

Impact of Oil and Non-Oil Revenue on Agricultural Output of Nigeria

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ABSTRACT

Nigeria has primarily two major sources of revenue classified as oil and non-oil revenue. Thus, the paper investigated the impact of oil and non-oil revenue on agricultural output in Nigeria. The specific objectives of the study are to examine the impact of oil and non-oil on agricultural output as well to determine the impact of oil price and real exchange rate on agricultural output in Nigeria. To achieve the objectives, a non linear autoregressive distributed lag (NARDL) model was specified and estimated to determine both short run and long run impacts. Findings revealed that the explanatory variables (oil revenue, non-oil revenue, oil price and real exchange rate has positive and significant impact on agricultural output. On the strength of the findings, the study recommends policy measures that could sustain increase in oil and non-oil revenue to promote sustainable increase in agricultural output.

Key Words: Oil revenue, non-oil revenue, Agricultural output, oil price Exchange rate

INTRODUCTION

Agriculture was the major source of Nigeria's revenue until the advent of crude oil discovery in 1956, Since then oil has been contributing significantly to government revenue in Nigeria, having supplanted agricultural products as the primary source of foreign exchange earnings for the nation. (Adeyemi and Abiodun, 2013).

Revenue derived from the Nigerian economy between 1960 and early 1970s was mainly from agriculture while revenue from other sources was considered as residual. But from 1973/1974 financial year, Nigeria's revenue structure changed and oil share in federally generated revenue rose from 26.3% in 1970 to 81.8% in 1979, 72.6% in 1989 and 76.3% in 1999 (Odusola, 2016).

Ihendinihu and Nwaiwu (2015) also reported that available data from Central Bank of Nigeria indicated that the oil and gas sector contributed 77.5% of federally collected revenue from 1986 to 2012 while non-oil sector generated only 22.5% for the same period. From 2005 to 2014, revenue from oil was 77% while that of non-oil revenue was 33%, But in recent time (2011 – 2022) revenue from oil has witness a decline at 61% while non-oil revenue rose to 39%.

Nigeria is one of the largest oil-producing countries in Africa and relies heavily on oil exports as a primary source of revenue. Oil exports have dominated the country's economy since the discovery of oil in commercial quantities in the 1950s, with the sector contributing a substantial portion of the government's revenue.

Agricultural Sector in Nigeria: Agriculture has historically been a significant contributor to Nigeria's GDP, providing employment for a large portion of the population. However, despite its potential, the sector has faced various challenges, including limited investment and declining productivity.

In the case of developed countries like the United States, Russia, and several European countries where oil discovery led to the development of not only the oil industry, but the diversification of their economies, investing in sectors beyond agriculture, including manufacturing and services, the resource curse theory effect is not prevalent in the mentioned economies.

In the case of Nigeria, the resource curse theory is prevalent; this is as a result of the lopsided dependence on the nation's abundant natural resources, like oil, experiences economic and political instability, corruption, and poor development outcomes. The oil sector has overshadowed other sectors, like agriculture, leading to neglect and mismanagement.

The oil and gas sector still accounts for 80 per cent of Nigeria's total national revenue despite crude oil theft. Nigeria's exports in the second quarter of 2022 were dominated by crude oil, accounting for 80 per cent of total export revenue despite the huge oil theft recorded in recent times (NBS, 2022).

Onwualu (2019) argues that a value chain approach to agriculture has the potential to create a diverse range of activities that can open up the economy, create jobs and promote industrialization and virtually for future sustained economic growth.

In the past, the government made efforts to increase non-oil export trade by introducing supportive measures such as the protectionist policies of import substitution policies of industrialization in the 1960s, trade liberalization policies in the mid-1980s (which took the form of structural adjustment programs), export promotion policies in the 1990s through increased policy support for small and medium enterprises (SMEs) to increase productivity and export local products. Nigeria's diversification approach should cover manufacturing and exports. This includes robust manufacturing, agricultural processing, other non-agricultural production, refined products, and other services (World Bank, 2017).

The primary focus here which is agriculture has suffered serious setback. Over the years, successive Nigerian governments have made efforts to diversify the economy through policy formulation, institutional support, and implementation of policies across different economic sectors. Developing countries are producing large amounts of primary raw materials that are subject to large price volatility and climate change and for economic stability it is important to diversify its export activities to make the most of its abundant natural resource base (World Bank, 2019). In this way, country's economy will experience stability and compete with other world economic powers. The importance of diversification has been discussed and established as a cornerstone of sustainable economic growth. Some authors argue that this is very important for providing employment opportunities through the development of export-oriented industries.

Joining in the discourse, Uzonwanne (2018) argues that economic diversification requires the full inclusion and active engagement of other key sectors that can make valuable contributions to the economy and enhance Nigeria's growth potential. Sound export policies must be encouraged to promote per capita income.

Ogunjimi, Aderinto and Ogunro (2019) in their studies shown that economic diversification can improve a country's balance of payments through inflows of foreign currency earnings.

A battery of development policies to promote non-oil exports, including the Structural Adjustment Program (SAP) between 1986 and 2000, the National Economic Empowerment and Development Strategy (NEEDS) between 2004 and 2017, and the Economic Recovery and Growth Plan (ERGP) more recently, have had limited impact on export diversification. The negative effects of over-reliance on the oil trade have increased the need and reputation to diversify Nigeria's economy from oil to non-oil export trade. Proponents of this increased share of non-oil exports argue that non-oil trade has great potential to lead the Nigerian economy to desired growth and development. Recently, zero oil Initiative was developed in 2016 by the Nigerian Export Promotion Council in partnership with the Ministry of Budget and National Planning, the Zero Oil Initiative aims to boost exports, diversify the economy away from oil dependency and enhance the country's reserve status. The plan is incorporated into the Economic Recovery and Growth Plan and was developed in response to the 2016 economic recession and to reduce over-reliance on crude oil exports for export growth and economic diversification in general. However, despite the adoption of the Zero Oil Initiative in the Federal Government's 2017-2020 Recovery and Growth Plan (ERGP), the performance of the non-oil sector remains limited as diversifying the agenda.

The 2020 oil price crisis was caused by a disagreement between Russia and OPEC over proposed production cuts amidst Corona Virus pandemic. Nigeria economy was largely affected by the Corona virus pandemic and

Covid-19 lockdowns. Among others, oil price witnessed a sharp fall and the country lowered the daily crude oil production consistently. In January 2019, the oil price was \$57/barrel, whereas in 2020 the price fell to \$15/barrel (Statista, 2022). Nigeria's economy lost approximately \$15.8bn. The country's gross domestic product diminished by 6.1 percent in the second quarter and by 3.62 percent in the third quarter of 2020 (Olujobi, 2022).

