IMPACT OF INTERNATIONAL OIL PRICE ON NIGERIAN MACROECONOMIC VARIABLES FROM 1990-2017

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Abstract

This study was aimed at using multiple regression technique to analyze the effect of oil price on the Nigerian macroeconomic variables from 1990 to 2017. In a bid to achieve the objectives of this study, five null and alternative hypotheses were formulated to guide the study. The statistical technique discussed in this study was used to justify the hypotheses. The diagnostic tests showed that there is no presence of multicollinearity symptoms among the explanatory variables and there is no presence of serial correlation in the residuals. The result from the diagnostic tests also showed that heteroscedasticity does not exist in the data, and the error term is normally distributed. The empirical results emanating from the analysis indicated that Nigerian macroeconomic variables (inflation rate, exchange rate, RGDP, unemployment rate, interest rate) jointly have significant effect on the oil price during the year under study. Testing if international oil price has effect on each of the Nigerian macroeconomic variables revealed that exchange rate and interest rate have significant but inverse effect on oil price, while inflation rate and RGDP have no significant effect on oil price. Again, only unemployment rate has a direct significant effect on oil price. The coefficient of determination (R^2), which indicates the proportion in oil price that is explained by Nigerian macroeconomic variables turned out with a percentage of 82.9% showing that there is a strong relationship between the international oil price variable and the Nigerian macroeconomic variables. This result entails that 82.9% (percent) variation in the value of international oil price is explained by a change in the macroeconomic variables.

Key words: International oil price, Macroeconomic variables, Coefficient of Determination, diagnostic test, Multiple regression

Background of the Study

The provision of plausible explanation for the oil price-macroeconomic relationship has occupied the attention of researchers and policymakers over the last four decades. The attention was drawn by the central role which oil plays in the world economy and the observed linkage between oil price movement and business cycle. Oil plays a dominant role in Nigerian economy given its huge contribution to the revenue of the country. For instance, CBN statistical bulletin (2011) shows that oil receipts accounted for 82.1%, 83% and about 90 per cent of the nation's foreign exchange earnings in 1974, 2008 and 2010 respectively.

However, it is empirically established that oil price is one of the most volatile prices which has significant impact on macroeconomic behavior of many developed and developing economies (Ferderer, 1996; Guo & Kliesen, 2005). Therefore, the dependence of the Nigerian economy on oil proceeds as the major source of revenue is capable of raising suspicion about the impact of oil price volatility on macroeconomic volatility in the country. Macroeconomic volatility implies the vulnerability of macroeconomic variables to shocks. It is the tendency of macroeconomic variables such GDP, inflation, exchange rate, interest rate etc to be unstable and weak in terms of withstanding shock. It is a situation whereby little shock in the economy subjects the macroeconomic variables to fluctuations and uncertainty. In the light of this, many studies investigated the impact of oil price changes on macro economic variables in Nigeria. The consensus finding is that while oil price changes have direct significant relationship with many macroeconomic variables, it does not significantly affect output growth (Adeniyi, 2011; Omojolaibi, 2013; Olowe, 2009; Wilson, *et al*; 2014; Taiwo, *et al*; 2012; Apere & Ijiomah, 2013).

The impact of oil price volatility on Nigeria's economy is quite complicated to analyze because oil has been the life wire of all economic activities in Nigeria. Total dependence of Nigeria on oil production for income generation obviously has serious implications for the economy. Since agriculture was abandoned for oil, oil became the major source of Nigeria's revenue and it was expected to bring about substantial economic growth and development. However, there have been series of fluctuations in oil price since the last four decades, thereby hampering the macro-economic objectives of Nigeria, (CBN, 2008). There is no doubt that the total dependence on oil, its attendant corruption and constant volatility in oil price are the major causes of poverty and under-development in oil producing African Countries.

The effect of oil prices on the macro-economic variables has been the subject of many studies. Most of these studies are concerned with the developed economies while few have recently showed concern with the developing country. Hence, this study looked into the effects of international oil price on five macroeconomic variables (inflation rate, exchange rate, RGDP, unemployment rate, and interest) from 1990 to 2017.

