 Sources of Data

This study makes use of secondary annual time-series data for the period 1994–2024, obtained from reputable institutions to ensure reliability and consistency. Real Gross Domestic Product (RGDP), exchange rate, and inflation were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the National Bureau of Statistics (NBS). Data on non-oil exports and foreign exchange earnings were collected from the CBN Statistical Bulletin and annual publications of the Nigerian Export Promotion Council (NEPC), while employment figures were derived from NBS labour force surveys. All data were collated, organized in Microsoft Excel, and subsequently analyzed using appropriate econometric software.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULT

4.1 DATA PRESENTATION

4.1.1 Descriptive Statistics

Descriptive statistics summarize datasets and can be categorized into central tendency (e.g., mean and median), variability (e.g., standard deviation), and normality (e.g., skewness and kurtosis) measures. They provide insights into variables such as average values, data spread, symmetry, and distribution shape. Mean represents typical values, median is the middle value, maximum shows the highest point, and standard deviation indicates data variation around the mean. Skewness measures symmetry, with positive skewness indicating a longer right tail and negative skewness a longer left tail. Kurtosis assesses distribution shape, with 3 being standard, higher values suggesting more peakedness, and lower values indicating flatter distributions. The Jarque-Bera statistic is another normality indicator.

Table 4.1 Descriptive Statistics

	EMP	EXR	FX	INF	NOX	RGDP
Mean	82.27173	216.7297	10065360	17.18725	7302380.	49142.56
Median	82.18300	140.8850	8566322.	12.70720	4858142.	48683.50
Maximum	83.69900	1478.970	31410879	72.83550	27810593	80606.53
Minimum	80.98500	21.88000	206059.2	5.388008	125788.2	21881.56
Std. Dev.	0.993003	273.9673	8765357.	14.59801	7794324.	20433.21
Skewness	0.249168	3.506170	0.904073	2.627916	1.235596	-0.009136
Kurtosis	1.520041	16.35497	3.112052	9.647746	3.517615	1.460351
Jarque-Bera	3.048271	284.4101	4.102432	89.77038	7.968397	2.963565
Probability	0.217809	0.000000	0.128578	0.000000	0.018607	0.227232
Sum	2468.152	6501.890	3.02E+08	515.6174	2.19E+08	1474277.
Sum Sq. Dev.	28.59562	2176684.	2.23E+15	6179.957	1.76E+15	1.21E+10
Observations	30	30	30	30	30	30

Source: Authors computation (2025) using eviews 10

The descriptive statistics presented in table 4.1 offer a clear view of the dataset, showing the behavior of six key variables used in the study: Employment (EMP), Exchange Rate (EXR), Foreign Exchange Earnings (FX), Inflation Rate (INF), Non-Oil Exports (NOX), and Real Gross Domestic Product (RGDP). These measures reveal both the average trends and the variability

over the 30-year study period. The mean values reflect the average performance of these variables. EMP averaged 82.27, which indicates relative stability in employment levels throughout the study. EXR averaged 216.73, showing Nigeria's exchange rate changes over the years. FX had a mean of ₦10,065,360 million, while NOX recorded a mean of ₦7,302,380 millions, highlighting the important roles of foreign exchange earnings and non-oil exports in the economy. RGDP averaged ₦49,142.56 Billion, pointing to the overall output level, while INF averaged 17.19%, suggesting a moderate but ongoing inflation trend. Looking at the median values provides additional insights into the averages. EMP had a median of 82.18, which is very close to its mean, reflecting stability in employment. EXR's median of 140.88 is significantly lower than its mean, indicating a skewed distribution caused by extreme exchange rate drops in certain years. The medians for FX and NOX (₦8,566,322 and ₦4,858,142, respectively) were also below their means, showing the presence of some very high values. Similarly, RGDP's median of ₦48,683.50 was slightly under the mean, indicating a mild rightward skew. For INF, the median was 12.71%, which is lower than the mean, suggesting that inflation was generally moderate but spiked notably in some years. The range of observations shows variability in the data. EMP was relatively stable, with a range between 80.99 and 83.70. In contrast, EXR had large fluctuations, ranging from 21.88 to 1,478.97, reflecting episodes of severe currency drops. FX varied widely from ₦206,059.2 to ₦31,410,879, while NOX ranged from ₦125,788.2 to ₦27,810,593, indicating the volatility of external earnings. RGDP varied significantly from

₦21,881.56 to ₦80,606.53, highlighting structural changes in the economy. INF showed a wide range from 5.39% to 72.84%, confirming inflationary spikes during the study period. The standard deviation measures dispersion in the data. EMP had a low standard deviation of 0.99, reflecting high stability in employment levels. EXR displayed considerable volatility with a standard deviation of 273.97, showing exchange rate instability. FX (₦8,765,357), NOX (₦7,794,324), and RGDP (₦20,433.21) all had substantial deviations, indicating significant variability over time. INF had a standard deviation of 14.60, demonstrating moderate but noticeable inflation fluctuations. The results for skewness and kurtosis shed light on the shape of the distributions. EMP (0.25) and RGDP (-0.009) were nearly symmetric, while FX (0.90) and NOX (1.24) were positively skewed, indicating a concentration of lower values with some extreme higher outcomes. EXR (3.51) and INF (2.63) showed strong rightward skewness, suggesting that a few years with extreme spikes greatly influenced the averages. Regarding kurtosis, EMP (1.52) and RGDP (1.46) were platykurtic, meaning they had flatter distributions. In contrast, FX (3.11) and NOX (3.52) were nearly normal but slightly peaked. EXR (16.35) and INF (9.65) were highly leptokurtic, reflecting sharp peaks and fat tails due to extreme outliers in currency depreciation and inflation rates. Finally, the Jarque-Bera normality test examines distribution patterns. EMP, RGDP, and FX had probabilities above 0.05 (0.218, 0.227, and 0.129, respectively), indicating no significant departure from normality. In contrast, EXR and INF had probabilities of 0.000, confirming significant deviations from normality caused by extreme

values. NOX also showed a departure from normality ($p = 0.019$), suggesting that non-oil export values were unevenly distributed during this period.

4.2 Correlation analysis

Table 4.2 Correlation Matrix

	LNEMP	LNFX	LNRGDP	LNNOX	INF	LNEXR
LNEMP	1					
LNFX	-0.828593	1				
LNRGDP	-0.894200	0.945789	1			
LNNOX	-0.827207	0.965710	0.973133	1		
INF	0.397865	-0.389831	-0.300228	-0.330652	1	
LNEXR	-0.638249	0.881622	0.871105	0.890423	-0.2921387	1

Source: Author's Computation using Eviews 10

From the correlation results in Table 4.2, Real Gross Domestic Product (RGDP) shows a very strong positive correlation with non-oil exports (0.9731) and the exchange rate (0.8711), suggesting that growth in non-oil exports and favorable exchange rate movements are strongly associated with higher economic performance in Nigeria. This supports the export-led growth hypothesis and highlights the importance of diversifying exports while ensuring exchange rate

stability. Inflation, however, is negatively related to RGDP (-0.3002), indicating that rising price levels tend to dampen economic growth by eroding purchasing power and discouraging investment. Interestingly, RGDP has a strong negative correlation with employment (-0.8942), reflecting a “jobless growth” pattern in which economic expansion, largely driven by capital-intensive activities, has not translated into adequate job creation.

