



Impact of Oil Price Changes on Selected Macroeconomic Variables in Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author HF designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author ODC managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

In this study, the impact of oil price changes on selected variables in Nigeria within the period, 1981-2016 had been evaluated. Adopting the ex-post facto research design with annual time series and using The Autoregressive Distributed Lag (ARDL) model; the results revealed that the change in oil price had a positive and significant impact on government revenue and government expenditure, but had no positive and significant impact on the domestic price level. It is therefore recommended that the monocultural economy should be omitted through well-planned and implementation diversification.

Keywords: Oil price; government revenue; government expenditure; ARDL; Nigerian economy.

1. INTRODUCTION

The price of crude petroleum rose for the first time in Nigeria in 1973 from \$3 to \$11.6 per

barrel in response to the uncertainties created by the Arab – Israel war, which erupted in October 1973. The resultant rise in the price of crude petroleum generated a total of N9.2 billion in

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revenue for Nigeria. In 1994 as the country exported 108 million tons of crude oil that year, the upsurge in crude oil and price and the resultant increase in the revenue for the country created the opportunity for industrial development and modernisation of the Nigeria economy.

Although the oil price increase in 1973 was short-lived, between 1979 and 1980, the price of oil rose in the international market between 135 and \$40 a barrel from et \$14 level recorded in the early part of 1978. the rise in crude oil price again was only mainly to the Iranian revolution. In responses, Nigeria produced 84.25 million barrels in 1979 and realised N9305.6 million in the prices "The Africa Guardian, 1986, First Bank Business Report,1990" with the increased revenue derivable from oil sector the Nigeria economy became mono-cultural as emphasis shifted from the agriculture sector to the oil sector. Thus in 1980, the nation experienced a severe economic crisis which is traceable to the over-dependence a severer economic crisis which is traceable to the overdependence on the oil sector. The oil glut era of the 1980s created a serious problem for the industrial sector, as there was a decline in industrial output and the level of industrial employment [1] and [2].

Consequent upon the freezing, the country experienced a period of structural adjustment programme in 1986. This was accompanied by austerity measure of enormous proportion. By 1990 a sign of relief was welcomed with the price of oil in the international market soaring as a result of the Gulf war between Iraq and Kuwait [3]. Nigeria earning from crude oil export reached N106.62 million as against the targeted N38.62 million [4].

This windfall of N68 billion since the exchange rate was stabilised at N9 to 11 between September and December 1990. The revenue gained from the glut crises was however not translated to productive investment and increased manufacture productivity.

In the late 1990s and early 2000 crude oil maintained its position as the highest contributor to the federation account which was shown in the annual budget of 2003. Out of the estimated revenue of N1,819.0214 billion, a total of N120.1789 billion (61.58%) was expected to be generated from oil. The projection was predicated on a crude oil price at \$21 per barrel: the answer to this question rests on the pattern of crude oil price volatility.

According to Afolabi [5], the recent oil price shock (large fall in oil prices) has been attributed to the factors such as higher than expected supply, weakness in global demand for oil, driven largely by improvements in production technology, particularly the shale technology in the United States, steady rise in production of countries not belonging to the Organisation of Petroleum Exporting Countries (OPEC), the faster than expected recovery of production in some stressed OPEC producers (Iran for instance); OPEC's November 2014 decision to maintain production level despite the sharp decline in prices, which clearly shows that the trend might not abate soon. Oil price volatility has been and will remain a subject of discourse among different scholars. It can be external when it comes from a large unanticipated change in world economic conditions which impacts upon a national economy. Oil shocks are of great concern to most economies because of its transmission effects on several spheres of economies of the world.

The current declining oil price and the daunting challenges it poses to the Nigerian economy, has brought to the fore, the need to reconcile theory with practical realities. Given that empirical literature on the recent decline in oil price, the finding of this study fills an important research gap by clarifying the direction of the transmission effects of declining oil prices on Nigerian economic indicators in terms of magnitude and impact. The permanent/transitory nature of the shock and most importantly, the symmetry of the shock. Because of the foregoing analysis of this research will focus on the impact of oil price changes on Government Revenue, Expenditure and Domestic Prices.

