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## **OIL PRICE FLUCTUATION AND ITS EFFECTS ON THE PERFORMANCE OF THE ECONOMY OF OIL PRODUCING COUNTRIES; THE CASE OF NIGERIA (2006-2018)**

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### **ABSTRACT**

*This paper examined the oil price fluctuations and its effects on the performance of the economy of oil producing countries; the case of Nigeria 2006-2018. The purpose of this work is to investigate the extent to which crude oil price volatility, crude oil export and domestic oil production affect oil revenue in Nigeria. Secondary data were sourced from Central Bank of Nigeria statistical bulletin and analyzed via multiple regression ordinary least square method (OLS), The results show that oil price fluctuation has insignificant impact on oil revenue but was found to be positively related to Growth, crude oil export revealed negative relationship and statistically insignificant with Economic growth. The volatile nature of the explanatory variables and its corresponding effect on oil price reveals reasons for inconsistency in the growth of Nigeria economy since it is oil dependent. Hence, the economy is vulnerable to external shocks. It is therefore recommended that government should diversify to other productive sector of the economy in other to avoid economic shock.*

***Keyword:*** *Price Fluctuation, Economy, Shocks, Volatility, Revenue*

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### **INTRODUCTION**

Nigeria being a mono economy falls amongst oil producing countries that are easily affected by fluctuations in international oil prices. The Nigeria nation was

actively incorporated to the colony of oil producing nations in 1958 when its first oil field came on stream producing 5,100bpd (Udoka & Nkamare, 2014). Nigeria's fiscal authorities and the National Economic Council, NEC (2018), being the single most critical bane of the economy and public finance said that oil price, is threatening to be back on the front-burner of issues around Nigeria's economy. As at end of November 2018, international oil price had crashed below the 2019 Federal Budget oil price benchmark of \$60 per barrel, after about seven weeks of free fall. Oil price had peaked at \$86 per barrel early October.

The drive to exploit the vast wealth in fossil fuel is to displace the crushing poverty that affects majority of Nigerians through providing structures that facilitate economic growth and development. The continuing gap in poverty level despite the vast natural resources indicates what scholars describe as "resource curse." Of course Nigeria exports of oil and natural gas at a time of peak prices have enabled the country to post current account surplus in recent years. Reportedly, 80 percent of Nigeria's energy revenues flow to the government 16 percent covers operational costs and the remaining 4 percent go to investors (Nwanna & Eyedayi, 2014).

Oil price shock (sudden increase in the price of oil) in the past resulted to increase in revenue to Nigeria and caused an increase in money supply (Oyeyemi, 2013).

The fluctuation of oil price in the global market has become a source of concern for oil producing countries. The price of crude oil had dropped precariously from a peak of \$112.06 per barrel by the fourth quarter of 2013 to \$75.72.06 per barrel 2014. However, this fluctuation continued negatively to 2018, resulting in Nigeria experiencing a sudden and significant drop in revenue inflow from oil sale (Bernanke, Mark and W. Mark, 1997). Nigeria, a mono-cultural and a hydrocarbon economy depends largely on revenue realized from oil to sustain her teeming population and the economy in order to foster physical, political and socio-economic development. Despite the fact that Nigeria is the 6th largest oil producer, the country also imports oil from other countries. The surplus of exporting value over the importing value makes Nigeria a net oil exporting country.

Oil prices have witnessed profound fluctuations and this has implications for the performance of macroeconomic variables, posing great challenges for policy making. The transmission mechanisms through which oil prices have

impacted on real economic activity include both supply and demand channels. The supply side effects are related to the fact that crude oil is a basic input to production and consequently an increase in oil price leads to a rise in production costs that induce firms to lower output. Oil price changes also entail demand side effects on consumption and investment (Adelakun, 2011). Thus the impact (positive or negative) which oil price volatility could have on any economy, depends on what part of the divide such economy falls into and of course the nature of such price change (rise or fall). However, the Nigerian economy uniquely qualifies as both an oil exporting and importing economy by reason of the fact that she exports crude oil, but imports refined petroleum products. However, most of the empirical studies carried out have focused on the oil importing economies, particularly the developed economies. Few studies exist yet on the effect of oil price on key macroeconomic variables for an oil exporting country like Nigeria. Alley *et al.*(2014) study empirically the impact of oil price shock on economic growth in Nigeria using aggregate demand model and applied Generalized Method of Moment (GMM). Despite the robustness of the study by Alley *et al.*(2014), it is flawed by the sample size used (1981-2012) concentrates more on price shock and does not show clearly the direction of relationship among the variables studied..

### **Statement of the problem**

The effect of fluctuation in oil price in international market is a function of if the country is an exporter or importer of crude. However, oil price depth has little or no significant impact on the diversified economy as adequate measures are already in place to cushion its effect on fiscal and monetary policies. Today, Nigeria has substantially lost income from oil and has to fund the 2019 budget mainly from borrowed funds and perhaps from recovered loot. It is also argued that Nigeria is faced with consistent devalued standards of living. The current living standard in Nigeria showed that about 60% of her citizen live below one dollar per day. There are instances where the economic activities become stagnated due to government's inability to implement its fiscal and monetary policies. In a bid to avert oil price shock orchestrated by movement of crude oil at the international market, government established Sovereign Wealth Fund (SWF) but the benefits of SWF in the event of oil price dip is yet to be seen. Most works on oil price fluctuation and shock revealed either positive or negative effect on both revenue generated and economic growth. Berument

(2010) studied the influence of shock in oil prices on GDP growth of selected countries. He discovered that movements in oil prices do not appear to have statistical significant impact on the outputs of oil-importing countries. The findings of Aliers (2010) supported the work of Berument (2010). He is of the view that shock in oil price insignificantly impedes economic growth. Thus, this research seeks to determine the effect of oil price fluctuation and its effect on the performance of the economy of oil producing company like covering the period of 2006 to 2018.

### **Purpose of the Study**

The main objective of this study is to investigate on oil price fluctuation and its effect on the performance of the economy of oil producing countries in Nigeria. Specifically, the study seeks to;

- examine the effect of crude oil price on Gross Domestic Product in Nigeria
- ascertain the effect of domestic oil production on Gross Domestic Product in Nigeria
- evaluate the effect of crude oil export on Gross Domestic Product in Nigeria

### **Research Question**

The study is guided by the under listed questions;

- i. What effect has crude oil price on Gross Domestic Product in Nigeria?
- ii. To what extent has domestic oil production affected Gross Domestic Product in Nigeria?
- iii. What is the effect of crude oil export on Gross Domestic Product in Nigeria?

