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EFFECT OF OIL PRICE SHOCKS ON THE MARKET CAPITALIZATION OF NIGERIA

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Abstract: *This study examines the effect of oil pricevolatility on the volatility of Nigeria's market capitalization.It uses monthly frequency data for the period from January,1997 to December 2016and the EGARCH [1,1] model for data analysis. Average monthly inflation and exchange rates are introduced in the model as control variables. The results suggest that oil price volatility has a positive and weak effect on the volatility of market capitalization.The study advises market participants to target oil price movements as an important instrument for predicting the stock market volatility in Nigeria.*

Keywords: *NIgeria, oil price, volatility, market capitalization.*

1.0 Introduction

The relationships between oil price changes and macro-economic activities have have cntinued to attract the attention of researchers for several decades.This is as a result of the overwhelming importance of crude oil worldwide.Oil price movements have captured the attention of scholars who regard them as important determinants thatinfluence macroeconomic activities and, ultimately, stock market indices in different parts of the world (see Siddique,2014) . The degree of attention currently given to oil price oscillations is justified by the fact that oil prices play important roles in the modern economy.Studies such as Cunado and Garcia (2003), Kilian (2008) as well as Cologne and Manera (2008) projectoil price changes as a variable that impactssignificantly on domestic price levels, gross domestic product, investment and savings.Consequently, wild price movements in the energy markets have beecome an issue of serious concern among economists and policy-makers (Eksi, Senturk&Vildirim, 2012). Various attempts have been made to explain the behavior of the crude oil price and assess the macroeconomic consequences of its fluctuations. Since the first oil crisis in 1973, investors and policy-makers have partnered in the discussion of oil price shocks. This arises from the revelation by several studies that the price of crude oil, which is the primary fuel of industrial activities, plays a significant role in determining the shape of countries' economic and political developments(see Siddique, 2014 ;Berk& Aydogen,2012). It performs such function by influencing aggregate indicators directly and, also, impacting operational costs and revenues.

Notwistanding those general impressions about the importance of crude oil and the economic consequences of the fuctuations in its price, the studies carried out on the relationship between oil price changes and stock markets are relatively few, especially in sub Saharan Africa countries. Peter and De-Mello (2011) in Soyemi (2017)explain this dearth of studies as arising from the difficult nature of evaluating stock market activities which did not trend until the 1990s. The few studies that have investigated such interactionswere carried out mainly on industrialized net oil-importing countries such as the United States of America, United Kingdom and Japan (see Jones

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&Kaul 1996;Sadorsky,1999 cited in Akinlo,2014). This study considers it worthwhile contributing to fill this vacuum by examinining the interaction between oil price changes and market capitalization in one of the emerging economies. Here, Nigeria is selected as case–study. The use of Nigeria as a case study is interesting for several reasons. Firstly, Nigeria is the largest exporter of oil in Africa. Secondly, the Nigerian stock market is a highly promising area for international portfolio diversification. Thirdly, a lot of major reforms have been implemented recently in almost all the sectors of the economy(see Akinlo,2014). The cardinal objective study is to model the volatility of market capitalization as a response to oil price shocks in Nigeria.Nigeria's market capitalization refers to the total naira market value of the outstanding shares of Nigeran listed companies. Market capitalization is important as it is often used to show the size of a company which is a basic determinant of various characteristics in which investors are interested, including risk.From the perspective of a nation, market capitalization is also a pointer to its stock market's pattern of growth and development. The remainder of the paper is arranged as follows: section 2 provides a review of the related theories and previous empirical studies. Section 3 describes the data and methods adopted in this study. Section 4 presents the estimation results.while section 5 concludes the paper.

2.0Theoretical Underpinnings and Review of Related Literature

2.1 **Theoretical underpinnings**

Soyemi et al. (2017) posit that among the several basic global commodities, crude oil occupies a unique position.This is explained by the fact that every country, one way or another, relies on it either as a producer or a consumer. For this reason, fluctuations in crude oil price ultimately affect the global economy. Nwanna and Eyedayi (2016) define volatility as upward and downward drifts of the prices of crude oil universally, whileByström(2014) cited in Dahlvid and Granberg (2017) considers volatility as the most common risk measure in finance. Theyunderstand the cocept as the risk associated with the upward and downward movements in the value of an asset. Volatility has also been defined as the conditional standard deviation of the underlying assets return and denoted by σ **(zigma).**It is a characterization of price changes over time. It has to do with consecutive positive and negative price shocks.