Similarly, foreign exchange earnings (FX) exhibit very strong positive correlations with non-oil exports (0.9657) and exchange rate (0.8816), underscoring the role of export diversification and currency movements in shaping Nigeria’s external reserves. This suggests that increased non-oil exports and a competitive exchange rate are key drivers of foreign exchange inflows. On the other hand, inflation is negatively correlated with FX (-0.3898), implying that rising prices reduce export competitiveness and worsen external balances. Employment is also strongly and negatively correlated with FX (-0.8286), pointing to the fact that sectors generating foreign exchange, particularly oil and capital-intensive non-oil exports, have weak linkages with job creation in the domestic economy.

Employment itself displays a strong negative correlation with RGDP (-0.8942) and non-oil exports (-0.8272), reinforcing the structural challenge where economic growth and export expansion fail to produce sufficient employment opportunities. The negative relationship with exchange rate (-0.6382) suggests that exchange rate instability undermines labor market

outcomes by raising production costs and discouraging investment in labor-intensive industries. In contrast, inflation shows a moderate positive correlation with employment (0.3979), which may reflect the short-run tendency for price increases to stimulate certain forms of employment, particularly in the informal sector, although in the long run persistent inflation is generally detrimental to job sustainability.

4.3 Preliminary Tests

4.3.1 Unit Root Test

In order to establish the stationarity of the data and to check if they move in the same proportion and the significance of the variables, the Augmented Dickey Fuller (ADF) unit root test was used. The series is not expected to have a unit root; hence, each variable was evaluated at level and at first difference in order to identify correlations between the variables over the long run. If the likelihood at the point is less than 0.05, we can assume that they are stationary at level; otherwise, we check for stationarity at the first difference. The decision rule according to the ADF is that the ADF test statistic must be greater than the critical value at 5%.

Table 4.3: Unit Root Test result

LEVEL			FIRST DIFFERENCE		
Variable	ADF stat.	Prob. Values (at 5% critical value)	ADF stat.	Prob. Values (at 5% critical value)	Conclusion
INF	-3.249180	-2.963972	-5.152419	-2.967767	I(0)
lnEMP	-1.347403	-2.963972	-4.301263	-2.976263	I(1)
lnEXR	-0.541235	-2.971853	-4.352078	-2.967767	I(1)
lnFX	-2.790112	-2.963972	-6.102792	-2.967767	I(1)
lnNOX	-2.331920	-2.963972	-12.91163	-2.967767	I(1)
lnRGDP	-1.469510	-2.963972	-2.992885	-2.967767	I(1)

Source: Author's Computation using Eviews 10

The unit root test results presented in Table 4.3 were carried out using the Augmented Dickey-Fuller (ADF) procedure to determine the stationarity properties of the variables included in the study. At level, only inflation (INF) was found to be stationary, with an ADF statistic of -

3.249180 exceeding the 5 percent critical value of -2.963972, leading to its classification as integrated of order zero, $I(0)$. By contrast, the remaining variables employment (lnEMP), exchange rate (lnEXR), foreign exchange earnings (lnFX), non-oil exports (lnNOX), and real gross domestic product (lnRGDP) were all non-stationary at level, as their test statistics did not surpass the critical values in absolute terms.

However, after differencing once, these variables became stationary, as shown by their respective ADF statistics falling beyond the 5 percent critical thresholds. For instance, lnEMP recorded an ADF value of -4.301263 against a critical value of -2.976263, while lnEXR and lnFX produced ADF values of -4.352078 and -6.102792, respectively. Similarly, lnNOX and lnRGDP also achieved stationarity after first differencing, with significant ADF statistics of -12.91163 and -2.992885.

4.3.2 Cointegration Test

It is crucial that we examine the possibility of having a cointegration in our regression results because there are different levels of stationarity, some at level and some at the first difference.

To do this, we use the Johansen Cointegration technique

Table 4.4a Johansen co-integration test (Trace)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.912372	177.5877	95.75366	0.0000
At most 1 *	0.783224	106.9826	69.81889	0.0000
At most 2 *	0.576585	62.64481	47.85613	0.0011
At most 3 *	0.526021	37.72214	29.79707	0.0050
At most 4 *	0.263626	16.07097	15.49471	0.0409
At most 5 *	0.219760	7.196460	3.841466	0.0073

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Authors's Computation using Eviews 10

The trace test in Table 4.4a indicates the presence of six cointegrating equations at the 5 percent significance level, as the trace statistics for each rank exceed their corresponding critical values. Specifically, the null hypothesis of no cointegration is rejected, with a trace statistic of 177.5877 far greater than the 95.75366 critical value.

Table 4.4b Johansen Cointegration test (Maximum Eigenvalue)

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.912372	70.60506	40.07757	0.0000
At most 1 *	0.783224	44.33784	33.87687	0.0020
At most 2	0.576585	24.92267	27.58434	0.1056
At most 3 *	0.526021	21.65117	21.13162	0.0422
At most 4	0.263626	8.874513	14.26460	0.2967
At most 5 *	0.219760	7.196460	3.841466	0.0073

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation using eviews 10

The maximum eigenvalue test in Table 4.4b also confirms the existence of cointegration, although it identifies two cointegrating equations at the 5 percent significance level. For instance, the null hypothesis of no cointegration is strongly rejected, with a maximum eigenvalue statistic of 70.60506 compared to a critical value of 40.07757.

4.4 Error Correction Model.

To determine the error correction model which is also referred to as the short run model, the variables need to be in differenced in their stationary form. The error correction terms, which are the residuals of the long run equation, are then incorporated into the model. The error correction term is however to be lagged one period. The results are shown in the table below:

Table 4.5 ECM Results for Model 1: D(LNRGDP) as Dependent Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.046675	0.007472	6.246848	0.0000
D(INF)	0.000274	0.000604	0.453808	0.6539
D(LNEXR)	-0.043231	0.019393	-2.229181	0.0350
D(LNNOX)	0.020355	0.021256	0.957631	0.3474
ECM(-1)	-0.195188	0.067364	-2.897523	0.0077
R-squared	0.330003	Mean dependent var	0.043440	
Adjusted R-squared	0.222804	S.D. dependent var	0.033586	
S.E. of regression	0.029609	Akaike info criterion	-4.050441	
Sum squared resid	0.021918	Schwarz criterion	-3.816908	
Log likelihood	65.75661	Hannan-Quinn criter.	-3.975731	
F-statistic	3.078403	Durbin-Watson stat	1.148428	
Prob(F-statistic)	0.034325			

Source: Author's computation using Eviews 10

The error correction model (ECM) analysis presented in table 4.5 explores the relationship between Real Gross Domestic Product (RGDP) and several factors, including inflation (INF), exchange rate (EXR), and non-oil exports (NOX).