The main thrust of this study is to investigate the asymmetric nexus between oil revenue and non-oil revenue in relation to the fluctuations in oil prices and their asymmetric impact on agricultural output in Nigeria. The study specific objectives are: I, determine the impact of oil revenue on Agricultural output in Nigeria. ii. examine the impact of non-oil revenue on Agricultural output in Nigeria. iii. ascertain the effect of oil price on agricultural output in Nigeria. iv. Investigate how exchange rate has affected agricultural output in Nigeria.

Theoretical Literature

Resource Curse Theory

The "resource curse" theory, also known as the "paradox of plenty" or the "Dutch disease," is the idea that countries rich in natural resources, such as oil, gas, or minerals, may experience negative economic and social consequences as a result of their resource abundance. Various scholars and experts have contributed to the development of this theory over time. Here are some key proponents of the resource curse theory along with approximate dates of their contributions:

Richard Auty (1993): Auty is often credited with popularizing the concept of the resource curse. In his book "Sustaining Development in Mineral Economies," he discussed the challenges that resource-rich countries face in achieving long-term economic development and stability.

Jeffrey Sachs and Andrew Warner (1995): In their influential paper "Natural Resource Abundance and Economic Growth," Sachs and Warner examined the relationship between resource abundance and economic growth, suggesting that there is a negative correlation between the two.

Paul Collier and Anke Hoeffler (1998): In their paper "On Economic Causes of Civil War," Collier and Hoeffler explored how resource wealth can be associated with an increased risk of civil conflict in resource-rich countries.

Terry Karl (1997): Karl's book "The Paradox of Plenty" examined the political and economic consequences of oil wealth in countries, particularly focusing on Latin American oil-producing nations.

Michael L. Ross (2001): In his book "Extractive Sectors and the Poor," Ross discussed the relationship between resource wealth, governance, and the impact on poverty in developing countries.

The resource curse theory is based on several key assumptions that help explain the potential negative economic and social consequences associated with the abundance of natural resources in a country. These assumptions include:

Rentier State Assumption: Resource-rich countries can become "rentier states" where the government derives a significant portion of its revenue from resource rents (e.g., oil, mineral royalties). This reliance on resource income can lead to a concentration of power and resources within the government, potentially reducing the government's accountability to its citizens.

Dutch Disease Assumption: The theory assumes that the discovery and exploitation of valuable natural resources can lead to an appreciation of the country's currency. This can make other sectors, particularly manufacturing and agriculture, less competitive on the international market, potentially leading to economic imbalances and decreased diversification.

This theory centers around some relevant attributes as it concerns the Nigerian economy, these relevant attributes include; Economic dependence, Fiscal Mismanagement, Income Inequality.

It is important to note that this theory has its own weaknesses, some of which are;

Limited Diversification, Policy Interventions, External Factors, Heterogeneity within Resource-Rich Countries.

The Endogenous Economic Growth Model

Endogenous economic growth models are a category of economic theories and models that focus on explaining the sources of sustained, long-term economic growth within a country or region.

Paul Romer is a prominent figure in endogenous growth theory. He introduced the concept of "endogenous technological change," emphasizing the role of human capital, knowledge accumulation, and innovation as drivers of long-term growth. His work has influenced policies related to education, research and development, and innovation.

Critics argue that endogenous growth models like Romer's sometimes struggle to explain the full dynamics of technological progress and may not provide a clear roadmap for specific policy recommendations.

Theoretical Framework

Government generates its earning both from oil and non- oil sources. The lopsided nature in favour of the oil sector has called for various policy reforms to see to how a balance between the two sectors can be reached. Government makes use of its budgetary policy to create the balance between the two sectors in other to achieve Agricultural sustainability growth, import substitution, increase in the export of cash crops and also a reasonable contribution to the economic growth. Out of the four theories captured in this model, this study will employ the following theories: The resource curse theory, The Staples Theory of economic growth, Endogenous Growth theory and the theory of Agricultural Diversification.

In line with the Endogenous Growth theory, the theorists believe that exploitation and revenue of valuable natural resources can lead to an appreciation of the country's currency. But this can have an adverse effect on other sectors, particularly manufacturing and agriculture, making them less competitive on the international market, potentially leading to economic imbalances and decreased diversification.

According to Olaleye, Edun and Taiwo (2014), Nigeria is stepping up efforts to improve its non-oil sector as a step towards diversification through its macroeconomic policy framework. These policies had attributes of protectionism, trade liberalization, and export promotion. The authors cite the establishment of several institutions such as the Nigerian Export-import Bank (NEXIM) and the Nigerian Export Promotion Council (NEPC) as further efforts to effectively implement the guidelines developed (Olaleye, et al, 2014). This assertion connotes with the staple theory of economic growth and Resource Curse Theory.

Conclusively, all the theories agrees that it is possible to be rich in natural resources like crude oil and also be recognized in the international market as a giant in non-oil exports.

Empirical Literature

There are handful of contributors with divergent views and conclusion about the subject matter of oil and non-oil contribution to agricultural development and economic growth in general. For instance, Adegbe, Ajayi, Agugum and Otolaiye (2023) empirical evidence from descriptive and inferential support GDP growth rate is significant and positively related to sustainable growth. Furthermore, the paper posits insignificant but positive effect of infrastructural expenditure to sustainable growth.

Ogbonna (2021) conducted research on the impact of non-oil revenue and economic growth in Nigeria between 1981 and 2019. The study employed ARDL model to examine the impact and the result showed that non-oil revenue has positive and significant impact on economic growth in Nigeria. Yusuf (2021) carried out research on the dynamic impact of VAT on economic growth in Nigeria between 1994 and 2019. The study utilized dynamic ordinary least square method to examine the impact and the result showed that VAT has positive relationship with economic growth in Nigeria. Ideh. (2021) empirically examined the impact of non-oil sector revenue on economic growth in Nigeria from 2000 to 2019. Vector autoregressive method was employed and it

revealed that the revenues generated by sectors categorized under non-oil contribute to the growth of Nigeria economy between 2000 and 2019. Fossong (2021) empirically analyzed the effect of oil and non-oil revenue on economic growth in Cameroon from 1980 to 2018. The study employed ARDL method of analysis and the result revealed that non-oil revenue exerts negative but significant impact on economic growth in the long run while in the short run, it has positive and statistically significant.

