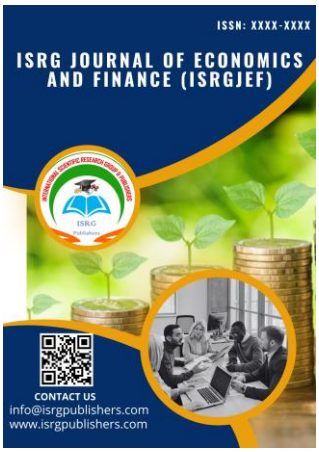
ISRG JOURNAL OF ECONOMICS AND FINANCE (ISRGJEF)

ISRG PUBLISHERS
Abbreviated Key Title: ISRG J Econ Fin.
ISSN: 3048-6998 (Online)
Journal homepage: https://isrgpublishers.com/isrgjef-2/
Volume – I Issue - 3 (September-October) 2024
Frequency: Bimonthly



ASSESSING THE CAUSAL RELATIONSHIP BETWEEN NON-OIL EXPORT AND ECONOMIC GROWTH IN NIGERIA (1980 -2022)

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| **Received:** 14.09.2024 | **Accepted:** 19.09.2024 | **Published:** 22.09.2024

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Abstract

The study examined the causal relationship between non-oil exports and economic growth in Nigeria 1980 to 2022. The study utilized data from the central bank of Nigeria spanning from 1980 to 2022. Nigeria's economy heavily relies on oil exports, making it susceptible to fluctuations in global oil prices. Diversifying the economy through increased non-oil exports becomes crucial for sustainable economic growth. Data were analyzed using the Toda-Yamamoto causality model. Findings from the study reveals a bidirectional causality between non-oil export and gross domestic product, suggesting that changes in non-oil export activity influence economic performance and vice versa; indicating that an increase in non-oil export cause an impact on gross domestic product. Similarly, unidirectional causality exists between exchange rate and non-oil export, with exchange rate impacting non-oil export but not the other way around. These findings provide valuable insights into the dynamic interactions between exchange rate, non-oil export, and economic performance. Based on the findings, it is recommended that the Nigerian government should intensify efforts to improve ease of doing business, diversify export earnings, develop regional trade integration, and invest in trade infrastructures to increase nonoil export and exchange rate in other to increase overall economic growth of the country.

DOI: 10.5281/zenodo.13824690

1. Introduction

Nigeria is the most populous nation in Africa with abundant natural resources, particularly crude oil. However, its economy is heavily dependent on oil exports, making it vulnerable to global oil price fluctuations. This dependence has led to a cyclical pattern of rapid economic growth during oil price increases followed by economic decline during price drops. This instability hinders long-term economic planning and development. To create a more resilient economy, Nigeria needs to diversify its exports beyond oil (Dahiru, 2023).

Prior to the oil boom of the 1970s, Nigeria's economy primarily relied on non-oil exports, such as agricultural commodities including cocoa, cotton, groundnut, palm oil, and palm kernel. This export-driven economy enabled the government to fund significant capital projects without resorting to external debt. Furthermore, Nigeria's export market was well-established during this period (Akpan et al, 2017).

In Africa, between 1995 and 2010, Africa's total non-oil exports increased from US$ 57 billion to US$ 169 billion and rises further to US$ 198 in 2015. By third quarter of 2022, Africa's overall export performance as a share of the world total has been persistently declining and fluctuates between 2.5% and 1.64% from 2005-2019**.** Specifically, Africa's share of total world exports rises only by 2.4 percent in 2022 (Usama, 2022).

In Nigeria's post-independence era, the expansion of non-oil exports was slow and discouraging. From 1960 to 1970, the average relative proportion of exports was approximately 2.3%. This proportion steadily decreased as the share of overall exports dropped from almost 40% in 1970 to nearly 5% in the second quarter of 1980 (World Bank, 2011). In the fourth quarter of 1980, the aggregate production of non-oil commodities reached 6,461,000 tonnes. In 1985, the proportion of non-oil export in total revenue decreased to 23%, while the share of oil revenue increased to 73%. The design of the Structural Adjustment Programme (SAP) was a response to the underperformance of the non-oil export industry in the country. According to the National Bureau of Statistics (NBS) (2022), data reveals that in the first quarter of 2022, the total nonoil commerce in the country rose to N 13 trillion. This figure is higher than the N 11.70 trillion recorded in the fourth quarter of 2021 and significantly higher than the N 7.86 trillion in the first quarter of 2021 (Emejo, 2023). The effects of a rise in non-oil exports on economic growth have been extensively studied and documented in academic economic literature. When discussing economic growth, they were referring to a noticeable increase in the level of performance of several macroeconomic indicators of growth over time. Todaro and Smith (2010) argue that the rate of economic growth is a crucial concern for every country. This is because economic growth ultimately forms the essence of economic development, which is the objective of any economy. The benefits of economic growth are integrated into all aspects of development indicators that the affected economy experiences. These indices demonstrate the advancement of many facets of economic development. Stephen and Obah (2017) argue that governments now prioritise maximising their available resources to promote sustainable economic growth and development.

The exportation of non-oil items is a crucial catalyst for economic growth and development. This phenomenon arises from the interdependence of the economy with other global economies, mostly through the implementation of commerce, which enhances the overall productivity of the economy. Hence, the primary objective of non-oil commerce in every nation is to augment the overall level of economic activity inside its economy.

Cocoa, palm kernels, rubber, and groundnuts are among the primary non-oil export commodities in Nigeria that have significantly contributed to the country's Gross Domestic Product (GDP) over the years. Cocoa is a highly significant agricultural commodity that is exported from the country. Currently, Nigeria ranks as the fourth most significant cocoa producer globally, trailing only Ivory Coast, Indonesia, and Ghana. Nevertheless, the nation currently ranks as the third most significant cocoa exporter globally, trailing only Ivory Coast and Ghana. Adeyeye (2014) asserts that cocoa played a crucial role in the growth of the Nigerian economy during the 1970s. For example, it served as a supplier of raw materials, contributed to employment possibilities, and significantly boosted the country's gross domestic product (GD P).