The coefficient of the error correction term (ECM) is -0.195188, indicating statistical significance at the 5% level ($p = 0.0077$). This suggests that approximately 19.52% of the discrepancies between short-run and long-run models are corrected within a period, signifying a moderate adjustment mechanism in the relationship between the explanatory variables and RGDP.

The coefficient of determination (R-squared) is 0.330003, indicating that approximately 33.00% of the variation in Real Gross Domestic Product (RGDP) is explained by the variation in the explanatory variables. The adjusted R-squared is 0.222804, suggesting that 22.28% of the variation in RGDP between short-run and long-run models is accurately accounted for, considering the degrees of freedom.

Individually assessing the significance of the coefficient estimates, it is observed that the coefficient associated with the exchange rate (EXR) is statistically significant at the 5% level, indicating its substantial impact on Real Gross Domestic Product. However, the coefficients related to inflation (INF) and non-oil exports (NOX) are statistically insignificant at the 5% level.

Starting with the constant term (C), the coefficient of 0.046675 suggests that without any

influencing factors, there is a baseline increase in Real Gross Domestic Product (RGDP) by approximately 4.67%. This aligns with the expectation of a natural increase in RGDP in the absence of external influences

The coefficient for inflation (INF) indicates the impact of this variable on RGDP. Specifically, a one-unit increase in inflation is associated with an estimated increase in RGDP by 0.000274 units. This relationship is statistically insignificant at the 5% level, indicating that fluctuations in inflation do not significantly influence RGDP although in line with the expected relationship. The coefficient for exchange rate (EXR) reflects its influence on RGDP. An increase in exchange rate by one unit corresponds to a decrease in RGDP by -0.043231 units. This relationship is statistically significant at the 5% level, indicating that movements in exchange rate substantially influence economic performance. The empirical results align with this expectation, confirming that exchange rate volatility negatively affects growth. For the coefficient of non-oil exports (NOX) on RGDP, the estimated effect suggests that a one-unit increase in NOX leads to an increase in RGDP by 0.020355 units. However, this relationship is statistically insignificant at the 5% level, indicating that short-run fluctuations in non-oil exports do not significantly affect RGDP.

The F-statistic tests the overall significance of the regression model. In this context, the F-statistic value is 3.078403 with a corresponding p-value of 0.034325. This indicates that the

overall model is statistically significant at the 5% level. Therefore, the independent variables, collectively, have a significant explanatory power in predicting Real Gross Domestic Product (RGDP).

The Durbin-Watson statistic is used to detect the presence of autocorrelation in the residuals of the regression model. In this case, the Durbin-Watson statistic is approximately 1.148428. A value close to 2 indicates no significant autocorrelation, but this value suggests mild positive autocorrelation in the residuals.

Table 4.6. Ecm Results for Model 2: D(LNFX) as Dependent Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016285	0.070352	0.231475	0.8188
D(INF)	-0.008325	0.005775	-1.441605	0.1618
D(LNEXR)	0.061376	0.198903	0.308572	0.7602
D(LNNOX)	0.764113	0.175199	4.361403	0.0002
ECM(-1)	-0.474204	0.188115	-2.520820	0.0185
R-squared	0.487981	Mean dependent var	0.167558	
Adjusted R-squared	0.406059	S.D. dependent var	0.365691	
S.E. of regression	0.281830	Akaike info criterion	0.455984	

Sum squared resid	1.985699	Schwarz criterion	0.689517
Log likelihood	-1.839758	Hannan-Quinn criter.	0.530693
F-statistic	5.956590	Durbin-Watson stat	1.385882
Prob(F-statistic)	0.001649		

Source: Author's Computation using Eviews 10

The error correction model (ECM) analysis in table 4.6 describes the relationship between Foreign Exchange Earnings (FX) and other variables, including inflation (INF), exchange rate (EXR), and non-oil exports (NOX).

The coefficient of the error correction term (ECM02) is -0.474204, indicating statistical significance at the 5% level ($p = 0.0185$). This suggests that approximately 47.42% of the discrepancies between short-run and long-run models are corrected within a period, signifying a strong adjustment mechanism in the relationship between the explanatory variables and foreign exchange earnings.

The coefficient of determination (R-squared) is 0.487981, indicating that approximately 48.80% of the variation in Foreign Exchange Earnings (FX) is explained by the variation in the explanatory variables. The adjusted R-squared is 0.406059, suggesting that 40.61% of the variation in FX between short-run and long-run models is accurately accounted for, considering the degrees of freedom.

Individually assessing the significance of the coefficient estimates, it is observed that the coefficient associated with non-oil exports (NOX) is statistically significant at the 5% level, indicating its substantial impact on Foreign Exchange Earnings. However, the coefficients related to inflation (INF) and exchange rate (EXR) are statistically insignificant at the 5% level.

Starting with the constant term (C), the coefficient of 0.016285 suggests that without any influencing factors, there is a baseline increase in Foreign Exchange Earnings (FX) by approximately 1.63%. This indicates a natural improvement in foreign exchange in the absence of external influences.

The coefficient for inflation (INF) indicates the impact of this variable on FX. Specifically, a one-unit increase in inflation is associated with an estimated decrease in FX by -0.008325 units. This relationship is statistically insignificant at the 5% level, indicating that fluctuations in inflation do not significantly influence FX although in line with the expected relationship.

The coefficient for exchange rate (EXR) reflects its influence on FX. An increase in exchange rate by one unit corresponds to an increase in FX by 0.061376 units. However, this relationship is statistically insignificant at the 5% level, suggesting that exchange rate fluctuations do not significantly influence foreign exchange earnings in the short run.

For the coefficient of non-oil exports (NOX) on FX, the estimated effect suggests that a one-unit increase in NOX leads to an increase in FX by 0.764113 units. This relationship is

statistically significant at the 5% level, indicating that expansion in non-oil exports substantially improves foreign exchange inflows.

The F-statistic tests the overall significance of the regression model. In this context, the F-statistic value is 5.956590 with a corresponding p-value of 0.001649. This indicates that the overall model is statistically significant at the 5% level. Therefore, the independent variables, collectively, have a significant explanatory power in predicting Foreign Exchange Earnings (FX). The Durbin-Watson statistic is used to detect the presence of autocorrelation in the residuals of the regression model. In this case, the Durbin-Watson statistic is approximately 1.385882. A value close to 2 indicates no significant autocorrelation, but this value suggests mild positive autocorrelation in the residuals.

