

## Crude Oil Export Earnings and Economic Growth in Nigeria

**Imoh Kingsley Ikpe, Ph.D**

*Department of Economics*

*Faculty of Social Sciences*

*Akwa Ibom State University*

*Email: kngslyikpe@yahoo.com*

*Phone: 08096953365,07080588368*

<https://orcid.org/0009-0003-8981-7526>

**Christian Effiong Bassey**

*Department of Economics*

*Faculty of Social Sciences*

*University of Calabar, Calabar, Nigeria*

*Email: xebazy04@gmail.com*

*Phone: 07034882592*

<https://orcid.org/0000-0003-2389-8055>

**Paul Umoren**

*Department of Economics,*

*Faculty of Social Sciences*

*Akwa Ibom State University*

*Email: emmanuelpaul959@yahoo.com*

*Phone: 09078734101,08051283058*

<https://doi.org/10.61090/aksujacog.2023.023>

### **Abstract**

*The crude oil sector is one of the main sectors saddled with the potential to employ a large segment of the population and is an essential key to the sustenance of the economic growth of countries. This study presented an empirical analysis of the impact of crude oil export earnings on economic growth in Nigeria spanning the period of 1981 - 2020. The model built for the study was the proxied Real Gross Domestic Product (RGDP) as the endogenous variable measuring economic growth as a function of Crude Oil Export (OEX), while Exchange Rate (EXR), Trade Openness (TOP) and Transportation Cost (TPC) were the exogenous variables. The annual time series data were gathered from CBN Statistical Bulletin, and the World Development Indicator (WDI). The study used econometric techniques of Augmented Dickey-Fuller (ADF) unit root test, Johansson co-integration, error correction model and Granger causality for empirical analysis. The results of unit root suggested that RGDP, OEX, EXR TOP, and TPC were stationary at first difference. The Johansson co-integration showed a long-run relationship among the variables. The findings from the ECM showed that crude oil exports have a positive and significant impact on the Nigerian economy. The study recommended that the activities by the government in promoting economic growth and development in the country should be geared towards promoting and developing the Oil export base of the country as it has a significant relationship with economic growth.*

**Keywords:** Crude oil earnings, economic growth, econometric analysis

## **Background to the Study**

Successful nations of the world never exist in isolation. The mono-nature of the Nigerian economy is a result of the inability of the key players of the economy to use the embedded natural and human resources to actualise the yearnings and aspirations of the populace and the overall growth and development of the economy, to the level of recognition of advancement in all spheres of life (Ikpe et al, 2018). Over the years, diverse research work has been carried out by different scholars on this subject with outstanding recommendations for the benefits of the economy. Despite this, the economy of Nigeria is still faced with some socio-economic issues such as poor income distribution, militancy, oil violence and theft in the Niger Delta region of Nigeria, endemic corruption, unemployment and relative poverty (Nwezeaku 2010).

The problems of the low economic performance of Nigeria cannot be attributed solely to the instability of earnings from the oil sector but as a result of the failure of the government to utilize the earnings from the export of crude oil from the mid-1970s to develop other sectors of the economy. Instead of relegating these sectors (especially, agriculture) to the background. Although large proceeds are obtained for the domestic sales and export of petroleum products, its effect on the growth of the Nigerian economy as regards returns and productivity is still questionable (Adedipe, 2014). For instance, available data reveal that Nigeria earned about 54.513 billion in 2018 from crude oil exports (OPEC 2018) yet Nigeria is among the poorest countries in the world, with the poverty incidence estimated at 54% in 2006 (Ikpe et al, 2015). The economy has been substantially unstable, a consequence of the heavy dependence on oil revenue and the volatility in the international prices of crude oil. The oil boom of the 1970s led to the neglect of non-oil tax revenue, expansion of the public sector and deterioration in financial discipline and accountability. In turn, oil revenue over-dependency exposed Nigeria to oil price volatility which threw the country's public finance into disarray.

