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THE ROLE OF STOCK MARKET DEVELOPMENT ON ECONOMIC GROWTH IN OPEC COUNTRIES: DOES OIL PRICE MOVEMENT MATTER? FRESH EVIDENCE FROM NIGERIA

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ABSTRACT

This study investigates the relationship link crude oil price and stock market development and economic growth in one of the OPEC countries with emphasis on Nigeria over the period 1981 to 2014, using the latest methodology autoregressive distributed lag approach (ARDL) to cointegration analysis. Three indicator of stock market development are constructed using principal component analysis. The revels the dominant role of rule oil price as one of the engine for economic growth in Nigeria. Using inflation and trade openness as a moderator on economic activities in Nigeria, this study found that stock market is insignificant in driving economic growth in Nigeria indicating poor financial sector performance. In general, the results highlight the dominant role crude oil price and posits the weakness of the stock market in stimulating economic growth through resource mobilization and allocation in Nigeria. Therefore for government to achieve sustainable economic development and maximize stock market performance, policy maker in oil exporting countries should monitor the movement of crude oil prices.

1. INTRODUCTION

Crude oil market and stock market are the two most volatile markets among the financial markets in the study of financial economics. The two, in addition to their huge volatility, are also crucial in the world economy especially in economies of countries that produce and export crude oil. The reasons for this cannot be far-fetched. On one hand is that the revenue from crude oil plays a vital part in the infrastructural development of the country while on the other hand is that stock market helps broaden financial market by encouraging savings and funding of both private and public borrowing needs. For this, there have been remarkable interests on the relationship between the performance of the stock market, economic growth and crude oil price. Hamma *et al.* (2014) reporting on the study of the effect of oil price volatility on the Tunisia stock market found not only that there exist a relationship that flows from oil market shock to the variability on the stock market performances but also that the conditional volatility of the stock market depends on its past variation and that of the shocks on the oil prices. Olufisayo (2014) supports this finding of a unidirectional relationship using a different data set from Nigeria between 1981 and 2011.

Using some selected macroeconomic variables in the likes of oil price and trade openness to establish the possible link with economic growth in Nigeria, this study investigates empirically the roles of stock market development on economic growth in Nigeria using the newly technique-autoregressive distributed lag (ARDL) approach to cointegration analysis. Although few studies based exclusively on Nigeria data exist, none has considered stock market development indicators in the interaction between crude oil price movement and economic growth in Nigeria (see for instance Hamma *et al.* (2014); Olufisayo (2014)). This study therefore aims to extend the preview work in the existing literature. The results of this study would be of importance to researchers and policy-makers in Nigeria and other developing oil-exporting countries seeking to understand the independent effects of stock market, crude oil price movement and economic growth.

The remainder of this study is structured as follows. Section 2 presents methodology and data issues of the study. Section 3 presents empirical analysis. Finally, Section 4 offers summary of findings and policy implications.

2. LITERTURE REVIEW

2.1 Theoretical review

Stock prices are said to reflect and incorporate all fundamental information of the underlying variables. When this occur, it implies that the stock market is efficient. Therefore, the transmission of shock to stock prices should be reflected through the changes in all or some of the fundamentals such as the future productive capability, earning capability, quality of management, etc. In the same sense, it is not unreasonable to expect that information on shocks of oil prices should be incorporated into the values or prices of stock. This was aptly noted by Apergis and Miller (2009) that oil price shock affects the economic growth through stock return through changes on the earning of the stock market. Sadorsky (1999) documents that oil price shock has a negative and statistically significant impact on stock returns by changing economic activities through the effect on the industrial production and then the earning of the companies. A more detailed economic relationship between the oil price, economic growth and stock market return was well captured by Huang *et al.* (1996). They pointed out that oil price can affect the stock prices, economic growth through the cash flow by changing the expected cost of production and thus change the stock price in the opposite direction and on the other hand by changing the discount rate through a relative change in inflation and expected real rate of interest.