Table 4.7 Ecm results for Model 3: D(LNEMP) as Dependent Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001382	0.001137	1.215632	0.2359
D(LNRGDP)	-0.058026	0.017367	-3.341168	0.0027
D(INF)	3.81E-05	5.81E-05	0.654629	0.5189
D(LNEXR)	0.003786	0.002560	2.478622	0.0022
D(LNNOX)	0.000956	0.001912	0.499946	0.6217

ECM(-1)	-0.349136	0.236096	-3.478789	0.0071
R-squared	0.395666	Mean dependent var	-0.000404	
Adjusted R-squared	0.269763	S.D. dependent var	0.003391	
S.E. of regression	0.002898	Akaike info criterion	-8.672887	
Sum squared resid	0.000202	Schwarz criterion	-8.392647	
Log likelihood	136.0933	Hannan-Quinn criter.	-8.583236	
F-statistic	3.142632	Durbin-Watson stat	1.997717	
Prob(F-statistic)	0.025391			

Source: Author's computation using eviews 10

The error correction model (ECM) results in table 4.7 describes the relationship between Employment (EMP) and several factors, including Real Gross Domestic Product (RGDP), inflation (INF), exchange rate (EXR), and non-oil exports (NOX).

The coefficient of the error correction term (ECM) is -0.349136, indicating statistical significance at the 5% level ($p = 0.0071$). This suggests that approximately 34.91% of the discrepancies between short-run and long-run models are corrected within a period, signifying a moderate adjustment mechanism in the relationship between the explanatory variables and employment.

The coefficient of determination (R-squared) is 0.395666, indicating that approximately 39.57%

of the variation in Employment (EMP) is explained by the variation in the explanatory variables. The adjusted R-squared is 0.269763, suggesting that 26.98% of the variation in EMP between short-run and long-run models is accurately accounted for, considering the degrees of freedom.

Individually assessing the significance of the coefficient estimates, it is observed that the coefficients associated with Real Gross Domestic Product (RGDP) and exchange rate (EXR) are statistically significant at the 5% level, indicating their substantial impact on Employment. However, the coefficients related to inflation (INF) and non-oil exports (NOX) are statistically insignificant at the 5% level.

Starting with the constant term (C), the coefficient of 0.001382 suggests that without any influencing factors, there is a baseline increase in Employment (EMP) by approximately 0.14%. This indicates a natural improvement in employment in the absence of external influences.

The coefficient for Real Gross Domestic Product (RGDP) indicates the impact of this variable on EMP. Specifically, a one-unit increase in RGDP is associated with an estimated decrease in EMP by -0.058026 units. This relationship is statistically significant at the 5% level, indicating that changes in output significantly reduce employment. The empirical results align with the notion of jobless growth, confirming that increases in GDP do not necessarily translate into proportional employment gains.

The coefficient for inflation (INF) indicates the impact of this variable on EMP. Specifically, a one-unit increase in inflation is associated with an estimated increase in EMP by 0.000038 units. This relationship is statistically insignificant at the 5% level, indicating that fluctuations in inflation do not significantly influence EMP.

The coefficient for exchange rate (EXR) reflects its influence on EMP. An increase in exchange rate by one unit corresponds to an increase in EMP by 0.003786 units. This relationship is statistically significant at the 5% level, suggesting that movements in exchange rate substantially influence employment in the short run.

For the coefficient of non-oil exports (NOX) on EMP, the estimated effect suggests that a one-unit increase in NOX leads to an increase in EMP by 0.000956 units. This relationship is statistically insignificant at the 5% level, indicating that short-run fluctuations in non-oil exports do not significantly affect EMP.

The F-statistic tests the overall significance of the regression model. The F-statistic value is 3.142632 with a corresponding p-value of 0.025391. This indicates that the overall model is statistically significant at the 5% level. Therefore, the independent variables, collectively, have a significant explanatory power in predicting Employment (EMP).

The Durbin-Watson statistic is approximately 1.997717. A value close to 2 indicates no significant autocorrelation in the residuals.

4.5 Diagnostic Tests

Table 4.8 Presentation of diagnostic tests

Variable	Model 1	Model 2	Model 3
Breusch-Pagan-Godfrey Prob.	0.4048	0.7531	0.6529
Breusch-Godfrey Prob.	0.1479	0.1926	0.7371
Jarque-Bera Prob.	0.6091	0.2747	0.0000

Source: Author's computation using Eviews 10

The diagnostic test results presented in Table 4.8 provide evidence on the robustness and reliability of the estimated models. The Breusch-Pagan-Godfrey test was conducted to detect the presence of heteroskedasticity in the residuals. For all three models, the reported probability values (0.4048, 0.7531, and 0.6529 for Models 1, 2, and 3 respectively) are well above the 5% significance threshold, indicating that the null hypothesis of homoskedasticity cannot be rejected. This suggests that all the models are free from heteroskedasticity, and the variance of the error terms remains constant.

Similarly, the Breusch-Godfrey serial correlation LM test was employed to check for the presence of autocorrelation in the residuals. The probability values of 0.1479, 0.1926, and 0.7371 for Models 1, 2, and 3 respectively are greater than the 5% significance level. This implies that the null hypothesis of no serial correlation cannot be rejected, confirming that the models do not

suffer from autocorrelation problems and that the error terms are independently distributed over time.

The normality of the residuals was also tested using the Jarque-Bera statistic. The results show probability values of 0.6091 and 0.2747 for Models 1 and 2, which are both greater than 0.05, indicating that the residuals of these models are normally distributed. However, the Jarque-Bera probability value for Model 3 is 0.0000, which is below the 5% level. This indicates that the residuals of Model 3 deviate from normality, suggesting a possible violation of the normality assumption.

Taken together, the diagnostic test results demonstrate that Models 1 and 2 satisfy the assumptions of homoskedasticity, absence of serial correlation, and normal distribution of residuals, thereby making them robust for inference.

4.6 Test of Research Hypotheses

Hypothesis One H_{01} : Non-oil exports have no significant relationship with Nigeria's economic growth.

Given the coefficients:

- ◆ Variable: D(LNNOX)
- ◆ Coefficient: 0.020355

- ◆ Prob. (p-value): 0.3474

From model 1, the coefficient for D(LNNOX) is 0.020355, indicating a positive relationship between non-oil exports and economic growth. However, the p-value associated with this coefficient is 0.3474, which is greater than the conventional significance level of 0.05. Therefore, we fail to reject the null hypothesis (H_{01}) and conclude that there is no significant evidence of a causal relationship between non-oil exports and economic growth in Nigeria.