Moreover, mismanagement of this oil revenue, over the years, has hindered the Nigerian economic reforms from achieving their full economic potential. In Nigeria, the exchange rate and its constant movement are of great importance to the general economy because their fluctuation affects the competence of the economy to attain optimal productive capacity. This is alarming given its macro-economic importance specifically in a highly import-dependent country like Nigeria (Olisadebe, 1991). The exchange rate reflects the ratio at which one currency can be exchanged with another currency. It is the value of a foreign nation's currency in terms of the home nation's currency. It also specifies how much one currency is worth in terms of the other. A viable exchange rate has been one of the most important factors for economic growth in the economies of most developed countries, whereas regular fluctuations in the exchange rate have been a major obstacle to the economic growth of many African countries of which Nigeria is not an exception. All policy measures put in place to stabilize the exchange rate, ranging from floating to fixed and most recently, multiple, have not been successful but leave many questions on the lips of many.

As the largest oil producer in Africa, it is expected that there should be an increase in the level of employment in the economy, as a higher demand for exports will require more production which will in turn lead to the employment of more people (Adenugbe & Dipo, 2013). The influence and the relationship between crude oil export and economic growth have been given much attention by different economists because of their immense contributions to the Nigerian economy.

For instance, Odularu (2010) observed that crude oil export contributes to the economic growth but has no significant improvement on the economic growth of Nigeria, without specifying if it is a short-run or a long-run phenomenon. Again, Eravwoke et al., (2014) in their study on crude oil export and its impact on Nigeria included inflation and real gross domestic product in their model. In contrast, this study excludes inflation from the model. The reason

behind this exclusion is that inflation has already been taken care of in the real gross domestic product.

Also, the work of Ugwu et al., (2017) used crude oil by barrel as well as crude oil revenue as explanatory variables in their model. Again, this study excludes crude oil by barrel on the ground that crude oil revenue is derived from crude oil by barrels. Also, there has been limited empirical work on the impact of crude oil export earnings on economic growth that spans from 1990 to 2021. Therefore, this study establishes the gap in these areas which it intends to fill. Thus, it is against this background that this study investigates the influence and impact of crude oil export earnings on economic growth in Nigeria. The main objective of this study is to provide an econometric analysis of the impact of crude oil exportation earnings on Nigeria's economic growth.

### **Literature Review**

One debate centres on whether countries should promote the export sector to obtain economic growth. An abundant empirical literature on this export-led growth hypothesis has followed empirical research studies that found a positive relationship between total exports and economic growth. The contribution of crude oil exports and economic growth has attracted the attention of different economists using different econometric techniques. The issue under review is a vital subject that should be subjected to painstaking empirical review to keep abreast with the positions of concerned researchers and scholars on this subject and to determine the research gap inherent in earlier related studies.

Hecksher-Ohlin Model explains that countries export what can be most efficiently and plentifully produced. This theory therefore argues that each country has a comparative advantage in that commodity which uses the country's abundant factor. Capital-abundant countries should specialize in the production and export of capital-intensive goods, while labour-abundant countries should specialize in the production and exportation of labour and land-intensive primary product exports. This model is used to evaluate trade and more especially the equilibrium of trade between two countries that have varying specialties.

The proponents of this theory of trade argue that trade can contribute largely to the development of primary products exporting countries through export earnings. However, dependency economists such as Emmanuel, Furtado and Frank strongly believe that the gain from international trade is biased and in favour of the advanced industrial countries and that foreign trade has inhibited industrial development in less developed countries (Olarola 2012). These economists see international trade as being irrelevant for LDCs and their development process as well.

The export-led growth theory hypothesis has been explored by various scholars using divergent econometric applications and data sets. Additionally, there exists a huge literature focusing on developing nations, using abundant pragmatic techniques and data sets (panel, cross-section, time series).

Nwoba & Abah (2010) conducted a study on the impact of crude oil revenue on the growth of the Nigerian economy between 1960 and 2010. The method of data analysis was the Ordinary Least Square (OLS) regression analysis. The result of the finding showed that there is a long-run relationship between crude oil proceeds and Gross Domestic Product (GDP). The findings revealed that the extent of economic growth impacted by the oil industries was significant.

