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Investigating the Causality Between Oil Consumption and Economic Growth in Nigeria

Haruna Modibbo[a]
Mohammed Saidu[b]

Abstract
In Nigeria, the demand for oil is significant due to its essential role in the manufacturing and transportation industries. This study investigates the causality relationship between oil consumption and economic growth in Nigeria over the period from 1980 to 2022. The research utilizes Johansen's maximum likelihood cointegration technique and the Granger causality test to explore this relationship comprehensively. The cointegration test results indicate that there is no long-term equilibrium relationship between oil consumption and economic growth. However, the Granger causality test reveals a unidirectional causality from oil consumption to economic growth. The findings underscore the critical role of oil consumption in driving Nigeria's economic growth. Any attempts to conserve oil could negatively impact economic growth, highlighting the importance of oil consumption for the nation's economic stability. This study's results contribute to the broader understanding of the interplay between energy consumption and economic development, particularly in oil-dependent economies like Nigeria. By examining data over an extensive period, this study provides robust evidence on the nature of the relationship between oil consumption and economic growth in Nigeria. The absence of a long-term equilibrium relationship, as indicated by the cointegration test, suggests that fluctuations in oil consumption do not have a sustained impact on economic growth over the long term. Instead, the Granger causality test's findings of unidirectional causality suggest that changes in oil consumption can predict changes in economic growth in the short term. This research has significant policy implications. Policymakers must recognize the importance of oil consumption in driving economic growth. Efforts to reduce oil consumption without alternative energy sources or strategies in place may hinder economic growth. Thus, a balanced approach is necessary, where energy conservation measures are implemented alongside initiatives to diversify energy sources and enhance energy efficiency. Moreover, this study highlights the necessity for further research to explore alternative energy sources that could support economic growth while reducing dependency on oil. This is particularly important in the context of global efforts to combat climate change and reduce carbon emissions. Nigeria's economic policies should thus aim to balance between sustaining economic growth and transitioning towards more sustainable energy consumption patterns.
Keywords: Oil Consumption, Economic Growth, Nigeria, Granger Causality
JEL Codes: Q43, O13, C32, E21

1. INTRODUCTION

Oil plays a crucial role in fostering and maintaining economic growth. Despite Nigeria being the largest oil producer in Africa, a significant portion of the oil consumed is imported (Sambo, 2010). According to the Energy Information Administration in 2013, Nigeria's crude oil production peaked at 2.44 million barrels per day in 2005 but declined sharply due to increased violence from militant groups, leading many companies to evacuate personnel and halt production. Although production partially recovered after 2009-2010, it has not returned to its peak levels due to persistent supply disruptions. As of January 2013, Nigeria's proven oil reserves are estimated at 37.2 billion barrels, yet oil accounts for only 11% of the country's total energy consumption. The connection between oil consumption and economic growth holds significant policy implications. The literature identifies four hypotheses concerning the causal relationship between them. The first, known as the growth hypothesis, proposes a one-way causality from oil consumption to economic growth. The second hypothesis, termed the conservation hypothesis, posits a one-way causality from economic growth to oil consumption. The feedback hypothesis suggests a bidirectional causality between oil consumption and economic growth. Lastly, the neutrality hypothesis proposes that there is no causal relationship between oil consumption and economic growth.

In other words, the consumption of oil appears to be independent of its impact on economic growth. Unlike previous studies that extensively investigated the relationship between overall energy consumption and economic growth in Nigeria (Ebohon, 1996; Odularo, 2008; Olusegun, 2008; Odularo and Okonkwo, 2009; Dantama and Inuwa, 2012; Dantama,

[a] Department of Economics, Faculty of Arts and Social Sciences, Gombe State University, Gombe, Nigeria
[b] Department of Economics, Faculty of Arts and Social Sciences, Gombe State University, Gombe, Nigeria

Zakari, and Inuwa, 2012), there has been relatively limited research specifically focusing on how oil consumption influences economic growth. This gap in the literature highlights the need for further exploration to understand the unique dynamics and implications of oil consumption on Nigeria's economic development. To the best of the authors' knowledge, no study has specifically investigated the causal relationship between oil consumption and economic growth in the context of Nigeria. Therefore, the objective of this paper is twofold: firstly, to explore the causality between oil consumption and economic growth; and secondly, to assess whether oil conservation policies can be implemented in Nigeria without negatively impacting economic growth. This study aims to fill this gap in the literature by providing insights into the dynamics of oil consumption and its implications for economic development in Nigeria, while also addressing the feasibility of sustainable energy policies in the country.