Pollet (2002) pointed out explicitly the theoretical underpinning between oil price, economic growth and stock exchange. He averred that the predictability of stock market returns and industrial performance based on the forecasting ability of oil price shock can be comparable to market efficiency. He found that economic growth and stock returns as depended on the price of oil are not forecastable using predicted component of the oil price changes. From Guidi (2009) point of view, a boom in a natural resource transmits its effect to manufacturing by increasing real wages and exchange rate appreciation. Therefore, while some researchers focused on the direct relationship between the oil price shock economic growth and stock market returns, others follow indirect methods by investigating the effects of oil prices on macroeconomic variables. Strand of literature in this area is a research on the relationship between macroeconomic variables and stock market by Gan *et al.* (2006) which found that New Zealand stock market is consistently determined by macroeconomic variables. Sequel to this, Guidi (2009) found a mixed result. While the result showed that oil price is an important factor on the variations of outputs from service sector, it showed that oil prices held no influence on the variation of United Kingdom manufacturing sector outputs. Thus, it can be drawn from the preceding statements that variations in the oil prices will have strong effect, either positively or negatively on the industrial activities.

The theoretical foundation of volatility of crude oil prices was liked with the supply side shocks. Events such as wars, political disturbances, deliberate regulations by the oil-producing and exporting organization such as OPEC and sudden natural disturbances like natural phenomena in the likes of earthquakes transmit shock to the world oil price. However, recent occurrences like the reduction of demand for oil from major oil consumer such as United States of America and China can have a substantial effect on crude oil prices as well. In financial economics, volatility as a risk measure is a very important concept. It measures the return that is expected from an investor as it relates to the risk taken be the investor. The underlying fundamentals backing this relationship is theory of capital assets pricing model (CAPM). In the study of this relationship, Kilian (2010) captured two fundamental factors that drive the theory of crude oil pricing. The first is that oil price is determined by the shock which is influenced by the demand side shock. The other is the supply-shock determined oil price. It was buttressed that the origin of the effect is very important as the effect of one on the economy differ from the other and may result in different kinds of policy prescription. However, due to the short period span of data used, a conclusion could not be reached on whether or not the volatility of the oil price could be detrimental or beneficial to the productivity of the economy. In support of this finding, Ani *et al.* (2014) confirmed that evidence does not sustain the conclusion that oil price volatility has an influence of macroeconomic variables. On the contrary, Ghosh and Kanjilal (2014) were of the view that uncertainty in the price of oil may lead to the reduction in the potential output of the country. Berk and Aydogan (2012) differed slightly on their approach by incorporating global liquidity in the study of the relationship between the oil price fluctuation and stock market return. The result revealed insignificant empirical evidence that the oil price shocks have a reasonable influence on the Turkish stock market, rather global liquidity accounts far more for the variation in the stock market.

2.2. Empirical Review

The empirical evidence on the impact of oil price fluctuation, stock market performance on economic have been equivocal. On the global implication of lower crude oil prices, Husain *et al.* (2015) reported that the impact depends on whether the country is exporting or importing oil but the general effect will be a boost in global economic activities. However, there is expected to be global financial strain in several areas especially in the oil-exporting countries, they affirmed. They concluded that the effect may not be significant because advanced countries are likely to save a large portion of the surplus while the impact on emerging countries will be constrained due to structural deficiencies. Asaolu and Ilo (2012) found long run but a negative relationship between economic growth, Nigerian stock market return and world crude oil price. Adenuga, Abeng, and Omanukwue support these findings. However, Abraham (2016) using autoregressive distributed lag (ARDL) model contradicted this finding by reporting that oil prices are positively related to the performance of Nigeria stock market and economic acticities.

Creti *et al.* (2014) using evolutionary co-spectral analysis reported comovement to be either positive or negative which its effect will not be felt in short run but in the medium time frame of about three to four years and there would be a significant impact of the oil prices on stock market during global financial crises. Akinlo and Apanisile (2014) analyzed panel data with ordinary least square (OLS), fixed effect Model and generalized methods of moment (GMM) to determine the impact of volatility of oil price on the economic growth in sub-Saharan Africa and their result showed that oil price volatility has positive and significant effect on economic growth for oil-exporting but positive and insignificant for non-oil producing countries. Similarly, Alley *et al.* (2014) used generalized methods of moments (GMM) to interpret the impact of oil shock on economic growth and concluded that while oil price significantly improves economic growth of the country, its shock insignificantly impedes economic growth. With oil price volatility, uncertainty is created and the effective fiscal policy management is undermined. However, Dogah (2015) investigated the impact of oil shock on the macro-economy of Ghana using VAR and Johansen cointegration techniques and found out that oil prices have significant negative impact on the output and other economic activities.