The main objective of this study was to investigate the impact of oil price changes on Nigeria's key macroeconomic variables. The study would specifically seek to: investigate the impact of changes in crude oil price on Government revenues; ascertain the impact of changes in oil prices on Government expenditure and to examine the impact of changes in oil price on Nigeria's inflation Nigeria represents the geographical settings for this study. It covered a period of 35 years from 1981 to 2016 with a focus on the oil price changes and selected macroeconomic variables. The year 2016 was chosen as the endpoint period to ensure the currency of data and 1981 to cover the period immediately before the introduction of the structural adjustment programme.

The results of this study would be significant for the stakeholders in the oil and gas industry and the Nigerian economy at large. It will help to further enrich the literature in this very important area of macroeconomics and finance in Nigeria. Economic planners, policymakers and macroeconomic managers will find this work as a valuable tool for improved economic planning. The rest of the paper is divided into four sections, section two present literature review. Section three presents the methodology, followed by the results and discussion in Section four, and finally, section five presents the main conclusion and recommendations.

2. LITERATURE REVIEW

Nations that export oil is most likely to experience contributions to the economic conditions and well-being of the populace. There are positive and negative contributions. Among the positive contributions are source of revenue to the government transformation and addition to balance of payment [6] increase in external trade increase in Gross Domestic Product [7], source of employment [8] transfer of technology [4], provision of internal energy requirements, increased income per capita [9], and development of the economy say by providing infrastructure, industry, health facilities, educational supports, transportation and agricultural development [5].

The negative contributions resulting from oil exploration and exports include Neglect of Agricultural sector and increased food import bills, urban congestion and oil spillage. Others are excess liquidity and its attendant consequences such as high rate of inflation and over-dependence on it to the detriment of strategic planning of the economy [1]. Odeyemi [2], observed the implications of the fall of oil price on the Nigeria economy. Among the consequences is the devaluation of the naira, depletion of external reserves in a bid to save devaluing naira, depletion of funds for Government business, economic recession and dwindling activities in the Capital Market.

Several theories guided thinking in this study. Among the theories are Mainstream Theory, Linear/Symmetric Theory, Renaissance Growth and Dutch Disease Theory. The principal theory upon which data were analysed was the Dutch disease theory. The mainstream theory postulates that economic growth results from production; and production refers to the

transformation of matter in some way, and requires energy. Capital, labour and land are primary factors of production; and energy resources such as oil and gas, coal and fuel are categorised as intermediate inputs usually created during the production period and entirely used up during the production process. The mainstream theory downplays the role of energy resources in economic growth [10].

The linear/symmetric theory asserts that oil price volatility has a 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 [11,12,13]. The renaissance growth theory an off-shoot of the symmetric theory propounded that volatility/change in oil prices rather than oil price level that has a significant influence on economic growth [14].

The Dutch disease theory of economic growth states that higher oil prices, generally, change the industrial structure of the oil-exporting country making it more concentrated on the oil industry and non-traded sectors. The higher oil revenues lead to the appreciation of the local currency, which consequently causes an increase in imports of consumer goods. Thus, the high concentration on imports tends to reduce the competitiveness of the local producers. It follows according to the Dutch disease theory that an increase in oil prices is not a beneficial situation for the economy of an oil-exporting country [15].

3. EMPIRICAL REVIEW

From related studies no other nations a mixed result was recorded. According to [16], the economy of Russia is highly sensitive to oil price changes. The results of the analysis showed that in a long-term period 1% increase in oil prices would increase GDP by 0.44%. Odeyemi and Vera [17], studied the asymmetric effect of oil price shocks on economic growth and found that the oil price shocks that occurred during the period (1984-2008) had a positive effect on the Venezuelan economy. The study showed that oil price increases were more significant and affected the economy more intensively than the oil price decreases. Salim and Rafiq [18], investigated the impact of oil price volatility on six major emerging economies of Asia, namely China, India, Indonesia, Malaysia, Philippines and Thailand. The work measured quarterly oil