Nedra and Kavita (2020) also examined the impact of non-oil revenue on the economy of Saudi Arabia for the period of 1994 to 2019, using descriptive statistics and correlation analysis. The findings showed that non-oil revenue (VAT, CIT, PIT) exerts positive and industrial impact on economic growth in Saudi Arabia. Owuru and Olabisi (2020) studied the impact of non-oil revenue on economic growth in Nigeria from 2011 to 2016. The study utilized fully modified ordinary least square method and the result showed that non-oil revenue impacts negatively on economic growth in Nigeria.

Adeusi (2020) studied the impact of non-oil revenue on economic growth in Nigeria between 1994 and 2018. The variables used in the study include value added tax (VAT), companies' income tax (CIT), personal income tax (PIT) and customs and excise duties (CED). The study utilized ordinary least square method to estimate the parameters of the model. The study found that VAT and CED have positive and significant impact on economic growth while PIT and CIT have negative but significant impact on economic growth in Nigeria.

Also, Adeigbe. (2020) investigated the impact of non-oil revenue on economic growth and development in Nigeria between 1994 and 2017, using multiple regression model. The findings showed that value-added tax and company income tax have positive and significant effect on economic growth and development in Nigeria. Uremadu. (2020) studied the impact of non-oil revenue on economic growth of Nigeria, spanning from 1994 to 2017. The study utilizes Autoregressive Distributed Lag model and the findings showed that Value-Added Tax is positive but insignificant on the economy of Nigeria. Olowo, (2020) studied the impact of non-oil revenue on economic growth in Nigeria between 1981 and 2018, using ARDL model. The findings revealed that sectoral distribution of non-oil revenue is positive and significant to economic growth in Nigeria. Raja and Assil (2020) studied the impact of non-oil revenue on economic growth in Saudi Arabia from the period of 1990 to 2018, using ordinary least square method. It was revealed from the study that non-oil revenue has negative effects on economic growth in the study area.

Ilori and Akinwumi (2020) examined the effect of oil and non-oil revenue on economic growth in Nigeria. The study covered the period of 1989 to 2018 and utilized error correction mechanism to examine the effect. The findings showed that oil and non-oil revenue harms real gross domestic product in Nigeria. Alexander, (2019) also utilized ARDL model to study the impact of taxation on economic growth in Nigeria between 1980 and 2018. The result showed that petroleum profit tax, personal income tax and value-added tax have significant effects on economic growth process in Nigeria.

Yahaya and Yusuf (2019) studied the impact of non-oil revenue on economic growth in Nigeria spanning from 1981 to 2018. The study employed Autoregressive Distributed Lag model and the result showed that Value-Added Tax, Companies Income Tax and Customs and Excise Duties have positive but insignificant impact on economic growth. Zeraibi and Subhadeep (2019) studied the impact VAT on economic growth in China between 1985 and 2016. The study uses ARDL model and it was found out that VAT has positive relationship with economic growth GDP both in the short and long run in China. Osho (2018) examined the impact of company income tax on gross domestic product in Nigeria between 1993 and 2017. The ordinary least square method of analysis was employed and the findings revealed that company income tax has positive as well as significant impact on gross domestic product in Nigeria. Omodero (2018) investigated the impact of internally Generated Revenue on Economic Development in Nigeria from 1981 to 2016, using ex-post facto research design. The findings show that federal government independent revenue has positive and significant impact on economic development in Nigeria.

Asaolu . (2018) employed ARDL model to study the impact of non-oil revenue on economic growth in Nigeria from 1994 to 2015. The findings showed that CIT has negative but significant impact on economic growth in Nigeria. Likita (2018) also examined the impact of non-oil revenue on economic growth in Nigeria between 1981 and 2016, using error correction model and the result showed that company income tax has negative

relationship with gross domestic product in Nigeria. Salami (2018) used ordinary least square method to analyze the impact of non-oil revenue on economic growth in Nigeria between 1981 and 2016. It was revealed that non-oil revenue has significant impact on economic growth in Nigeria. Aderoju (2017) studied the empirical analysis of oil revenue, non-oil revenue and economic development in Nigeria between 1980 and 2015, using ordinary least square method. The result showed that non-oil revenue has a positive and significant relationship on economic development in Nigeria.

Nwaeze. (2017) also studied the impact of non-oil revenue on economic growth in Nigeria spanning from 1994 to 2015, using ordinary least square method. The result showed that value-added tax, agricultural revenue, manufacturing revenue exerts positive and significant impact on economic growth in Nigeria. Oraka (2017) examined the impact of non-oil revenue on economic growth in Nigeria from 2003 to 2015, using simple regression analysis. The result showed that VAT has no significant effect on economic growth in Nigeria.

Owan, Ndibe and Anyanwu (2020) observed positive and significant effect of non-oil gross domestic product on economic growth. The exchange rate on the other hand reveals negative but significant effect economic growth in Nigeria under the period of investigation. Moreover, economic growth receives positive but insignificant shock from non-oil export and investment in the country.

Odi (2015) the estimated results using ordinary least squares method and found moderate effect of non-oil diversification to economic growth in Nigeria. Moreover, increase in non-oil export product has a positive impact on productive capacity on goods and services under the period of investigation.

In investigating the challenges and prospects of economic diversification and national development in Nigeria by Olamide, Kalu, Soloman and Joseph (2019) found that the connection between economic expansion and national advancement is positive and statistically significant. In applying Autoregressive Distributed Lag Model by Riti, Gubak and Madina (2016) in analyzing the growth of non-oil sectors as key to diversification of economic performance in Nigeria. The study confirmed the mixture or combination of variable and the existence of co-integration which justifies the application of ARDL. The findings show that agricultural, manufacturing and telecommunication component Granger cause economic growth at five percent level of significant. Also, agriculture and telecommunication component parameters contribute positively to economic growth in the long run while manufacturing component contributes negatively to growth in Nigeria. The speed of adjustment of error correction mechanism from short run to long run is statistically significant and negative.

Similarly, Oyelami and Alege (2018) investigate macroeconomic implication of trade diversification in Nigeria and found that trade diversification enhances economic growth and also reduces exchange rate movement. The results from the bound test confirm the existence of co-integration of trade diversification on both economic growth and exchange rate movement in the country.

Baghebo and Atima (2013) studied the impact of petroleum on economic growth in Nigeria using data covering the period 1980-2011. The regressand is Real Gross Domestic Product (RGDP) while Foreign Direct Investment (FDI), OIL revenue (OIL), Corruption Index (CI), External Debt (EXDEBT) was the regressors. The results of the Johansen co-integration test revealed that the variables: oil revenue and corruption index impact negatively on Real GDP, while FDI and EXDEBT have positive impact on the growth of the economy.