### **Research hypotheses**

- Ho1: crude oil price has no significant effect on Gross Domestic Product in Nigeria
- Ho2: domestic oil production has no significant effect on Gross Domestic Product in Nigeria
- Ho3: crude oil export has no significant effect on Gross Domestic Product in Nigeria

## **SCOPE OF THE STUDY**

The content scope of this paper is to investigate on oil price fluctuation and its effect on the performance of the economy of oil producing countries like Nigeria from 2006 to 2018.

### **Significance of the study**

#### **Oil marketers**

This will be of use to oil marketers as it reveal at a glance the trend of oil prices and its effect on the Nigerian economy.

#### **The government**

This study will serve as a useful material in the hand of the government as it reveals the activities of the petroleum sector and its effect on Nigeria oil revenue.

The study will serve as a viable source of materials for research purposes

## **REVIEW OF RELATED LITERATURE**

### **Conceptual Review**

#### **Oil and the Nigerian Economy**

Nigeria's economy can be described as growing economy with an average growth rate of 6.3% between 2005 and 2015 (Nigeria Economic and Growth Plan 2017-2020). Primary production is oriented around agriculture, mining and quarrying (which include oil and gas) and accounts for more than 65 per cent of real gross outputs and more than 80 per cent of foreign exchange revenues in the year 2011 (National Planning Commission 2011). With more than 65 per cent of Nigeria's Federal-collected revenue coming from oil in the last decade, Nigeria's fiscal policy remains heavily influenced by the oil industry and its volatile movement. According to the IMF, beginning in the last 35 years, Nigeria's revenue and expenditures followed a similar pattern to oil prices. In periods of high oil prices such as 1979-82, 1991-92, 2000-02, 2005-09 and 2010- 14, revenue and expenditures also experienced sharp increases. Consequently, when oil prices declined after the booms, Nigeria's revenue decreased as well. In 2016, the economy entered into recession with GDP contracting by 0.36% in the first quarter, 2.1% in the second quarter and 2.2% in the third quarter and made inflation soar to 18.5% in November 2016 from 9.5% in December 2015 (Alley, Asekomeh, Mobolaji, Adeniran, 2014). Nigeria's economy is highly dependent on the oil and gas sector. Although the

sector accounts for just 10% of GDP, it represented 94% of export earnings and 62% of Government revenues (Federal and State) in 2011-2015. Foreign exchange reserves declined from USD32 billion in January 2015 to USD25 billion in November 2016 (from a high of USD53 billion in 2008). As a result, the naira depreciated sharply, losing almost half of its value against the dollar. Similarly, foreign direct investment (FDI) declined sharply from a peak of USD8.9 billion in 2011 to USD3.1 billion in 2015 and did not recover in 2016. Falling oil revenues widened the Federal Government deficit from N1.2 trillion in 2013 to N1.4 trillion in 2015, and an estimated N2.2 trillion in 2016. States in particular have been badly hit by the oil price shock; in 2015, 40% of States were running a deficit of more than 30% of their revenues. Fiscal sustainability is therefore a critical challenge for Nigeria. But Nigeria's challenges are not only economic. On the social side, poverty and social exclusion rates are high. About 61% of the population lives on USD1 or less a day. Human development indicators paint a bleak picture of Nigeria's health and education systems. The country has the fourth-highest infant mortality rate in the world, and nearly 55% of this is attributable to malnutrition. Nigeria's primary school net enrolment rate is 54% and 10 million children of school age do not attend school. Unemployment is high, especially among youth. Nigeria has 17.6 million unemployed/underemployed youth who account for about 22% of the labour force (Q2 2016). Unless additional jobs are created as a matter of extreme urgency, these numbers will increase dramatically over the next five years as the 45% of the population under 15 years enters the work force.

The country also faces governance challenges. Nigeria ranked 169 out of 190 countries in the World Bank's 2017 Doing Business index, 44 places lower than in 2010. Paying taxes, enforcing contracts and trading across borders are among the areas where Nigeria performs poorly and this has a negative impact on tax revenue, investor confidence and mobility of goods. Businesses in Nigeria cite poor infrastructure – the lack of reliable power supply and transportation as a critical challenge. The total value of Nigeria's infrastructure stock represents only 35% of GDP, compared to 45-90% in BRICS countries (Brazil, Russia, India, China, and South Africa). Insufficient investment in maintenance means that only one-third of the country's installed power capacity is operational while the quality and coverage of roads is inadequate. Governance - policy design, execution and oversight - requires review. Corruption and security issues –

terrorism, insurgency, piracy, oil theft – are of serious concern and constitute major barriers to economic growth and social development.

#### **a. Theoretical review**

The theories reviewed in this work are Mainstream Theory, Linear/Symmetric Theory and the structural economic theory.

#### **Mainstream economists view on resource-based growth**

Mainstream economics argues that countries should produce and export according to their comparative advantage. The theory of comparative advantage suggests a country gains the greatest economic benefit relative to other countries by producing at lower overall cost commodities which a country has in abundance or can easily produce. Other trading countries will therefore benefit if they accept the cost advantage of the trading country and focus on producing a commodity in which they have an advantage. It is this theory which guides mainstream economists to believe in free trade, specialization and the international division of labor. This is the reason why some countries produce agricultural and mineral commodities while others produce industrial goods (O'Toole 2007). Mainstream economists believe that this process allows for efficient use of resources which lead to more gains from trade (WTO 2010). Hence countries with an abundance of capital would export capital intensive goods and import labor intensive goods, while countries with an abundance of labor would export labor intensive goods and import capital intensive goods (Clarke 2009).

#### **Structural Economists view**

The Structural Theory argues that structural shocks such as sudden large changes in the prices of food and oil and could be attributed to macroeconomic fluctuations (Sommer, 2002). However, there is a sharp disagreement among the structuralist theorists on the amplitude effect of structural shocks. One school argues that supply shocks are in the short-run and have only transitory effect on the macro-economy (Ball and Mankiw, 1995). They further argue that since the role of policy makers is to ensure favorable economic environment in the long term, policy makers should not respond to adverse pressures from food and oil prices that are highly volatile in the short-run, in order not to drive the economy into recession (Armando, 2009). They suggested that policy makers should rather, focus on preventing the second-round effect, which is likely to be

more prolonged and could result in economic recession (Inflation Report, 2006). Fischer (1985) argues that if there is no real wage resistance by workers, supply shock by themselves do not require policy response.