Volatility has some important characteristics, one of the most important being that it changes over time .It is not directly visible in daily data owing to the fact that there is only one observation each trading day. Volatility depends on the trading in each day and between the days (the over-night volatility). It is calculated on the assumption that it has a geometric Brownian motion.

Kilian (2009) argues that the price of crude oil is influenced by innovations to global crude oil supply, aggregate demand for all industrial commodities, and oil specific demand.The hike in crude oil price leads to a reduction in domestic demand and stock prices. For oil exporters such as Oil Mineral Producing Countries (OPEC) , the reverse is the case.Volatility in oil prices can be either permanent or persistant(Okoro,2014b). When oil price increases are considered by investors as permanent, investment decreases.Oil price volatilitiesattract the attention of both financial practitioners and market participants for the following reasons:- (1) they impact the decisions made by producers and consumers in strategic planning and project appraisals and (2) they influence investors' decisions in oil related activities, allocation of portfolios and risk management(see Dhaoui&Khraief, 2014).

Tabar(2013) and Angelidis, Degiannakis, and Filis. (2015) contend that oil price fluctuation exerts significant effects on stock markets through a number of channels apart from affecting the world economy. For Angelidis et al, (2015), oil price shocks possess incremental price in predicting the state of the stock market. Zhang (2017) also confirms that large oil shocks contribute in a big way to stock markets occasionally.

2.2Review of the related literature

The nexus between oil price changes and macroeconomic fundamentals such as gross domestic product, inflation, employment, exchange rate and investment have continued to be investigated by several studies (see Chen & Chen, 2007, Huang & Guo, 2007 and Nandha & Hammoudeh 2007 cited in Akinlo, 2014). However,as of today, only very few studies have focused on the interaction between oil price changes and stock markets, especially in developing countries like Nigeria. For instance, Jones and Kaul (1996) examined the reaction of international stock markets to oil price shocks.They ascertain that the reaction of US and Canadian stock prices to oil shocks could be completely accounted for by the impact of these shocks on real cash flows in the postwar period... However, the results for Japan and the Uk were inconclusive.

Huang, Musulis and Stoll (1996) carried out a smilar study. They investigated the link between daily oil future returns and daily US returns using an unrestricted vector autoregressive (VAR) approach. The results of the studyshow that oil returns influence some individual oil company stock returns but do not have much impact on general market indices.At a later date,Sadorsky (1999) studied the relationship between oil

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changes and aggregate stock returns using American monthly data. The results obtained using VAR and GARCH approaches show that oil price and its volatility both play important roles in affecting real stock returns. They study reports that oil price movements after 1986 accounted for a larger fraction of the forecast error variance in real stock returns than did interest rates.

After employing the VAR methodology to find out the interaction amongst oil prices with the real stock prices, interest rates, real economic activity and employment in Greece. Pappetrou (2001) reports that oil price changes affect real economic activity and employment. Moreover, oil prices account for a significant movement in stock price.

In a related dimension, Park and Ratti (2008) observe after carrying out a study that oil price shocks have a statistically significant negative effect on stock prices for an extended sample of thirteen developed markets. Another study by Miller and Ratti (2009) investigated the relationship between the world price of oil and international stock markets. The authors affirm that stock market indices responded negatively to increases in the oil price in the long run. However, according to them, this pattern appeared to have changed from the beginning of 2000. On the other hand Boyer and Filion (2007) find the Canadian energy stocks to be positively associated with the overall markets return and the appreciations of crude oil and natural gas prices.

The findings of the empirical work of Lescaroux and Mignon (2008) point that a strong unidirectional causality run from oil prices to share prices, most especially for oil exporting countries.

Gogineni (2007) and Yurtsever and Zahor (2007) confirm the finding that oil prices are positively associated with stock prices where oil price shocks reflect changes in aggregate demand. However,they contend that the relationship would be negative where oil price shocks reflect on aggregate supply. This aside, the results of those studies show that stock prices respond symmetrically to changes in oil prices, while lower oil prices are not associated with higher oil prices. Hammoudeh and Aleisa (2004) assert that there is a bidirectionalrelationship between Saudi stock returns and oil price changes.However,using VAR metodology for Gulf cooperation countries, Basher (2006) notice that only the Saudi and Oman markets have predictive power of oil price increase. Also, the results of the study by Bhar and Nikolova (2010) show that global oil price returns have significant impact on Russian equity returns and volatility.The outcome of the study by Chen (2010) suggests that an increase in oil prices leads to a higher probability of a bear emerging market.