Adesoji and Sotubo (2013) evaluated the effectiveness of the Nigerian export promotion strategies in diversifying the productive base of the Nigerian economy from crude oil as the major source of foreign exchange. The OLS was used to run the data from 1981 through 2010. The results showed that non-oil exports have performed below expectations. Alley, Asekomeh, Mobolaji and Adeniran (2014) examined the impact of oil price shocks on the Nigerian economy. The researchers used the General Methods of Moment (GMM) to test the data from 1981 to 2012. The study found that oil price shocks insignificantly retard economic growth while oil price itself significantly improves it. Oladele and Aderemi (2020) examined the impact of the Nigerian Extractive Industries Transparency Initiative (NEITI) in promoting revenue transparency in the oil and gas industry. The study employed the OLS regression technique to analyze both the primary and secondary data collected. Results indicated that the establishment of NEITI has helped in reducing corruption and also encouraged tighter scrutiny of oil revenue flows.

Bakare and Fawehinmi (2011) examined the econometric analysis of the extent to which oil revenue has affected standard of living in Nigeria. The OLS regression technique was used to analyze the secondary data from 1975 to 2008. The results showed a significant and negative relationship between oil revenue and standard of living in Nigeria.

Hodo, Emmanuel, Amenawo and Cornelius (2013) explored the relationship between oil revenue shock, non-oil export and industrial output in Nigeria using data spanning the period 1970-2010. Vector Autoregressive (VAR) model and co-integration technique were used to examine the long run relationship, while the Vector Error Correction Model (VECM) was used to analyze the short-run behaviour of the variables. The short-run result showed that it would take a very slow process for industrial output to recover from shock arising from variation in oil revenue while the long run result shows that oil revenue shock and policy/regime shift had negative impact on industrial output and non-oil export.

Kareem, Bakare, Ademoyewa, Ologunla and Arije (2015) studied the nexus between the Nigerian government's expenditure on agricultural sector, agricultural output and economic growth. Secondary data from 1979 to 2013 were used, analysed by the OLS regression technique. The results indicated that government spending on agricultural sector has significant impact on economic growth.

Ehigiamusoe (2012) investigated the performance of the agricultural sector under the military and the civilian regimes in Nigeria comparing the proportion of public expenditures on agriculture with the allocations to other sectors of the economy. Descriptive statistics was used to analyze the secondary data from 1984-1998 (military) and 1999-2012 (civilian). The results showed that there is a positive relationship between public expenditure on agriculture and agricultural performance under either regime.

Oladipo and Fabayo (2012) investigated the effect of the global recession and the oil sector on economic growth in Nigeria. Data covering the period 1990-2006 were used while the OLS was used to analyze the effect of oil activities on gross domestic product. The result revealed that there was a negative relationship between GDP and oil produced.

Aroriode and Ogunbadejo (2014) examined the impact of macroeconomic policy on agricultural growth in Nigeria. Time series data from 1970 to 2010 were analyzed using the OLS regression technique. The result showed that there is a positive relationship between agricultural output and GDP.

Ugwuanyi and Matthew (2015) researched on the contribution of agriculture, petroleum, human capital to the economic growth in Nigeria. Time series data for the period 1970-2012 were used for this study. The results of the OLS regression technique showed that while agriculture and petroleum contribute positively and significantly to economic growth, human capital contributes negatively and insignificantly to output growth.

METHODOLOGY

Model Specification

The study is anchored on the Endogenous Growth Theory as developed by Pagano in 1993. The Endogenous Growth Theory explains the lasting effects of non-oil sector diversification on the economic development in advanced and developing nations such as Nigeria.

The econometric form of the model

$$AGRQ_t = \alpha_0 + \alpha_1 OREV_t + \alpha_2 NOREV_t + \alpha_3 OP_t + \alpha_4 EXCH_t + \mu_t \quad 3.3$$

Where:

$\alpha_0, b_0 =$ Constants parameters in the models

$\alpha_1,$ = parameter for OREV

α_2 , = parameters for NOREV

α_3 , = parameters for OP

α_4 , = parameters for EXCH

't' = time series trend, and μ_t = Stochastic error term

NON-LINEAR AUTO REGRESSIVE DISTRIBUTION LAG (NARDL)

In order to capture the nonlinear and asymmetric co-integration between the variables used in this study, the study used the Nonlinear ARDL (NARDL) bound testing approach developed by (Shin, 2014). NARDL makes distinction between short term and long-term changes of the independent variables and the dependent variables. NARDL allow the combination of different integration orders, and it also allows incorporating the possibility of asymmetric effect of negative and positive changes in the independent variables on the dependent variables,

Equation (2) is modified to an asymmetric long run equation as:

$$LNAGRQ_t = \alpha_0 + \alpha_1 POS_t + \alpha_2 NEG_t + \alpha_3 OREV_t + \alpha_4 NOREV_t + \alpha_5 OP_t + \alpha_6 EXCH_t \mu_t \dots \dots \dots (3)$$

Where $\alpha_0, \alpha_1, \alpha_5$ are long run parameters to be estimated and μ_t is the stochastic error term. The constant term α_0 captures all the exogenous factors such as a constant term, linear trend and dummy variable for structural breaks, if any. In equation (3), POS and NEG represent the element of asymmetry in ARDL model. The values of POS and NEG are generated by computing

$$POS = \sum_{i=1}^K \Delta OP_j^+ = \max(\Delta OP_j, 0) \dots \dots \dots (4)$$

And

$$NEG = \sum_{i=1}^K \Delta OP_j^- = \min(\Delta OP_j, 0) \dots \dots \dots (5)$$

Where POS is the partial sum of positive changes in OP, and NEG is the partial sum of negative change in OP. The impact of oil price on fiscal policy may be asymmetric. The equation can be framed in ARDL setting the line of Pesaran and Shin (1999) and Pesaran et al. 2001) as:

$$\begin{aligned} \Delta \ln(AGRQ)_t &= \alpha_0 + \alpha_1 \ln(AGRQ)_{t-1} + \alpha_2 \ln(OREV)_{t-1} + \alpha_3 \ln(NOREV)_{t-1} + \alpha_4 \ln(OP)_{t-1} + \alpha_5 \ln(EXCH)_{t-1} \\ &+ \sum_{i=1}^S \theta_{0i} \Delta(AGRQ)_{t-i} + \sum_{i=1}^S \theta_{1i} \Delta(OREV)_{t-i} + \sum_{i=1}^S \theta_{2i} \Delta(NOREV)_{t-i} + \sum_{i=1}^S \theta_{3i} \Delta(OP)_{t-i} + \sum_{i=1}^S \theta_{3i} \Delta(EXCH)_{t-i} \\ &+ \sum_{i=1}^S (\theta_j^+ \Delta OREV_j^+ + \theta_j^- \Delta NOREV_j^-) \dots \dots (6) \end{aligned}$$

All variables defined above in lag orders, the aforementioned long run impact of increase in oil and non-oil revenue and its reduction in agricultural output. $\sum_{i=1}^S (\theta_j^+)$ Measures the short run influence of oil and non- oil revenue increase on agricultural output while; $\sum_{i=1}^S (\theta_j^-)$ the short run influences of oil reduction on economic output. Hence, in addition to the asymmetric long run relation, the asymmetric short run influences of oil price changes on Agricultural output are also captured.