2. LITERATURE REVIEW

This section reviews studies that have explored the causal relationship between oil consumption and economic growth. For instance, Zou and Chau (2006) utilized the Johansen maximum likelihood cointegration technique and vector error correction model (VECM) to analyze the short- and long-run connections between oil consumption and economic growth from 1953 to 2002 in China. They divided the period into two sub-periods: 1953-1984 and 1985-2002. The findings indicated a long-run equilibrium relationship between oil consumption and economic growth in both sub-periods. In terms of causality, the short-run results supported the neutrality hypothesis, while the long-run analysis revealed a bidirectional causal link between oil consumption and economic growth. Furthermore, Yoo (2006) conducted a comprehensive analysis using the Johansen maximum likelihood cointegration technique and Granger causality test within the vector error correction model (VECM) framework to examine how oil consumption influences economic growth in Korea from 1968 to 2002. The study's findings underscored a stable long-run equilibrium relationship between oil consumption and economic growth over the specified period. Importantly, the Granger causality test results from the VECM revealed a bidirectional causal link between oil consumption and economic growth. This suggests that changes in oil consumption can impact economic growth, and conversely, economic growth dynamics also influence oil consumption patterns in Korea. These insights contribute significantly to understanding the intricate interplay between energy consumption and economic development in the Korean context.

Aktas and Yilmaz (2008) utilized the Johansen maximum likelihood test and error correction model (ECM) to investigate how oil consumption influences economic growth in Turkey from 1970 to 2004. Their study found evidence of bidirectional causality between oil consumption and economic growth, both in the short and long run. Similarly, Bhusal (2010) employed the Johansen maximum likelihood test cointegration technique and ECM to analyze the relationship between oil consumption and economic growth in Nepal spanning from 1975 to 2009. The results indicated a stable long-run equilibrium relationship between oil consumption and economic growth, accompanied by bidirectional causality in both the short and long run. These studies contribute to a deeper understanding of how oil consumption dynamics interact with economic growth in diverse national contexts, highlighting the complex interdependencies between energy use and economic development. Moreover, Farooq and Ullah (2011) conducted a rigorous empirical analysis using the Johansen maximum likelihood cointegration technique and Granger causality test within the vector error correction model (VECM) framework to investigate the causal relationship between sectoral oil consumption and economic growth in Pakistan over the period 1972-2008. Their study provided nuanced insights into the interplay between different sectors of the economy and their influence on oil consumption dynamics.

The findings revealed distinct patterns of causality: firstly, economic growth was found to significantly drive oil consumption within the transport sector. Secondly, there was a causal relationship from the industry sector to power generation, indicating that industrial activities affect energy demand for power generation. Thirdly, the study identified feedback effects, where the transport sector's oil consumption also influenced energy consumption in power generation. This comprehensive analysis not only deepens our understanding of the sector-specific impacts on oil consumption but also highlights the broader implications for energy policy and economic development strategies in Pakistan. By elucidating these complex relationships, the study contributes valuable insights for policymakers aiming to foster sustainable economic growth while managing energy resources effectively across different sectors.

Behmiri and Manso (2012) conducted a comprehensive study using the Johansen maximum likelihood cointegration technique and Granger causality tests, employing both VECM and Toda-Yamamoto methods, to analyze the causal relationship between oil consumption and economic growth in Portugal from 1980 to 2009. Their findings indicated the existence of a stable long-run relationship between oil consumption and economic growth, characterized by bidirectional causality. This implies that changes in oil consumption can impact economic growth, and economic growth dynamics also influence oil consumption patterns in Portugal. The study's conclusions suggest that implementing conservation policies aimed at reducing oil consumption could potentially have adverse effects on the Portuguese economy. This insight underscores the complexity of balancing environmental sustainability goals with economic development imperatives, highlighting the need for carefully crafted policies that consider both energy conservation and economic growth objectives.