Awujola et al., (2015), in their study, explained the economic impact of oil exportation on the Nigerian economy covering the period from 1970 to 2012. A Vector error correction model was used for analysis. The results obtained from the empirical analysis showed that there exists a long-run relationship between crude oil exports and economic growth. The study concluded that exports should not be promoted at all costs, rather there should be the utilization

and allocation of physical resources and labour complement of the country in the most advantageous combination between production for the local and foreign markets and that diversification should be seen as an economic management strategy aimed at ensuring stability of incomes.

Usman et al., (2015), carried out a study titled "Evidence of Petroleum Resources on Nigerian Economic Development (2000-2009)". The time series variables were two, that is, crude oil Revenue and the Gross Domestic Product GDP. The tool of analysis used was the simple linear regression model. The study found that petroleum has a direct and positive significant relationship with the economy.

Eravwoke et al., (2014) investigated the impact of crude oil export on developing countries, the case of Nigeria. The study used the ordinary least squares regression method, Augmented Dickey-Fuller unit root, co-integration test and the short-run dynamics. The study found that there was a positive relationship between crude oil exports and the economic growth of the Nigerian economy. This implies that crude oil exports are a significant factor that can transform the growth of an economy. The study also found that there was a significant relationship between crude oil exports and the Nigerian economy.

Baghebo & Atima (2013) worked on the impact of petroleum on the economic growth of Nigeria, with data covering the period 1980-2011. Oil revenue impacted negatively and significantly on Real GDP. A unit change in Oil revenue brings about a fall in GDP. The results indicated that a unit change in oil revenue resulted in 1.362996 reductions in GDP. This means that the Dutch disease phenomenon existed in Nigeria.

Ogbonna & Appah (2012) investigated the effects of petroleum income on the Nigerian economy from the year 2000 to 2009, using the gross domestic product (GDP), per capita income (PCI), and inflation (INF) as the explained variables, and oil revenue, petroleum profit tax/royalties (PPT/R), and Licensing Fees (LF) as the explanatory variables. The study found that oil revenue had a positive and significant relationship with GDP and PCI but a positive and insignificant relationship with INF. Similarly, PPT/R had a positive and significant relationship with GDP and PCI but a negative and insignificant relationship with inflation. It was also found that LF had a positive but insignificant relationship with GDP, PCI and INF, respectively. Based on these findings, the study concluded that petroleum income (Oil Revenue and PPT/R) had positively and significantly impacted the Nigerian economy when measured by GDP and PCI for the period 2000 to 2009.

Akinlo (2012) carried out an analysis of how important is oil in Nigeria's economic growth. The study assessed the importance of oil on the development of the Nigerian economy during the period 1960-2009. The study used secondary data. The multivariate co-integration VAR model developed by (Johansen 1988) and (Johansen & Juselius 1990; 1992) was used. The quarterly time series data of GDP indices of the five sectors over 1960-2009 were used in setting up the VAR model namely: agriculture (agr), manufacturing (man), building & construction (buc), oil (oil) and trade & services (tsr) or  $xt = (\text{oil, agr, man, buc, tsr})$ . The study found that the five subsectors were co-integrated and that oil caused other non-oil sectors to grow. However, oil hurt the manufacturing sector. Granger causality test found bidirectional causality between oil and manufacturing, oil and building/construction, manufacturing and building/construction, manufacturing and trade/services, and agriculture and building/construction.

Odularu (2010) used Harrod-Domar's theory and Solow's theory of economic growth. The Ordinary Least Square Regression and Cobb-Douglas production function was employed to test the impact of crude oil on Nigeria's economic performance. The result showed that crude oil production contributed to the economic growth but had no significant improvement in the economic growth of Nigeria. Samad (2011) concluded on the hypothesis, that there existed a relationship between exports and the economic growth of Algeria, using VEC Granger

causality and block exogeneity Wald test. The augmented Dickey-Fuller test was used to run the regression. The result showed that the variables were non-stationary. It was concluded that there was a causal relationship between economic growth, exports and imports.

Khaled (2010) tested if export enhanced economic growth in Libya, using co-integration with Granger causality. The results showed that income, exports, and relative prices are co-integrated. It was concluded that both exports and growth are related to each other. Gemechu (2010), using co-integration and error correction approaches in the regression analysis investigated policies and tested for the relationship between exports and economic growth. The result showed that exports significantly affected economic growth in the short run. There is causality that runs from exports to economic growth.