Apriori Expectation

$$(AGRQ): \frac{\partial OILREV}{\partial AGRQ} > 0; \frac{\partial NOILREV}{\partial AGRQ} > 0; \frac{\partial OP}{\partial AGRQ} > 0; \frac{\partial EXCHR}{\partial AGRQ} > 0$$

RESULTS AND DISCUSSION

Descriptive Summary Statistics

Table 4.1: Descriptive Statistics

	AGRQ	OREV	NOREV	OP	EXCH
Mean	5.514634	2611.590	1436.733	44.28390	119.0578
Median	3.930000	1707.600	501.0000	29.04000	118.5700
Maximum	55.58000	8879.000	7944.560	109.4500	448.0000
Minimum	-4.380000	7.300000	3.000000	12.28000	0.670000
Std. Dev.	8.781364	2656.534	1931.354	30.51537	120.8529
Skewness	4.693546	0.616531	1.554127	0.867283	1.051039
Kurtosis	27.28028	2.170761	4.960449	2.453514	3.366724
Jarque-Bera	1157.652	3.772136	23.07035	5.650084	7.778408
Probability	0.000000	0.151667	0.000010	0.059306	0.020462
Sum	226.1000	107075.2	58906.06	1815.640	4881.370
Sum Sq. Dev.	3084.494	2.82E+08	1.49E+08	37247.52	584216.7
Observations	41	41	41	41	41

Source: Author's computation (2024)

To get a feel of the time series data employed for the study, the descriptive statistics for the variables; Agricultural Output (AGRQ), Oil revenue (OREV), Non-Oil Revenue (NOREV), Oil Price (OP), and Exchange Rate (EXCH) were obtained. The results shows that within the 41-year period (1981-2022), (AGRQ) was lowest at about 4.4% annual growth rate as at 1981, and highest at about 55.6% in 2022. In the case of the oil revenue (OREV), the minimum recorded during the 41-year period is 7.3 billion, whilst the maximum is about 8879 billion.

The probability values all the variable assumes normal distributions expect oil revenue. We can therefore conclude that the variables are reliable enough for further studies.

Unit Root Test

Table 4.2: ADF & PP Unit Root Results

Augmented Dickey-Fuller Unit Root Test							
	At Level			At 1 st Differencing			
VARIABLES	ADF Statistics	5% Critical Value	Remarks	ADF Statistics	5% Critical Value	Remarks	Order of Integration
LNAGRQ	-3.893223	-2.948404	Stationary			Stationary	I (0)
LNOREV	-1.678871	-2.935001	Not Stationary	-6.270150	-2.936942	Stationary	I (1)
LNNOREV	-1.078506	-2.936942	Not Stationary	-7.622656	-2.936942	Stationary	I (1)

LNOP	-0.897119	-2.935001	Not Stationary	-5.271072	-2.936942	Stationary	I (1)
LNEXCH	-2.123268	-2.935001	Not Stationary	-3.821809	-2.936942	Stationary	I (1)

Source: Author’s computation (2024)

The Augmented Dickey-Fuller unit root test and the Phillips-Perron Unit Roots test was performed. The test result was presented in table 4.2.

The a priori expectation when using the ADF is that a variable is stationary when the value of the ADF test statistic is greater than the 5% critical value, Only Agricultural output (AGRQ) became stationary at level. The other variables had to be differenced at first difference to become stationary. Thus, Augmented Dickey-Fuller unit root tests showed that the log of the variables Oil Revenue (LNOREV), Non-Oil Revenue, (LNNOREV), Oil Price (LNOP), and Exchange Rate (LNEXCH) are all stationary after first difference (ADF Statistics > 0.05 critical value) i.e. there is a mixed order of integration.

Co-Integration Test

Table 4.3: NARDL Bound Test

OP---RGDP	F-Statistics	Lower bound	Upper bound	Conclusion
(I)	4.810864	2.17	3.21	Cointegration

Source: Authors computation using Eviews10 (2024)

From Table 4.2, the F statistic (4.81) is larger than the upper bound critical value (3.21) at 5% significance level, which indicates the occurrence of co-integration (or long-run relationship) between Oil and Non-oil Revenue on Agricultural output in Nigeria.

Result of Nonlinear ARDL Estimation

Table 4.4 Nonlinear Autoregressive Distributed Lag (NARDL) Estimation Results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	1.40762	0.733421	1.919253	0.0719
DLNOREV	0.092079	0.226534	0.40647	0.6895
DLNOREV	-0.84111	0.203165	-4.14002	0.0007
DLNNOREV	0.245562	0.252495	-0.97254	0.3444
DLNOP	2.54207	0.534033	4.760133	0.0002
LNOREV	0.146445	0.478966	0.305752	0.7635
LNOREV_POS	0.092079	0.544001	0.169263	0.8676
LNOREV_NEG	0.953812	0.789158	1.208645	0.243
LNNOREV_POS	0.612427	0.361965	1.691948	0.1089
LNNOREV_NEG	4.633955	1.538753	3.0115	0.0079
LNOP_POS	-0.46015	0.361071	-1.2744	0.2197

LNOP_NEG	-0.46121	1.073663	-0.42957	0.6729
LNEXCH	0.571432	0.48337	1.182183	0.2534
CointEq (-1)	-0.95514	0.119698	-7.97955	0
Adjusted R²	0.808758			

Source: Authors computation using Eviews10 (2024)

Table 4.4 above is the Nonlinear Autoregressive Distributed Lag (NARDL) Estimation Results, LNOREV, LNNOREV, LNEXCH, are the estimated long-run coefficients related with positive and negative changes in oil prices on agricultural output in Nigeria.

The results from the table indicate that asymmetric changes in oil revenue, non-oil revenue and oil price have a positive and insignificant relationship with the agricultural output in both the short run and long run. Result suggests that when oil revenue increase by 1% increase, it cause agricultural output to increase by 0.92% in the in the short run.