Replicating the analysis with a different approach, Fuinhas and Marques (2012) employed the autoregressive distributed lag (ARDL) bounds test to investigate the relationship between oil consumption and economic growth in Portugal spanning from 1965 to 2009. Their study found robust evidence of a long-run equilibrium relationship between oil consumption and

economic growth. Importantly, the results indicated bidirectional causality between oil consumption and economic growth, both in the short and long run. This alternative methodology corroborates earlier findings and underscores the consistent presence of mutual interactions between oil consumption and economic growth dynamics in Portugal. These insights contribute to a more comprehensive understanding of the interdependent nature of energy consumption patterns and economic development, informing policymakers about the potential implications of energy conservation policies on Portugal's economic performance over time.

Park and Yoo (2013) conducted an extensive analysis using the Johansen maximum likelihood test cointegration technique and Granger causality test within a vector error correction model (VECM) framework to investigate the causal relationship between oil consumption and economic growth in Malaysia over the period 1965-2011. Their findings provided robust evidence of a long-run equilibrium relationship between oil consumption and economic growth in Malaysia. Specifically, the short-run causality analysis revealed bidirectional causality between oil consumption and economic growth, indicating that changes in oil consumption can influence economic growth, and vice versa, in the short term. Furthermore, the long-run causality results also demonstrated bidirectional causality between oil consumption and economic growth, suggesting persistent mutual interactions between these variables over the long term. These results contribute valuable insights into the dynamic interactions between energy consumption patterns, particularly oil consumption, and economic growth dynamics in Malaysia. Such findings are crucial for policymakers seeking to formulate sustainable energy and economic policies that balance environmental concerns with economic development goals.

Another study conducted by Yazdan and Hossein (2013) utilized the Johansen maximum likelihood cointegration technique and error correction model (ECM) to investigate the causal relationship between oil consumption and economic growth in Iran from 1980 to 2010. Their findings yielded interesting insights: contrary to many other studies, they found no evidence of a long-run relationship between oil consumption and economic growth in Iran. Moreover, the causality test results indicated a unidirectional causality running from economic growth to oil consumption. This suggests that economic growth influences the demand for oil consumption in Iran, rather than the reverse relationship where oil consumption impacts economic growth. These findings challenge conventional wisdom and underscore the unique dynamics of the Iranian economy in relation to energy consumption and economic growth. They emphasize the importance of context-specific analysis when exploring the relationship between oil consumption and economic performance, providing valuable implications for energy policy and economic strategy in Iran.

Lim, Lim, and Yoo (2014) conducted a comprehensive study using the Johansen maximum likelihood cointegration test and Granger causality test within a vector error correction model (VECM) framework to examine the causal relationship between oil consumption and economic growth in the Philippines from 1965 to 2012. Their findings indicated bidirectional causality between oil consumption and economic growth, supporting the feedback hypothesis. This suggests that changes in oil consumption can influence economic growth, and economic growth dynamics also affect oil consumption patterns in the Philippines. Similarly, Stambuli (2014) applied the Johansen maximum likelihood cointegration technique and Pairwise Granger causality test to investigate the relationship between oil consumption, oil prices, and economic growth in Tanzania over the period 1972-2010. The study revealed a long-run equilibrium relationship among oil consumption, oil prices, and economic growth. The Granger causality test results indicated unidirectional causality running from oil consumption to oil prices and from economic growth to oil consumption, thus supporting the conservation hypothesis. This suggests that economic growth influences oil consumption and, in turn, oil prices in Tanzania.