Hypothesis Two H_{02} : Non-oil exports have no significant relationship with Nigeria's foreign exchange earnings.

Given the coefficients:

- ◆ Variable: D(LNNOX)
- ◆ Coefficient: 0.764113
- ◆ Prob. (p-value): 0.0002

From model 2, the coefficient for D(LNNOX) is 0.764113, indicating a strong positive relationship between non-oil exports and foreign exchange earnings. Furthermore, the p-value associated with this coefficient is 0.0002, which is less than the conventional significance level of 0.05. Therefore, we reject the null hypothesis (H_{02}) and conclude that there is strong evidence of a statistically significant relationship between non-oil exports and foreign exchange earnings in Nigeria.

Hypothesis Three H₀₃: Non-oil exports have no significant effect on employment generation in Nigeria.

Given the coefficients:

- ◆ Variable: D(LNNOX)
- ◆ Coefficient: 0.000956
- ◆ Prob. (p-value): 0.6217

The coefficient for D(LNNOX) is 0.000956, indicating a positive relationship between non-oil exports and employment generation. However, the p-value associated with this coefficient is 0.6217, which is greater than the conventional significance level of 0.05. Therefore, we fail to reject the null hypothesis (H₀₃) and conclude that there is no significant evidence of a causal relationship between non-oil exports and employment generation in Nigeria.

4.7 Policy Implications

The analysis of the relationship between non-oil exports and economic growth in Nigeria provides several important policy implications. The statistically significant positive relationship between non-oil exports and foreign exchange earnings suggests that policymakers should prioritize strategies to expand and diversify the non-oil export base. This can be achieved by improving the value chain of agricultural and manufactured products, reducing overdependence on primary commodity exports, and enhancing the quality of goods to meet international

standards. In particular, investments in processing facilities for agricultural produce such as cocoa, palm oil, sesame seeds, and cashew nuts can add significant value, generate higher foreign exchange, and reduce the vulnerability of export earnings to price fluctuations in the global market.

Given the significant role of exchange rate movements in influencing real gross domestic product and employment, it is clear that a stable and predictable exchange rate regime is essential. Exchange rate volatility discourages investment in export-oriented industries, increases transaction costs, and undermines competitiveness. Policymakers should therefore adopt monetary and fiscal measures that support exchange rate stability, including strengthening foreign reserves, curbing speculative activities in the foreign exchange market, and encouraging export proceeds repatriation. In addition, trade agreements and regional integration frameworks such as the African Continental Free Trade Area (AfCFTA) should be leveraged to expand market access for Nigerian non-oil exports, supported by an exchange rate policy that fosters competitiveness.

The evidence of jobless growth, where increases in GDP do not automatically translate into corresponding employment gains, highlights the need for employment-driven export strategies. This requires shifting focus from raw commodity exports to labor-intensive industries such as agro-processing, textiles, solid minerals, and light manufacturing. Expanding these sectors would

create more jobs, especially for the youth population, while also strengthening the non-oil export base. Complementary policies should include vocational training, technology transfer, and entrepreneurship development to equip the workforce with relevant skills for the export sector.

Although inflation was found to be statistically insignificant in the short-run models, maintaining low and stable inflation remains critical for sustaining export competitiveness. Rising domestic inflation erodes cost advantages, discourages investment, and undermines the ability of exporters to compete in international markets. Policymakers should therefore ensure sound macroeconomic management, including prudent fiscal policies, effective monetary tightening when necessary, and improved agricultural productivity to reduce food-induced inflation. This will create a more stable business environment that enhances the performance of non-oil exports.

Furthermore, Nigeria's weak trade and transport infrastructure remains a critical bottleneck for non-oil export growth. High costs of transportation, delays at ports, inadequate storage facilities, and limited access to reliable electricity increase the cost of production and reduce competitiveness. Investments in road and rail networks, modernization of seaports, and streamlining of customs procedures are essential to improve trade efficiency. Establishing export processing zones with adequate infrastructure and tax incentives could also attract investment into non-oil export industries and foster competitiveness.

The findings underscore the importance of designing policies that not only expand non-oil exports but also integrate them into Nigeria's broader growth and development agenda. Targeted policies that promote non-oil export diversification, exchange rate stability, infrastructure development, and job-oriented growth strategies are essential for harnessing the full potential of non-oil exports in driving economic development. Effective implementation of these measures can foster a more resilient and inclusive economy, reduce Nigeria's overreliance on oil revenues, and ensure that non-oil exports become a sustainable engine for long-term growth and employment generation.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 Summary of Findings

This study examined the impact of non-oil exports on economic growth in Nigeria using annual data from 1995 to 2024. The research employed econometric techniques, including unit root tests, cointegration analysis, and the Error Correction Model (ECM), to establish both the short-run and long-run dynamics of the relationship between non-oil exports and economic performance. Three separate models were developed with Real Gross Domestic Product (RGDP), Foreign Exchange Earnings (FX), and Employment (EMP) as dependent variables.

The unit root test results showed that all variables were integrated of order one, $I(1)$, except inflation which was stationary at level, $I(0)$. Johansen cointegration tests revealed the existence of multiple cointegrating relationships among the variables, suggesting a stable long-run relationship.

The ECM results for Model 1 revealed that non-oil exports had a positive but statistically insignificant effect on Real GDP. Exchange rate fluctuations were found to have a significant negative effect on economic growth, while inflation did not significantly impact GDP. The error correction term was significant, confirming that about 19.52% of short-run deviations are corrected annually.

In Model 2, non-oil exports showed a positive and statistically significant effect on foreign exchange earnings, indicating that diversification of exports beyond oil strongly enhances Nigeria's foreign reserves. Inflation and exchange rate effects were insignificant, while the ECM coefficient revealed that 47.42% of disequilibria are corrected within a year, signifying a strong adjustment mechanism.

Model 3 showed that non-oil exports had a positive but insignificant impact on employment generation. Interestingly, Real GDP had a significant negative effect on employment, pointing to the phenomenon of jobless growth in Nigeria. Exchange rate was found to significantly enhance employment in the short run, while inflation remained insignificant. The ECM coefficient indicated that 34.91% of short-run disequilibria were corrected each year.

The diagnostic tests confirmed that the models were free from heteroskedasticity and serial correlation, with normally distributed residuals in Models 1 and 2, though Model 3 revealed a mild deviation.

The results highlight that non-oil exports contribute significantly to foreign exchange earnings but have yet to exert a strong impact on GDP growth and employment in Nigeria.