Korsah,P. & Fosu(2016) investigated the relaationship between exchange rates movements and stock market capitalisation in Ghana using Johansen cointegration technique and vector error corrction model and quarterly time series data covering the period of 1990 to 2013. The study finds a negative and significant relationship between exchange rates and stock market capitalisation both in the long-run and in the short run suggesting that a depreciation of the Ghana cedi against the US dollar is inimical to the performance of the Ghana Stock Exchange (GSE) Market.

In a study carried out in Nigeria,Akinlo(2014) used vector error correction modeling approach to examine the relationship between changes in oil prices and market capitalization over the period 1981-2011. Theresults suggest a long-run relationship between oil price, exchange rate and market capitalization. A unidirectional causality runs from oil price change to stock marketcapitalization. The study finds that impulse response function shows that oil price has a temporary positiveimpact on stock market capitalizationand that the latteris very much dependent on oil price fluctuation.

3.Methodology

3.1 Data description

This study is carried out to ascertain the effect of oil price volatility on the volatility of market capitalization in Nigeria. We select monthly data covering the period from January 1997–December 2016. We choose monthly frequency data in line with the general preference of empirical studies for such data-frequencies when investigating oil-stock-prices correlation(see Cheikh,Naceur, Kanaan & Rault, 2018). . In order to check for robustness, other crude oil benchmarks such as West Texas Intermediate (WTI) and OPEC spot prices were employed. We find that those oil prices do not significantly alter the results of our benchmark specifications. Our study covers the very recent episode of economic recession in Nigeria.Concerning oil data, we use the monthly Brent spot prices to analyze the international crude oil market. Oil prices are denominated in US dollars and available from the US Energy Information Administration (EIA). We compute oil volatility using the historical method. The end month data for market capitaalization(MCAP) are obtained from the Central Bank of Nigeria Statistical Bulletins of the relevant period. The average monthly data on Nigeria's official exchange(OER) rate and inflation rate(INF) are retrieved from the CBN publications of the relevant years. The variables of the study include the historical prices of Brent spot crude oil price , used as

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independent variable, market capitalization as the dependent variable. The Nigerian official exchange rates which are the Nigerian naira exchange rates against the US$ and inflation rates are employed as control variables.According to Fama(1963),both of them are among the macroeconomic variables that affect stock markets significantly.. The Brent crude oil price measures the spot price of various barrels of oil which are quoted in the global oil market.

A number of preliminary tests are carried out to discover the properties of the data time series.

3.1.1 Descriptive Statistics

A wide range of descriptive statistics are desplayed in table.1..The table demonstrates that all the variables selected for the study have positive mean values. The table reveals that the mean values of oil price,inflation rate,official exchange rate and market capitalization are 57.48429, 11.47804, 131.3484 and 5028.893 respectively.Their median values are 50.31000, 11.38500, 130.3400 and 4681.300 respectively.The JarqueBerastatistics for Market capitalization is 22.17485 and a p-value of 0.000015; This means that market capitalizationis not normally distributed since the p-value is less than 0.05. A standard deviation shows how data is spread out from mean. A low standard deviation indicates that the data points tend to be close to the mean of the data set, while a high standard deviation indicates that the data points are spread out over a wider range of values. It is the most common measure of variability. It is the numeric index that describes how far away from the mean the scores in the distribution are located. The standard deviation values for OP,INF, OER and MCAPare 34.55795, 4.202081,52.08417 and 4352.340 respectively. This shows that inflation rate remained most stable during the period covered by this study,while MCAP was the most volatile.The JarqueBerastatistics for inflation rate is 2.677119 and has a p-value of 0.262223; This means that inflation rateis normally distributed since the p-value is higher than 0.05 The JarqueBerastatisticsfor OER is 88.03586 and has a p-value of 0.00000; This means that official exchane rateis not normally distributed as thep-value is less than 0.05 The JarqueBera Statistics for OP is 20.25920 and has a p-value of 0.000040; This means that oil priceis not normally distributed since the p-value is lessthan 0.05.