Another school documented extensive evidence from Latin America and developing countries to show that structural shocks could be persistent, and are rooted in bottlenecks of inelastic supply in the agricultural and oil sectors (Watcher, 1979). In their view, agriculture, oil, foreign trade, and government sectors suffer from institutional rigidities that cause prices to rise

### **Linear/Symmetric Theory**

The linear/symmetric theory asserts that oil price volatility has linear relationship on the macroeconomic indicators. Thus fluctuations in say Gross National Product (GNP), and Gross Domestic Product (GDP) are occasioned by frequent fluctuations in oil prices (Goodwin, 1985; Hooker, 1986, Laser, 1987; Hooker, 2002). The principal theory upon which data were analyzed was the linear/symmetric theory.

### **Empirical Review**

Ebimobowei (2012) examined the impact of oil revenue and the Nigerian economy during the period of 1970-2009. They used Pearson correlation to analyze primary and secondary data and descriptive statistics to explain evidence and events. The results of the analysis show that oil revenue positively affect the gross domestic product and per capita income of Nigeria. However, the relationship between petroleum revenue and inflation rate was negative. They suggested proper utilization and management of oil revenue to achieve long-run growth and development of the country.

Olomola (2006) investigated on the impact of oil price shocks on aggregate economic activity (output, inflation, the real exchange rate and money supply) in Nigeria using quarterly data from 1970 to 2003, analyzed via Multiple regression OLS method. The findings revealed that contrary to previous empirical findings, oil price shocks do not affect output and inflation in Nigeria significantly. However, oil price shocks were found to significantly influence the real exchange rate. The author argues that oil price shocks may give rise to wealth effect that appreciates the real exchange rate and may squeeze the tradable sector, giving rise to the —Dutch-Disease.



Akpan Farzanegan and Markwardt (2009) studied the dynamic relationship between oil price fluctuations and main macroeconomic variables in Iran's economy through applying a VAR model for the period 1975-2006. The study shows that the asymmetric impacts of shocks in oil price. For instance, positive and negative shocks in oil prices contributed significantly to high inflation. In addition, that there is a significant positive relationship between shocks in oil price and the growth of industrial production.

Berument(2010) Studied the influence of shock in oil prices on GDP growth of selected countries that are considered either exporters or importers of oil. Using VAR approach and employing an IRF, for the period 1952-2004. The study suggests that movements in oil prices do not appear to have a statistically significant impact on the outputs of oil-importing countries. However, this study shows that higher oil price has a positive and statistically significant and effect on output in oil-exporting countries. Libya was included in that study, but the analysis was conducted on the aggregate level. Our analysis is detailed and uses more accurate data.

Ahmed and Wadud (2011) worked on the impact of oil price uncertainty on Malaysian macroeconomic variables and monetary responses for the period from 1986 to 2009. Applied Impulse response functions. Their result show a long-term impact of oil price fluctuations on industry. They furthermore show that level of CPI drop with a positive fluctuations to oil price uncertainty.

Abdalla (2013) examined the effect of shocks in oil price on stock returns in Saudi Arabia 1985-2004. Their data were analyzed using ECM The empirical evidence from daily returns on the Saudi stock returns (Tadawul) index and daily oil price shows that the stock returns volatility Increase as a result of shocks in crude oil prices during the study period.

Ayşen and Mehmet (2014) investigated on the impact of oil price on economy growth in Turkey from the period 1980-2013. For this purpose, unit root test, Johansen Co-integration test, variance decomposition, and impulse response functions were applied. According to obtained results, there is no long-term relationship between the variables. That shocks in oil price have a negative effect on gross domestic product in the short-run.

Alleyet(2014)examine the effect of oil price on the Nigerian economy for the period 1981-2012. This research shows that shocks in oil price insignificantly impede economic growth; hence oil price changes impact was negative. While oil price significantly improves it. The significant positive effect of oil prices

on economic growth stresses the conventional wisdom that the high oil prices are beneficial to the oil-exporting country like Nigeria. However, the oil price shocks created effective fiscal management of oil revenues.

Ftitiet (2016) studied the degree of interdependence between oil price shocks and economic growth for (United Arab Emirates, Kuwait, Saudi Arabia, and Venezuela) in OPEC during the period from 2000 to 2010. Using cointegration test, the researcher showed that oil price shocks in short-term and medium-term during the period of fluctuations in financial turmoil and the global business cycle impact on economic growth in Organization of the Petroleum Exporting Countries. Although, the effect of the medium-term effects is greater than that of the short-term effects.

Negi (2015) studied the impact of oil price shocks on gross domestic product (India, Russia, Brazil, and China) 1987-2014. The study shows that the oil price has a positive relationship with GDP. The oil price increase has a negative relationship with gross domestic product in China and India and on the other side the positive coefficient values of Russia and Brazil the positive impact of oil price increase on GDP.

Rahma (2016) in his work on the impact of oil prices on Sudan's GDP growth and unemployment rates, using (VAR) model for the period 2000-2014. They found that the decrease in oil price has a greater impact on gross domestic product growth. The decrease in oil price has a significant positive effect on the unemployment rate. Nusair (2016) the impact of oil prices on the economies of the Gulf Cooperation Council (GCC) countries: Non-linear analysis. The study found that positive oil price changes have a considerably larger effect on real GDP than negative changes.

### **Gap in literature**

Most works on oil price fluctuation and shock revealed either positive or negative effect on both revenue generated and economic growth. Berument (2010) studied the influence of shock in oil prices on GDP growth of selected countries. He discovered that movements in oil prices do not appear to have statistical significant impact on the outputs of oil-importing countries. The findings of Aliers (2010) supported the work of Berument (2010). He is of the view that shock in oil price insignificantly impedes economic growth. Thus, this research seeks to determine the effect of oil price fluctuation and its effect on

the performance of the economy of oil producing company like covering the period of 2006 to 2018

### **SECTION THREE**

#### **Methodology**

##### **Research Design**

The quasi-experimental research design was adopted for this study. Data analyzed were generated from CBN statistical bulletin 2017 edition and CBN publication on Crude oil prices. Multiple regression analytical techniques via ordinary least square method was used to analyze the generated data.

##### **Sources of Data**

The choice of the use of secondary data in the research study or analysis is a function of the relevance of such data to be a technique applied to the research topic in particular. Despite the limitation of secondary data, they are extensively used due to their indispensability. So, the data used in this study were collected from Central Bank of Nigeria (CBN) publication, textbooks, journals, magazines, newspapers and other published and unpublished books.