Mohammed & Amirahi (2010) investigated if factors such as oil price, world oil supply and demand, and production capacities enhanced export growth in Iran using the Error Correction Version of ADRL. It was found that there was an inverse relationship between oil product consumption and oil export revenues. Rahmadi (2011) investigated the exports and economic growth nexus in Indonesia employing the vector autoregressive (VAR) model. The findings indicated the significance of both exports and economic growth to the economy of Indonesia as indicated in the GIRF analysis. It was concluded that exports and economic growth exhibit a bidirectional causal structure, which is Export-Led Growth in the long run and Growth Led Export in the short run.

### **The Performance of the Oil Sector to GDP in Nigeria**

There are three main oil sectors in Nigeria namely: upstream sector, downstream sector and gas sector. The downstream sector is the sector concerned with the sale and marketing of petroleum products; it is the most problematic because it is the distributor and connects to the final consumers of refined petroleum products in the domestic economy. In 2003, the government decided to deregulate the downstream sector for efficient production in the price of oil. Meanwhile, its implementation has been controversial because it ignores the economic realities in Nigeria. The oil production by the “joint Venture” [JV] companies accounted for about 95% of Nigeria’s crude oil production. One of the joint ventures is Shell Petroleum Development Company of Nigeria (SPDCN), which has about 55% of Nigeria's crude oil (Olabiri, 2010). Others like Exxon Mobile, Chevron, Texaco, Ente Nazionale, Nigerian Agip Oil Company and Total finally operate the other joint ventures in which the NNPC has a 60% stake (Olabiri, 2010).

However, as a member of the Organization of Petroleum Exporting Countries [OPEC], Nigerian oil attracts huge buyers in the international markets because the oil is of high quality and mostly environmentally friendly relative to oil from other countries. Nigeria’s export blends are light sweet crude and low surplus contents of 0.05 to 0.2% (Olabiri, 2010). The place of oil in the mind of the average Nigerian has become more profound since the initiation of the deregulation of the downstream segment of the Nigerian oil industry in 2003. The recent fall in crude oil prices at the global markets makes the country earn less and also increases the expense burden on imported refined petroleum products in the country.

At present, Nigeria has four refineries with a combined installed refining power of 445,000 barrels per day. These are:

- i. The first Port Harcourt refinery was commissioned in 1965 with an installed refining capacity of 35,000 bpd and later increased to 125,000 bpd in 1986 (Chukwu, 2010).
- ii. The Warri refinery was commissioned in 1978 with an installed refining capacity of 100,000 barrels per day and upgraded to 125,000 bpd in 1986.
- iii. The Kaduna refinery was commissioned in 1980 with an installed refining capacity of 100,000 bpd, and increased to 110,000 in 1986.

iv. The second Port Harcourt refinery was commissioned in 1989 with 150,000 bpd processing capacity. It was designed to supply the domestic market and to export its surplus. The combined capacities of these refineries exceed the domestic consumption of refined products, the chief of which is premium motor spirit (gasoline whose demand is estimated at million litres daily). The refineries are operating far below their installed capacities as they were more or less abandoned during the military era (Adedipe, 2014).

To assess the performance of the oil sector in Nigeria, two underscores are discussed below.

### **The Boom Period**

After independence in 1960, agriculture was the dominant sector of the Nigerian economy. Agriculture provided a higher level of employment for the economy and the needs of the household. The proportion of GDP accounted for agriculture was 67.0%. Petroleum stood at 23.4% and agriculture stood at 45.5% of GDP, while in 1980, there was a decline in both sectors, the proportion of agriculture was 15.55%, while petroleum was 28.0% of GDP. In 1990, agriculture was 30% and petroleum was 12.8% of GDP. In 2000, agriculture stood at 24.6% and petroleum, at 51% of GDP. In 2006, agriculture was 50.78%, while petroleum was 66.21% of GDP (Odularu 2010).