Table 1 : Descriptive Statistics
Source : Researcher's Computation

	OP	INF	OER	MCAP
Mean	57.48429	11.47804	131.3484	5028.893
Median	50.31000	11.38500	130.3400	4681.300
Maximum	133.9000	24.10000	321.5451	14027.70
Minimum	9.800000	0.900000	21.88610	215.9000
Std. Dev.	34.55795	4.202081	52.08417	4352.340
Skewness	0.458444	0.248519	0.285226	0.366864
Kurtosis	1.911314	3.143751	5.911730	1.704188
Jarque-Bera	20.25920	2.677119	88.03586	22.17485
Probability	0.000040	0.262223	0.000000	0.000015
Sum	13796.23	2754.730	31523.63	1206934.
Sum Sq. Dev.	285426.2	4220.139	648349.7	4.53E+09
Observations	240	240	240	240

3.1.2 Histograms

The histograms in figure 1 show that market capitalization has a positive skewness (0.3668) and isplatykurtic (1.7041).Oil price has a positive skewness (0.4584) and is alsoplatykurtic(1.9113). Official exhange rate has a positive skewness (0.285226) and a positive krtosis (5.911730)Inflationraten has a positive skewness (0.248519) and a positive kurtosis (3.143751).

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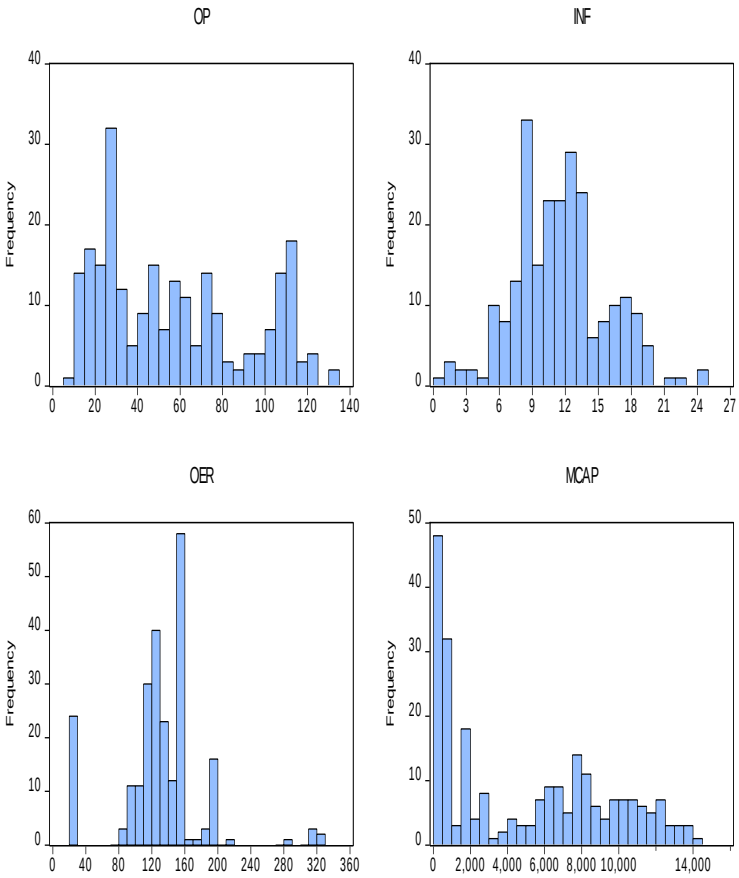

Fig 1: Histograms for the dependent and independent variables
Source : Researcher's Computation

3.1.3 Co-integration tests

From the Trace Test Output in table 2a,the null hypothesis is that there is no cointegration among the variables, meaning that none of the variables are co- integrated. This is rejected since p-value is 0.0313 (less than 0.05) The second hypothesis which is under the maximum eigeh value test is that there is at "most 1" cointegrating equation. This is accepted as the p-value is equl to 0.4250. The results of the co-integration tests confirm the existence long-run relationsrhips among the variable data series of this study.