The time varying correlation are the same for oil-exporting and oil-importing countries, however, the demand shocks due to global business fluctuation and world chaos affect the correlation either positively or negatively (Degiannakis *et al.*, 2011). They further asserted that supply-side oil price shock does not affect the stock market while the demand-side shock affects the stock markets negatively and the origin of the oil price shock does not matter.

Gogineni (2008) found that oil price shock affects both companies that intensively use oil and those that use insignificant quantity. He supports the assertion that supply-side and demand-side driven oil price shocks are vital to understanding the sensitivity of stock market return to oil price variation. Using VECM to compare the reactions of oil importing countries like China and Pakistan stock markets to fluctuation of oil prices, Tajalli and Adnan (2014) found a negative relationship. By taking the past values of oil prices into consideration, it is possible to predict Nigeria stock market behavior (Ebong and Ekong, 2016). In other words, they established a cointegration relationship between crude oil prices fluctuation, stock market movement and economic growth while Adaramola (2012) reported a significant positive relationship between oil prices and stock return in the short run and significant negative relationship in the long run. Sorensen (2009) decomposed the oil price changes into those that are caused by exogenous factors and those that endogenous in nature and showed that it was those that are exogenously caused that can predict the stock returns. In a cautionary note, Ebrahim *et al.* (2014) recommended demand-side and supply-side policy such as proper regulation of trading in oil financial derivatives to curtail speculations and cooperation among global players in oil production and distribution respectively to combat excessive oil price volatility. This recommendation is based on the finding that oil market is characterized by high volatility and this has damaging effects on aggregate consumption, investment, industrial production, inflation and employment.

For government to achieve sustainable economic development and maximize stock market performance, policy maker in oil exporting countries should monitor the movement of crude oil prices (Ogiri *et al.*, 2013). This recommendation was due to their findings that there is a significant link between the performance of stock market and crude oil prices. Bjørnland (2009) using structural vector autoregressive (VAR) model found a positive relationship between the oil price shock and stock return variation though the effect dies out progressively afterward. Al Hayky and Nizar (2016) separated the effects of oil price on stock market index into two regimes with the help of Markov Switching technique. There is positive and significant relationship between oil price and stock market index in regime of high volatility while no relationship is revealed between oil price and stock market index in low volatility regime. Bust and boom state, and supply and demand shock, influence the way through which oil price shock affects the stock market return (Zhu *et al.*, 2016). They used quartile impulse response approach which allows for the observation of the asymmetric effect of oil price on Chinese stock market and reported that during bust period, supply and demand shock depress stock market return significantly while the aggregate demand shock enhances stock mark return during boom. In generalizing, Creti *et al.* (2013) studied the relationship between a panel of 25 commodity and stock markets' volatility using DCC GARCH model. Their findings revealed that correlation between the markets are high during financial crises and the correlation evolve over time, displacing high volatility at crisis periods picking oil and coffee to display a phenomenon of high volatility while gold has negative relationship with stock prices and is considered as a good material for hedging.

3. DATA AND METHODOLOGY

3.1 Data Description

This study uses annual data covering the period from 1981 to 2014. Economic growth is defined as the real GDP per capita. Other variables include; crude oil price measured as the (in US dollars per barrel) and the trade openness captured using the ratio of total trade (exports plus imports) to GDP. The summary is provided in Table 1. We use the three indicators of stock development to construct the overall composite index *skindex*. In agreement with the existing literature, that none of the indicators could be regarded as overall measure of stock market development and there could be presence of correlation between the indicators (see table 2), a composite index is constructed from these indicators using principal component analysis (PCA). Each of the three stock market development indicators captures various components of the stock market development in Nigeria. Stock market capitalization to GDP ratio (MCap) captures the size of the Nigerian stock market; value of trades of domestic stocks over GDP (VTRd) measures the liquidity of the stock market while turnover ratio (Tun) captures the efficiency of the stock market in resource allocation. A factor analysis is constructed from these indicators using principal component analysis (PCA). Strand of scholars have applied Principal component analysis (PCA) and is commonly been used to address the problem of inherent multicollinearity by reducing a large set of correlated variables into a smaller set of uncorrelated variables (see Stock and Watson (2002)) and has been widely employed in the construction of financial development indices in recent studies (see for instance Samargandi *et al.* (2014)). Table 2 shows that the first principal component accounts for about 85.37% of the total variation in the three stock market indicators. STindex is calculated as a linear combination of the three stock market indicators with weights given as the first eigenvector.