Statement of the Problem

The most important problem confronting Nigeria today is the price of oil and its attendant consequences on economic wellbeing of its citizen. This is because Nigeria does not have control over oil product, as a result of her inability to independently refine its crude oil into petroleum products. For instance, the major reason for the fuel shortage is the collapse of the country's four oil refineries in Port Harcourt, Warri and Kaduna. Though the government

claims that it has spent a whooping sum on their repairs, yet the country still relies mainly on importation of refined fuel. In fact, a cartel has developed in the elite class which makes millions of dollars of profit from fuel importation and artificial scarcity of petroleum products. Nigeria's inability to attain sustainable development, certain level of full employment, poverty reduction, solve the unfavorable balance of trade, inflation and high debt ratio, are all linked to its high dependence on oil as it major source of revenue, and negligent of agriculture and other sectors in a comprehensive and sincere diversification policy. The elasticity of a change in oil price on macroeconomic variables is so perfect that economy response to even mere speculations. Thus persistent oil shocks could have severe macroeconomic implications like fluctuation in the GDP which may induce challenges with respect to policy making. In addition, the revenue from oil is the pivot for government budgets and subsidies. In spite of oil price volatility and fall in revenues in recent times, the attempts by government to continue with petroleum subsidy is still a source of challenge in terms of budget deficit. Hence, it appears that oil price volatility poses a significant problem to macroeconomic stability and sustainable development in Nigeria. The problem is compounded by decades of corruption in the oil sector, poverty, unemployment, processing and distribution costs, social conflicts in oil-producing areas resulting to pipeline vandalism, oil theft, kidnapping of expatriate oil workers, disruption in petroleum product supply and demand.

Literature Review

A lot of research has been carried out in the past on the impact of oil price on the Nigerian economy. A few of these are mentioned here for the purpose of giving quality to this present study.

Offiong *et al* (2016) carried out a research on the Impact of Oil Price Shocks on the Economic Growth and Development of Cross River State, Nigeria. The study investigated the impact of this plunge on the economic development of Cross River State, Nigeria and found that international oil price shocks affected the State's economy inversely, while a positive but insignificant relationship existed between the other model variables and the economic growth of the State. Consequently, the study recommended that CRS government should de-emphasize the over-reliance on crude oil revenue and seek and optimize earnings from other non-oil sectors of the economy. Further, the State's economy should be diversified to boost internally generated revenue with less dependence on Federal government revenue allocation. Finally, there should be effective machinery for checks and balances put up by the government to stem fiscal abuse and wastage of resources by the ministries, departments and agencies in the State.

Babajide and Soile (2015) worked on Oil Price Shocks and Nigeria's Economic Activity: Evidence from Autoregressive Distributed Lag (ARDL) Co-integration and Vector Error Correction Model (VECM) Analysis. The study examined the impact of oil price shocks and their transmission channels to selected macroeconomic variables which served as proxies for economic activities in Nigeria using quarterly data from 1980 in Quarter 1 to 2011 in Quarter 4. Empirical analysis was carried out using VAR framework. Further the Impulse Response Function (IRF) and the Variance Decomposition (VDC) were carried out to trace the impact of oil shocks to the Nigerian economy. The result showed that oil price shocks have negative impact on nearly all the variables used in the analysis; furthermore the asymmetric relationship between oil price shocks and GDP was not established as the effects was found to be minimal in all the tests results. The result clearly illustrated that oil price decreases affected most of the

macroeconomic indicators than increases. Specifically, oil price decrease affected trade balance, inflation, government revenue and exchange rate. The implications are that oil price decreases affected macroeconomic activity in Nigeria than increases as most of the variables except inflation did not respond to increases. Based on the findings it was recommended that a relaxation of monetary policy during an oil price fluctuation era as the government has already through the central bank adopted a inflation targeting policy in order to protect the economy from possible outcome of a full blown stagflation (persistent high inflation) amongst others.

Mhamad and Saeed (2016) worked on the Impact of Oil Price on Economic Growth: Empirical Evidence from Iraq. To achieve this objective (of fulfilling its full potential), the study adopted OLS approach, and the secondary data was used for the period of 2000-2015 and multiple regression with its assumption were used in order to analyse the data. Findings showed that, oil price and oil export were very important determinates of economic growth in Iraq because the p-value of those were less than the common alpha α =0.05. For instance, for each unit increasing of oil price, the economic growth will increase by 36.9% after holding all other variable constant. However, they found that exchange variable has no impact on the participations of increasing the economic growth because of having corruption in public banks in Iraq.