price volatility with the realised volatility (RV) and made several findings. For China, it was reported that oil price volatility impacts output growth in the short run. And, for India and the Philippines, oil price volatility was found to impact both GDP growth and inflation before and after the Asian financial crisis. A related study in Nigeria, the Dutch disease theory seems evident. Olaokun [19], showed that oil price increases exert a negative effect on the economies of Ghana and Nigeria, but has a positive effect on Russia, which like Nigeria is an oil-producing country. Olomola [20], found out that oil price volatility is highly significant in explaining GNP growth and unemployment. Similarly, [10], examined the consequences of oil price volatility on the growth of the Nigerian economy within the period 1970 to 2010 using quarterly data and employing the Vector Auto regression (VAR) methodology. They found that oil price volatility impacted directly on real government expenditure, real exchange rate and real import, while real government expenditure impact on real GDP, real money supply and inflation. By implication, oil price changes determine government expenditure level, which in turn determine the growth of the economy thereby reflecting the dominant role of government in Nigeria.

Omisakin [21], carried out a study on the impacts of oil price shocks on the macroeconomic performance in Nigeria using a Vector Autoregression (VAR) approach. The study found that oil price shocks significantly contributed to the variability of oil revenue and output. Thus, oil price shock does not have substantial effects on money supply, price level and government expenditure in Nigeria over the period covered by the study. The impact of oil price volatility on macroeconomic activity in Nigeria has also been examined by Apere and Apere [22], finds a unidirectional relationship between interest rate, exchange rate and oil prices. However, a significant relationship between oil prices volatility and real GDP was not found. The paper concludes that oil price volatility is an important determinant of real exchange rates and in the long run, while the exchange rate rather than oil price volatility affects output growth in Nigeria.

Oyeyemi [23], confirms the positive relationship between oil price increases and economic situation; showing that during the periods of oil price decreases disruption effects occurred in the balance of payments and government finances. Moreover, it was mentioned that even a small

shock in global oil prices will have a long-term effect on the economic growth of the country. Similarly, [24], in a study on Oil price volatility and economic development: Stylised evidence in Nigeria investigated chiefly the causal relationship between oil prices and key macroeconomic variables 1980 to 2010. The findings indicate that there is a positive but insignificant relationship between oil price and the Nigerian GDP. Generally, oil prices have no significant impact on real GDP and exchange rate in Nigeria.

Most studies exploring the impact of oil prices on inflation rates employed the linear time-series model. Razmi et al. [25], applied the SVAR model intending to examine the impact of oil price on China's economy. The results revealed that increases in oil price have a positive impact on inflation, even though there is price control over domestic oil consumption and other commodities in domestic Markets.

[26], applied the Bayesian VAR model to examine the impact of oil price and inflation in USA quarterly data from 1948:1 to 2011:2. They found that oil price fluctuations do not necessarily spread and result in changes to overall inflation but rather are time-specific. Some of the subsequent researchers attempted to investigate further the argument that oil price can affect CPI but not economic activities. [12], applied the USA monthly data ranging from 1974:1 to 2014:7 and disaggregated the consumer price into five different components and compared the impact of oil price separately. The results revealed that oil price shock has significant positive effects on the energy-intensive CPI. While [27], used the Autoregressive Distributed Lags (ARDL) method to study the pass-through effect of oil prices in Malaysia's consumer prices. The results indicated that oil prices and inflation have a positive relationship. On the contrary, [28], found that since 1980, oil price passthrough has become negligible. In a recent study by Lamotte et al. [29], the authors found that a fluctuation in oil price is absorbed and disappeared within the first five to six quarters after the shocks occurred. Notably, the shocks do not have any significant impact in the long-run, especially when the oil price is converted to domestic currency.

Ferrucci et al. [30], examined the long-run impact of oil export and food production on inflation in African OPEC member countries. Found that oil exports have positive and significant impact connected to inflation meanwhile increases in

food production has a negative impact related to inflation.

Similar findings were reported in Ferrucci et al. [29], where the authors investigated the asymmetric response of the gasoline price to changes in the oil price in France. In this study, they applied the ARDL method and found asymmetric relations with oil price changes, for which the gasoline prices gradually adjusted to a long equilibrium position. In this case, the adjustment was found to be faster when the crude oil price increases rather than decreases. In a separate study, the authors in Farzanegan and Markwardt [31], found that Iran was greatly exposed to oil price changes that have asymmetric impacts on the economy. The study revealed that positive and negative oil price shocks significantly increase inflation, but the magnitude depends on the size of the shock. The authors in Ghosh and Kanjilal [32], showed that inflation was profoundly affected by oil price shocks and to some extent the impact was asymmetric. The authors confirmed this result by comparing the impact of a negative oil price shock to that of a positive shock that was noted in India. The authors in Çat and Önder [33], applied a multivariate two-regime threshold VAR model to assess the impact of oil prices in Turkey and found that oil price changes have a significant effect on inflation when the changes exceed the optimal threshold point and have the ability to adversely influence macroeconomic variables.