##### **Method of Data Analysis**

For this study, the econometric Ordinary Least Square (OLS) estimation technique is used via multiple regressions to find estimate of the parameters specified in the model. This model is chosen because of its characteristics of being linear and packaged computer routines which makes it a lot easier than hand computation.

The statistical technique to be used in establishing this relationship will be the multiple regression analysis technique with the aid of econometric view (E-view) software was used to run the regression. The regression analysis is aimed at finding the relationship existing between the dependent and a combination of the independent variables.

**i Student's T-Test:** This is used to test the statistical significance of the coefficient of the model. T-distribution is a bell shaped distribution and a function of the degree of freedom ( $n-k$ ); when the size is small ( $n < 30$ ), but larger when ( $n > 30$ ), it helps to test the significance of the individual parameter estimates. Obioma (2004:177), the calculated value of T-test P-value is compared with its corresponding critical value at 5% level of significance.

If t-calculated P-value is greater than 5% the null hypothesis ( $H_0$ ) is accepted while the alternative hypothesis ( $H_1$ ) is rejected vice versa.

**ii. F-Statistics (Joint Test):** This test helps us to ascertain whether the independent variables will jointly affect the dependent variables or not. This test seeks to determine the various factors which cause variations of the dependent variable or not. The method of analysis of variation (ANOVA) is used in regression analysis for conducting various test of significance, the most important being;

### Model Specification

The model for this study is specified thus;

$$LGDP = F(LCOP, LDOP, LCOE)$$

Where  $LGDP =$  Gross Domestic Product

$LCOP =$  Crude oil price

$LDOP =$  Domestic oil price

$LCOE =$  Crude oil export

$L =$  Log of variables. Variables were logged to bring them

in equal form

In a linear function, it is represented as follows;

$$LGDP = b_0 + b_1LCOP + b_2LDOP + b_3LCOE + U_t$$

## SECTION FOUR

### 4.1: Data Presentation

**Table 4.1:** Gross Domestic Product (GDP), Crude Oil Prices (COP), Domestic Oil Production (DOP), Crude Oil Export (COE).

YEAR	GDP	COP	DOP	COE	LGDP	LCOP	LDOP	LCOE
2006	39,995.50	61.33	2.36	1.91	4.602011	1.787673	-1383.94	0.281033
2007	42,922.41	90.77	2.26	1.81	4.632684	1.957942	-1228.36	0.257679
2008	46,012.52	58.89	2.15	1.7	4.662876	1.770042	-1442.05	0.230449
2009	49,856.10	77.16	2.16	1.71	4.697718	1.887392	-1104.91	0.232996
2010	54,612.26	87.97	2.65	2.2	4.73729	1.944335	-1322.93	0.342423
2011	57,511.04	113.17	2.32	1.87	4.759751	2.053731	-1667.01	0.271842
2012	59,929.89	111.49	2.14	1.69	4.777644	2.047236	-1582.68	0.227887
2013	63,218.72	112.06	2.14	1.69	4.800846	2.049451	-1461.29	0.227887
2014	67,152.79	75.72	2.21	1.76	4.827064	1.879211	-1467.33	0.245513
2015	69,023.93	43.83	2.16	1.71	4.839	1.641771	-1177.8	0.232996

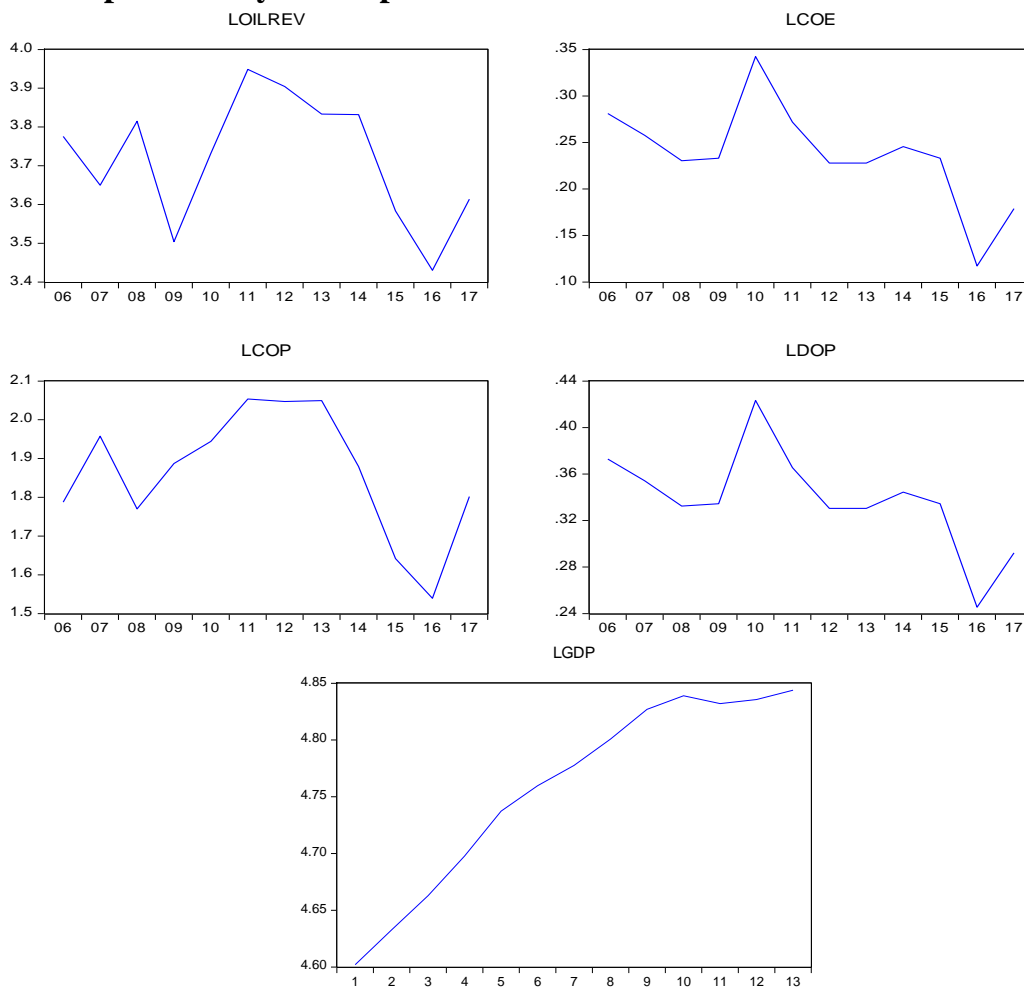
2016	67,931.24	34.61	1.76	1.31	4.83207	1.539202	0.245513	0.117271
2017	68,490.98	63.38	1.96	1.51	4.835633	1.801952	0.292256	0.178977
2018	69,799.94	54.65	1.89	2.78	4.843855	1.897687	1.988654	0.797576

Source: Central Bank of Nigeria Annual Reports several issues

The table above presents data for normal and logged values of Oil revenue, Crude Oil Prices (COP), Domestic Oil Production (DOP), Crude Oil Export (COE) for the period of 2006 to 2017.