Since the early 1990s, the economy had depended solely on oil earnings neglecting the non-oil sectors of the economy, which led to a reduction in the contribution of the non-oil sector to gross domestic product, despite the increase in prices of oil over the years. In 1973, the price of oil was 20 dollars per barrel and rose to 36.6 per barrel in 1980. In 2005, the oil price had risen to 13,500 dollars per barrel. This rise in oil prices was the result of the Arab-Israeli war and energy crises and depression in the industrial countries resulted in increased oil revenue and a boom for Nigeria and other oil exporting countries (Olabiri 2010).

The enormous increase in the oil revenue created unplanned wealth for Nigeria. As a result, the government embarked on projects that were not productive to the economy. They invested in socio-economic infrastructure across the country, especially in urban areas. The relative attractiveness of the urban centre made youths in Nigeria migrate from rural to urban areas, leaving their farmland to partake in the growing and prosperous oil company. This created social problems such as congestion, pollution of the environment, air, unemployment and crimes.

### **The Non-Boom Period and Policies Responses**

The oil boom of the 1970s led to the neglect of the agricultural sector since the nation had access to cheap money to import all sorts of things, including foodstuffs, raw materials and manufactured goods. The economy witnessed structural changes in the 1980s, which was attributed to slow growth of the outputs in all sectors of the economy. The manufacturing sector suffered from the decline in output mostly because of a drastic reduction in capacity utilization due to a shortage of raw materials. By 1986, the overall average capacity utilization of the Nigeria manufacturing sectors, an index of economic performance in the sector, stood at 38.8% as against 77.4% ten years back. However, with the remarkable reforms in the 1990s, capacity utilization increased to 57.8% in 2005 (World Bank and Nigeria 2006). The over-reliance on petroleum is clear in the external sector trends.

### **Research Methodology**

An ex-post facto research design and econometric method of analysis were employed in this study. An ex-post facto research design was a quasi-experimental study that examined how an independent variable present before the study affects the dependent variable. The study also employed the econometric technique. Since the study was of time series, some pre-test assessment was carried out. For instance, the unit root test was important as it allowed the

examination of whether a time series data is stationary or not, to avoid spurious regression. Again, the Ordinary Least Square was used to treat the relative impact of crude oil export earnings on economic growth in Nigeria. The Granger Causality test was also carried out to test for causality between the variables employed. The study used annual data to examine crude oil export and economic growth in Nigeria between 1990 and 2020. Data used in this research were secondary data and were gathered together from the reports and bulletin of the Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS) and World Development Indicators (WDI) for the period under review.

**Model Specification**

This study was anchored on the export-led growth of the Heckscher-Ohlin model. The model states that countries should export what can be most efficiently and plentifully produced. Therefore, this study is aimed at establishing the relationship between Crude Oil Exports (which presumably is abundantly produced) and economic growth in Nigeria. To capture the effect of crude oil export on the economic growth in Nigeria, the model is formulated as follows:

$$RGDP = f(COR, COB) \text{-----}(1)$$

Where

RGDP = Real Gross Domestic product

COE = Crude oil earnings

COB = Crude oil by Barrel

Hence, the functional form of this study is stated in equation 2 below:

$$RGDP = f(COE, EXR, TPC, LABF, GFCF) \text{-----}(2)$$

Where;

RGDP = Real Gross Domestic Product (Dependent variable)

COX = Crude oil Earnings (Independent variable)

EXR = Exchange Rate (Dependent variable)

TPC = Transport Cost

LABF = Labour force

GFCF = Gross Fixed Capital Formation

**The mathematical form of the model is stated in equation 2 below:**

$$RGDP_t = \beta_0 + \beta_1 COX_t + \beta_2 EXR_t + \beta_3 TPC_t + \beta_4 LABF_t + \beta_5 GFCF_t \text{-----}(3)$$

Where the variables are as defined in equation 1 above.

$\beta_0$  = intercept or constant term,  $\beta_1$  and  $\beta_2$  = parameter estimates.

**The log form of the model is stated in equation 3 below:**

$$\ln RGDP_t + b_0 + \beta_1 \ln COX_t + \beta_2 \ln EXR_t + \beta_3 \ln TPC_t + \beta_4 \ln LABF_t + \beta_5 \ln GFCF_t + U_t \text{-----}(4)$$

Where:

$U_t$  = stochastic error term

$\ln$  = logarithm

A priori expectation:  $b_1, b_2, b_4, \text{ and } b_5 > 0; b_3 < 0$ .