4. METHODOLOGY

The study adopted the *ex-post facto* research design given that it was a discourse on documented outcomes to draw conclusions and inferences. The choice of these research designs was based on the fact that this work was *after-the-fact research* the employed variables were such that the researcher cannot manipulate [3].

All the data to be utilised were time series, quantitative and sourced from secondary source basically, the 2017 Statistical Bulletin of Central Bank of Nigeria. They were time series data because they were ordered following a natural frequency [34].

4.1 Model Specification

The Classical Linear Regression Model (CLRM) was employed for this study. The model, according to Brooks [34], was expressed as follows:

$$Y_t = \alpha + \beta x_t + U_t \quad (1)$$

Where:

Y = dependent variable (explained variable)

X = independent variable (explanatory variable)

α = Constant term (i.e. value of Y when X is zero)

β = Coefficient of the parameter estimates

U = error term (residual term)

t = (1, 2, 3, ..., n) denotes the number of observations.

Concerning (Eq. 1), α and β are expressed as follows:

$$\beta = \frac{\sum (X_t - \bar{x})(y_t - \bar{y})}{\sum (X_t - \bar{x})^2} \quad (2)$$

$$\alpha = \bar{y} - \beta \bar{x} \quad (3)$$

The dependent variables are:

- i. Government Revenue (GREV)
- ii. Government Expenditure (GEXP)
- iii. Inflation Rate (INFR) that proxied price level

The main independent variable in the model was the crude oil price, proxied by the change in Crude Oil Price (DCROP) that was the first difference of the level series crude oil price.

ARDL variant of regression was deployed in testing the hypothesis and is presented thus:

Hypothesis one (Model 1)

$$GREV_t = \beta_0 + \beta_1 \Delta OP_t + \sum a_i OP_{t-i} + u_t$$

Where:

GREV = Govt. Revenue,

ΔOP = Change in Oil Price (in absolute terms)

There was also the inclusion of the lagged values of the independent variables given that the model was lagged.

Hypothesis two (Model 2)

$$GEXP_t = \beta_0 + \beta_1 \Delta OP_t + \sum a_i OP_{t-i} + u_t$$

where:

GEXP = Govt. Expenditure and the other terms are as defined above

Hypothesis three (Model 3)

$$\text{INFR}_t = \beta_0 + \beta_1 \Delta \text{OP}_t + \sum a_i \text{OP}_{t-i} + u_t$$

Where: INFR = Inflation Rate

4.2 Methods of Data Analyses

The basic steps followed were:

- Standard tests
- Regression Analyses

This served as preliminary tests to ascertain the data behaviour and their goodness towards employing them for model estimation. These tests include basic descriptive statistics such as the mean, median, mode, variance, standard deviation, skewness, kurtosis and normality.

Stationarity implied that the 'mean' and 'variance' were constant over time and the value of the covariance between two periods depends only on the distance or lag between the two periods and not the actual time at which the covariance was computed. In this study, therefore, the Augmented Dickey-Fuller Unit Root Test was employed to test for the presence or otherwise of the unit root.

In this work, the Autoregressive Distributed Lag Model was used because of its relative advantages over other regression methods. These include

1. The small Sample size is involved
2. When there is a combination of different stationarity properties in the datasets
3. There is a need to guard against autocorrelation.

5. PRESENTATION AND ANALYSES OF DATA

5.1 Data Presentation

Table 1 contains the proxies for the variables under period spanning the period 1970 to 2015 in their level series form.

5.2 Data Description

Table 2 shows basic descriptive statistics of the series under study.