Based on panel data analysis, Narayan and Wong (2009) employed panel cointegration developed by Pedroni and Panel Granger causality tests to investigate the determinants of oil consumption across 6 Australian states and Territory during the period 1985-2006. Their study uncovered several key findings: Firstly, the results indicated the presence of a long-run relationship among oil consumption, oil prices, and income across the Australian states and Territory. Secondly, regarding the impact of variables on oil consumption, the study found that oil prices had a positive but statistically insignificant influence on oil consumption. In contrast, income demonstrated a positive and significant effect on oil consumption, suggesting that a 1% increase in per capita income led to a 0.2% increase in per capita oil consumption. Lastly, the causality test results revealed unidirectional causality running from income to both oil prices and oil consumption in both the short and long run. This implies that changes in income levels affect both oil prices and subsequently oil consumption across the Australian regions studied. These findings provide valuable insights into the drivers of oil consumption within regional contexts, highlighting the role of income as a significant determinant and underscoring the economic factors influencing energy consumption patterns over time.

Similarly, Pourhosseingholi (2013) conducted an extensive analysis using the Pedroni panel cointegration technique, full modified ordinary least squares (FMOLS), and Granger causality test within a vector error correction model (VECM) framework to explore the causal relationship between oil consumption and economic growth among OPEC member countries from 1980 to 2011. The study's findings indicated the existence of a long-run equilibrium relationship between oil consumption and economic growth across the OPEC member countries. Importantly, the Granger causality test results revealed bidirectional causality between oil consumption and economic growth. This suggests that changes in oil consumption can impact economic growth, and conversely, economic growth dynamics also influence oil consumption patterns among OPEC nations. These insights provide valuable implications for understanding the interdependencies between energy consumption, particularly oil consumption, and economic growth within the context of OPEC member

countries. They underscore the mutual interactions and complex dynamics shaping energy policies and economic strategies in oil-producing nations.

Al-mulali (2011) conducted a comprehensive analysis using Engle and Granger, Kao cointegration techniques, and panel Granger causality tests to explore the impact of oil consumption on economic growth across MENA (Middle East and North Africa) countries from 1980 to 2011. The study revealed a long-run equilibrium relationship between oil consumption, CO2 emissions, and economic growth in the MENA region. This suggests that changes in oil consumption and associated CO2 emissions can have lasting effects on economic growth dynamics over extended periods. Furthermore, the Granger causality test results indicated bidirectional causality between oil consumption, CO2 emissions, and economic growth. This finding implies that fluctuations in oil consumption and CO2 emissions can mutually influence economic growth, underscoring the interconnected nature of energy use, environmental impact, and economic performance in the MENA countries. These insights are crucial for policymakers in the MENA region as they navigate the challenges of energy policy, economic development, and environmental sustainability. They highlight the need for integrated approaches that consider the interplay between energy consumption patterns, environmental consequences, and economic growth goals to foster sustainable development strategies.

Behmiri and Manso (2012) conducted a recent study using the Engle-Granger two-stage cointegration technique and panel Granger causality tests to examine the long-run and causal relationships between crude oil consumption and economic growth across 27 OECD countries from 1976 to 2009. The findings of the study revealed the presence of long-run relationships among crude oil consumption, crude oil prices, and GDP as a proxy for economic growth across the OECD countries studied. This suggests that changes in crude oil consumption and oil prices have lasting impacts on economic growth dynamics in these nations. Moreover, the panel Granger causality test results indicated bidirectional causal relationships between crude oil consumption, crude oil prices, and GDP in both the short and long run. This finding challenges the crude oil conservation hypothesis, suggesting that fluctuations in crude oil consumption can influence economic growth, and conversely, economic growth dynamics also impact crude oil consumption and prices among OECD nations. These insights provide important implications for energy and economic policy in OECD countries, emphasizing the need for policies that balance energy security with economic growth objectives. They underscore the complex interdependencies between energy consumption patterns, oil prices, and economic performance, urging policymakers to consider integrated approaches to promote sustainable development and energy resilience.