Ebele (2015) conducted a research on Oil Price Volatility and Economic Growth in Nigeria: An Empirical Investigation. The study investigated the impact of crude oil price volatility on economic growth in Nigeria from 1970 to 2014. The study aimed at extending the frontier of knowledge by estimating the impact of the oil price volatility on the Nigerian economic growth using aggregate demand framework that theoretically connect analytical variables, rather than just explaining output behaviour by oil price and host of arbitrarily variables as done by earlier studies. The study adopted Engel-Granger co-integration test and Granger Representation theorem in testing the long run and short run relationships between crude oil volatility and economic growth respectively. The study found that, oil price volatility (OPV) has negative impact on the economic growth while other variables such as crude oil price, oil revenue and oil reserves have positive impact on the Nigerian economy. Based on the findings, the study recommended that-the country should diversify its export revenue base as a means of minimizing reliance on crude oil outputs. The study further proffered that government should adopt a prudent fiscal policy in relation to oil prices. This could be done through the elimination of some taxes on crude oil and the gradual removal of oil price subsidies

Having reviewed these past researches, we examined the effect of oil price on Nigerian macroeconomic variables using multiple regression analysis from 1990 to 2017. The macroeconomic variables considered in this study are; exchange rate, interest rate, inflation rate, unemployment rate and real gross domestic product.

Methodology

If a regression model involves more than one independent variable, it is called a multiple regression model and is of the form (Gauss; 1809)

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k \quad \ldots \quad (1)$$

Due to the nature of numerous explanatory variables, as it is applicable in this study, we employed the general linear model (that is working in matrix form).

The General Linear Regression Model

The general linear regression model expresses a linear relationship between the dependent variable Y, and K explanatory variables, where k can be 1, 2, 3, … etc. In fact, when k is more than two as it is in this research work, estimation of the parameters of the model becomes extremely tedious. However, this difficulty can be greatly reduced by the use of matrix algebra. Matrix algebra provides a compact method of handling regression model.

Suppose we postulate that there is a linear relationship between the dependent variable, Y and k – 1 explanatory variables x_2, x_3, x_4, …, x_k for a population of size N observations on Y and the X's, we may write:

$Y_i = b_1 + b_2X_{2i} + b_3X_{3i} + \ldots + b_kX_{ki} + u_i$, i = 1, 2, …, N … (2)

where b_1 = the intercept on the Y-axis, b_2, b_3, …, b_k are the unknown population parameters.

u = error (or stochastic disturbance) term.

Re-writing equation (2) as a set of N simultaneous equation, we obtain:

$$\left.\begin{array}{l} Y_1 = b_1 + b_2X_{21} + b_3X_{31} + \ldots + b_kX_{k1} + U_1 \\ Y_2 = b_1 + b_2X_{22} + b_3X_{32} + \ldots + b_kX_{k2} + U_2 \\ Y_3 = b_1 + b_2X_{23} + b_3X_{33} + \ldots + b_kX_{k3} + U_2 \\ \vdots \qquad \vdots \qquad\qquad \vdots \qquad\qquad \vdots \\ Y_N = b_1 + b_2X_{2N} + b_3X_{3N} + \ldots + b_kX_{kN} + U_N \end{array}\right\} \quad \ldots \quad (3)$$

Equation (3) can be re-written more compactly in matrix form as:

$Y = X\beta + U$ … (4)

where

$$Y = \underset{N\times 1}{\begin{pmatrix} Y_1 \\ Y_2 \\ Y_3 \\ \vdots \\ Y_N \end{pmatrix}}, \qquad X = \underset{N\times K}{\begin{pmatrix} 1 & X_{21} & X_{31} & \ldots & X_{k1} \\ 1 & X_{22} & X_{32} & \ldots & X_{k2} \\ 1 & X_{23} & X_{33} & \ldots & X_{k3} \\ \vdots & \vdots & \vdots & & \vdots \\ 1 & X_{2N} & X_{3N} & \ldots & X_{KN} \end{pmatrix}}$$

$$\beta = \underset{k\times 1}{\begin{pmatrix} b_1 \\ b_2 \\ b_3 \\ \vdots \\ b_k \end{pmatrix}}, \qquad U = \underset{N\times 1}{\begin{pmatrix} U_1 \\ U_2 \\ U_3 \\ \vdots \\ U_N \end{pmatrix}}$$