According to Onunze (2012), the non-oil (agricultural production) exports made up less than 5% of Nigeria's GDP in 2012. From the 1990s to the year 2000, Nigeria's non-oil exports accounted for 2.95 percent of the country's gross domestic product. However, this percentage rose to 3.88 percent in 2001, 4.25 percent in 2002, and 7.40 percent in 2006 (CBN, 2015). The proportion of non-oil exports to the Gross Domestic Product (GDP) had a slight decline to 7.20 percent in 2007, followed by further decreases to 6.30 percent in 2008 and 5.90 percent in 2009. From 2010 to 2012, it declined to 4 percent, and further dropped to 2.61 percent in 2013 (CBN, 2016). The National Bureau of Statistics (NBS) reported that the non-oil industry experienced a growth rate of 4.23 percent in 2017, compared to 3.06 percent in the previous year. The persistence of this trend indicates that Nigeria's non-oil exports have made only a little contribution to the country's total economic growth. Consequently, Nigeria's non-oil exports have been experiencing a decreasing contribution to the country's total economic development.

Cocoa, coffee, rubber, cashew nuts, and palm oil are the primary non-oil commodities that are exported from Nigeria's agricultural sector. Nevertheless, both the volume and the pricing of the aforementioned items are very unpredictable on the marketplaces for these goods. In regard to volume, the Gross Domestic Product (GDP) per capita dropped by 15 percent (Jones & Kiguel, 1994) between 1980 and 1985 as a result of a reduction of these exports from 10.9 per cent (Damian, 1997) within the exact same period of time. This decline occurred over the same time period. According to Koester et al. (1990), the percentage of non-oil exports that contributed to GDP plummeted by approximately 12.2 percent between 1985 and 1990, while the percentage of imports contributed to GDP continuously climbed. These exportables had consistent increase from 2010 to 2016, reaching a total value of N170.4 billion ($550.9 million) and growing by 180.7% above the 2016 level. The leading indicators of export performance were good through the end of 2018, falling dramatically in 2019, then improving modestly in 2022. The volume of Nigeria's non-oil exports dropped by 30.23 percent in 2019, while the total value of the nation's agricultural exports dropped by ₦ 32 billion, going from ₦ 302 billion in 2018 to ₦ 270 billion in 2019, but is expected to rise to ₦ 302.07 billion in 2022.

In addition, information from the International Cocoa Organisation (ICCO) (2019) indicates that over the years, cocoa production in Nigeria has decreased to 210,000 metric tonnes in 2017 despite the growing demand for the product, ranking it sixth among cocoa-

producing countries globally with a production accounting for 5 percent of total market share in 2021. In recent years, similar to cocoa, Nigeria has been a net importer of palm oil rather than an exporter of the product. This is due to the country's gradual drop in local palm oil output. For example, in 2017, the domestic output of the country was 970,000 metric tonnes (mt), whereas the demand was 2.7 million mt, resulting in a shortfall of 1.73 million mt. In 2017, the nation bought 450 000 tonnes worth of palm oil at a cost of 116.3 billion Nigerian naira.

In a similar manner, rubber production has been on a declining trend from its peak of 113,479 metric tonnes in 1970 to 46,000 metric tonnes in 2004 and has since then rarely registered any major gain in production until in 2018 (Hassan, 2019). This negative trend began in 1970 and continued until it reached its current level in 2018. The low yield of trees, particularly those of unknown lineage that predominate in the tiny holdings, and the prevalence of older trees that have passed their peak of production are two of the primary contributors to the low output of rubber in Nigeria.

A growing body of research explores the link between non-oil exports and economic growth in developing countries. Several studies support a positive relationship. For instance, Ilori (2020) found that non-oil exports significantly contribute to economic growth in Nigeria. Similarly, Zoramawa (2019) observed a positive impact of non-oil exports on economic growth in Nigeria, highlighting the importance of diversification. Some studies however suggest a more nuanced relationship. Uremadu (2020) found a positive long-run but negative short-run association between non-oil exports and economic growth in Nigeria. This underscores the need for further investigation into the dynamics of this relationships between the non-oil export and economic growth in Nigeria.

2. Literature Review

Non-oil Export

Non-oil exports refer to goods and services sold to other countries that do not involve crude oil or petroleum products. These exports can diversify a nation's economy, reduce its dependence on a single commodity, and generate foreign exchange revenue.

Abogan, et. al. (2022), non-oil exports refer to commodities, except crude oil (petroleum products), that are sold on the global market with the aim of generating revenue for the government. Nigeria's non-oil exports sector can be categorised into four main components: agricultural exports, manufacturing exports, solid resource exports, and service exports. The non-oil export sector encompasses a wide range of products and services such as crops, manufactured items, solid minerals, entertainment, and tourism. The potential for growth in this sector is nearly limitless. This clarifies the significance of non-oil export within the context of this research.

According to Yifru (2015), non-oil export refers to the transportation of agricultural commodities or products (such as Cocoa, Rubber, Palm Kernel, Cotton, and Groundnuts), whether in their raw or processed form, from a country's port or the sale of agricultural goods produced in the home country to other markets. These commodities are produced in large quantities because the country producing them has a competitive advantage in their production compared to other countries that import them.

According to Shombe (2008), non-oil exports refer to agricultural items that are transferred across international borders. These commodities are crucial for supporting the growth momentum as they contribute to the expansion of productive employment possibilities. While domestic demand plays a crucial role in driving economic growth in less-developed countries (LDCs), the export of agricultural goods is also significant. The balance of payments constrains economic growth and the full utilisation of productive capacities, making them important factors. Every aspect of demand has an import component that is crucial for sustaining and expanding ongoing economic operations. Countries require foreign cash in order to cover the costs of these imports. An examination of the Least Developed Countries (LDCs) under this paradigm reveals that the expansion of exports has had a favourable impact on economic growth. Underdeveloped nations encounter deficits in both financial resources and technological advancements.