Chu (2012) conducted a comprehensive study using the Bootstrap panel Granger Causality test to investigate the direction of causality between oil consumption and economic growth across 49 countries from 1970 to 2010. The study categorized the results into four hypotheses: neutrality, growth, conservation, and feedback. The study found that for 24 countries, the direction of causality between oil consumption and economic output supported the neutrality hypothesis. This suggests that in these nations, changes in oil consumption do not significantly affect economic growth, nor does economic growth significantly influence oil consumption patterns. In contrast, for 5 countries, the results supported the growth hypothesis. This indicates a unidirectional causality running from oil consumption to economic growth, implying that changes in oil consumption have a notable impact on economic growth dynamics in these specific countries. Furthermore, the conservation hypothesis was validated for 13 countries, indicating a unidirectional causality from economic growth to oil consumption. This suggests that economic growth dynamics, such as increased industrial activity or transportation demand, influence the level of oil consumption in these countries. Lastly, the study identified the feedback hypothesis as applicable for 7 countries. This hypothesis suggests bidirectional causality between oil consumption and economic growth, indicating that changes in both variables mutually influence each other over time in these nations. These findings underscore the variability and complexity of the relationship between oil consumption and economic growth across different countries. They highlight the importance of considering local economic conditions and energy dynamics when formulating energy and economic policies aimed at promoting sustainable development and resilience in the face of global energy challenges.

Halkos and Tzeremes (2011) conducted a cross-country study involving 42 countries to compare the relationship between oil consumption and economic efficiency across advanced, developing, and emerging economies. They employed Data Envelopment Analysis (DEA) and generalized method of moments (GMM) over the period 1986-2006 to analyze their findings. The study found notable differences in the economic efficiency turning points among advanced, developing, and emerging economies. Advanced economies generally exhibited higher turning points compared to developing and emerging economies, indicating that these countries could sustain higher levels of economic efficiency with increased oil consumption. Moreover, the results indicated that oil consumption positively correlated with economic efficiency across all countries studied. This suggests that higher levels of oil consumption were associated with improved economic efficiency across diverse economic contexts. Lastly, the GMM estimates revealed the presence of an inverted U-shaped relationship between economic efficiency and oil consumption across countries. This relationship implies that economic efficiency initially increases with rising oil consumption but may reach a peak after which further increases in oil consumption could potentially decrease economic efficiency. The estimates provided statistically significant insights into how variations in oil consumption affect economic efficiency levels globally. These findings contribute valuable insights into the nuanced relationship between oil consumption and economic performance across different types of economies, offering implications for energy policy and economic development strategies aimed at optimizing energy use and enhancing economic efficiency worldwide.

3. METHODOLOGY

In order to conduct cointegration tests, it is crucial that the variables involved are integrated of the same order or contain a deterministic trend (Granger, 1988). To ascertain whether this condition is met, the study employed the Dickey-Fuller Generalized Least Squares (DF-GLS) unit root test. The DF-GLS test is a variant of the Dickey-Fuller test designed to address issues such as serial correlation and heteroscedasticity in the residuals, which are common in econometric time series data. It is used to determine the stationarity of a time series, which is essential for ensuring that the variables are integrated of the same order necessary for cointegration analysis. By applying the DF-GLS unit root test, the study aimed to verify whether the variables under investigation exhibit stationary behavior or possess a deterministic trend. This step is crucial as it ensures the validity of subsequent cointegration tests, allowing researchers to properly assess the long-run relationships among the variables and draw reliable conclusions about their economic significance. Engle and Granger (1987) established that if two series, X and Y, are integrated of the same order (I(1)) and cointegrated, there exists a causal relationship in at least one direction between them. Cointegration ensures that the relationship is not spurious, preventing misleading results in econometric analyses. However, if both X and Y are non-stationary yet cointegrated, standard Granger causality tests may produce spurious outcomes. In such cases, alternative methods like error-correction models or the Toda and Yamamoto approach (1995), as recommended by Behmiri and Manso (2012), are more appropriate. Conversely, if X and Y are both non-stationary and their linear combination is non-stationary, standard Granger causality tests can still be valid. Therefore, it is essential to first test the integration properties of the oil consumption and economic growth series before proceeding with Granger causality tests. This involves determining if both series are integrated of the same order. If so, the next step would be to test for the presence of cointegration between them. The Johansen-Jeselius cointegration test procedure is commonly used for this purpose in econometric studies, providing insights into the long-run relationships between variables.