5.2 Policy Recommendations

Based on the findings, the following recommendations are proposed:

- i. **Diversification of Non-Oil Exports:** Policymakers should expand and diversify Nigeria's non-oil exports beyond raw agricultural products. Emphasis should be placed on value-added agro-processing, light manufacturing, and services exports to enhance competitiveness in international markets.
- ii. **Exchange Rate Stability:** The significant influence of exchange rate fluctuations on GDP and employment calls for policies that stabilize the naira. The Central Bank of Nigeria (CBN) should adopt consistent exchange rate management frameworks that reduce volatility and provide certainty for exporters.
- iii. **Employment-Oriented Export Policies:** To address jobless growth, government policies should target labor-intensive industries within the non-oil sector. Expanding agro-processing, textiles, and small-scale manufacturing can generate substantial employment while boosting non-oil exports.
- iv. **Improved Infrastructure and Logistics:** Inadequate infrastructure remains a key bottleneck to non-oil export performance. Investments in transportation, power supply, and port efficiency are essential to reduce the cost of doing business and improve Nigeria's trade competitiveness.
- v. **Access to Finance and Incentives for Exporters:** Non-oil exporters often face challenges in accessing credit. Establishing specialized financing windows, reducing bureaucratic

bottlenecks, and offering tax incentives for value-added exports will encourage private sector participation and growth in the sector.

- vi. **Institutional Strengthening and Trade Facilitation:** Strengthening institutions such as the Nigerian Export Promotion Council (NEPC) and Customs services is critical. Simplifying export documentation, reducing delays, and aligning policies with international trade standards will enhance efficiency.
- vii. **Human Capital Development:** Skilled labor is crucial for expanding value-added exports. Government should invest in vocational training and technical education programs tailored to non-oil export industries to ensure a competent workforce that can support industrial expansion.

5.3 Contribution to Knowledge

This study contributes to the growing literature on export diversification and economic development in Nigeria in several ways. Using recent data covering 1995–2024 and three distinct models, it provides empirical evidence on the impact of non-oil exports not only on GDP growth but also on foreign exchange earnings and employment generation. This multi-model approach makes the study more comprehensive than earlier works that often focused on GDP alone.

The findings highlight that non-oil exports have a statistically significant positive effect on foreign exchange earnings, underscoring their role in reducing Nigeria’s dependence on oil revenue. At the same time, the weak and insignificant impact on GDP and employment shows

that the gains from non-oil exports have not yet translated into broad-based economic development. By drawing attention to this imbalance, the study enriches policy debates on the quality of growth and the challenges of “jobless growth” in Nigeria.

Another contribution lies in showing the importance of exchange rate dynamics. The significant role of exchange rate fluctuations in shaping both GDP and employment outcomes emphasizes the need for macroeconomic stability in maximizing the benefits of non-oil exports.

5.4 Suggestions for Further Studies

Building on the findings and scope of this study, several directions for further research are suggested. First, future studies could disaggregate non-oil exports into components such as agricultural exports, manufactured products, and services. This would help to identify which categories of exports are most effective in driving growth and creating jobs.

Second, researchers could make use of more detailed employment data across sectors to better assess how non-oil exports translate into job opportunities. This would provide clearer insights into whether specific industries within the non-oil sector are labor-intensive enough to address unemployment.

Third, comparative studies involving other resource-dependent economies could provide lessons on successful diversification strategies. For example, examining how countries like Malaysia or

Indonesia transitioned from resource dependence to export-driven growth could offer valuable guidance for Nigeria.

Finally, future studies may also explore how new trade frameworks, such as the African Continental Free Trade Area (AfCFTA), can shape Nigeria's non-oil export potential. Investigating these emerging opportunities would provide important insights into how Nigeria can expand its role in regional and global markets.

5.5 Conclusion

This study set out to examine the impact of non-oil exports on Nigeria's economic growth, foreign exchange earnings, and employment generation over the period 1995–2024. The findings reveal that while non-oil exports make a significant contribution to foreign exchange earnings, their effect on GDP growth and employment remains statistically insignificant. This suggests that the potential of non-oil exports to drive inclusive and sustainable development in Nigeria has not yet been fully realized.

The results further show that exchange rate volatility plays an important role in shaping growth and employment outcomes, underscoring the vulnerability of Nigeria's economy to macroeconomic instability. The evidence of jobless growth, where increases in GDP did not translate into proportional employment gains, highlights structural weaknesses in the economy

and points to the need for policies that strengthen linkages between export growth and job creation.

While non-oil exports are crucial for reducing Nigeria's dependence on oil revenues and enhancing external reserves, their current structure and scale are insufficient to generate broad-based economic development. For non-oil exports to serve as an engine of inclusive growth, Nigeria must adopt strategies that promote diversification, value addition, and employment-centered export expansion.

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APPENDIX

Unit Root Test

Null Hypothesis: INF has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.249180	0.0268
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Null Hypothesis: LNEMP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.347403	0.5942
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Null Hypothesis: LNEXR has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.541235	0.8684
Test critical values: 1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

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

Null Hypothesis: LNFX has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.790112	0.0717
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Null Hypothesis: LNNOX has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.331920	0.1690
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Null Hypothesis: LNRGDP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.469510	0.5350
Test critical values: 1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Null Hypothesis: D(INF) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.152419	0.0002
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Null Hypothesis: D(LNEMP) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.301263	0.003
Test critical values: 1% level	-3.699871	
5% level	-2.976263	
10% level	-2.627420	

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

Null Hypothesis: D(LNEXR) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.352078	0.0019
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Null Hypothesis: D(LNFX) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.102792	0.0000
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Null Hypothesis: D(LNNOX) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-12.91163	0.0000
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Null Hypothesis: D(LNRGDP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.992885	0.0474
Test critical values: 1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

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

Cointegration Tests

Date: 09/30/25 Time: 06:00

Sample (adjusted): 1996 2024

Included observations: 29 after adjustments

Trend assumption: Linear deterministic trend

Series: LNRGDP LNEMP LNFN INF LNEXR LNNOX

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.912372	177.5877	95.75366	0.0000
At most 1 *	0.783224	106.9826	69.81889	0.0000
At most 2 *	0.576585	62.64481	47.85613	0.0011
At most 3 *	0.526021	37.72214	29.79707	0.0050
At most 4 *	0.263626	16.07097	15.49471	0.0409
At most 5 *	0.219760	7.196460	3.841466	0.0073

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.912372	70.60506	40.07757	0.0000
At most 1 *	0.783224	44.33784	33.87687	0.0020
At most 2	0.576585	24.92267	27.58434	0.1056
At most 3 *	0.526021	21.65117	21.13162	0.0422
At most 4	0.263626	8.874513	14.26460	0.2967
At most 5 *	0.219760	7.196460	3.841466	0.0073

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Regression results

Dependent Variable: D(LNRGDP)