**Results Presentation and Interpretation**

The results of the stationarity (unit root) test indicate that Real Gross Domestic Product (RGDP), Crude Oil Export (COX), Exchange Rate (EXR), Labour force (LABF), Gross Fixed Capital Formation (GFCF) and Transportation Cost (TPC) were stationary at first difference because the variables' ADF statistics were greater than the critical values at 5%. Having established the unit root properties of the variables, the combination of two or more non-

stationary variables could however be stationary if these series shared a common long-run equilibrium relationship. In this case, these variables are said to be co-integrated. Thus, given the time series characteristics of the variables, this study further investigates employing (Trace Statistics) using the methodology proposed by Johansen (1990) (See appendices 2.i,2.ii)

The results of the multivariate co-integration test based on the Johansen co-integration technique reveal that there are two co-integrating equations at 5% for the trace statistics. This shows that there is a long-run relationship among the variables. That is, the linear combination of these variables cancels out the stochastic trend in the series. This will prevent the generation of spurious regression results. This result implies that there is a long-run relationship between economic growth, crude oil exports, exchange rate, capital, labour force and transportation cost. The result presented in Table 1 is therefore put into an econometric form as displayed below:  

$$RGDP = 0.038830 + 0.014952COX + 0.009547EXCR - 0.002278LLABF - 0.128857TPC + 0.042298GFCF + U_t$$

### Discussion of Findings

Discussion of findings is made in light of the data analysis and linking the results of the analysis to the existing theory. The unit root test shows that all the variables are stationary at the first difference in ADF tests. Considering the time series using Augmented-Dickey Fuller at Trend & Intercept, all their calculated statistics are greater than the critical values at a 5% level of significance. According to Pesaran & Yongcheol (1999) and Pesaran, et al., (2001), if the data used in the econometric analysis is not stationary at a level but is stationary after differencing the data, it means that information regarding the long-run relationship between the variables has been lost during the process of differencing the data. As such they advocate for the test of long-run relationship to ascertain the long-run status of the model.

The summary of the Johansen Co-Integration Test revealed that there are two co-integrating equations among the co-integrating equations. The trace statistics is greater than the critical value at a 5% level of significance and was collaborated by the Eigen-value which is significantly different from zero. In other words, the null hypothesis of no co-integration among the variables is rejected since at least one equation at a 5% critical value is statistically significant. The test result shows the existence of a long-run equilibrium relationship among the variables. The error correction model was used for estimating the data. After examining the variables employed in the study, the researcher observed that Oil export has a positive and significant impact on economic growth (RGDP) in the period under review. This implies that as crude oil exports increase, economic growth also increases. This conforms to our a priori expectation. This finding is in line with studies such as Eravwoke et al., (2014) in their study titled Crude Oil Export and its Impact in Developing Countries: A Case of Nigeria.

The study reveals that there was a direct relationship between crude oil exports on economic growth in the Nigerian economy. This implies that crude oil export is a significant factor that can transform the growth of an economy. Also, this result is consistent with the work of Ogbonna et al, (2012), Usman et al, (2015) and Nwoba (2010) who all found a positive and significant impact of oil export on economic growth. The finding contradicts the findings of Odularu (2010) who found a positive but insignificant impact of oil export on Nigeria's economic growth. More so, the exchange rate has a significant and positive relationship with the economic growth of Nigeria in the period under study. This implies that as the Nigerian exchange rate appreciates, economic growth will increase. This is so because, over the years, the Nigerian economy has experienced growth in her RGDP which has strengthened her exchange rate thus, giving foreign investors confidence in investing in the country. More so, an appreciation in the naira has helped the country in financing her budget deficit and has made it easier to pay for her trade deficit that is owed to overseas creditors. Learning by doing, if the price of a country's exports rises by a greater rate than that of its imports, its terms of trade



have favourably improved. Increasing terms of trade shows a greater demand for the country's exports. This, in turn, results in rising revenues from exports, which provides increased demand for the country's currency and consequently brings about an increase in the currency's value.