Table 1: ANOVA Table for Regression Analysis

Source of variation	DF	SS	MS
Regression	k – 1	$\Sigma\hat{y}_t^2$	$\dfrac{\Sigma\hat{y}_t^2}{k-1}$
Error	n – k	$\Sigma y_t^2 - \Sigma\hat{y}_t^2$	$\Sigma y_t^2 - \dfrac{\Sigma\hat{y}_t^2}{n-k}$
Total	n – 1	Σy_t^2	

$$F_{calculated} = \frac{\frac{\Sigma \hat{y}_t^2}{k-1}}{\frac{\Sigma y_t^2 - \Sigma \hat{y}_t^2}{n-k}} = \frac{RMS}{EMS} \quad \ldots \quad (5)$$

The decision rule is to reject H_0 is $F_{cal} \geq F_{k-1,n-k;\alpha}$ otherwise accept H_0.

The (multiple) coefficient of determination is given by

$$R^2 = \frac{\sum \hat{y}_t^{\,2}}{\sum y_t^{\,2}} \quad \ldots \quad (6)$$

where x_1, x_2, y are in deviation form. The adjusted R^2 written as $\overline{R}^2$ is defined by

$$\overline{R}^2 = 1 - (1 - R^2)\frac{n-1}{n-k} \quad \ldots \quad (7)$$

Test of Hypotheses

Our model $Y = \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \hat{\beta}_3 x_3 + \hat{\beta}_4 x_4 + \hat{\beta}_5 x_5 + U$ involves five explanatory variables. Hence we conducted two types of tests about the parameters of the model, namely; individual tests and joint tests.

Individual Test

Individual test involves testing whether an explanatory variable has any influence on the dependent variable when the other explanatory variable is held constant.

The null and alternative hypotheses may be stated as follows:

$H_0 : \beta_i = 0$, i = 1,2, … k (i.e. there is no linear relationship between x_i and y, the other x held constant).

$H_1 : \beta_i \neq 0$ (i.e. a relationship exists between x_i and y).

Under the assumption that each U_i is $N(0, \delta^2)$, the test statistic will be given by

$$t_{cal} = \frac{\hat{\beta}_i}{SE(\hat{\beta}_i)} \quad \ldots \quad (8)$$

The decision rule is to reject H_0 at the α level of significance if $t_{cal} > t_{tab}$ (and hence conclude that a relationship exists between y and x_i) and to accept H_0 otherwise. Alternatively, we can reject H_0 if the p-value is less than α level of significance, and to accept H_0 otherwise.

Joint Test

This involves testing whether X_i, i=1,2,…,k are jointly related to Y. This is equivalent to testing whether

$\beta_1 = \beta_2 = \ldots = \beta_k = 0$

Thus, the null and alternative hypotheses are:

$H_0 : \beta_1 = \beta_2 = \ldots = \beta_k = 0$ (i.e. x_1, x_2…, x_k are not jointly related to y)

$H_1 : \beta_i \neq 0$ for at least one i i.e. x_1, x_2, …, x_{k-1} and x_k are jointly related to y.

Thus, a joint test can be conducted using the Analysis of variance techniques as follows:

$$TSS = \Sigma y_t^2$$

$$RSS = \Sigma \hat{y}_i^2 = \hat{\beta}_1 \Sigma x_1 y + \hat{\beta}_2 \Sigma x_2 y$$

$$ESS = TSS - RSS = \Sigma y_t^2 - \Sigma \hat{y}_t^2$$

Analysis of Data

The data collected for this study were analyzed using multiple linear regression technique to achieve the five objectives. From the data presented, international oil price is the response variable, while exchange rate, interest rate, inflation rate, unemployment rate and real gross domestic product are the explanatory variables.

Table 1: Summary of Regression for Hypotheses

Dependent Variable: IOP
Method: Least Squares
Date: 10/01/20 Time: 10:37
Sample: 1990 2017
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	56.52006	23.84463	2.370348	0.0270
INFR	0.175245	0.204820	0.855605	0.4014
EXR	-0.197460	0.068959	-2.863455	0.0090
RGDP	1.169401	0.876728	1.333824	0.1959
UNR	3.761270	0.538952	6.978865	0.0000
INTR	-2.163768	0.996947	-2.170394	0.0410