Method: Least Squares

Date: 09/30/25 Time: 06:10

Sample (adjusted): 1995 2024

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.046675	0.007472	6.246848	0.0000
D(INF)	0.000274	0.000604	0.453808	0.6539
D(LNEXR)	-0.043231	0.019393	-2.229181	0.0350
D(LNNOX)	0.020355	0.021256	0.957631	0.3474
ECM01(-1)	-0.195188	0.067364	-2.897523	0.0077
R-squared	0.330003	Mean dependent var	0.043440	
Adjusted R-squared	0.222804	S.D. dependent var	0.033586	
S.E. of regression	0.029609	Akaike info criterion	-4.050441	
Sum squared resid	0.021918	Schwarz criterion	-3.816908	
Log likelihood	65.75661	Hannan-Quinn criter.	-3.975731	
F-statistic	3.078403	Durbin-Watson stat	1.148428	
Prob(F-statistic)	0.034325			

Dependent Variable: D(LNFX)

Method: Least Squares

Date: 09/30/25 Time: 06:22

Sample (adjusted): 1995 2024

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016285	0.070352	0.231475	0.8188
D(INF)	-0.008325	0.005775	-1.441605	0.1618
D(LNEXR)	0.061376	0.198903	0.308572	0.7602
D(LNNOX)	0.764113	0.175199	4.361403	0.0002
ECM02(-1)	-0.474204	0.188115	-2.520820	0.0185
R-squared	0.487981	Mean dependent var	0.167558	
Adjusted R-squared	0.406059	S.D. dependent var	0.365691	
S.E. of regression	0.281830	Akaike info criterion	0.455984	
Sum squared resid	1.985699	Schwarz criterion	0.689517	
Log likelihood	-1.839758	Hannan-Quinn criter.	0.530693	
F-statistic	5.956590	Durbin-Watson stat	1.385882	
Prob(F-statistic)	0.001649			

Dependent Variable: D(LNEMP)

Method: Least Squares

Date: 09/30/25 Time: 06:31

Sample (adjusted): 1995 2024

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001382	0.001137	1.215632	0.2359
D(LNRGDP)	-0.058026	0.017367	-3.341168	0.0027
D(INF)	3.81E-05	5.81E-05	0.654629	0.5189
D(LNEXR)	0.003786	0.002560	2.478622	0.0022
D(LNNOX)	0.000956	0.001912	0.499946	0.6217
ECM(-1)	-0.349136	0.236096	-3.478789	0.0071
R-squared	0.395666	Mean dependent var	-0.000404	
Adjusted R-squared	0.269763	S.D. dependent var	0.003391	
S.E. of regression	0.002898	Akaike info criterion	-8.672887	
Sum squared resid	0.000202	Schwarz criterion	-8.392647	
Log likelihood	136.0933	Hannan-Quinn criter.	-8.583236	
F-statistic	3.142632	Durbin-Watson stat	1.997717	
Prob(F-statistic)	0.025391			

Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.043427	Prob. F(4,25)	0.4048
Obs*R-squared	4.291921	Prob. Chi-Square(4)	0.3679
Scaled explained SS	4.306722	Prob. Chi-Square(4)	0.3661

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 09/30/25 Time: 06:12

Sample: 1995 2024

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000857	0.000318	2.695958	0.0124
D(INF)	1.56E-05	2.57E-05	0.606198	0.5498
D(LNEXR)	-0.000835	0.000825	-1.012015	0.3212
D(LNNOX)	0.000105	0.000904	0.116115	0.9085
ECM01(-1)	-0.004965	0.002865	-1.732809	0.0955

R-squared	0.143064	Mean dependent var	0.000731
Adjusted R-squared	0.005954	S.D. dependent var	0.001263
S.E. of regression	0.001259	Akaike info criterion	-10.36525

Sum squared resid	3.97E-05	Schwarz criterion	-10.13172
Log likelihood	160.4788	Hannan-Quinn criter.	-10.29054
F-statistic	1.043427	Durbin-Watson stat	2.333507
Prob(F-statistic)	0.404757		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.475723	Prob. F(4,25)	0.7531
Obs*R-squared	2.121956	Prob. Chi-Square(4)	0.7133
Scaled explained SS	1.272746	Prob. Chi-Square(4)	0.8660

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 09/30/25 Time: 06:24

Sample: 1995 2024

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.079858	0.022932	3.482389	0.0018
D(INF)	-0.000837	0.001882	-0.444615	0.6604
D(LNEXR)	-0.076298	0.064835	-1.176815	0.2504

D(LNNOX)	-0.019417	0.057108	-0.340002	0.7367
ECM02(-1)	-0.044643	0.061318	-0.728064	0.4733
<hr/> <hr/>				
R-squared	0.070732	Mean dependent var	0.066190	
Adjusted R-squared	-0.077951	S.D. dependent var	0.088482	
S.E. of regression	0.091865	Akaike info criterion	-1.785972	
Sum squared resid	0.210982	Schwarz criterion	-1.552439	
Log likelihood	31.78958	Hannan-Quinn criter.	-1.711263	
F-statistic	0.475723	Durbin-Watson stat	1.813507	
Prob(F-statistic)	0.753144			
<hr/> <hr/>				

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.665896	Prob. F(5,24)	0.6529
Obs*R-squared	3.654823	Prob. Chi-Square(5)	0.6001
Scaled explained SS	24.51452	Prob. Chi-Square(5)	0.0002
<hr/> <hr/>			

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 09/30/25 Time: 06:42

Sample: 1995 2024

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.45E-06	1.26E-05	0.193500	0.8482
D(LNRGDP)	-9.66E-05	0.000193	-0.500045	0.6216
D(INF)	3.70E-07	6.47E-07	0.572343	0.5724
D(LNEXR)	4.43E-05	2.85E-05	1.554448	0.1332
D(LNNOX)	1.07E-05	2.13E-05	0.502151	0.6201
ECM03(-1)	-0.003563	0.002625	-1.357054	0.1874
R-squared	0.121827	Mean dependent var	6.72E-06	
Adjusted R-squared	-0.061125	S.D. dependent var	3.13E-05	
S.E. of regression	3.22E-05	Akaike info criterion	-17.67091	
Sum squared resid	2.49E-08	Schwarz criterion	-17.39067	
Log likelihood	271.0637	Hannan-Quinn criter.	-17.58126	
F-statistic	0.665896	Durbin-Watson stat	2.003702	
Prob(F-statistic)	0.652894			

Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.477352	Prob. F(2,23)	0.1479
Obs*R-squared	6.965220	Prob. Chi-Square(2)	0.1107

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 09/30/25 Time: 06:13

Sample: 1995 2024

Included observations: 30

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.003623	0.007039	-0.514642	0.6117
D(INF)	-0.000164	0.000555	-0.296276	0.7697
D(LNEXR)	0.017149	0.018873	0.908647	0.3730
D(LNNOX)	0.006630	0.020308	0.326463	0.7470
ECM01(-1)	-0.035471	0.063824	-0.555760	0.5837
RESID(-1)	0.433727	0.215208	2.015386	0.0557
RESID(-2)	0.181008	0.212592	0.851434	0.4033