Furthermore, positive oil revenue shows a positive but insignificant relationship with agricultural output in the long run and 1% increase oil revenue led to increase in agricultural output by 0.09%. Similarly, negative oil revenue shows a positive but insignificant connection with agricultural output. 1% decrease in oil revenue led to increases agricultural output by 0.95%. This asserted that both positive and negative change in oil revenue leads to increase in agricultural output but in an insignificant measure.

In the same order, positive non-oil revenue shows a positive but insignificant relationship with agricultural output in the long run and 1% increase non-oil revenue led to increase in agricultural output by 0.61%. Similarly, negative non-oil revenue shows a positive and significant connection with agricultural output. 1% decrease in non-oil revenue led to increases agricultural output by 4.6%. This asserted that both positive and negative change in non- oil revenue leads to increase in agricultural output but in an insignificant measure.

Positive oil price shows a negative relationship with agricultural output in the long run and a 1% increase oil price led to decrease in government expenditure by 0.95%.

Table 4.5: Wald Test Result

Wald Test:			
Equation: Untitled			
Test Statistic	Value	Df	Probability
F-statistic	970.9997	(6, 20)	0.0000
Chi-square	5825.998	6	0.0000

Source: Authors computation using Eviews 10 (2024)

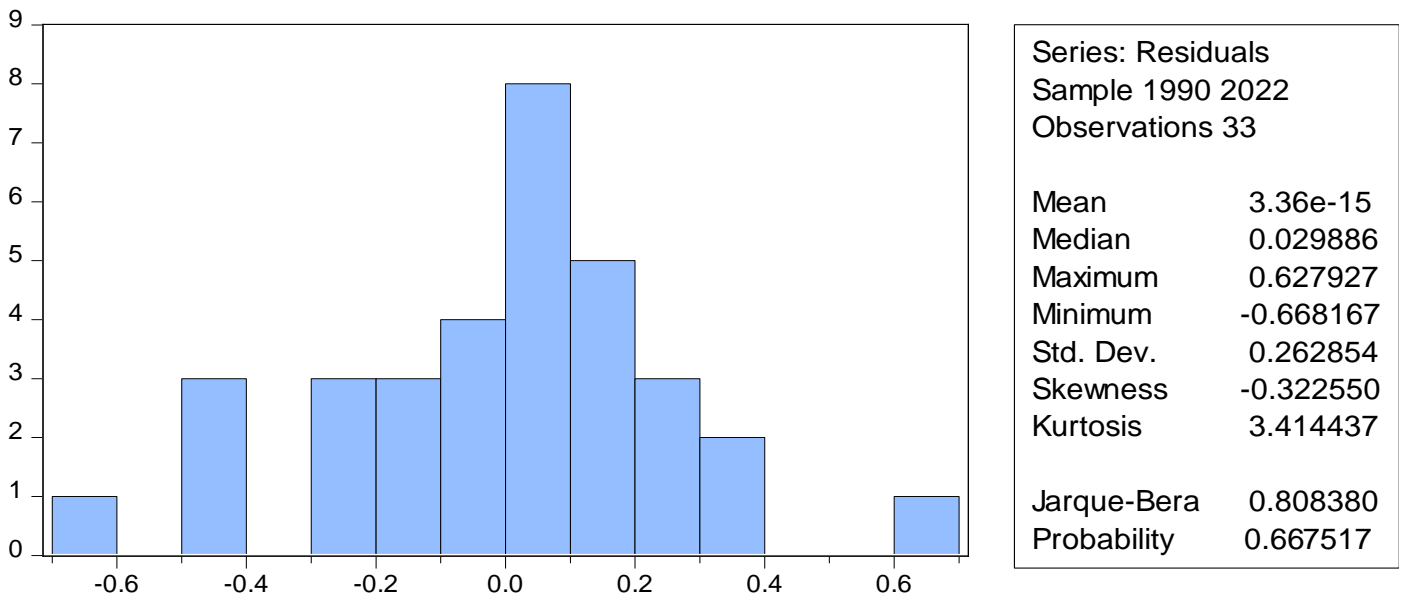
The Wald test was conducted in order to check for asymmetric relationship between oil and non-oil revenue on agricultural output growth in Nigeria. It is noticed that both the probability value of F- statistics and Chi-square are less than 5%. This is evidence that there is long run asymmetric relationship between oil and non-oil revenue on agricultural output growth in Nigeria.

Diagnostic Tests

Following the estimates of the NARDL model, five diagnostic tests were performed to verify the accuracy, reliability and stability of the model.

Residual Diagnostic Tests

Figure 4.6 Normality Test



Source: Authors computation using Eviews 10 (2024)

The residual normality test measures normality of the residuals of the dependent variable which would indicate that nothing more can be gleaned from the dependent variable. According to table 4.6, the probability that the residuals are normal (0.808380) is greater than 0.05, indicating that the null hypothesis cannot be rejected. Thus, the residuals are normal.

Table4.6.1: Ramsey Reset Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.749107	Prob. F (2,15)	0.4897
Obs*R-squared	2.996754	Prob. Chi-Square (2)	0.2235

Source: Authors computation using Eviews 10 (2024)

Similarly, the Residual Serial Correlation LM Tests shows that there is no serial correlation, no heteroscedasticity and the model is reliable; the Ramsey regression specification error test (RESET) determined that the model is well specified and does not require additional independent variable to explain AGRQ.

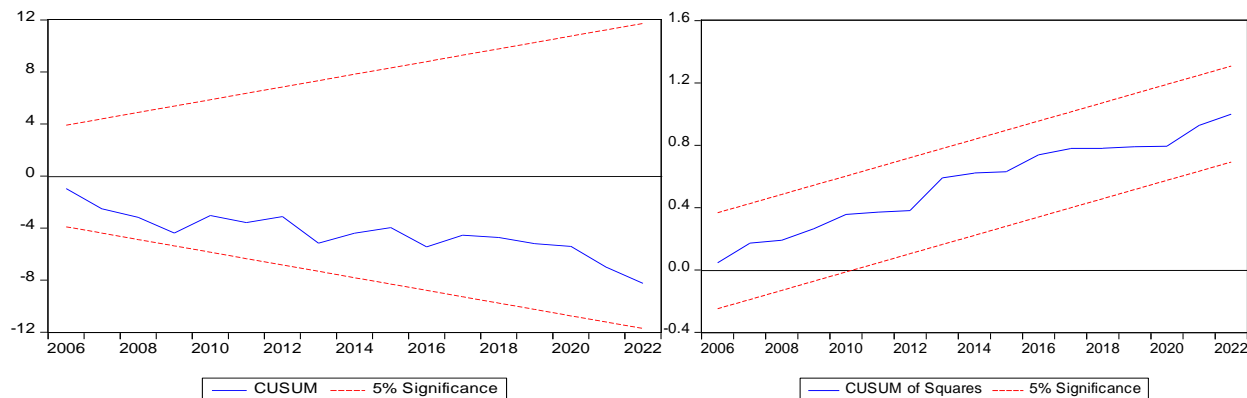
Table4.6.2: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.866949	Prob. F (15,17)	0.1083
Obs*R-squared	20.53451	Prob. Chi-Square (15)	0.1524
Scaled explained SS	6.578699	Prob. Chi-Square (15)	0.9683

Source: Authors computation using E-views 10 (2024)

The Heteroskedasticity test shows that the value of the probability is greater than 0.05, we therefore conclude that there is no presence of Heteroskedasticity in the model.