According to McMichael (2009), agricultural export refers to the act of exporting goods by producing countries to other countries that have a demand for them. These commodities often contribute to economic development in four main ways: through their impact on product development, the factors of production, market expansion, and foreign exchange. Multiple studies conducted in certain countries have consistently identified them as a catalyst for economic expansion. Agriculture in emerging countries has been seen to experience a decline in its contribution to economic growth. Asian states have recognised that agriculture plays a significant part in driving economic growth. It has been established that by enhancing the value added in the agriculture sector, overall economic growth can be positively impacted.

In the words of Faridi (2012), agricultural exports refer to the exportation of agricultural commodities. In developing countries, the contribution of agriculture to total exports is typically significant. The neglect of empirical study on the impact of agricultural exports on economic growth, despite its well-established role in the development process, is an unexpected finding in the literature. However, several economists have contended that the increase in agricultural exports is essential for driving economic growth.

Ijirsha (2015) asserted that agricultural exports have the potential to be as financially rewarding and profitable as any other sector of the economy in terms of return on investment. Hence, it is imperative to rectify the prejudice against agriculture and the unfavourable impression of the agricultural sector in order to fully harness its potential for contributing to GDP. This can be achieved by directing investments towards agriculture, as it offers significant opportunities for employment, food security, and exports.

This study defines non-oil export as the act of selling agricultural commodities (such as cocoa, palm oil, and rubber) on the global market with the aim of generating revenue for the country.

Economic Growth

A nation's economic growth is a crucial indicator of its overall economic health and development.

The National Bureau of Statistics (NBS) (2021) defines economic growth as the sustained rise in real per capita income over a period of time. Gross Domestic Product (GDP) is a metric that quantifies the total value of goods and services generated inside a country over a certain time period. It provides insight into the impact of these commodities on the well-being of the population residing in the country. The standard method of measurement is the percentage rate of increase in real gross domestic product or real

GDP. Economic growth is achieved when individuals utilise resources and reorganise them in ways that increase their value.

According to Samuelson and Nordhaus (2005), economic growth is the increase in a country's potential GDP or national output. In other words, economic growth occurs when a country's production possibility frontier (PPF) expands. The researchers identified four key drivers of economic growth: human resources, natural resources, capital formation, and technology. Economic growth refers to the expansion of the production of goods and services in a country. This expansion is achieved by utilising natural resources, human resources, capital formation, and technology. As a result, the country experiences an increase in its real gross domestic product (GDP) and per capita income, leading to an improvement in the standard of living for its citizens.

Dwivedi (2004) defines economic growth as a continuous rise in per capita national output or net national product over an extended duration. This statement suggests that the rate at which the overall output increases must be higher than the rate at which the population grows. Another measure of economic progress is that the whole production of a country should consist of commodities and services that fulfil the greatest desire of the largest number of individuals. The four key factors of economic growth are human resources, natural resources, capital formation, and technical advancement.

Woodford (2000) differentiates between growth and development, stating that economic growth refers to a positive increase in the overall output of a country within a specific time period, while economic development is a sustainable increase in both output and incomes. Development also takes into account factors such as quality of life, including equal income distribution, healthcare, education, environmental preservation, reduction in global pollution, freedom, and justice. Hence, economic development can be defined as the progression in which an economy undergoes three primary phenomena, namely: consistent expansion in production, alterations in structure, and modifications in institutions. If these three occurrences occur, it will result in an increase in the standard of living of the population. Therefore, while numerous countries may experience economic expansion, not all of them will necessarily undergo development.

Theoretical Review

Export-Led Growth Hypothesis

This study is based on the export-led growth hypothesis (ELG hypothesis). Richards (2019) states that the Export-Led Growth (ELG) concept has existed for as long as the classical school. Both Adam Smith and David Ricardo supported this notion. Mishkin (2015), a contemporary economist, ascribed the favourable influence of exports mainly to the enhancements in production efficiency resulting from better resource allocation. Jahid (2016) and John (2020) highlighted the importance of dynamic benefits, such as the enhanced availability of foreign money and technology by removing the limitation on balance of payments. Vernon (1966), cited in John (2020), focused on the reverse causation mechanism, whereby the autonomous growth of the domestic economy results in enhanced competitiveness and ultimately leads to the expansion of exports. John (2020) recognized Vernon's research. Contemporary conceptions of "endogenous growth" focus on the benefits that come from a thriving export sector. These ideas are based on a framework that is defined by increasing returns to scale and positive technical and managerial spill-over impacts to other industries (Fedor, 2020). Helpman (2019) elaborated on certain concepts introduced by Beckerman and Vernon. He contended that the initial surge in growth, brought about by expanding nonoil exports through efficiency and allocation effects, leads to enhanced international competitiveness. This, in turn, promotes further expansion of nonoil exports and sets the stage for a positive cycle of economic growth. Both Beckerman and Vernon made significant contributions to the development of these theories.

However, there is still no agreement on whether the export-led growth theory is theoretically adequate, despite several decades of research and the collection of a large amount of study material. Jin (2017) and Richards (2019) state that there is a lack of consensus among theorists on the significance of exports, and this is reflected in the contradictory empirical findings. In order to achieve this objective, it is imperative to acknowledge the reality that efforts to empirically establish that exports are a significant driver of economic growth face two major obstacles. Firstly, it is important to note that since exports are a constituent of GDP, the available evidence of a correlation is inadequate to consistently demonstrate any actual causal connection that may exist. This is because exports are a constituent part of GDP. Additionally, there is a strong correlation between GDP growth and other important macroeconomic variables, particularly those factors that contribute to overall demand. Consequently, when these variables are not included in the model, it leads to a problem of model misspecification known as the missing variables problem (Sheehey 2014). This is due to the fact that other components of total demand are similarly correlated with GDP expansion.