R-squared	0.232174	Mean dependent var	4.52E-18
Adjusted R-squared	0.031872	S.D. dependent var	0.027492

S.E. of regression	0.027050	Akaike info criterion	-4.181299
Sum squared resid	0.016829	Schwarz criterion	-3.854353
Log likelihood	69.71949	Hannan-Quinn criter.	-4.076707
F-statistic	1.159117	Durbin-Watson stat	2.058355
Prob(F-statistic)	0.361533		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	7.813932	Prob. F(2,23)	0.1926
Obs*R-squared	12.13725	Prob. Chi-Square(2)	0.1623

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 09/30/25 Time: 06:25

Sample: 1995 2024

Included observations: 30

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002401	0.057324	-0.041881	0.9670
D(INF)	0.001970	0.004727	0.416809	0.6807
D(LNEXR)	0.045490	0.160763	0.282962	0.7797

D(LNNOX)	-0.011321	0.150851	-0.075050	0.9408
ECM02(-1)	0.217126	0.436986	0.496873	0.6240
RESID(-1)	0.334336	0.408480	0.818487	0.4215
RESID(-2)	-0.699810	0.325720	-2.148504	0.0424

R-squared	0.404575	Mean dependent var	-2.98E-17
Adjusted R-squared	0.249247	S.D. dependent var	0.261672
S.E. of regression	0.226729	Akaike info criterion	0.070838
Sum squared resid	1.182335	Schwarz criterion	0.397784
Log likelihood	5.937437	Hannan-Quinn criter.	0.175430
F-statistic	2.604644	Durbin-Watson stat	1.862422
Prob(F-statistic)	0.044822		

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.309239	Prob. F(2,22)	0.7371
Obs*R-squared	0.820318	Prob. Chi-Square(2)	0.6635

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 09/30/25 Time: 06:44

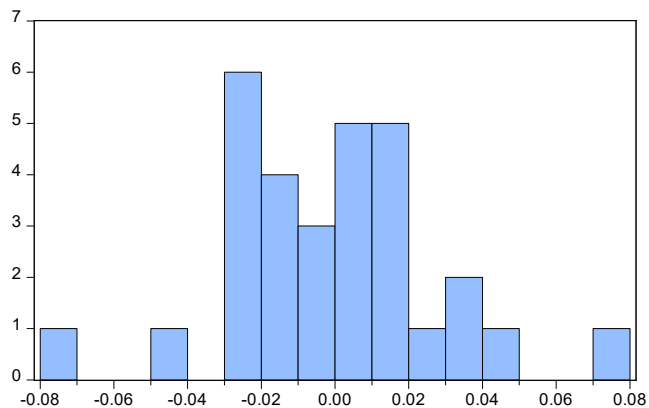
Sample: 1995 2024

Included observations: 30

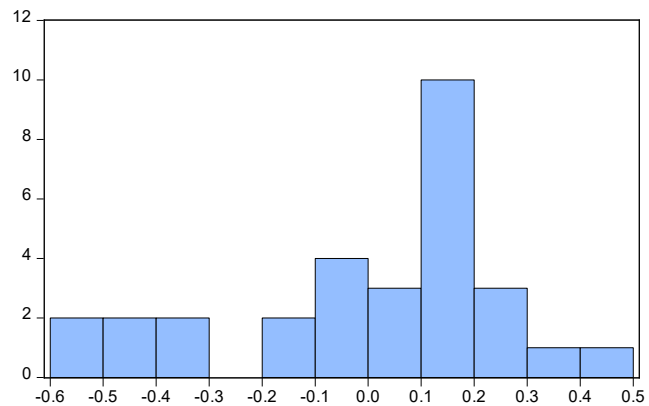
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000460	0.001318	-0.348646	0.7307
D(LNRGDP)	0.003238	0.019363	0.167240	0.8687
D(INF)	-4.97E-06	6.02E-05	-0.082517	0.9350
D(LNEXR)	0.000793	0.002825	0.280841	0.7815
D(LNNOX)	-0.000247	0.002032	-0.121390	0.9045
ECM03(-1)	0.096322	0.367941	0.261786	0.7959
RESID(-1)	-0.152407	0.410222	-0.371523	0.7138
RESID(-2)	-0.591040	0.752049	-0.785906	0.4403
R-squared	0.027344	Mean dependent var	7.84E-19	
Adjusted R-squared	-0.282138	S.D. dependent var	0.002636	
S.E. of regression	0.002985	Akaike info criterion	-8.567278	
Sum squared resid	0.000196	Schwarz criterion	-8.193625	
Log likelihood	136.5092	Hannan-Quinn criter.	-8.447743	
F-statistic	0.088354	Durbin-Watson stat	2.095690	
Prob(F-statistic)	0.998507			

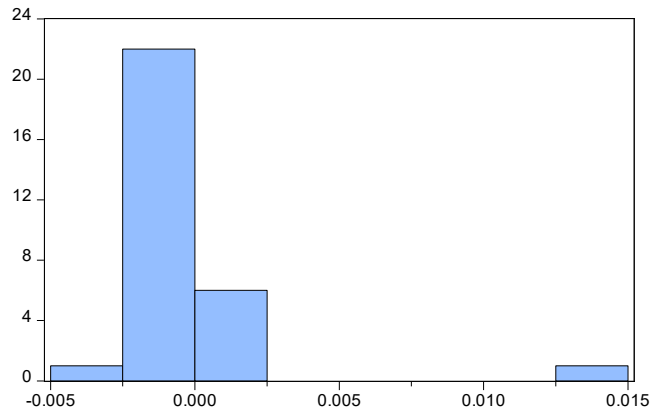
Normality



Series: Residuals	
Sample 1995 2024	
Observations 30	
Mean	4.52e-18
Median	-0.000707
Maximum	0.070139
Minimum	-0.071744
Std. Dev.	0.027492
Skewness	0.016934
Kurtosis	3.889932
Jarque-Bera	0.991407
Probability	0.609142



Series: Residuals	
Sample 1995 2024	
Observations 30	
Mean	-2.98e-17
Median	0.099192
Maximum	0.479920
Minimum	-0.554254
Std. Dev.	0.261672
Skewness	-0.705832
Kurtosis	2.727420
Jarque-Bera	2.583869
Probability	0.274739



Series: Residuals	
Sample 1995 2024	
Observations 30	
Mean	7.84e-19
Median	-0.000597
Maximum	0.013118
Minimum	-0.002973
Std. Dev.	0.002636
Skewness	4.275227
Kurtosis	21.96076
Jarque-Bera	540.7760
Probability	0.000000