The bivariate Granger causality test, pioneered by Granger (1969), has been utilized in this study to investigate the causal relationships between two specific time series: oil consumption and economic growth. The primary objective is to determine the direction of causality between these variables. Granger causality testing involves assessing whether past values of one variable provide significant predictive power for forecasting another variable, beyond what can be explained by its own past values. By applying this test to the oil consumption and economic growth data, the study aims to discern whether changes in oil consumption lead to changes in economic growth (X causing Y), changes in economic growth lead to changes in oil consumption (Y causing X), or if there is bidirectional causality. This approach is crucial for understanding the dynamic interactions between oil consumption and economic growth over time, offering insights into how changes in one variable affect the other and vice versa. Such analysis helps in formulating effective policy interventions and economic strategies that account for the intertwined nature of energy consumption and economic performance.

4. RESULTS AND DISCUSSIONS

The study began by testing the order of integration for Real Gross Domestic Product (RGDP) and oil consumption before proceeding to investigate cointegration. Table 2 presents the results of the unit root tests conducted on the natural logarithms of the levels and the first differences of these two time series. According to the Dickey-Fuller Generalized Least Squares (DF-GLS) unit root test statistics, the null hypothesis of a unit root could not be rejected for the levels of the variables. However, stationarity was achieved when testing the first differences of the variables. This indicates that both RGDP and oil consumption series are integrated of order 1 (I(1)). The I(1) nature of the series suggests that both RGDP and oil consumption exhibit stochastic trends over time, meaning they are non-stationary in their levels but stationary after first differencing. This finding is crucial as it confirms the suitability of proceeding with further econometric tests, such as cointegration analysis, to explore the long-term relationship between RGDP and oil consumption in the study.

Table 1 provides the results of the Dickey-Fuller Generalized Least Square (DF-GLS) unit root test. For the variable RGDP, the test statistic at the level is -0.225930, indicating non-significance, suggesting that RGDP has a unit root and is non-stationary at level. However, at the first difference, the statistic is -2.246696, significant at the 5% level, indicating that RGDP becomes stationary after differencing once, thus integrated of order one, I(1). For CROC, the DF-GLS test statistic at the level is -1.362379, which is not significant, suggesting the presence of a unit root and non-stationarity at level. Upon taking the first difference, the statistic becomes -4.487645, significant at the 1% level, indicating that CROC also becomes stationary after differencing once, thus confirming that it is integrated of order one, I(1). These results imply that both variables require differencing to achieve stationarity, a common requirement for further econometric analysis such as cointegration testing or vector error correction modeling.

Table 1: Dickey- Fuller Generalized Least Square (DF- GLS) unit root test

Variable	DF-GLS test at Level	DF-GLS at first Difference
RGDP	-0.225930	-2.246696**
CROC	-1.362379	-4.487645***

Table 2 presents the results of the Johansen-Juselius likelihood cointegration tests. The Johansen-Juselius likelihood cointegration tests evaluate the presence of long-term relationships between variables in a multivariate time series model. In this analysis, both the trace test and the maximum eigenvalue test were conducted. For the trace test, the null hypothesis of no cointegration ("None") yielded a statistic of 6.631337, which is below the 5% critical value of 15.49471. This result suggests that we cannot reject the null hypothesis, indicating no significant cointegration relationships at this level. Additionally, for the case of "At most 1" cointegrating equation, the trace statistic was 0.065353, still below the critical value of 3.841466. This reinforces the conclusion that no cointegration is present. Similarly, in the maximum eigenvalue test, the statistic for "None" was 6.565983, which is also below the 5% critical value of 14.26460. This finding is consistent with the trace test, indicating the absence of cointegration at this rank. For "At most 1," the maximum eigenvalue statistic was 0.065353, which remains below the critical threshold of 3.841466, confirming the lack of a cointegrated relationship between the variables. Overall, the results from both tests suggest that there are no long-term equilibrium relationships between the variables under consideration in the data set. This implies that while short-term fluctuations may occur, the variables do not move together in a stable, long-term manner. Further analysis may be needed to explore other aspects of the relationships between these variables or to consider different model specifications that could capture potential dynamics not identified in this cointegration framework.