Empirical Review

Amaoa et al (2021) analyse the impact of non-oil export items on economic growth in Nigeria between 1960 and 2016. The study obtained data from the World Bank Development Indicators and analysed it using the Generalised Method of Moments (GMM). The data analysis reveals that food and live animals, beverages, and tobacco had a significant negative influence on agricultural exports. On the other hand, agricultural exports (total) and crude materials, inedible except fats, were shown to have a negative impact but were not statistically significant. Nevertheless, it is necessary to expand the range of the data beyond 2016 in order to include up-to-date information in the study.

Olojede and Michael (2020) analyse the relationship between detailed non-oil exports and economic development from 1981 to 2018, employing the Ordinary Least Square and Granger causality methods. The study's findings demonstrate a robust long-term correlation between cocoa, oil palm, and economic growth. The granger causality analysis revealed a unidirectional causality, indicating that there is a causal relationship from the export of oil palm and cocoa to economic growth. Taiga and Ameji (2020) conducted a study to analyse the influence and correlation between agricultural exports and economic growth in Nigeria. They employed the vector autoregressive model for their analysis. The OLS regression model results indicate a positive and statistically significant correlation between agricultural exports and economic growth.

Osabohien, et al (2019) analyse the influence of agricultural exports on Nigeria's economic growth between 1980 and 2016 by employing the ARDL Model. The findings indicate that agricultural exports had a favourable and considerable impact on Nigeria's economic growth over the study period.

Simasiku and Sheefeni (2017) conduct an analysis on the relationship between agricultural exports and economic growth in Namibia. They utilise co-integration and error correction models for their study. Empirical evidence indicates that agricultural exports have a positive but not statistically significant impact on economic growth in Namibia. On the other hand, non-agricultural exports have a positive and statistically significant effect on the country's Gross Domestic Product (GDP). In their 2017 study, Bakari and Mabrouki examined the impact of agricultural exports on economic growth in South-Eastern Europe using several statistical techniques including OLS regression, Granger causality, Impulse Response Function, and Variance Decomposition. The findings indicate a negative correlation between the level of agricultural openness and economic growth in the nation. The results of the Impulse Response Function exhibit fluctuations and indicate both positive and negative shocks resulting from agricultural exports on the country's economic growth.

Verter (2016) examined the influence of economic growth on non-oil exports in Nigeria. The study utilised secondary data and applied the Johansen Co-integration and Granger Causality methods. The study found that there is a negative correlation between the level of openness in agriculture and economic growth. The study determined that in order for Nigeria to achieve a positive trade balance in agricultural commerce, it is necessary to promote domestic businesses. Specifically, there should be a focus on encouraging domestic processing enterprises while discouraging the importation of items that may be produced within the country at a lower cost. Nevertheless, the study was unable to separate the many elements of agricultural export in order to determine specifically which components will have a long-term impact on economic growth.

In a study conducted by Dawson (2015), the author examined the impact of non-oil exports on the economic growth of several Developed countries. The analysis of the study incorporated two theoretical models. The initial model incorporated an aggregate production function that considered both agricultural and non-agricultural exports as inputs. The subsequent model, known as the dual economy models, consisted of separate agricultural and non-agricultural models. Each model consists of two subsectors, one dedicated to producing exports and the other focused on manufacturing goods or services for domestic consumption. The study utilised fixed and random effects models to analyse panel data from 62 Least Developed Countries (LDCs) during the time frame of 1974 to 2005. The study elucidated the impact of agricultural exports on economic growth. It is crucial to note that this study did not provide a detailed breakdown of the agricultural products being exported by the countries under investigation. This lack of information prevents us from determining whether specific products had a more accurate impact on the economy.

Ojo and Olufemi (2014) investigated the causal connection between non-oil exports and economic growth in Nigeria by using time series data spanning from 1980 to 2012. This study employed the Phillips-Peron unit root, Johansen cointegration, and error correction approaches to assess the stationarity, long-run, and short-run dynamics of the research models. The obtained conclusion indicates that the primary factors influencing long-term economic growth are agriculture exports and output. Aladejare (2014) conducted a study that aimed to empirically examine the influence of agricultural export on economic growth in Nigeria. The study utilised the ARDL technique. The investigation was done utilising monthly data spanning from January 1999 to December 2012. The findings indicated a significant and enduring correlation between agricultural export, currency rate, and foreign revenues. The variables examined demonstrated a clear impact on the immediate and long-term correlation between agricultural exports and economic growth. Additionally, it is crucial to mention that the researcher neglected to incorporate significant variables such as trade openness, which would have resulted in a more comprehensive model for determining aspects in international commerce.

Ojo and Olufemi (2014) conducted a study on a significant number of nations (forty two poor countries) in order to investigate the influence of non-oil exports on economic growth in underdeveloped countries, utilising panel co-integration techniques. The objective was to assess the correlation between Gross Domestic Product (GDP) and the exports of both agricultural and non-agricultural goods in these countries. Their findings revealed that the agricultural export elasticity of GDP was 0.09, whereas the non-agricultural export elasticity of GDP was 0.13. Therefore, they reached the conclusion that they endorse the concept of growth driven by exports. Nevertheless, the study neglected to adequately address the distinct challenges and provide specific policy suggestions for each of the countries examined.

Ahungwaet et al (2014) utilised ordinary least square regression to examine the impact of non-oil exports on the economic growth of Nigeria. An empirical correlation was found between Gross Domestic Product (GDP) and government expenditure on agriculture from 1986 to 2007. The analysis also disclosed that 81% of the fluctuations in GDP could be accounted for by domestic savings and government expenditure. In a study conducted by Anyanwu et al (2013), the authors analysed the composition and expansion of Nigeria's Gross Domestic Product (GDP) over a span of 49 years. They employed multiple regression analysis and found that agriculture played a crucial role in determining Nigeria's GDP, particularly from 1960 to 1984. This supremacy can be traced to the fact that the agricultural and macroeconomic policies implemented by different governments at that time were heavily focused on achieving large-scale crop production.

3. Methodology

This research investigates the causal relationship between non-oil exports and economic growth in Nigeria between 1980 to 2022.