R-squared	0.829189	Mean dependent var	45.42786
Adjusted R-squared	0.790368	S.D. dependent var	32.30007
S.E. of regression	14.78878	Akaike info criterion	8.413023
Sum squared resid	4811.573	Schwarz criterion	8.698496
Log likelihood	-111.7823	Hannan-Quinn criter.	8.500295
F-statistic	21.35943	Durbin-Watson stat	2.089135
Prob(F-statistic)	0.000000		

Source*: *E-view software

From the E-views output displayed Table 1, the fitted regression model of International Oil Prices (IOP) on Inflation Rate (INFR), Exchange Rate (EXR), Real Gross Domestic Product (RGDP), Unemployment Rate (UNR), and Interest Rate (INTR) is given as;

$$IOP = 56.520 + 0.175 INFR - 0.197 EXR + 1.169 RGDP + 3.761 UNR - 2.164 INTR$$

Testing for the Hypothesis

The hypotheses were tested using the e-view output in Table 1. The necessary hypotheses according to the objectives of this study are as follows:

Hypothesis One

$H_0 : \hat{\beta}_1 = 0$ (Inflation rate does not have any significant effect on international oil price).

$H_1 : \hat{\beta}_1 \neq 0$ (Inflation rate has significant effect on international oil price)

The t-test shows that t-calculated for inflation rate is 0.8556 with a prob. value of 0.4014. This shows that Inflation rate does not have any significant effect on international oil price.

Hypothesis Two

$H_0 : \hat{\beta}_2 = 0$ (Exchange rate does not have any significant effect on international oil price).

$H_1 : \hat{\beta}_2 \neq 0$ (Exchange rate has significant effect on international oil price)

The t-test shows that t-calculated for exchange rate is -2.8635 with a prob. value of 0.0090. This shows that exchange rate has significant but inverse effect on international oil price.

Hypothesis Three

$H_0 : \hat{\beta}_3 = 0$ (RGDP does not have any significant effect on international oil price).

$H_1 : \hat{\beta}_3 \neq 0$ (RGDP has significant effect on international oil price)

The t-test shows that t-calculated for RGDP is 1.3338 with a prob. value of 0.1959. This shows that RGDP has no significant effect on international oil price.

Hypothesis Four

$H_0 : \hat{\beta}_4 = 0$ (Unemployment rate does not have any significant effect on international oil price).

$H_1 : \hat{\beta}_4 \neq 0$ (Unemployment rate has significant effect on international oil price)

The t-test shows that t-calculated for unemployment rate is 6.9789 with a prob. value of 0.0000. This shows that unemployment rate has a positive significant effect on international oil price.

Hypothesis Five

$H_0 : \hat{\beta}_5 = 0$ (Interest rate does not have any significant effect on international oil price).

$H_1 : \hat{\beta}_5 \neq 0$ (Interest rate has significant effect on international oil price)

The t-test shows that t-calculated for exchange rate is -2.1704 with a prob. value of 0.041. This shows that interest rate has significant but inverse effect on international oil price.

Multiple Coefficient of Determination

The coefficient of determination as displayed in e-view output in Table 1 is 0.829, which implies that the model is adequate.

Diagnostic Tests

In this section, the diagnostic tests that the study shall consider are normality, serial correlation, heteroscedasticity, and multicollinearity.