Table 2 a : Trace Test
Date: 06/23/19 Time: 16:44
Sample (adjusted): 6 240
Included observations: 235 after adjustments
Trend assumption: Linear deterministic trend
Series: MCAP OP OER INF
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.119782	49.95083	47.85613	0.0313
most 1	0.049798	19.96830	29.79707	0.4250
At most 2	0.033275	7.964434	15.49471	0.4692
At most 3	5.00E-05	0.011754	3.841466	0.9134

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
*** denotes rejection of the hypothesis at the 0.05 level**
****MacKinnon-Haug-Michelis (1999) p-values**

Table 2.b :
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.119782	29.98253	27.58434	0.0241
At most 1	0.049798	12.00387	21.13162	0.5473
At most 2	0.033275	7.952680	14.26460	0.3835
At most 3	5.00E-05	0.011754	3.841466	0.9134

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source : Researcher's Computation

3.1.4.Unit Root Tests

3.1.4.1 Test for stationarity of oilprice using Augmented Dickey fuller technique

The time series data for DOP were not stationary at their levels[I(0)].Consequently, they were differenced to achieve its first difference in order to find out if they are stationary at first difference(see table 3a).The null hypothesis is that the series has a unit root,If this becmes true,the implication is that the seiries is non-stationary. The Augmented Dickey- Fuller test statistic suggests a significant result [p-value = 0.0000],Cosequently, the null hypothesis is rejected.The implication is that DOP is stationary as it has no unit root.

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Table 3a : Unit Root test forDOP
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=14)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.620566	0.0000
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DOP)
Method: Least Squares
Date: 06/04/19 Time: 14:35
Sample (adjusted): 4 240
Included observations: 237 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DOP(-1)	-0.742573	0.086140	-8.620566	0.0000
D(DOP(-1))	-0.166106	0.064700	-2.567305	0.0109
C	0.118816	0.397821	0.298666	0.7655

R-squared	0.458697	Mean dependent var	0.039030
Adjusted R-squared	0.454070	S.D. dependent var	8.286513
S.E. of regression	6.122662	Akaike info criterion	6.474448
Sum squared resid	8771.955	Schwarz criterion	6.518348
Log likelihood	-764.2221	Hannan-Quinn criter.	6.492143
F-statistic	99.14494	Durbin-Watson stat	2.001256
Prob(F-statistic)	0.000000		

Source : Researcher's Computation
Source : Researcher's Computation

3.1.4.2 Unit root test for DMCAP using Augmented Dickey fuller technique

The time series data have for DMCAP were not stationary at their levels[I(0)].Consequently, they were differenced in order to find out if they are stationary at first difference(see table 3b).The null hypothesis is that the series have a unit root .If that becomes true, it means that thjey are non-stationary. The Augmented Dickey- Fuller test statistic shows a significant result [p-value = 0.0000],.Cosequently, the null hypothesis is rejected.The implication is that theseries for DMCAP are stationary as they have no unit root

Table 3b : Unit Root Test for DMCAP
Null Hypothesis: DMCAP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=14)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-21.05359	0.0000
Test critical values:	1% level	-3.457747	
	5% level	-2.873492	
	10% level	-2.573215	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DMCAP)
Method: Least Squares
Date: 06/04/19 Time: 15:26
Sample (adjusted): 3 240
Included observations: 238 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DMCAP(-1)	-1.305638	0.062015	-21.05359	0.0000
C	48.20727	65.04400	0.741149	0.4593

R-squared	0.652560	Mean dependent var	2.264706
Adjusted R-squared	0.651088	S.D. dependent var	1697.825
S.E. of regression	1002.885	Akaike info criterion	16.66752
Sum squared resid	2.37E+08	Schwarz criterion	16.69670
Log likelihood	-1981.435	Hannan-Quinn criter.	16.67928
F-statistic	443.2535	Durbin-Watson stat	2.064192
Prob(F-statistic)	0.000000		

Source : Researcher's Computation

2.1.5 Stability [CUSUM] Test for the model with DMCAP as the dependent variable (DMCAP_DOP_DOER_DINF)

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The classical Chow (1960) structural stability test was carried out to spot out evidence of potential structural break (see Zivot.& Andrews, 1992).. Though most of the residuals are within their confidence interval limits or bounds, the CUSUM squared result presented in Figure 6 rejected the hypothesis of coefficient stability at five per cent significance. This suggests the presence of structural change in the model. Structural breaks potentially occur in the model at 2008M12 and lasted through 2011M07 during which point the residuals drifted upward. This break point period coincided with the global financial crisis, which though noticed in 2007 only had impact on the Nigerian economy from the end of 2008.