Figure 4.6.2: Stability Test



Source: Authors computation using Eviews 10 (2024)

To check the stability of the data employed in the model the cusum and cusum of square test was carried out. The figure above shows that the data are stable because the blue dotted line falls in between the red dotted lines.

FINDINGS

The findings show that both the positive and negative changes in oil and non-oil revenue will have a positive but insignificant increase in agricultural output in Nigeria from the period under investigation. This could be attributed to the poor channeling of these funds to the right channels through budgetary allocation and other medium to create a boost in the agricultural sector. The positive impact of oil and non-oil revenue on agriculture output indicates that Nigeria can be an export giant in both oil and non-oil products but further ways in which this positive but insignificant effect of oil and non-oil revenue on agricultural output will be discussed extensively under the recommendation. The empirical analysis showed that there existed an insignificant long run relationship between oil revenue and agricultural output and also an insignificant long run relationship between non-oil revenue, exchange rate and agricultural output, while there exist a significant relationship between oil price and agricultural output.

RECOMMENDATIONS

On the basis of the findings, the study made the following recommendations; Sustained increase investment in agriculture by both public and private sector for enhance increase in agricultural output and national food security.

Furthermore, Government should encourage local production through coordinated fiscal and monetary policies to reduce importation and and boost domestic production.

Finally, Nigeria needs to focus its anti-corruption fight on long-term, high return institution building activities, coupled with the justice infrastructure and political will to hold those who transgress accountable. By so doing, the government can achieve having the country prosper in both oil and non- oil sector.

REFERENCE

1. Adesoji, A. A., &Sotubo, O. D. (2013). Non-oil exports in the economic growth of Nigeria A study of agricultural and mineral resources. *Journal of Educational and Social Research*, 3(2), 403-418.
2. Adeyemi, K. S., &Abiodun, A. J. (2013). Development of the non-oil sector in Nigeria: Challenges and lessons for less developed countries. *Covenant Journal of Business and Social Sciences (CJBSS)*, 5(1), 1-22.
3. Adegbie, F. F., Ajayi, A., Aguguom, T. A., &Otitolaiye, E. D. (2023). Diversification of the economy, tax revenue and sustainable growth in Nigeria. *International Journal of Innovative Research and Scientific Studies*, 6(1), 115-127.

4. Adeusi, A. S., Uniamikogbo, E., Erah, O. D., & Aggreh, M. (2020). Non-oil revenue and economic growth in Nigeria. *Research Journal of Finance and Accounting*, 11(8), 95-106.
5. Adeigbe, O. C. Egbo, O. K., & Esegbue, O. (2020). Geochemical Characterization of Some Biodegraded Oils from the Niger Delta Basin, Nigeria. *Environmental & Earth Sciences Research Journal*, 7(4).
6. Aderoju, O. M., Dias, G. A., & Echakraoui, Z. (2017, December). Assessment of renewable energy sources & municipal solid waste for sustainable power generation in Nigeria. In *IOP Conference Series: Earth and Environmental Science* (Vol. 95, No. 4, p. 042043). IOP Publishing.
7. Adesoji, A., Adenugba, & Dipo, S. O. (2013). Non-oil exports in the economic growth of Nigeria: A study of agricultural and mineral resources. *Journal of Educational and Social Research*, 3(2), 403.
8. Alexander, A., De Vito, A., & Jacob, M. (2020). Corporate tax reforms and tax-motivated profit shifting: evidence from the EU. *Accounting and Business Research*, 50(4), 309-341.
9. Akinlo, A. E. (2012). How Important is Oil in Nigerias Economic Growth? *Journal of Sustainable Development*, 5(4), 165.
10. Asaolu., & Yusuf, K. Yahaya, K. (2019). Impact of non-oil tax revenue on economic growth in Nigeria. *The journal of accounting and management*, 9(2), 56-69.
11. Aroriode, O. R., & Ogun Badejo, H. K. (2014). Impact of macroeconomic policy on agricultural growth in Nigeria. *IOSR Journal of Agriculture and Veterinary Science*, 7(11).
12. Auty, R., & Warhurst, A. (1993). Sustainable development in mineral exporting economies. *Resources Policy*, 19(1), 14-29.
13. Baghebo, M., & Atia, T. O. (2013). The impact of petroleum on economic growth in Nigeria. *Global Business and Economics Research Journal*, 2(5).
14. Bakare, A. S., & Fawehinmi, F. O. (2011). An econometric study of the contribution of oil sector to the standard of living in Nigeria. *Asian Journal of Business and Management Sciences*, 1(3).
15. Collier, P., & Hoeffler, A. (1998). On economic causes of civil war. *Oxford economic papers*, 50(4), 563-573.
16. Ehigiamusoe, U. K. (2012). A comparative analysis of agricultural performance between the military and civilian regimes in Nigeria. *International Journal of Humanities and Social Science Invention*, 1(1), 13-23.
17. Ehigiamusoe, U. K. (2012). A comparative analysis of agricultural performance between the military and civilian regimes in Nigeria. *International Journal of Humanities and Social Science Invention*, 1(1).
18. Fossong, D., Ndamsa, D. T., & Mofor, G. Z. (2021). An Empirical Analysis of the Modulating Effect between Oil and Non-Oil Revenue in Explaining Economic Growth in Cameroon. *Neuroeconomics*, 40(1).
19. Hodo, B. R., Emmanuel, S. A., Amenawo, I. O., & Cornelius, M. O. (2013). Nexus between oil revenue, non-oil export and industrial output in Nigeria: An application of the VAR Model. *International Journal of Financial Economics*, 1(2).
20. Ideh, A. O., Okolo, N. M., & Emengini, E. S. (2021). Non-oil sector and economic growth in Nigeria: the national accounts perspective. *European Journal of Sustainable Development*, 10(1), 185-185.
21. Ilori, F., & Akinwunmi, A. (2020). Comprehensive analysis of the effect of oil and non-oil revenues on economic development in Nigeria. *International Journal of Accounting Research*, 5(3), 93-106.
22. IMF. (2015). Selected issues paper on Nigeria. *International Monetary Fund Country Report*. Mohsen, M., Maysam, M., & Abbas, R. K. (2012). The relationship between revenue and expenditure in oil exporting countries. *International Journal of Business and Behavioral Sciences*, 2(6).
23. Kareem, R. O., Bakare, H. A., Ademoyewa, G. R., Ologunla, S. E., & Arije, A. R. (2015). Nexus between federal government spending on agriculture, agricultural output response and economic growth of Nigeria (1979–2013). *American Journal of Business, Economics and Management*, 3(6), 359-366.
24. Likita (2018) The impact of non-oil export strategies on economic growth in Nigeria (1970-2013). *Journal of Economic and Sustainable Development*, 5(24).
25. . Ross, M.L (2001). Does oil hinder democracy? *World politics*, 53(3), 325-361.
26. Nedra., Shili, & Panjwani, K. (2020). Non-oil Revenue Impact on Economic Growth: Empirical Study of Saudi Arabia's Economy. *Business and Economic Research*, 10(4), 13-25.
27. Nwanchukwu, P. O. (2014). The impact of non-oil export strategies on economic growth in Nigeria (1970-2013). *Journal of Economic and Sustainable Development*, 5(24).
28. Nwaeze, O. E., & ekane, R. O. (2022). OIL AND NON-OIL REVENUE AND THE NIGERIAN ECONOMY. *International Journal of Management & Entrepreneurship Research*, 4(11), 441-457.
29. Odusola, A. (2006). Tax policy reforms in Nigeria. *World Institute for Development Economics Research*,