The basic aggregative averages like mean, median and mode for all the observations were

shown in the table. The spread in the observations was also shown by their respective standard deviation which lies between the minimum and the maximum. Kurtosis and skewness were also shown which showed the degree of peakedness and degree of symmetry of the given series.

The stationarity properties of the series which was a test for the unit root of the variables under study were shown below:

5.3 Tests for Stationarity Properties of the Series

To select a suitable model for the analyses and tests, it was interesting to note that ARDL was chosen because it tolerates a combination of I (1) and I (0) variables. The unit root tests indicated that the variables combine the I (1) and I (0) features.

Hypothesis One

Restatement of Hypothesis in Null and Alternate Form

Ho₁: Changes in Oil Price do not have a positive and significant impact on Government Revenue.

Ha₁: Changes in Oil Price have a positive and significant impact on Government Revenue

Test Statistics: Autoregressive Distributed Lag (ARDL) Model.

Interpretation of Estimates: The overall regression was significant as the probability of F-stat was less than 5% (0.05). There was also the goodness of fit as the R² was reasonably high at 90% indicating that 90% of the changes in government revenue (GREV) are accounted for by the lagged values of government revenue and the principal explanatory variable which was oil price volatility (DCROP). Also, there was no suspicion of autocorrelation as the Durbin statistics (1.90) by the rule of thumb is approximately equal to 2. The model was hence certified fit for meaningful analyses.

Given that the p-value was less than 0.05, the null hypothesis had been rejected and accepted the alternate hypothesis and concluded that crude oil price volatility positively and significantly impacts on government revenue.

Table 1. Crude oil price and selected macroeconomic variables 1981 to 2016

YEAR	CRUDEPRICE	GOVT EXP	GOVT. REV	INFR
1981	29.10	1225.9660	1023.2410	14.0
1982	21.60	337.2176	325.1440	29.3
1983	26.10	701.0594	597.2821	6.9
1984	19.50	428.2152	351.2623	8.5
1985	12.80	487.1134	353.7241	10.0
1986	16.20	160.8932	90.6226	57.0
1987	15.10	27.7495	15.5886	38.3
1988	26.10	701.0594	597.2821	6.9
1989	19.50	428.2152	351.2623	8.5
1990	28.20	13.0411	10.0014	5.5
1991	18.50	22.0187	16.1290	10.2
1992	64.60	4605.3900	3629.6070	18.9
1993	14.20	16.2237	7.9694	5.4
1994	16.00	191.2289	126.0712	57.2
1995	38.70	1426.2000	1253.6000	15.0
1996	52.65	4988.8640	3431.0710	18.3
1997	21.60	337.2176	325.1440	29.3
1998	15.10	27.7495	15.5886	38.3
1999	29.20	9.9276	7.2672	39.6
2000	29.10	1225.9660	1023.2410	14.0
2001	15.10	27.7495	15.5886	38.3
2002	38.70	1426.2000	1253.6000	15.0
2003	43.70	5185.3180	4031.8280	18.6
2004	63.30	4712.0620	3553.5430	21.6
2005	61.80	3452.9910	2642.9820	21.0
2006	63.30	4712.0620	3553.5430	21.6
2007	18.60	41.0283	25.8936	40.9
2008	29.10	1225.9660	1023.2410	14.0
2009	17.40	248.7681	249.7681	72.8
2010	63.80	4194.5770	3089.1750	21.6
2011	38.70	1426.2000	1253.6000	15.0
2012	21.60	337.2176	325.1440	29.3
2013	12.80	487.1134	353.7241	10.0
2014	64.60	4605.3900	3629.6070	18.9
2015	20.00	92.7974	53.2649	44.5
2016	16.00	191.2289	126.0712	57.2

Source: Central Bank Statistical Bulletin 2016. Where: CROP = Crude Oil Price (US Dollar per barrel); INFR = Inflation Rate; GREV = Government Revenue

Table 2. Basic descriptive statistics

Variable	Mean	Median	Standard deviation	Skewness	Kurtosis
DROP	0.99	0.32	14.50	1.32	14.50
GEXP	838.57	54.62	1441.57	1.29	3.10
GREV	2106.84	170.89	1774.38	1.41	3.48
INF	27.34	15.30	15.92	4.70	5.71