3.2 Methods

3.2.1 Research Design

This work employed the *ex post facto* research design for determining the influence of oil prices shock on market capitalization..

3.2.2 Model Specification

The estimation was carried out with the Exponential GARCH (EGARCH) model.Soyemi et al, (2017) report that this model has been used in recent studies to measure volatility (See Lux, Segnon & Gupta, 2015, in Soyemi et al, 2017; Lawal. Somoye & Babajide., 2016; Eagle, 2017), among others.Several authors such as Andreas and Constatinos (2009), Somoye *et al., (*2015),Manasseh and Omeje(2016), and Lawal et al., (2016). consider this approach as a better means for accounting for the size effect of oil price movements on the dependent variable and allowing for movementsin the conditional variance.Proposed by Nelson (1991),the EGARCH model is important in capturing asymmetry(that is, the different impacts on conditional volatility of positive and negative shocks of equal magnitude) and also leverage.The latter refers to the negative correlation between returns shocks and subsequent shocks to volatility.

One advantage of the EGARCH model over the basic GARCH (1,1) specification is that it is an asymmetric model that specifies the logarithm of conditional volatility and avoids the need for any parametric constraints Exponential GARCH has some form of leverage effects in its equation. Accoding to Sardrsky (1999),many authors have suggested that oil price volatility shocks may play an essential role in explaining economic activity. Ross (1989) contends that volatility of price changes may be an accurate measure of the rate of information flow in financial markets.

The EGARCH[p,q] model is specified as follows: -

$$\log(h_t) = \alpha_0 + \sum_{j=1}^{q} \beta_j \log(h_{t-j}) + \sum_{i=1}^{p} \alpha_i \left| \frac{u_{t=i}}{\sqrt{h_{t=i}}} \right| + \sum_{k=1}^{r} \gamma_k \frac{u_{t-k}}{\sqrt{h_{t-k}}}$$

(conditional variance equation).....(2.1)

For this study, the conditional mean and variance equations for testing the hypothesis are presented as follows:-

LOG(GARCH) = C(1) + C(2)*DOP

.....(2.2)

LOG(GARCH) = C(3) + C(4)*ABS[RESID(-1)/@SQRT{GARCH(-1)}] + C(5)*RESID(-1)/@SQRT(GARCH(-1)) + C(6)*LOG{GARCH(-1)} + C(7)*DOP ……(2.3)

where LOG (GARCH) is the conditional variance of the residual; it isDMCAP(the dependent variable). C (3) stands for the constant which indicates the last period (t-1) volatility. C(4) is the constant representing theimpact of a magnitude of a shock (size) /arch effect / spillover effect . It indicates the impact of long term volatility. At five percent level of significance, if C(4) has a p-value not higher than 0.05, the implication is that it is significant and there seems to be an impact of long term volatility..C (5) is the Gamma (γ) or leverageterm. The gamma parameter measures the asymmetry or the leverage effect. If gamma = 0 , then the model is symmetric. When gamma < 0 , then positive shocks (good news) generate less volatility than negative shocks (bad news). When gamma > 0 , the implication is that positive innovations are more destabilizing than negative innovations.C (6) re[resents the GARCH effect. That is the alpha. Its parameter represents a magnitude effect or the symmetric effect of the model.Beta (the GARCH term) measures the persistence in conditional volatility irrespective of anything happening in the market). When beta is relatively large, then volatility takes a long time to die out following a crisis in the market..C (7) is DOP ((the explanatory variable),The statistics for the hypotheses are shown in tables 11 – 16. The decision is based on 5% level of significance. According to Brooks (2014), the model above, which is based on the assumption of normal gaussian distribution, captures the asymmetric volatility through the variable gamma(γ). The sign of the gamma determines the size of the asymmetric volatility and whether the asymmetric volatility is positive or negative.