Dataanalysis

Descriptive Analysis Graph



NB: 06-17 represent 2006-2017 for the X-axis

Gross domestic product from the above graph reveals a rise in economic growth from 39995.50 in 2006 to 69799.94 in 2018, showing a consistent increase in the growth level of the economy in Nigeria.

Oil revenue from the above graph reveals a fall in oil revenue from 5965.10 in 2006 to 4462.91 in 2007. Oil revenue experienced another increase in 2008 and decline in 2009. 2010 experienced a geometric increase in oil revenue from 3191.94 in 2009 to 5396.09 2010 respectively. This fluctuation in oil revenue is as a result of instability in international oil price per barrel.

The fall in oil revenue is as a result of the rise and fall of international price of oil. Oil price from our graph indicated a rise from 2006 to 2007 and fall in 2008. The price of oil experienced consistent increase from 2009 to 2013. The global oil price crunch led to the crashing of oil price 2014/2015 to 2016 which later pick up in 2017.

From the graphical presentation of domestic oil production and crude oil export, it is clear that both oil production and oil export has the same trend. This implies that virtually all what is produced in Nigeria oil market is exported and re-imported as finished goods which is not good for the Nigerian economy.

### Analysis and Results

Dependent Variable: LGDP				
Method: Least Squares				
Date: 03/29/21 Time: 10:24				
Sample: 1 13				
Included observations: 13				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.691678	0.337937	13.88327	0.0000
LCOE	-0.028298	0.176837	-0.160022	0.8764
LCOP	0.083586	0.208290	0.401297	0.6976
LDOP	7.72E-05	5.28E-05	1.460943	0.1780
R-squared	0.639886	Mean dependent var		4.757572
Adjusted R-squared	0.513485	S.D. dependent var		0.084452
S.E. of regression	0.085019	Akaike info criterion		-1.844215
Sum squared resid	0.065055	Schwarz criterion		-1.670385
Log likelihood	15.98740	Hannan-Quinn criter.		-1.879945
F-statistic	23.946777	Durbin-Watson stat		1.599650
Prob(F-statistic)	0.000085			

From our regression result, the estimated equation model is stated as follows;  
 $GDP = 4.691678 - 0.028298 LCOE + 0.083586 LCOP + 7.72E-05 LDOP$

### **Test of Hypothesis**

The hypotheses of this study were tested using the student T-test distribution as a test for individual significance of the dependent variables at 5% significance level.

#### **Test of Hypothesis One**

H<sub>01</sub>: There is no significant relationship between crude oil export and Gross Domestic Product in Nigeria.

H<sub>1</sub>: There is a significant relationship between crude oil export and Gross Domestic Product in Nigeria

The result of hypothesis one between COE and GDP showed a negative relationship with a coefficient of -0.028298. The negative value indicates an inverse and decreasing effect on economic growth. The T- statistics and its corresponding probability value was obtained as -0.160022 and 0.8764 respectively. Since the T- stat. Prob (0.8764) is greater than 5%, the null hypothesis is accepted and the alternative rejected, thereby concluding that there is an insignificant relationship between crude oil export and Gross domestic product in Nigeria.

#### **Test of Hypothesis Two**

H<sub>02</sub>: There is no significant relationship between crude oil price and Gross domestic product in Nigeria.

H<sub>12</sub>: There is a significant relationship between crude oil price and Gross domestic product in Nigeria.

The result of hypothesis two between COP and GDP indicated a positive relationship with a coefficient of 0.083586. The positive value indicates a direct and increasing effect on oil revenue in Nigeria. The T- statistics and its corresponding probability value was obtained as 0.401297 and 0.6976 respectively. Since the T- stat. Prob (0.6976) is greater than 5% the null hypothesis is accepted and the alternative rejected, thereby concluding that there is no significant relationship between COP and GDP

#### **Test of hypothesis three**

H<sub>03</sub>: There is no significant relationship between domestic oil production and Gross Domestic Product in Nigeria.

H<sub>13</sub>: There is a significant relationship between domestic oil production and Gross Domestic Product in Nigeria.

The result of hypothesis three between DOP and GDP also indicated a positive relationship with a coefficient of 7.72E-05. The negative value indicates an inverse and decreasing effect on oil revenue. The T- statistics and its corresponding probability value was obtained as 1.460943 and 0.1780

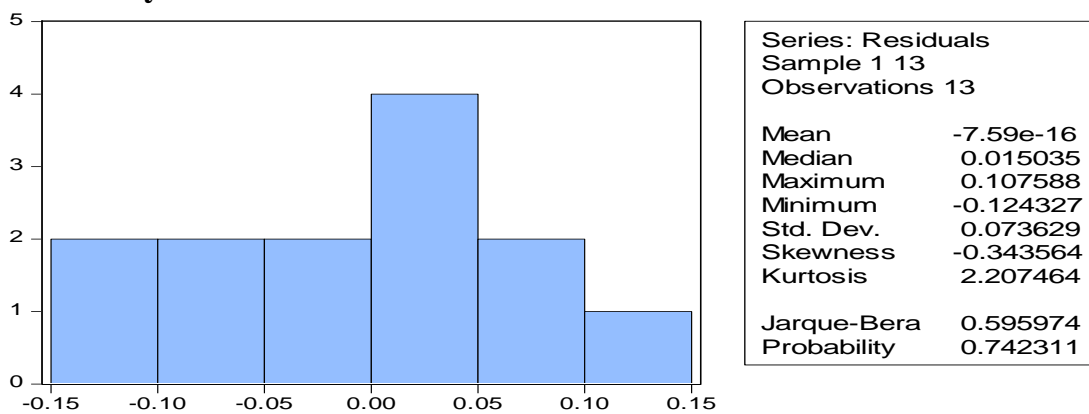
respectively. Since the T- stat. Prob (0.1780) is greater than 5% the null hypothesis is accepted and the alternative rejected, thereby concluding that there is a negative and insignificant relationship between domestic oil production and Gross Domestic Production Nigeria..