Source: Author's Computation

Table 3. Summary of unit root tests results

Variables	ADF stat	Critical values @1%	Critical values @5%	Critical values @10%	P-value	Order of integration
DCROP	-7.32	-4.18**	-3.52**	-3.19**	0.0000	I(0)
INFR	-3.50	-3.58	-2.93**	-2.60**	0.0100	I(0)
GREV	-4.43	-5.18**	-3.52**	-3.19**	0.0000	I(1)
GEXP	-7.22	-3.98*	-3.52**	-3.19**	0.0000	I(1)

**Stationary at the stated level of significance

Table 4. Summary of the ARDL estimates for Hypothesis 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DCROP	20.886537	1.778577	11.2994	0.0000

R² 90%, Adjusted R² 89%, F-Stat 873.92(0.000), DW Stat 1.90

Source: ARDL Estimates

Test of Hypothesis Two**Restatement of Hypothesis in Null and Alternate Form**

H₀₂: Changes in Oil Price have no positively significant impact on Government Expenditure.

H_{a2}: Changes in Oil Price positively and significantly impact on Government Expenditure.

Test Statistics: Autoregressive Distributed Lag (ARDL) Model

Interpretation of Estimates: The overall regression was significant as the probability of F-stat was less than 5% (0.05). There was also the goodness of fit as the R² was reasonably high at 90% indicating that 93% of the changes in government expenditure (GREV) are accounted for by the lagged values of government revenue and the principal explanatory variable which was oil price volatility (DCROP). Also, there was no

suspicion of autocorrelation as the Durbin statistics (2.3) by the rule of thumb was approximately equal to 2. The model was hence certified fit for meaningful analyses.

Given that the p-value is less than 0.05, we reject the null hypothesis and accept the alternate hypothesis and conclude that crude oil price volatility positively and significantly impacts on expenditure.

Test of Hypothesis Three**Restatement of Hypothesis in Null and Alternate Form**

H₀₃: Changes in oil price do not have a positive and significant impact on the Price level.

H_{a3}: Changes in oil price have a positive and significant impact on the Price level.

Test Statistics: Autoregressive Distributed Lag (ARDL) Model

Table 5. Summary of the ARDL estimates for Hypothesis 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(GEXP(-1))	0.959279	0.059170	16.21218	0.0000
DCROP	0.008609	0.003647	2.360891	0.0232
C	0.286522	0.135096	2.120877	0.0402

R² 93%, Adjusted R² 99%, F-Stat 803.54(0.000), DW Stat 2.3

Source: Extract from the ARDL Estimates in Appendix 5B

Table 6. Summary of the ARDL estimates for Hypothesis 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DCROP	-0.072966	0.145126	-0.502779	0.6180
C	13.07844	3.884168	3.367116	0.0017

R² 41%, Adjusted R² 34%, F-Stat 5.47(0.000), DW Stat 1.9

Source: Extract from the ARDL Estimates in Appendix 5C

Interpretation of Estimates: The overall regression was significant as the probability of F-stat was less than 5% (0.05). There is a less fit as the R^2 is reasonably high at 41% indicating that 41% of the changes price level was accounted for by the principal explanatory variable which was oil price (DCROP). There was also no suspicion of autocorrelation as the Durbin statistics (1.9) by the rule of thumb was approximately equal to 2. The model was hence certified fit for meaningful analyses.

Given that the p-value was greater than 0.05, the study refused to reject the null hypothesis and conclude that crude oil price changes positively and non-significantly impacts on the price level.

6. CONCLUSION

The impact of oil price changes on selected variables in Nigeria within the period, 1981-2016 had been evaluated in this study. Adopting the ex-post facto research design with annual time series and using The Autoregressive Distributed Lag (ARDL) model; the results revealed that the change in oil price had a positive and significant impact on government revenue and government expenditure, but had no positive and significant impact on the domestic price level. As the world continues to explore alternative energy sources Government must encourage diversifying the economy for improved revenue efficiency and effectiveness.

It is further recommended that the mono-cultural of the economy should be killed through well-planned and implementation diversification.

It is believed that this study will open vistas of opportunities for further research in such areas as the impact of oil price changes on different variants of inflation including a comparative study of the impact of positive oil price shocks and negative oil price shocks on all oil-producing African Countries.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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