Table2: Johansen–Juselius likelihood cointegration tests

Number of Cointegration	Statistic	5% critical value
Trace Test		
None	6.631337	15.49471
At most 1	0.065353	3.841466
Max eigenvalue Test		
None	6.565983	14.26460
At most 1	0.065353	3.841466

In table 3 the pairwise Granger causality test examines whether one variable can predict another. In the analysis, it was found that changes in CROC significantly Granger cause changes in RGDP, as indicated by the low p-value, which is well below conventional significance levels. This means we reject the null hypothesis and conclude that CROC has predictive power over RGDP. On the other hand, the test results for whether RGDP Granger causes CROC show a higher p-value, indicating that we fail to reject the null hypothesis. This suggests that changes in RGDP do not significantly predict changes in CROC. Therefore, the causality appears to be unidirectional, with CROC influencing RGDP but not vice versa. This finding could have important implications for economic modeling and policy, suggesting that monitoring CROC may help in predicting future trends in RGDP. Further analysis could be beneficial to confirm these results in different contexts.

Table 3: Pairwise Granger causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
CROC does not Granger Cause RGDP	30	17.1137	0.0003
RGDP does not Granger Cause CROC		1.33693	0.2577

5. CONCLUSION

This study aims to explore the causality relationship between oil consumption and economic growth in Nigeria over the period from 1980 to 2022. To achieve this, the study will employ Johansen maximum likelihood cointegration tests and Granger causality tests. The Johansen cointegration test is valuable for assessing whether oil consumption and economic growth in Nigeria share long-run equilibrium relationships, indicating if changes in one variable affect the other persistently over time. This test helps to determine the presence and nature of any stable, long-term association between the variables. Additionally, Granger causality tests will be used to investigate the direction of causality between oil consumption and economic growth. These tests will assess whether past values of oil consumption can predict future values of economic growth beyond what can be predicted by past values of economic growth alone, and vice versa. This analysis will provide insights into whether changes in oil consumption precede changes in economic growth, vice versa, or if there is bidirectional causality between the two variables in Nigeria's context. By applying these econometric methods, the study aims to contribute to a deeper understanding of the dynamics between oil consumption and economic growth in Nigeria, offering implications for energy policy, economic development strategies, and sustainability efforts in the country. The empirical results of the study suggest that there is no cointegration or long-run equilibrium relationship between oil consumption and economic growth in the context of Nigeria from 1980 to 2022. This finding implies that changes in oil consumption do not lead to persistent changes in economic growth, nor vice versa, over the long term. Furthermore, the causality test results indicate a unidirectional causality running from oil consumption to economic growth without any feedback effect. This means that variations in oil consumption precede and influence changes in economic growth in Nigeria, but there is no evidence of economic growth affecting oil consumption in return. These findings are significant as

they provide insights into the specific dynamics of energy consumption and economic development in Nigeria. They suggest that policies aimed at fostering economic growth may not necessarily rely on changes in oil consumption as a driving factor. This underscores the complexity and context-specific nature of the relationship between energy use and economic performance, informing future research and policy decisions in Nigeria's economic and energy sectors. The study's premise suggests that the substantial use of oil, particularly in Nigeria's industrial sector, directly stimulates economic growth. Therefore, it argues that policymakers in Nigeria should consider that implementing oil conservation policies might have a negative impact on economic growth. This conclusion is based on the finding that oil consumption plays a significant role in driving economic expansion in the country. By highlighting the direct link between oil consumption and economic growth, the study underscores the importance of maintaining or even increasing oil consumption to sustain economic momentum in Nigeria. This perspective urges policymakers to prioritize energy policies that support continued access to and use of oil as a crucial resource for economic development. However, it's important to note that this conclusion assumes a direct and positive causal relationship between oil consumption and economic growth without considering potential environmental or sustainability implications. Policymakers face the challenge of balancing economic priorities with long-term environmental goals and energy security concerns. Thus, while acknowledging the economic benefits associated with oil consumption, policymakers should also consider strategies for diversifying energy sources, promoting energy efficiency, and ensuring sustainable development practices to mitigate potential risks and enhance overall resilience in Nigeria's economy.

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