**F-Test (Joint Test)**

The f-test being the test used to check for joint significant impact exists amongst variables. The result of the p-value was obtained as 0.000085. If the p-value calculated is less than the significant level at 5% (0.05), we reject the null hypothesis otherwise accept it. From the result obtained P-value (0.018415) < critical value (0.05) we therefore conclude that a joint significant relationship exists between our predictors and oil revenue of Nigeria economy.

**Diagnostic Test**

**Normality Test**



**Figure 4.4.1** jarquebera normality of the residual of the estimated model.

The jarque-bera statistics P value was obtained as 0.742311 which is greater than 5%, we then reject the alternative hypothesis and accept the null hypothesis that the stochastic variable is normally distributed.

**Test for Heteroskedasticity**

<b>Heteroskedasticity Test: Breusch-Pagan-Godfrey</b>			
<b>F-statistic</b>	1.487658	Prob. F(3,9)	0.2827
<b>Obs*R-squared</b>	4.309498	Prob. Chi-Square(3)	0.2299
<b>Scaled explained SS</b>	1.247008	Prob. Chi-Square(3)	0.7418
<b>Test Equation:</b>			



<b>Dependent Variable: RESID^2</b>				
<b>Method: Least Squares</b>				
<b>Date: 03/29/21 Time: 10:27</b>				
<b>Sample: 1 13</b>				
<b>Included observations: 13</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>C</b>	0.034866	0.021478	1.623348	0.1390
<b>LCOE</b>	0.006579	0.011239	0.585399	0.5727
<b>LCOP</b>	-0.020816	0.013238	-1.572429	0.1503
<b>LDOP</b>	-6.70E-06	3.36E-06	-1.996810	0.0769
<b>R-squared</b>	0.331500	Mean dependent var		0.005004
<b>Adjusted R-squared</b>	0.108666	S.D. dependent var		0.005723
<b>S.E. of regression</b>	0.005403	Akaike info criterion		-7.355889
<b>Sum squared resid</b>	0.000263	Schwarz criterion		-7.182058
<b>Log likelihood</b>	51.81328	Hannan-Quinn criter.		-7.391619
<b>F-statistic</b>	1.487658	Durbin-Watson stat		1.482932
<b>Prob(F-statistic)</b>	0.282690			

The above result reveals the presence of homoskedasticity in the data set since probability Chi-square value of 0.2299 is greater than 5%. We therefore conclude that the variables consistent overtime.

### Coefficient of determination

The coefficient of determination also known as  $R^2$  was obtained as 0.639886 or 63.9%. This result implies that about 63.9% percent variation in Growth (GDP) is explained by our model. This implies that Crude Oil Export (COE), Crude Oil Price (COP), and Domestic Oil Price (DOP) explained only 63.9% of the model which is considerably fitted.

### Discussion of Findings

This paper focused on oil price fluctuation and its effect on the performance of the economy of oil producing countries. The oil prices generated were disaggregated into crude oil price, domestic oil price and crude oil export as published by CBN.

The coefficient of the first hypothesis showed a positive relationship exists between crude oil export and economic growth. This implies that an increase in

oil price export will result to a corresponding increase GDP in Nigeria. However, the test of hypothesis at 5% level of significance revealed an insignificant effect of crude oil export on oil revenue. This finding agrees with the work of Alleyet (2014) who examined impact of oil price fluctuations in the economy, concluding that an insignificant relationship exists between crude oil export and oil revenue in Nigeria.

The estimated slope of the second hypothesis tested revealed crude oil price to be positively related to GDP. This implies that as the international price of oil rises, the revenue generated in the sales of oil products rises proportionately. However, this rise in price of oil has no significant effect on the revenue generated in Nigeria. The study agrees with the work of Ahmed and Wadud (2011) whose study on the impact of oil price uncertainty on Malaysian macroeconomic concludes that the fluctuation of oil price though positive has a devastating effect of the growth of generated revenue.

The third hypothesis shows that domestic oil production was negatively related to oil revenue. The trend analysis between oil export and domestic oil production indicated that what is actually produced in Nigeria equals our exportation which is not healthy for the economy. By implication it means that oil product (processed) are being imported to the economy creating room for exchange disparity

## **CONCLUSIONS**

This study analyzes oil price fluctuation and its effects on the performance of the economy of oil producing countries. From our research it is evident that oil price fluctuation is not healthy for the Nigerian economy. Fluctuation in oil price to a very large extent distorts main economic policies that drive growth in Nigeria. However having seen from our study that the individual parameters studied (crude oil price per barrel, crude oil export per barrel and domestic oil production) has little or no significant impact on the economy, government should intensify her policy in favour of domesticating the production of oil product so as to generate more revenue locally. Having seen that the oil in international market is competitive in nature the government should not allow the shock in the fluctuation of oil prices to affect or determine the productiveness of her economy.

Considering our predictors, the evidence of the influence between oil revenue and oil price is extremely weak, and not statistically significant, which could be

due to the fact that there are instabilities in the relationship masking it. Indeed, over such a long period there have been important changes in the demand and supply for oil that could lead to identify some structural breaks.

## **RECOMMENDATIONS**

In view of the current global unpredictability in oil prices, it is now necessary for Nigeria to diversify its sources of foreign exchange earnings, so as not to remain almost dependent on crude oil for economic survival.

1. Federal government should wisely use excess crude oil account (ECA) in this time of crisis. The funds should be used to fund development of critical infrastructure for long term growth and development.
2. The country should diversify its export revenue base as a means of minimizing reliance on crude oil and petroleum product. This will further shield the economy from the impact of oil price fluctuation on the economy, and thus prevent the Naira from undue pressure.
3. Government should redirect her spending pattern by allocating more funds for capital project. It is a usual trend in Nigeria that recurrent expenditure takes a chunk of the budget which goes into salaries and allowances. Capital projects will create more jobs and reduce the unemployment rate.
4. Government should ensure they cut down overhead costs. Unless drastic reforms such as downsizing personnel and sharp cuts in overhead costs occur in the public sector, Nigeria will continue to plunge much money into recurrent expenditure.

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**APPENDIX**

Gross Domestic Product (GDP), Crude Oil Prices (COP), Domestic Oil Production (DOP), Crude Oil Export (COE).