- 2006(3).
30. Ogbonna, C. N., &Nwoba, E. G. (2021). Bio-based flocculants for sustainable harvesting of microalgae for biofuel production. A review. *Renewable and Sustainable Energy Reviews*, 139, 110690.
 31. Oladele, R., &Aderemi, A. A. (2013). Revenue generation and transparency in Nigerian oil and gas industry: Position of Nigerian extractive industry transparency initiatives (NEITI). *Research Journal of Finance and Accounting*, 4(8).
 32. Oladipo, S. O., &Fabayo, J. O. (2012). Global recession, oil sector and economic growth in Nigeria. *Asian Transactions on Basic and Applied Sciences*, 1(6).
 33. Olajide, O. T., Akinlabi, B. N., &Tijani, A. A. (2014). Agricultural resource and economic growth in Nigeria. *European Scientific Journal*, 8(22).
 34. Olaleye, S. O., Edun, F., Bello, H. T., &Taiwo, S. B. (2014). Government expenditure and economic growth: An empirical analysis of the Armey Curve in Nigeria. *Romanian Economic Journal*, 17(51), 47-66.
 35. Olujobi, O. J., Olarinde, E. S., Yebisi, T. E., &Okorie, U. E. (2022). COVID-19 pandemic: The impacts of crude oil price shock on Nigeria's economy, legal and policy options. *Sustainability*, 14(18), 11166.
 36. Olamide, O. F., Kalu, A. E., & Joseph, O. (2019). Economic diversification and national development in Nigeria: Challenges and prospects. *International Journal of Mechanical Engineering and Technology*, 10(8).
 37. Ogunjimi, O., Aderinto, E., &Ogunro, T. (2015). An empirical analysis on the relationship between non-oil exports and economic growth in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, 5(12), 68-78.
 38. Eslami, L. O., &Alege, P. O. (2018). Macroeconomic implications of trade diversification in Nigeria. *CBN Journal of Applied Statistics*, 9(1), 23-45.
 39. Olowo, S. O., Daramola, K. O., Ogunsanwo, O. F., &Edewusi, D. G. (2020). Sectorial Contributions of Non-Oil Revenue to Economic Growth in Nigeria. *Open Access Library Journal*, 7(8), 1-21.
 40. Omodero, C. O., Ekwe, M. C., &Ihendinihu, J. U. (2018). The impact of internally generated revenue on economic development in Nigeria. *Accounting and Finance Research*, 7(2), 166-173.
 41. Osho, A. E., Adeseyoju, A. A., &Idowu, A. S. (2019). Capital Gains Tax on Investment, Infrastructural Facilities Provision and Gross Domestic Products in Nigeria.
 42. Oraka, A. O., Okoye, J. A., &Ezejiofor, R. A. (2019). Determinants of financial reporting timeliness: an empirical study of Nigerian deposit money banks. *International Journal of Advanced Academic Research| Social and Management Sciences*, 5(9), 18-35.
 43. Owuru, J. E., &Olabisi, O. E. (2020). Revenue beyond Oil Reliance: Can Nigeria Leverage Non-oil Tax Revenue for Inclusive and Pro-poor Growth?
 44. Raja, Almarzoqi., & El Mahmah, A. (2020). Non-Oil Revenue and Economic Growth on major net oil exporters? Evidence from Saudi Arabia.
 45. Riti, J. S., Gubak, H. D., &Madina, D. A. (2016). Growth of non-oil sectors: A key to diversification and economic performance in Nigeria.
 46. Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of political economy*, 94(5), 1002-1037.
 47. Ugwuanyi, C. U., & Matthew, A. (2015). An empirical investigation of the contribution of agriculture, petroleum and development of human capital to the economic growth in Nigeria, 1970-2012. *British Journal of Economics, Management & Trade*, 7(1).
 48. Uremadu, S. O., Nwaeze, C., &Duru-Uremadu, C. E. (2020). Impact of Non-Oil Revenue on Economic Growth of Nigeria (1994-2017): An Empirical Analysis. *International Journal of Research and Innovation in Applied Science*, 5(6), 46-64.
 49. Uzonwanne, M. C. (2015). Economic diversification in Nigeria in the face of dwindling oil revenue. *Journal of Economics and sustainable development*, 6(4), 61-67.
 50. World Bank. (1988). *Oil windfalls: Blessing or Curse?* Alan Gelb and Associates. A World Bank Research Publication Published for The World Bank Oxford University Press.
 51. Yahaya, K. A., & Yusuf, K. (2019). Impact of non-oil tax revenue on economic growth in Nigeria. *The journal of accounting and management*, 9(2), 56-69.
 52. Zeraibi., Ayoub, & Mukherjee, S. (2019). Value Added Tax and economic growth: An empirical study of China perspective. *Significant: JurnalIlmuEkonomi*, 8(2), 235-242.