Table-1. list of variables

Variable	Definition	Source
RGDPC	GDP per capita (LCU)	Central Bank of Nigeria (CBN) Statistical Bulletin
Mkcap	Market capitalisation over GDP	Central Bank of Nigeria (CBN) Statistical Bulletin
Vtrd	Value traded over GDP	Central Bank of Nigeria (CBN) Statistical Bulletin
Tun	Value of trades over Market capitalisation	Central Bank of Nigeria (CBN) Statistical Bulletin
skindex	Stock market composite index constructed using Mkcap,Vtrd and Tun	
OPEN	Trade openness: total trade (export plus imports) over GDP	World development indicator database, world bank (online)
Inflation (INFLA)	Frequent fluctuations in the level of prices reflects instable macroeconomic environment in a country. Consumer price index 2010=100	World Development Indicators database, World Bank (Online)
Oil price (OILP)	Oil price is the price for which crude oil per barrel is bought or purchased, it is the global oil price. Brent oil price at $.	British petroleum.

Source: Author's Design.

Table-2. Correlation matrix and principal component analysis

Panel A	Eigenvalue: (Sum=3,Average=1)						
	Number		**Value**	**Difference**	**Proportion**	**Cumulative value**	**Cumulative Proportion**
		1	2.56108	2.16826	0.8537	2.561	0.8537
		2	0.39281	0.34671	0.1309	2.9538	0.9846
		3	0.0461		0.0154	3	1
panel B	Eigenvalues(loading):						
	Variables		PC1	PC2	PC3		
	MKGDP		0.57041	-0.62533	0.53252		
	TUNV		0.54484	0.77325	0.32438		
	VTRD		0.61462	-0.10510	-0.78178		
Panel C	Ordinary correction:						
			MKGDP	TUNV	VTRD		
	MKGDP		1				
	TUNV		0.6139	1			
	VTRD		0.90452	0.81402	1		

Source: eviews9

3.2. Model Specification

The following empirical model describes the relationship between oil price movement,stock market development and economic growth in Nigeria.

$$rgdpc = f(stindex, oilp, infl, open) \quad (1)$$

From the model, rgdpc captures the demand for financial intermediary services and oil consumption in the economy. It is believed that the growth of the economy will encourage high demand for financial intermediary services and growth in oil sector. Inflation captures the degree of macroeconomic stability in the economy. Boyd *et al.* (2001) suggest that high rates of inflation could reduce the volume of liquid liabilities issued by financial intermediaries and indeed, discourage economic activities. Therefore we expect a negative effect on economic growth. The ratio of total trade to GDP is included to capture the degree of openness of the Nigerian economy to trade. The openness of the economy to trade is another component of the macro economy that has been widely considered a significant driver of economic development in many economies. Therefore, we expect a positive sign on this variable. The international crude oil price measured as the Brent spot price (in US dollars per barrel) is used in this study to capture the crude oil price movement. Stindex has been extensively dealt with in the previous session. Therefore we expect a positive sign on this variable

The above equation can be written in econometric model and in their respective natural log form as thus;

$$lnrgdpc = \beta_0 + \beta_1 lnstindex + \beta_2 lnoilp + \beta_3 lninfl + \beta_4 lnopen + \varepsilon_t \quad (2)$$

Where $lrgdpc$ *is log of real gdp per capita,* $lnstindex$ *is log of composite stock index,* $lnoilp$ *is the log of crude oil price movement,* $lninfla$ *is the log of rate of inflation,* $lnopen$ *is the log of trade openess ,* ε_t *is the error term and* β_0 *is the intercept.*