Sources of Data

This study uses annual time series secondary data collected from the Central Bank of Nigeria (CBN) statistical Bulletin (2022). The data covers a period of forty-two years from 1980 to 2022; this is the period after the oil boom in Nigeria. The variables on which data were collected are gross domestic product (GDP), nonoil export (NOEX), nonoil trade (INF) and exchange rate (EXR). Gross domestic product (GDP) was the dependent variable, nonoil export (NOEX), nonoil trade (INF) and exchange rate (EXR) were the independent variables of the study.

Model Specification

To achieve its objectives, this study adopts the model from the work that Lawal and Ezeuchenne (2017) had done. According to the findings of their investigation, the following relationship exists between the variables:

GDP = *f (NXP, EXR, INF)* ……1

Functional Model

GDP= f (NOEX, EXR, INF) **……..2**

This can be written as;

$GDP_t = \beta_0 + \beta_1 NOEX_t + \beta_2 EXR_t + \beta_3 INF_t + \mu_t$**……..3**

Where, GDP is gross domestic product, NOEX is non-oil export, EXR is exchange rate, INF is Inflation rate, β_0 - β_3 are parameters to be estimated, t is the time period and μ_t is the error term.

For estimation purpose, the equation is re-specified in a log – linear functional form in order to linearize non-linear variables and also to minimize spurious results, the study therefore, converted the equation into their natural log form. Hence, the new equation is of the form:

$lnGDP_t = \beta_0 + \beta 1 lnNOEXt + \beta 2 lnEXRt + \beta 3 lnINFt + \mu_t$**……4**

Where:

$lnGDP_t$ is the natural log of GDP

$lnNOEX_t$ is the natural log of non -oil export

$lnINF_t$ is the natural log of inflation

$lnEXR_t$ is the natural log of external trade

υ_t is error terms

ln is natural log transformation.

$\beta_0 - \beta_3$ is parameters to be estimated.

Technique of Analysis of Data

Causality Analysis

The Granger-Causality, introduced by Granger (1969), is widely used in economics literature to examine the causal connection between two variables. The test entails the estimation of the following simple vector autoregressions (VAR):

$$Xt = \sum_{i=1}^{n} \alpha i\, Yt-i + \sum_{j=1}^{n} \beta j\, Xt-j + +\mu 1t \dots\dots\dots\dots\dots\dots (1)$$

$$Yt = \sum_{i=1}^{m} \emptyset i\, Xt-i + \sum_{j=1}^{m} \Upsilon j\, Yt-j + +\mu 2t \dots\dots\dots\dots\dots\dots (2)$$

It is postulated that the disturbances μ1t and μ2t are not connected. Equation (1) states that the value of variable X is determined by both the lagged variable Y and the current value of X. Equation (2) follows the same pattern, but with the dependent variable being Y instead of X. Granger causality refers to the significant influence of lagged variable Y on variable X in equation (1), and the significant influence of lagged variable X on variable Y in equation (2).

Put simply, researchers can use F-statistics to evaluate whether the estimated lagged coefficient Σαi and ΣØj are significantly different from zero when tested together. When the joint test rejects the two null hypotheses that Σαi and ΣØj are both equal to zero, it confirms the existence of causal links between X and Y. The Granger-Causality test is straightforward to conduct and applicable to various types of empirical studies. Nevertheless, conventional Granger-Causality is subject to several constraints. Firstly, conducting a Granger-Causality test with only two variables, without taking into account the influence of other factors, may result in potential specification bias. Gujarati (2009) has highlighted that a causality test is influenced by the specific model chosen and the number of lags included. If the information were pertinent and not incorporated into the model, it would yield distinct outcomes. Hence, the empirical evidence supporting the existence of a two-variable Granger-Causality is delicate due to this issue.

Furthermore, it is worth noting that time series data frequently exhibit non-stationarity, as highlighted by Maddala (2001). This scenario serves as an example of the issue of false regression. Gujarati (2006) also said that the F-test approach is not valid when the variables are integrated, as the test statistics do not follow a standard distribution. While researchers can still assess the importance of individual coefficients using the t-statistic, the F-statistic cannot be used to collectively test for Granger-causality.

Toda and Yamamoto (TY) (1995) suggest an intuitive approach that overcomes certain limitations. Their procedure involves estimating an augmented VAR model, which ensures that the Wald statistic follows an asymptotic χ2-distribution. This testing procedure is robust to the integration and cointegration properties of the process. The TY employs a bivariate Vector Autoregression (VAR) model with m + dmax variables, consisting of projected inflation and nominal interest rate, as outlined by Yamada (1998).

$$Xt = \Omega + \sum_{i=1}^{m} \emptyset i\, Xt-i + \sum_{i=m+1}^{m+dmax} \emptyset i Xt-i + \sum_{i=1}^{m} \beta i\, Yt-i + \sum_{i=m+1}^{m+dmax} \beta i\, Yt-i + \mu 3t \dots\dots\dots\dots\dots\dots (3)$$

$$Yt = \pi + \sum_{i=1}^{m} \Upsilon i\, Yt-i + \sum_{i=m+1}^{m+dmax} \Upsilon i Yt-i + \sum_{i=1}^{m} \alpha i\, Xt-i + \sum_{i=m+1}^{m+dmax} \alpha i\, Xt-i + \mu 4t \dots\dots\dots\dots\dots\dots (4)$$

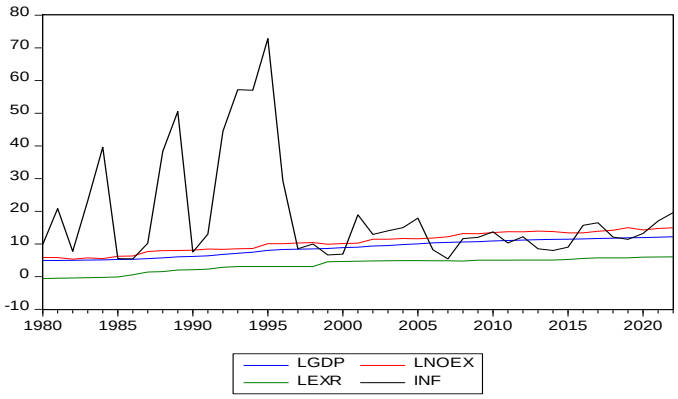
Where X= Nonoil export and Y= gross domestic product, and , Ω,, Øi, βi, π, Υi, αi are parameters of the model. dmax is the maximum order of integration suspected to occur in the system; v1t ~N(0, Σμ3t) and v2t ~N(0, Σ μ4t) are the residuals of the model and Σμ3t and Σμ4t the covariance matrices of μ3t and μ4t, respectively. The null of non-causality fromexpected inflation to nominal interest rate can be expressed as H0: δi= 0, ∀ i=1, 2, ..., m.