Furthermore, LABF and GFCF have a positive relationship with economic growth which implies that an increase in LABF and/or GFCF in Nigeria will lead to an increase in the economic growth in Nigeria during the period under review. This conforms to the a priori expectation. Statistically, the F-statistics tests the overall significance of the model. The F-statistics calculated value of 8.082982 is greater than the critical value of 3.32 at a 5% per cent level of significance. This also means that the independent variables have a joint impact on the dependent variable. Furthermore, the coefficient of determination value (R<sup>2</sup>) which shows the explanatory power of the model is 0.589030. This means that about 59% per cent of the total variation in the dependent variable (RGDP) is explained by a variation in the independent variables. The remaining 71% per cent can be accounted for by the error term (that is, all other explanatory variables not captured in the model). The Durbin-Watson statistics value of 1.896166 shows that the value fell in the region of no auto-correlation. Therefore, it can be concluded that there is no auto-correlation among the residual terms in the model. The absence of auto-serial correlation among the residual terms indicates that the estimated model is well-specified and well-behaved, and its findings can be employed for policy purposes in the Nigerian economy. The Granger causality test was conducted to assess the direction of causality between economic growth and crude oil exports. The result shows that there is a unidirectional causality between crude oil exports and economic growth as causality runs from economic growth to crude oil export. This is shown by the probability value of 0.0032. Thus, economic growth granger causes crude oil export.

### **Conclusion and Recommendation**

The study was aimed at investigating the impact of crude oil export on the economic growth of Nigeria using time series data from 1990 to 2020. A trend analysis was also carried out to show their different rates of changes yearly and how they affected the economy of the country in those years. The trend shows that RGDP has increased at an increasing rate all through the years and fell in 2016 as a result of the recession experienced in Nigeria during that year. Also, oil export, transport cost, trade openness and exchange rate depict unstable increases with the up and down movement in the trend. Given the stationarity of the data used for this study at first difference and long-run co-integration among the variables, the study employed the Error Correction Mechanism (ECM) for analysis.

Adopting the Error Correction Mechanism (ECM) test, the study revealed that crude oil export is positive and statistically significant to the growth of Nigeria's economy. Based on these findings, it is believed that revenue generated from the oil export forms the mainstay of the Nigerian economy as manifested in the fall in RGDP due to a fall in prices from 2015 to 2016. Therefore, the revenue it generates is generally agreed to be a catalyst to economic growth as the variables exert significant contributions in enhancing the growth of Nigeria.

From the findings and careful investigation of the contribution of oil exports to economic growth, it is, therefore, necessary to make the following policy recommendations to the government and all its agencies in charge of economic growth in Nigeria:

- i. Crude oil export has a significant positive impact on economic growth. Also, economic growth granger causes crude oil export. This study therefore recommends that the activities by the government in promoting economic growth and development in the country should be geared towards promoting and developing the Oil export base of the country as it has a significant relationship with economic growth in the country.

- ii. Given the huge revenue from oil exports, the government should put measures on the ground to sustain it and continue its improvement to effectively foster economic growth. Also, such revenue should be properly utilized by diversifying into the other sectors of the economy.
- iii. The government should adopt policies that will lead to exchange rate stability which is seen to be significantly related to economic growth.
- iv. The government needs to open its borders to trade with other countries to import what it does not have and also export its abundant resources like crude oil.
- v. Corruption in the oil sector should be checked out as this constitutes a lot of leakages in the economy.

It is obvious that if the above few recommendations are put in place and addressed, this will develop the Nigerian economy in a short period.