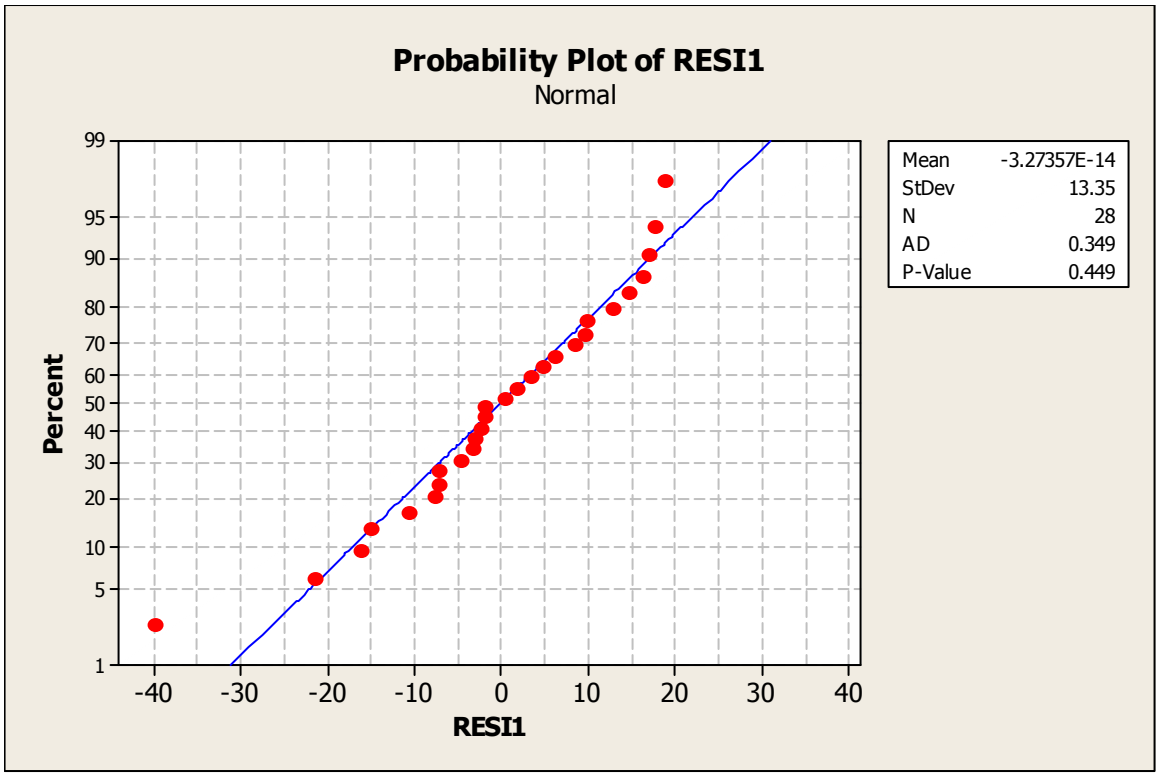
Testing for Normally Distributed Errors

To test for normal distributed errors, we used the Anderson-Darling test for normality. The hypotheses of the normality test are as follows:

H_0: Errors are normally distributed

H_1: Errors are not normally distributed

Fig. 1: Testing for Normally Distributed Errors



Source*: *Minitab software

Since the p-value (0.449) is greater than 0.05 from Fig. 1, the null hypothesis is not rejected. This implies that the assumption of normality distributed errors is satisfied.

Testing for Serial Correlation

To test for serial correlation, we used the Breusch-Godfrey Serial Correlation LM Test. The hypotheses of the Jarque-Bera test are as follows:

H_0: There is no serial correlation of the equation errors up to lag k
H_1: There is serial correlation of the equation errors up to lag k

Table 2: Testing for Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.064893	Prob. F(1,21)	0.8014
Obs*R-squared	0.086258	Prob. Chi-Square(1)	0.7690

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/01/20 Time: 09:06
Sample: 1990 2017
Included observations: 28
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.740793	25.30817	0.068784	0.9458
INFR	0.004210	0.209968	0.020051	0.9842
EXR	-0.010264	0.081177	-0.126438	0.9006
RGDP	0.059370	0.925792	0.064129	0.9495
UNR	0.047641	0.581669	0.081904	0.9355
INTR	-0.075637	1.061219	-0.071274	0.9439
RESID(-1)	-0.065018	0.255232	-0.254741	0.8014

R-squared	0.003081	Mean dependent var	1.78E-14
Adjusted R-squared	-0.281753	S.D. dependent var	13.34940
S.E. of regression	15.11346	Akaike info criterion	8.481367
Sum squared resid	4796.751	Schwarz criterion	8.814418
Log likelihood	-111.7391	Hannan-Quinn criter.	8.583184
F-statistic	0.010816	Durbin-Watson stat	2.031452
Prob(F-statistic)	0.999993		

Source*: *E-view software

The null hypothesis of these two tests is that there is no serial correlation of the equation errors up to *lag k* (mentioned above). Since the probability associated to the two tests is above 0.05, then the null hypothesis is not rejected, so we accept the non existence of serial correlation in the residuals.