Two steps are involved with implementing the procedure. The first step includes the determination of the lag length (m) and the second one is the selection of the maximum order of integration (dmax) for the variables in the system. Measures such as the Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), Final Prediction Error (FPE) and Hannan-Quinn (HQ) Information Criterion can be used to determine the appropriate lag order of the VAR.

4. Discussion of Results and Findings

4.1. Trend Analysis of the Variables of the Study

This analysis explores the trends of key macroeconomic indicators in Nigeria: Gross Domestic Product (GDP), Non-Oil Exports (NOEX), Exchange Rate (EXR), and Inflation (INF). By examining these variables, we aim to understand the interrelationships between economic growth, trade dynamics, monetary policy, and price stability in the country.



Source: Author's computation using E-views 12, 2024

Figure 1: Showing Joint Trend Analysis of variables (1980-2022)

Figure 1 shows the joint trends of non-oil export (NOEX), Inflation (INF), exchange rate (EXR) and gross domestic product (GDP) in Nigeria respectively over a period of 1980 to 2022. The result in the figure shows that GDP and NOEX maintain a slow and steady upward movement from 1980 to 2022. Exchange rate (EXR) presented a slower upward movement from 1980 but experienced a spike from 1986 to 2022. It is observed that NOEX and GDP shows slow downward movements from 1980 up to 1986 where it picked and began to move upward in a very slow dimension up till 2022. Inflation (INF) shows some fluctuations in the trend, reached its peak in 1986 and continued to show downward movements up till 2022.

Nigeria's non-oil export (NOEX) and exchange rate (EXR) fluctuated significantly between 1980 and 2022 due to a complex interplay of factors including current account deficits, capital flight, oil price recovery, global economic conditions, and policy shifts (CBN 2022). The government implemented policies to promote non-oil exports after 1986 which included measures like currency devaluation to make exports cheaper, investment in export-oriented industries, or trade agreements with other countries.

The findings of this research are consistent with the study conducted by Abogan in 2014, which employed a production function technique to demonstrate the favourable influence of non-oil exports on economic growth. The study utilised labour, capital, income, and technological change as estimators.

In his study, Christopher (2014) employed Ordinary Least Squares (OLS) to investigate the influence of non-oil exports on economic growth. He concluded that an increase in the volume of non-oil exports would result in a substantial enhancement in Nigeria's level of economic development. While individual variables may not have a substantial impact on economic development, when considered together, they can have a significant influence on it.

Table 1

Result of Descriptive Statistics

	GDP	NOEX	EXR	INF
Mean	3.0912	2.6802	1.6124	1.1321
Std. Dev.	0.3490	0.5532	0.9311	0.1834
Skewness	-0.5152	-0.2136	-1.8142	0.2342
Kurtosis	1.8460	2.3908	2.9737	2.8517
Jarque-Bera	2.6443	3.7209	6.2245	4.5143
Probability	0.2116	0.2732	0.0352	0.0756

Source: computed by the Researcher using E-views 12

Table 1 shows the result of descriptive statistics of the variables. The result shows that the mean value of GDP, NOEX, EXR and INF are 3.0912, 2.6802, 1.6124 and 1.1321 respectively. This implies that the average values of the variables of the study are as small as possible. The standard deviations of all the variables are also small, implying that the errors that may be due to the estimates are insignificant. Table 1 further revealed that INF has positive skewness which implied that it has long right tails while GDP, NOEX and EXR have negative skewness which implied that they have long left tails. Kurtosis measures the peakedness or flatness of the distribution of the series. If the kurtosis is above three, the distribution is peaked or leptokurtic relative to the normal and if the kurtosis is less than three, the distribution is flat or platykurtic relative to normal. From the Table 1 GDP (1.8460), NOEX (2.3908), EXR (2.9737) and INF (2.8517) are less than three which implies flat or platykurtic, that is, flatter than a normal distribution with a wide peak. As the value of skewness and kurtosis of the nonoil export series are not equal to 0 and 3 respectively, this suggests that data are not normally distributed.

The Jarque-bera measures the difference of the skewness and kurtosis of the series with those which have a normal distribution. From Table 1, only EXR variables do not follow a normal distribution as evident from the probability value which is less than 5% while all other variables (GDP, NOEX and INF) are normally distributed.

Table 2

Result of Unit Root Test

Variables	ADF Level	ADF Difference	PP Levels	PP Difference	Order of Integration
NOEX	-0.280	-9.989*	-0.279	-10.17*	**I (1)**
INF	-1.288	-6.041*	-2.885	-6.030*	**I (1)**
EXR	-1.014	-4.346*	-1.015	-4.675*	**I (1)**
GDP	-1.399	-10.96*	-1.746	-6.079*	**I (1)**
ADF Critical Value at 5% = 2.935				***PP Critical Value at 5% = 2.935***	

** denotes stationary at 5%*

Source: Computed by the Researcher Using Eviews 12, 2024

DOI: 10.5281/zenodo.13824690

Table 2 shows the results of augmented Dickey-Fuller (ADF) and Kwiatkowski –Philips-Schmidt-Shin (KPSS) unit root tests of stationarity. The KPSS unit root test is performed as a confirmatory test to ascertain the highest order of integration. Both the ADF and KPSS were conducted with intercept. This is because intercept was statistically significant. The ADF and the KPSS results shows that at 5%, all the variables are not stationary at levels because their calculated ADF and KPSS values are less than their critical values. However, all the variables are stationary at first difference. This implies that NOEX, INF, EXR and GDP are all integrated of order one [I(1)]. Therefore, it could be inferred from the result that the variables of the study are integrated of the same order and the order of integration is I (1).