The null hypothesis is that oil price volatility had no positive and significant effects on the Nigerian market capitalization. The model for testing this hypothesis is presented respectively :as follows:-

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DMCAP = C(1) + C(2)*DOP
……..…… (2.4)

LOG(GARCH) = C(3) + C(4)*ABS[RESID(-1)/@SQRT{GARCH(-1)}] + C(5)*RESID(-1)/@SQRT{GARCH(-1)} + C(6)*LOG{GARCH(-1)} + C(7)*DOP……(2.5)

3.2.3 Economic a priori expectations

In alignment with the reults of Brailsford (1999), Ono (2001), Park and Ratti (2008) and Degiannakis et al,(2017) that oil price shocks should impact positively and significantly on the stock market returns of an oil exporting country, this study has the a priori expectation that the effect of oil price volatility on the volatility of Nigeria's market capitalization would be positive..

4.0 Results

4.1 Diagnostics

In table 1,the Jaque Bera statistics show that, except for inflation, none of the variables data is normally distributed as each of them hasJarque Bera statistic with p-value less than 0.05.As forthe histograms in figure 1, theyshow that all the varibles time series have positive skewness and positive kurtosis.Futher, the result of the unit root tests carried out is that the data series allbecome stationaryonly after first differencing. In addition, the serial correlation tests carried out suggest that serial correlation is completely absent in the time series - an assurance of the validity of the regression results. Finally, after carrying out the ARCH(Lagrange multiplier) tests, this study finds that the residuals are conditionally heteroskedastic.Both the Trace test and Maximum Eigen-Value test results demonstrate that the variables have long-run equilibrium relationships among themselves. Finally, the outcome of the CUSUM test is that there is no deviation from the 5% boundary. This shows that the model of the study is stable.

4,2 : Econometric estimation using the EGARCH model for DMCAP as the dependent ariable

The econometric estimation was carried out with the normal Gaussian distribution type of EGARCH. In the equation estimation in table 6, the leverage term (gamma) is positive at 0.760449 , meaning that there is no leverage effect: bad news has less impact than good news of the same size. The GARCH (beta) term has a value of -0.027482 and a p-value of 0.8770, implying that it is not significant and there is no volatility persistence. Oil price shock has a p-value of 0.7519 and a positive coefficient at 0.003843. This means that the impact of oil price shock on market capitalization is positive but not significant. The volatility or shocks of oil price cannot affect the volatility of market capitalization.. The conclusion from this result is that oil price shock has a positive and non-significant effect on market capitalization of the Nigerian stock market.

Figure 5 shows that there is a prolonged period of low volatility (small shock) from day 1 to day 75 and also there exists a prolonged period of high volatility (big shock) from day 125 to day 225. In other words, periods of low volatility are followed by periods of low volatility and periods of high volatility tend to be followed by periods of high volatility. This suggests that residual or error term is conditionally heteroskedastic

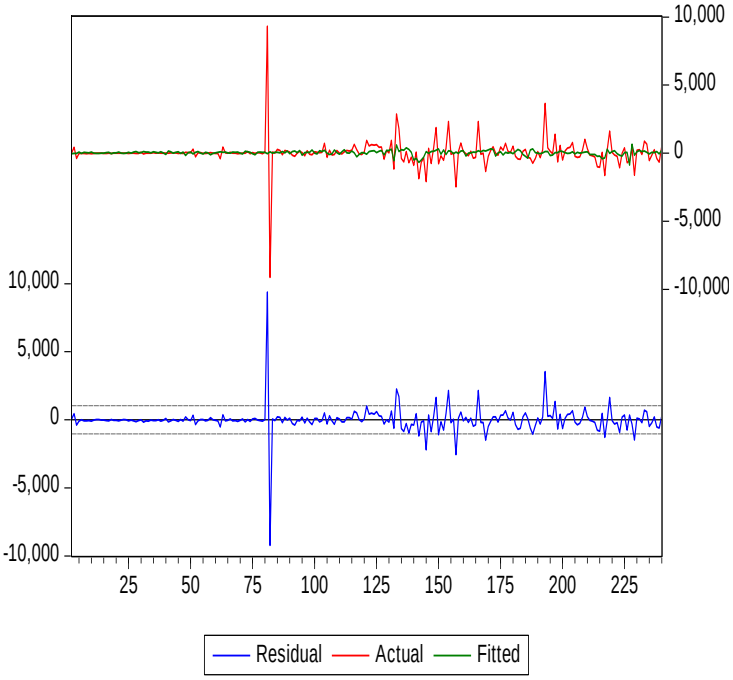

Figure 5: Residuals of DMCAP derived from equation 1.1
Source : Researcher's Computation