YEAR	GDP	COP	DOP	COE	LGDP	LCOP	LDOP	LCOE
2006	39,995.50	61.33	2.36	1.91	4.602011	1.787673	-1383.94	0.281033
2007	42,922.41	90.77	2.26	1.81	4.632684	1.957942	-1228.36	0.257679
2008	46,012.52	58.89	2.15	1.7	4.662876	1.770042	-1442.05	0.230449
2009	49,856.10	77.16	2.16	1.71	4.697718	1.887392	-1104.91	0.232996
2010	54,612.26	87.97	2.65	2.2	4.73729	1.944335	-1322.93	0.342423
2011	57,511.04	113.17	2.32	1.87	4.759751	2.053731	-1667.01	0.271842
2012	59,929.89	111.49	2.14	1.69	4.777644	2.047236	-1582.68	0.227887
2013	63,218.72	112.06	2.14	1.69	4.800846	2.049451	-1461.29	0.227887
2014	67,152.79	75.72	2.21	1.76	4.827064	1.879211	-1467.33	0.245513
2015	69,023.93	43.83	2.16	1.71	4.839	1.641771	-1177.8	0.232996
2016	67,931.24	34.61	1.76	1.31	4.83207	1.539202	0.245513	0.117271
2017	68,490.98	63.38	1.96	1.51	4.835633	1.801952	0.292256	0.178977
2018	69,799.94	54.65	1.89	2.78	4.843855	1.897687	1.988654	0.797576

Source: Central Bank of Nigeria Annual Reports several issues

**REGRESSION RESULT**

**UNIT ROOT**

Null Hypothesis: LCOE has a unit root

Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=2)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.921386	0.3118
Test critical values:	1% level	-4.200056

	5% level		-3.175352	
	10% level		-2.728985	
*MacKinnon (1996) one-sided p-values.				
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 11				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LCOE)				
Method: Least Squares				
Date: 02/22/19 Time: 00:24				
Sample (adjusted): 2007 2017				
Included observations: 11 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCOE(-1)	-0.608332	0.316611	-1.921386	0.0869
C	0.138269	0.078494	1.761522	0.1120
R-squared	0.290876	Mean dependent var		-0.009278
Adjusted R-squared	0.212085	S.D. dependent var		0.060747
S.E. of regression	0.053922	Akaike info criterion		-2.839608
Sum squared resid	0.026168	Schwarz criterion		-2.767264
Log likelihood	17.61785	Hannan-Quinn criter.		-2.885211
F-statistic	3.691724	Durbin-Watson stat		1.915124
Prob(F-statistic)	0.086863			

Null Hypothesis: D(LCOE) has a unit root

Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=2)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.419582	0.0399
Test critical values:	1% level		-4.420595	
	5% level		-3.259808	
	10% level		-2.771129	
*MacKinnon (1996) one-sided p-values.				
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 9				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LCOE,2)				
Method: Least Squares				
Date: 02/22/19 Time: 00:25				
Sample (adjusted): 2009 2017				
Included observations: 9 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCOE(-1))	-2.075756	0.607020	-3.419582	0.0142
D(LCOE(-1),2)	0.651656	0.444842	1.464915	0.1933
C	-0.015814	0.021937	-0.720879	0.4981
R-squared	0.735053	Mean dependent var		0.009882
Adjusted R-squared	0.646738	S.D. dependent var		0.105964
S.E. of regression	0.062981	Akaike info criterion		-2.430772
Sum squared resid	0.023799	Schwarz criterion		-2.365030
Log likelihood	13.93847	Hannan-Quinn criter.		-2.572642
F-statistic	8.323037	Durbin-Watson stat		2.439286
Prob(F-statistic)	0.018598			



**Null Hypothesis: LCOP has a unit root**

**Exogenous: Constant**

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

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	-6.551554	0.0008
<b>Test critical values:</b>		
1% level	-4.420595	
5% level	-3.259808	
10% level	-2.771129	

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

**Warning: Probabilities and critical values calculated for 20 observations  
and may not be accurate for a sample size of 9**

**Augmented Dickey-Fuller Test Equation**

**Dependent Variable: D(LCOP)**

**Method: Least Squares**

**Date: 02/22/19 Time: 00:26**

**Sample (adjusted): 2009 2017**

**Included observations: 9 after adjustments**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>LCOP(-1)</b>	-1.510063	0.230489	-6.551554	0.0012
<b>D(LCOP(-1))</b>	1.503095	0.256493	5.860180	0.0021
<b>D(LCOP(-2))</b>	0.891652	0.216790	4.112971	0.0092
<b>C</b>	2.908793	0.442771	6.569520	0.0012
<b>R-squared</b>	0.900839	Mean dependent var		0.003546
<b>Adjusted R-squared</b>	0.841342	S.D. dependent var		0.155657
<b>S.E. of regression</b>	0.062001	Akaike info criterion		-2.422229
<b>Sum squared resid</b>	0.019221	Schwarz criterion		-2.334573
<b>Log likelihood</b>	14.90003	Hannan-Quinn criter.		-2.611389
<b>F-statistic</b>	15.14101	Durbin-Watson stat		1.871502
<b>Prob(F-statistic)</b>	0.006080			

**Null Hypothesis: D(LCOP) has a unit root**

**Exogenous: Constant**

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

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	-4.178741	0.0165
<b>Test critical values:</b>		
1% level	-4.582648	
5% level	-3.320969	
10% level	-2.801384	

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

**Warning: Probabilities and critical values calculated for 20 observations  
and may not be accurate for a sample size of 8**

**Augmented Dickey-Fuller Test Equation**

**Dependent Variable: D(LCOP,2)**

**Method: Least Squares**

**Date: 02/22/19 Time: 00:27**

**Sample (adjusted): 2010 2017**

**Included observations: 8 after adjustments**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>D(LCOP(-1))</b>	-1.597319	0.382249	-4.178741	0.0139
<b>D(LCOP(-1),2)</b>	1.582210	0.425134	3.721677	0.0204
<b>D(LCOP(-2),2)</b>	0.935341	0.291468	3.209072	0.0326
<b>C</b>	0.002876	0.035440	0.081158	0.9392

<b>R-squared</b>	0.825913	Mean dependent var	0.018175
<b>Adjusted R-squared</b>	0.695349	S.D. dependent var	0.170365
<b>S.E. of regression</b>	0.094033	Akaike info criterion	-1.583480
<b>Sum squared resid</b>	0.035369	Schwarz criterion	-1.543759
<b>Log likelihood</b>	10.33392	Hannan-Quinn criter.	-1.851380
<b>F-statistic</b>	6.325694	Durbin-Watson stat	1.980824
<b>Prob(F-statistic)</b>	0.053411		