3.3. Methodology

3.3.1. Unit Root Test

In time series analysis, before running the cointegration test the variables must be tested for stationarity. For this purpose, we use the conventional ADF tests, the Phillips– Perron test following Phillips and Perron (1988). The ARDL bounds test is based on the assumption that the variables are I(0) or I(1). Therefore, before applying this test, we determine the order of integration of all variables using unit root tests by testing for null hypothesis $H_o: \beta = 0$ (i.e β has a unit root), and the alternative hypothesis is $H_1: \beta < 0$. The objective is all variables should not be I(2) so as to avoid spurious results. In the presence of variables integrated of order two we cannot interpret the values of F statistics provided by Pesaran *et al.* (2001) or it will go boasted.

3.3.2. Cointegration Approach

In order to empirically analyse the long-run relationships and short-run relationship between crude oil price movement, stock market development and economic development, this study apply the autoregressive distributed lag (ARDL) cointegration technique as a general vector autoregressive (VAR). The ARDL cointegration approach was developed by Pesaran and Shin (1998) and Pesaran *et al.* (2001). This approach enjoys several advantages over the traditional cointegration technique documented by Johansen and Juselius (1990). Firstly, it requires small sample size. Two set of critical values are provided, low and upper value bounds for all classification of explanatory variables into pure I(1), purely I(0) or mutually cointegrated. Indeed, these critical values are generated for various sample sizes. However, Narayan (2005) argues that existing critical values of large sample sizes cannot be employed for small sample sizes. Secondly, Johensen's procedure require that the variables should be integrated of the same order, whereas ARDL approach does not require variable to be of the same order. Thirdly, ARDL approach provides unbiased long-run estimates with valid t'statistics if some of the model repressors are endogenous (Narayan, 2005; Odhiambo, 2008). Fourthly, this approach provides a method of assessing the short run and long run effects of one variables on the other and as well separate both once an appropriate choice of the order of the ARDL model is made, (see Bentzen and Engsted (2001)) The ARDL model is written as follow;

$$\Delta lnrgpc_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta lnrgdpc_{t-1} + \sum_{i=0}^{n} \beta_{2i} \Delta lnstindex_{1_{t-1}} + \sum_{i=0}^{n} \beta_{3i} \Delta lnoilp_{2_{t-1}} + \sum_{i=0}^{n} \beta_{4i} \Delta lninfl_{3_{t-1}} + \sum_{i=0}^{n} \beta_{5i} \Delta lnopen_{4_{t-1}} + \beta_6 lnrgdpc_{t-1} + \beta_7 lnstindex_{t-1} + \beta_8 lnoilp_{t-1} + \beta_9 lninfl_{t-1} + \beta_{10} lnopen_{t-1} + \varepsilon_t \quad (3)$$

Where Δ is the difference operator while ε_t is white noise or error term. The ARDL test is based on the joint F-statistic whose asymptotic distribution is non-standard under the null hypothesis of no cointegration. The first step in the ARDL bounds approach is to estimate the three equations (3) by ordinary least squares (OLS). The estimation of this equation tests for the existence of a long-run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables. The null hypothesis of no co-integration and the alternative hypothesis which are presented below as thus:

null hypothesis of no co-integration	alternative hypothesis	Equation
$H_0: \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10} = 0$	$H_1: \beta_6 \neq \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq 0$	3

Source: author's design Note: all the variables defined previously

Two sets of critical values for a given significance level can be determined (Narayan, 2005). The first level is calculated on the assumption that all variables included in the ARDL model are integrated of order zero, while the second one is calculated on the assumption that the variables are integrated of order one. The null hypothesis of no cointegration is rejected when the value of the test statistic exceeds the upper critical bounds value, while it is not rejected if the F-statistic is lower than the lower bounds value. Otherwise, the cointegration test is inconclusive. In the spirit of Odhiambo (2009) and Narayan and Smyth (2008) we obtain the short-run dynamic parameters by estimating an error correction model associated with the long-run estimates. In equation 4, where the null hypothesis of no cointegration is rejected, is estimated with an error-correction term (Narayan and Smyth, 2006). The vector error correction model is specified as follows:

$$\Delta lnrgpc_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta lnrgdpc_{t-1} + \sum_{i=0}^{n} \beta_{2i} \Delta lnstindex_{1_{t-1}} + \sum_{i=0}^{n} \beta_{3i} \Delta lnoilp_{2_{t-1}} + \sum_{i=0}^{n} \beta_{4i} \Delta lninfl_{3_{t-1}} + \sum_{i=0}^{n} \beta_{5i} \Delta lnopen_{4_{t-1}} + \lambda_1 ECM_{t-1} + \mu_{2t} \quad (4)$$