Table 3

Selection of Optimal Lag length for Bayesian VAR

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2145.180	NA	3.99e+40	104.8381	105.0052	104.8989
1	-1951.739	339.7005	6.98e+36	96.18241	97.01830	96.48680
2	-1904.673	73.46892*	1.57e+36*	94.66700*	96.17160*	95.21489*

** indicates lag order selected by the criterion;*

LR: sequential modified LR test statistic; FPE: Final prediction error; SC: AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

Source: Computed by the Researcher Using Eviews 12, 2024

To estimate the causal relationship between non-oil exports and economic growth in Nigeria, it is necessary to test, first, for optimal lag length for the BVAR model. This is because causality result is very sensitive to lag length. Therefore, the study uses the traditional lag selection criteria (AIC, SIC, HQ, LR, FPE), obtained from the empirical VAR lag structure to decide the optimal lag length for the study. From table 2, all the lag selection criteria suggest an optimal lag of 2 except SC and HQ that suggested lag of one (1), Therefore, the study uses a lag length of 2 for subsequent analyses.

Table 4

Result of Bound Co-integration Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Significant.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	88.02228	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	41		Finite Sample: n=45	
		10%	2.56	3.428
		5%	3.078	4.022
		1%	4.27	5.412
			Finite Sample: n=40	
		10%	2.592	3.454
		5%	3.1	4.088
		1%	4.31	5.544

Source: Researcher's Computation using e-views 12, 2024

Co-integration is a way of reconciling the short-run and long-run equilibrium relationship among the variables of the study. Since the variables are confirmed to be non-stationary then their linear combination is expected to give a stationary result in the long-run. The result of F-bound co-integration in table 4 revealed that the F-statistics is 88.02228 which is greater than 1%, 2.5%, 5% and 10% asymptotic critical values. Therefore, the null hypothesis of no co-integration is rejected while the alternative hypothesis of the presence of co-integration among the variables is accepted. Based on the result in table 4, it can be concluded that the variables of the study have a long-run equilibrium relationship.

Specifically, it could be inferred from the result that GDP in current year had equilibrium relationship with non-oil export and exchange rate which keep them in proportion to each other in the long run for the period under study. This is in line with the work of Aljebrin (2017) which uses ordinary Least Square (OLS) and error correction model (ECM) to show a positive and statistically significant relationship between non-oil export and economic growth in the short and long-run.

Table (5a)

Result of Toda-Yamamoto Causality Test

Dependent variable: LGDP			
Excluded	**Chi-sq**	**Df**	**Prob.**
LNOEX	0.295794	2	0.0000
LEXR	21.69055	2	0. 8625
INF	6.553739	2	0.3772

Source: Researcher's Computation using e-views 12, 2024

Table (5b)

Result of Toda-Yamamoto Causality Test

Dependent variable: LNOEX

Excluded	Chi-sq	df	Prob.
LGDP	4.415960	2	0.0199
LEXR	4.430252	2	0.1091
INF	2.240070	2	0.3263

Source: Researcher's Computation using e-views 12, 2024

Table (5c)

Result of Toda-Yamamoto Causality Test

Excluded	Chi-sq	df	Prob.
LGDP	2.143560	2	0.3423
LNOEX	2.254450	2	0.0324
INF	1.393340	2	0.4983

Source: Researcher's Computation using Eviews 12, 2024

Table (5d)

Result of Toda-Yamamoto Causality Test

Dependent variable: INF			
Excluded	Chi-sq	df	Prob.
LGDP	2.877346	2	0.2374
LNOEX	0.415691	2	0.0412
LEXR	1.276408	2	0.5283

Source: Computed by the Researcher Using Eviews 12, 2024

The result of Toda-Yamamoto causality test is reported in table 4a, table 4b, table 4c and table 4d. In table 5a, GDP is the dependent variable, in table 5b NOEX is the dependent variable, in table 5c EXR is the dependent variable while in table 5d INF is the dependent variable.

Table 5a which revealed the results of the GDP model indicating that one of the variables is significant at 5% meaning that GDP have an impact on NOEX. This implies that there is causality between the two variables.

Table 5b which revealed the result of the NOEX model where NOEX is the dependent variable, shows that only GDP is statistically significant at 5% while EXR and INF are not significant at 5%. This implies that NOEX impact on GDP given the probability value of 0.0199, it thus mean that an increase in non-oil export will increase GDP by 4.4160 unit. Traditionally from Tables 5a and 5b, it means that there is bidirectional causality between NOEX and GDP with NOEX causing GDP and GDP causing NOEX.

Looking at the third equation in table 5c where EXR is the dependent variable, GDP and INF are statistically insignificant at 5% respectively given their probability values of 0.3423 and 0.4983; while NOEX is significant. This implies that NOEX has impact on EXR. That is, as exchange rate increase, non-oil export also increases by its respective Chi-square value of 2.2545. Traditionally, it can be said that there is unidirectional causality between EXR and NOEX with EXR causing NOEX.

Result from table 5d where INF is the dependent variable indicate that all variables are statistically insignificant at 5% given their probability values. These mean that GDP, EXR and NOEX have no impact on inflation (INF). Traditionally, this means that there is no causality between INF, GDP, EXR and NOEX. Furthermore, there is no directional causality between INF, GDP, EXR and NOEX. It also means that as inflation rate increases gross domestic product, exchange rate and non-oil export does not increase.

Results from Table 5a aligns with the **Export-Led Growth Theory** which suggests that increasing exports, particularly of manufactured goods, can be a significant driver of economic growth. Additionally, the study of Nwanne (2014) who used Ordinary Least Square Methods involving Error correction mechanism, co-integration, over-parametization, parsimonious and Johansen Co integration test to show the relationship between non-oil export and economic growth; the study revealed that agricultural and manufacturing components of non-oil export has positive and significant relationship with economic growth while solid minerals components has negative and insignificant relationship with economic growth in Nigeria.