As Equation 1.2 and table 4 reveal that C5 is positive(0.603254), this implication is that there is no leverage effect and that good news has more impact on volatility than bad news of the same size. C6 has a value of -0.703836 and a p-value of 0.0000.This shows that the GARCH term is significant; hence, there is volatility persistence. Its negative value points to the fact that negative shock has more effect on the persistence of past volatility than the positive shock of the same magnitude.Oil price volatility(DOP) has a p-value of 0.1694 .At a 5 percent level of significance,the impication is that the impact of oil

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price volatility on the volatility of Nigeria's market capitalization is not significant and its volatility or shocks cannot affect the volatility of the market capitalization.. The shock in oil price does not significantly affect Nigeria's market capitalization. With a positive coefficient (0.008871),oil price volatility has a psitive effect onNigeria's market capitalization.The EGARCH estimation results also suggest that the average monthly inflation rate(DINF) is an exogenous variable which can contribute to the volatility of market capitalization as the former has a p-value of 0.0000. Hence,the volatility in aqverage monthly inflation rate in Nigeria has a significant effect the volatility of her market capitalization.=With a p-value of 0.0001as disclosed in EGARCH estimation, average monthly official exchange rate has a significant impact on the volatility of market capitalization..In addition,with a positive coefficient of0.051, the impact of average monthlyofficial exchange rate on market capitalization is the positive.

TABL4: ESTIMATION EQUATION

Dependent Variable: DMCAP
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
Date: 06/15/19 Time: 15:57
Sample (adjusted): 2 231
Included observations: 230 after adjustments
Convergence achieved after 76 iterations
Coefficient covariance computed using outer product of gradients
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(3) + C(4)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(5)
*RESID(-1)/@SQRT(GARCH(-1)) + C(6)*LOG(GARCH(-1)) + C(7)*DOP
+ C(8)*DINF + C(9)*DOER

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	70.40196	52.36715	1.344392	0.1788
DOP	13.84469	3.991616	3.468443	0.0005
Variance Equation				
C(3)	22.80815	0.584919	38.99370	0.0000
C(4)	-0.262296	0.083169	-3.153785	0.0016
C(5)	0.603254	0.079877	7.552285	0.0000
C(6)	-0.703836	0.046236	-15.22262	0.0000
C(7)	0.008871	0.006455	1.374239	0.1694
C(8)	0.052571	0.006010	8.747544	0.0000
C(9)	0.051189	0.012946	3.954165	0.0001

R-squared	0.017521	Mean dependent var	36.48000
Adjusted R-squared	0.013212	S.D. dependent var	1064.151
S.E. of regression	1057.098	Akaike info criterion	16.26445
Sum squared resid	2.55E+08	Schwarz criterion	16.39898
Log likelihood	-1861.412	Hannan-Quinn criter.	16.31872
Durbin-Watson stat	2.643672		

Source : Researcher's Computation

4.3 Implication of Findings

The coefficient of oil price volatility was found to be positive while the p-value was non-significant..The result shows that a unit change in oil price generates some positive change in market capitalization, even though the influence was weak during the periodstudied. The result is consistent with the fact that an increase in oil price will have a positive effect on the stock market growth of an oil exporting country like Nigeria. This view is in agreement with Akinlo (2014) that found a long-run positive relationship between oil price and market capitalization.

5.0. Conclusions

This study examined the effect of oil price volatility on the volatility of selected market capitalization in Nigeria, using the EGARCH[1,1] model in the empirical analysis. It employed secondary data covering the period from January 1997 to December 2016.Monthly average official exchange rates and inflation rates were used as control variables to strengthen the explanatory power of the model. The findings of this study suggest that oil price volatility has a positive and weak effect on the volatility of market capitalization,Consequently, the study advises market participants to target oil price movements as an important instrument for predicting the volatility of Nigeria's stock market development.It recommendsthe extention of susequent works on its subject-matter using intra-day volatilty based on high frequency data. The study can equally be extended by determinig the effect of oil price volatility on the volatility of other financial market variables like earnings per share, dividend policy and dividend yield and comparing the volalility of the Nigerian stock market variables

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with those of other exchanges in emerging and developed economies.

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