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**Appendices**

**Appendix 1**

**Raw Result of Unit Root Tests  
Unit root for RGDP**

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.395063	0.0177
Test critical values: 1% level	-3.626784	
5% level	-2.945842	
10% level	-2.611531	

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

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(LRGDP,2)  
Method: Least Squares  
Date: 05/13/20 Time: 16:28  
Sample (adjusted): 1983 2020  
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRGDP(-1))	-0.480914	0.141651	-3.395063	0.0018
C	0.021091	0.008404	2.509712	0.0170
R-squared	0.253181	Mean dependent var		0.001031
Adjusted R-squared	0.231216	S.D. dependent var		0.040893
S.E. of regression	0.035856	Akaike info criterion		-3.764687
Sum squared resid	0.043711	Schwarz criterion		-3.676713
Log likelihood	69.76436	Hannan-Quinn criter.		-3.733982
F-statistic	11.52645	Durbin-Watson stat		1.962412
Prob(F-statistic)	0.001760			

(i)

**UNIT ROOT FOR OIL EXPORT**

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.277032	0.0000

Test critical values: 1% level	-3.626784
5% level	-2.945842
10% level	-2.611531

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOEX,2)

Method: Least Squares

Date: 05/13/20 Time: 16:25

Sample (adjusted): 1983 2020

Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOEX(-1))	-1.054496	0.167993	-6.277032	0.0000
C	0.224902	0.076898	2.924668	0.0061
R-squared	0.536792	Mean dependent var	0.017003	
Adjusted R-squared	0.523168	S.D. dependent var	0.603016	
S.E. of regression	0.416401	Akaike info criterion	1.139615	
Sum squared resid	5.895246	Schwarz criterion	1.227589	
Log likelihood	-18.51308	Hannan-Quinn criter.	1.170321	
F-statistic	39.40113	Durbin-Watson stat	2.047802	
Prob(F-statistic)	0.000000			

**(ii) UNIT ROOT FOR EXR**

Null Hypothesis: D(LEXCR) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.164910	0.0001
Test critical values: 1% level	-3.626784	
5% level	-2.945842	
10% level	-2.611531	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LEXCR,2)

Method: Least Squares

Date: 05/13/20 Time: 16:21

Sample (adjusted): 1983 2020

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LEXCR(-1))	-0.883101	0.170981	-5.164910	0.0000
C	0.149813	0.058207	2.573815	0.0146
R-squared	0.439649	Mean dependent var	-0.002697	
Adjusted R-squared	0.423168	S.D. dependent var	0.396270	
S.E. of regression	0.300965	Akaike info criterion	0.490305	
Sum squared resid	3.079711	Schwarz criterion	0.578278	
Log likelihood	-6.825488	Hannan-Quinn criter.	0.521010	
F-statistic	26.67629	Durbin-Watson stat	1.985524	
Prob(F-statistic)	0.000010			

## Appendix 2

### Co-integration Test Result

Date: 05/23/22 Time: 15:21

Sample (adjusted): 4 29

Included observations: 26 after adjustments

Trend assumption: Linear deterministic trend

Series: LRGDP LOEX LEXR LTOP LTTPC

Lags interval (in first differences): 1 to 2

### Unrestricted Co-integration Rank Test (Trace)

Hypothesized	Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value
None *	0.762394	91.86816	69.81889
At most 1 *	0.561520	54.50250	47.85613
At most 2 *	0.461630	33.06701	29.79707
At most 3 *	0.294340	16.96759	15.49471
At most 4 *	0.262123	7.903417	3.841466

Trace test indicates 5 co-integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

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

### Appendix 3

#### Error Correction Model (ECM) Result

Dependent Variable: D(LRGDP)

Method: Least Squares

Date: 05/23/22 Time: 15:38

Sample (adjusted): 3 30

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.038830	0.010226	3.797263	0.0010
D(LOEX(-1))	0.014952	0.018837	4.793742	0.0358
D(LEXR(-1))	0.009547	0.025162	-3.379403	0.0080
D(LTOP(-1))	-0.002278	0.009683	-0.235268	0.8162
D(LTPC(-1))	-0.128857	0.101050	1.275188	0.2155
ECM(-1)	-0.112619	0.183489	0.013762	0.0457
R-squared	0.589030	Mean dependent var	0.047254	
Adjusted R-squared	-0.585882	S.D. dependent var	0.034446	
S.E. of regression	0.036223	Akaike info criterion	-3.610811	
Sum squared resid	0.028867	Schwarz criterion	-3.325339	
Log likelihood	56.55136	Hannan-Quinn criter.	-3.523540	
F-statistic	8.082982	Durbin-Watson stat	1.896166	
Prob(F-statistic)	0.000155			