Table 6

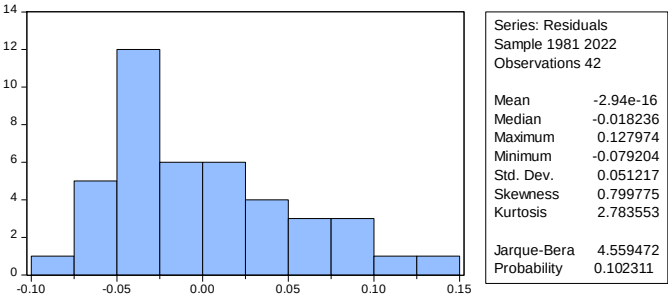
Post-estimation Statistics

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.006537	Prob. F(2,33)	0.9935
Obs*R-squared	0.016633	Prob. Chi-Square(2)	0.9917

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.938654	Prob. F(6,35)	0.4801
Obs*R-squared	5.821553	Prob. Chi-Square(6)	0.4435
Scaled explained SS	3.605225	Prob. Chi-Square(6)	0.7299

Source: Computed by the Researcher Using Eviews 12, 2024

Figure 2: Test of normality



Source: Computed by the Researcher Using Eviews 12, 2024

Figure 3: CUSUM Test

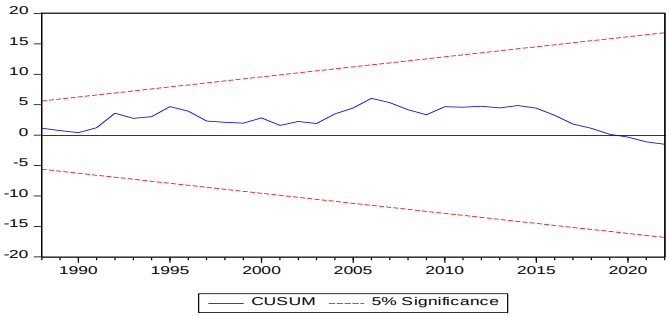


Figure 4: CUSUM of Squares Test

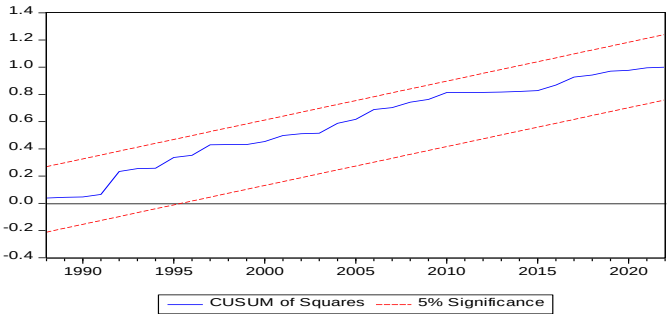


Table 6 displays the statistical estimates after the analysis. The serial correlation LM test yields a probability value of 0.9935, indicating that it is greater than the significance level of 0.05. This indicates that the null hypothesis, which states that there is no autocorrelation in the model, cannot be disproven. Similarly, the probability value for the heteroscedasticity test is 0.4801, indicating that we cannot reject the null hypothesis that there is no heteroscedasticity in the model. The outcome successfully passed the normality test, as indicated by the normality plot displayed in figure 2, which reports a Jarque-Bera value of 4.5595 and a corresponding probability of 1.1023 Therefore, the null hypothesis that the error terms of the data utilised in the study follow a normal distribution cannot be supported. Moreover, the outcome successfully met the criteria for stability. The reason for this is that the cumulative sum (CUSUM) of the square plot shown in figure 3 does not intersect any of the 5% essential lines. Thus, it can be inferred that the estimated parameters for the study remain consistent throughout the period being examined.

5. Conclusion and Recommendations

This study uses annual data spanning 1980 to 2022 to examine the causal relationship between non-oil exports and economic growth in Nigeria. The result of the trend analysis shows that gross domestic product (GDP) and Non-oil export (NOEX) maintain a slow and steady upward movement from 1980 to 2022. Exchange rate (EXR) showed a slow upward movement from 1980 to 2022. Inflation (INF) however shows some fluctuations in the trend from 1980 to 2022.

It is observed that non-oil export and gross domestic product shows slow downward movements from 1980 up to 1986 where it picked and began to move upward in a very slow dimension. In the same vein, exchange rate can be seen moving downward from 1981 to 1986 where an upward movement is observed from 1983 up till 1987 where a fluctuation continues up till 2022.

Nigeria's exchange rate (EXR) and inflation (INF) fluctuated significantly between 1980 and 2022 due to a complex interplay of factors including current account deficits, capital flight, oil price recovery, global economic conditions, and policy shifts. The government implemented policies to promote non-oil exports after 1986 which included measures like currency devaluation to make exports cheaper, investment in export-oriented industries, or trade agreements with other countries.

The decreased exchange rate will increase the size of the monetary multiplier and increase the excess reserves held by commercial banks, thus causing the money supply to increase. However, increase in exchange rate is because of the excess demand for the domestic currency and the growth of world trade.

The result of Toda-Yamamoto causality test shows that there is unidirectional causality between EXR and NOEX with EXR causing NOEX and NOEX not causing EXR. This means that exchange rate has an impact on non-oil export. The implication also is that as exchange rate increases so also will non-oil export increase. Furthermore, there is also unidirectional causality between INF and NOEX with INF causing NOEX but NOEX not causing INF. This means that inflation has an impact on non-oil export within the period under review, but non-oil export does not impact on inflation.

Lastly, there is bidirectional relationship between NOEX and GDP. This concludes that as non-oil export increase, gross domestic product will also increase and vice versa. Based on the findings, it is recommended that the Nigerian government should focus on measures and policies that will improve local production and exportation of non-oil products leveraging on exchange rate for strategic trade expansions and prioritizing policies that strengthens GDP.

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