Null Hypothesis: LDOP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.928054	0.3092
Test critical values:		
1% level	-4.200056	
5% level	-3.175352	
10% level	-2.728985	

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

Warning: Probabilities and critical values calculated for 20 observations

and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LDOP)

Method: Least Squares

Date: 02/22/19 Time: 00:36

Sample (adjusted): 2007 2017

Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDOP(-1)	-0.611459	0.317138	-1.928054	0.0859
C	0.202111	0.109386	1.847685	0.0977
R-squared	0.292308	Mean dependent var		-0.007332
Adjusted R squared	0.213675	S.D. dependent var		0.048037
S.E. of regression	0.042597	Akaike info criterion		-3.311104
Sum squared resid	0.016330	Schwarz criterion		-3.238759
Log likelihood	20.21107	Hannan-Quinn criter.		-3.356707
F-statistic	3.717391	Durbin-Watson stat		1.910384
Prob(F-statistic)	0.085940			

Null Hypothesis: D(LDOP) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.414681	0.0402
Test critical values:		
1% level	-4.420595	
5% level	-3.259808	
10% level	-2.771129	

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

Warning: Probabilities and critical values calculated for 20 observations

and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LDOP,2)

Method: Least Squares

Date: 02/22/19 Time: 00:37

Sample (adjusted): 2009 2017

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDOP(-1))	-2.054796	0.601754	-3.414681	0.0142
D(LDOP(-1),2)	0.635357	0.435814	1.457865	0.1951
C	-0.012241	0.017374	-0.704559	0.5075
R-squared	0.733503	Mean dependent var		0.007601
Adjusted R-squared	0.644671	S.D. dependent var		0.083824
S.E. of regression	0.049967	Akaike info criterion		-2.893699
Sum squared resid	0.014980	Schwarz criterion		-2.827958
Log likelihood	16.02165	Hannan-Quinn criter.		-3.035569
F-statistic	8.257163	Durbin-Watson stat		2.443288
Prob(F-statistic)	0.018927			

Null Hypothesis: LOILREV has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.018632	0.2756
Test critical values:		
1% level	-4.200056	
5% level	-3.175352	
10% level	-2.728985	

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

Warning: Probabilities and critical values calculated for 20 observations

and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOILREV)

Method: Least Squares

Date: 02/22/19 Time: 00:38

Sample (adjusted): 2007 2017

Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOILREV(-1)	-0.638092	0.316101	-2.018632	0.0743
C	2.364096	1.179492	2.004334	0.0760
R-squared	0.311657	Mean dependent var		-0.014709
Adjusted R-squared	0.235174	S.D. dependent var		0.190327
S.E. of regression	0.166449	Akaike info criterion		-0.585285
Sum squared resid	0.249349	Schwarz criterion		-0.512940
Log likelihood	5.219067	Hannan-Quinn criter.		-0.630888
F-statistic	4.074876	Durbin-Watson stat		1.833296
Prob(F-statistic)	0.074286			

Null Hypothesis: D(LOILREV) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.615712	0.0274
Test critical values:		
1% level	-4.297073	
5% level	-3.212696	
10% level	-2.747676	

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

Warning: Probabilities and critical values calculated for 20 observations

and may not be accurate for a sample size of 10

**Augmented Dickey-Fuller Test Equation**

**Dependent Variable: D(LOILREV,2)**

**Method: Least Squares**

**Date: 02/22/19 Time: 00:38**

**Sample (adjusted): 2008 2017**

**Included observations: 10 after adjustments**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOILREV(-1))	-1.285467	0.355522	-3.615712	0.0068
C	-0.013435	0.064679	-0.207718	0.8406
<b>R-squared</b>	0.620374	Mean dependent var		0.030944
<b>Adjusted R-squared</b>	0.572921	S.D. dependent var		0.307289
<b>S.E. of regression</b>	0.200817	Akaike info criterion		-0.195987
<b>Sum squared resid</b>	0.322620	Schwarz criterion		-0.135470
<b>Log likelihood</b>	2.979937	Hannan-Quinn criter.		-0.262374
<b>F-statistic</b>	13.07337	Durbin-Watson stat		1.877144
<b>Prob(F-statistic)</b>	0.006825			

**ORDINARY LEAST SQUARES RESULT**

**Dependent Variable: LGDP**

**Method: Least Squares**

**Date: 03/29/21 Time: 10:24**

**Sample: 1 13**

**Included observations: 13**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.691678	0.337937	13.88327	0.0000
LCOE	-0.028298	0.176837	-0.160022	0.8764
LCOP	0.083586	0.208290	0.401297	0.6976
LDOP	7.72E-05	5.28E-05	1.460943	0.1780
<b>R-squared</b>	0.639886	Mean dependent var		4.757572
<b>Adjusted R-squared</b>	0.513485	S.D. dependent var		0.084452
<b>S.E. of regression</b>	0.085019	Akaike info criterion		-1.844215
<b>Sum squared resid</b>	0.065055	Schwarz criterion		-1.670385
<b>Log likelihood</b>	15.98740	Hannan-Quinn criter.		-1.879945
<b>F-statistic</b>	23.946777	Durbin-Watson stat		1.599650
<b>Prob(F-statistic)</b>	0.000085			

**Heteroskedasticity Test: Breusch-Pagan-Godfrey**

<b>F-statistic</b>	1.487658	Prob. F(3,9)	0.2827
<b>Obs*R-squared</b>	4.309498	Prob. Chi-Square(3)	0.2299
<b>Scaled explained SS</b>	1.247008	Prob. Chi-Square(3)	0.7418

**Test Equation:**

**Dependent Variable: RESID^2**

**Method: Least Squares**

**Date: 03/29/21 Time: 10:27**

**Sample: 1 13**

**Included observations: 13**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.034866	0.021478	1.623348	0.1390
LCOE	0.006579	0.011239	0.585399	0.5727
LCOP	-0.020816	0.013238	-1.572429	0.1503

<b>LDOP</b>	-6.70E-06	3.36E-06	-1.996810	0.0769
<b>R-squared</b>	0.331500	Mean dependent var	0.005004	
<b>Adjusted R-squared</b>	0.108666	S.D. dependent var	0.005723	
<b>S.E. of regression</b>	0.005403	Akaike info criterion	-7.355889	
<b>Sum squared resid</b>	0.000263	Schwarz criterion	-7.182058	
<b>Log likelihood</b>	51.81328	Hannan-Quinn criter.	-7.391619	
<b>F-statistic</b>	1.487658	Durbin-Watson stat	1.482932	
<b>Prob(F-statistic)</b>	0.282690			