Testing for Heteroscedasticity

To test for heteroscedasticity, we used the Breusch-Pagan-Godfrey Test. The hypotheses of the Breusch-Pagan-Godfrey test are as follows:

H_0: There is presence of homoscedacity
H_1: There is presence of heteroscedacity

Table 3: Testing for Heteroskedacity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.663095	Prob. F(5,22)	0.6552
Obs*R-squared	3.667056	Prob. Chi-Square(5)	0.5983
Scaled explained SS	3.443823	Prob. Chi-Square(5)	0.6319

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/01/20 Time: 09:11
Sample: 1990 2017
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	161.6137	508.2594	0.317975	0.7535
INFR	-0.322447	4.365825	-0.073857	0.9418
EXR	-0.155733	1.469884	-0.105949	0.9166
RGDP	-2.671293	18.68787	-0.142943	0.8876
UNR	12.18370	11.48801	1.060558	0.3004
INTR	-4.843640	21.25040	-0.227932	0.8218

R-squared	0.130966	Mean dependent var	171.8419
Adjusted R-squared	-0.066541	S.D. dependent var	305.2378
S.E. of regression	315.2297	Akaike info criterion	14.53189
Sum squared resid	2186135.	Schwarz criterion	14.81736
Log likelihood	-197.4465	Hannan-Quinn criter.	14.61916
F-statistic	0.663095	Durbin-Watson stat	2.227595
Prob(F-statistic)	0.655208		

Source*: *E-view software

Table 3 shows that heteroskedacity does not seem to be a problem since the p-value (0.6552) is greater than 0.05. Hence, the null hypothesis is not rejected in testing for heteroskedacity.

Testing for Multicollinearity

To test for multicollinearity, we employed the Variance Inflation Factor (VIF). Making process in Multicollinearity test, the decision criteria are:

1. If the VIF value lies between 1 – 10, then there is no multicollinearity
2. If the VIF < 1 or > 10, then there is multicollinearity

Table 4: Testing for Multicollinearity

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	56.520	23.845		2.370	.027		
	INFR	.175	.205	.094	.856	.401	.638	1.568
	EXR	-.197	.069	-.439	-2.863	.009	.331	3.025
	RGDP	1.169	.877	.147	1.334	.196	.642	1.558
	UNR	3.761	.539	.969	6.979	.000	.403	2.481
	INTR	-2.164	.997	-.311	-2.170	.041	.378	2.644

a. Dependent Variable: IOP

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	INFR	EXR	RGDP	UNR	INTR
1	1	4.815	1.000	.00	.01	.00	.01	.00	.00
	2	.755	2.525	.00	.22	.01	.02	.03	.00
	3	.235	4.524	.00	.09	.02	.37	.17	.01
	4	.123	6.268	.02	.51	.07	.27	.02	.05
	5	.063	8.711	.01	.16	.60	.28	.65	.00
	6	.008	24.055	.97	.02	.29	.05	.12	.94

a. Dependent Variable: IOP

Source*: *SPSS software

The VIF values all the independent variables obtained as shown in Table 4 showed that the values are between 1 and 10; which implies no multicollinearity symptoms.

Discussion of Results

The diagnostic tests showed that there is no presence of multicollinearity symptoms among the explanatory variables and there is no presence of serial correlation in the residuals. The result from the diagnostic tests also showed that heteroscedasticity does not exist in the data, and the error term is normally distributed. All these results obtained do not violate the assumptions of multiple regression analysis.

The empirical results emanating from the analysis indicated that Nigerian macroeconomic variables (inflation rate, exchange rate, RGDP, unemployment rate, interest rate) jointly have significant effect on the oil price during the year under study. Testing if International oil price has effect on each of the Nigerian macroeconomic variables revealed that exchange rate and interest rate have significant but inverse effect on oil price, while inflation rate and RGDP have no significant effect on oil price. Again, only unemployment rate has a direct significant effect on oil price. The coefficient of determination (R^2), which indicates the proportion in oil price that is explained by Nigerian macroeconomic variables turned out with a percentage of 82.9% showing that there is a strong relationship between the international oil price variable and the Nigerian macroeconomic variables. This result entails that 82.9% (percent) variation in the value of international oil price is explained by a change in the macroeconomic variables.

Conclusion

Having completed the analysis of this study work, we can conclude that only unemployment rate has a direct effect on the international oil price, while exchange rate and interest rate have inverse determinant of international oil price. Again, inflation rate and RGDP are not determinant factors of international oil price under the years of study. Having concluded the analysis of this study and from the results, we recommend the following: future researchers should work on a similar topic by incorporating other macroeconomic variables that may relate to international oil price to compare result; since unemployment rate has an effect to the international oil price government should try and create job for the youths.

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