ECM_{t-1} is the error correction term obtained from the cointegration model. The error coefficients (λ_1) indicates the rate at which the cointegration model corrects its previous period's disequilibrium or speed of adjustment to restore the long run equilibrium relationship. A negative and significant ECM_{t-1} coefficient implies that any short run movement between the dependant and explanatory variables will converge back to the long run relationship.

3.6. Descriptive Statistics

Table-3. Summary of descriptive Statistics

	Mean	Median	Maximum	Minimum	Std.Dev	Skewness	Kurtosis	Jarq-Ber	Prob.
lnrgdpc	12.365	12.2479	12.8558	12.0575	0.2532	0.71074	1.9602	4.3942	0.1111
inskindex	3.4399	3.5786	4.9250	1.7824	0.79693	-0.63052	2.6609	2.4156	0.2988
inoilp	3.411	3.2767	4.6920	2.50225	0.70691	0.6064	2.0009	2.4156	0.17389
lninfl	2.6976	2.5291	4.2882	1.6831	0.73675	0.76648	2.5042	3.49855	0.15902
lnopen	0.4847	-0.3248	4.26540	-1.8409	1.81191	0.68041	2.1702	3.6773	0.1653

Source: eview9

Table 3 above provides the summary statistics, namely, sample means, maximums, minimums, medians, standard deviations, skewness, kurtosis and the Jarque-Bera tests with their p-values for the series. Whilst it is clear that all the statistics show the characteristics common with most time series, for instance normality in the form of low tails, there are a number of noticeable differences, especially between control variables. Specifically, the mean shows the arithmetic average of the distribution. While the median shows middle value for the distribution. Here, economic growth ($lnrgdpc$) has the highest mean value of N12.365 while trade openness ($lnopen$) has the lowest mean value of N0.4848. This depicts that economic growth has that highest maximum and minimum value N12.8559 and N12.0576 respectively. All other variables are in line with the dictates of the table 3.

The standard deviation shows the level of volatility in the variables. It shows the rate at which each variable deviates from the mean value. Interestingly, in table 3, trade openness ($lnopen$) is the most volatile at 1.811%. This has always been the usual tend in the related literature. The level of volatile in other variables are $lrgdpc$ is 0.2532%, $lnstindex$ is 0.7969%, $lnoilp$ is 0.7069% and $lninfl$ is 0.7367%.

The skewness measures the asymmetric nature of the data. Skewness is a measure of the asymmetry of the probability distribution of the real valued random variable about its mean. A normal distribution is symmetrical at point 0. If the value is greater than zero (>0) it is positively skewed (Wooldridge, 2010). From the table 3, $lnrgdpc$, $lnoilp$, $lninfl$, and $lnopen$ are positively skewed with the values 0.7107, 0.6064 and 0.7664 respectively while $lnskindex$ is negatively skewed with values of -0.6305.

Kurtosis measures the sharpness of the peak of a normal distribution curve. According to Hosking (2006) it measures the tail of the probability distribution of the real-valued random variable. If the value is approximately equal to 3, it is said to be mesokurtic distribution implying that it normally distributed. If approximately greater than 3, it leptokurtic distribution which has tails that are asymptotically approach zero slowly and has more outliers than the normal distribution. Indeed, if approximately, less than 3 it is playkurtic which means that the distribution produces fewer fewer and less outliers than the normal distribution (Wooldridge, 2010). Therefore are the variables are platykurtic.

The Jarque-Bera is a test for normality of the distribution where the null hypothesis is that the distribution of the sample is a normal one. If the probability value of the Jarque-Bera test is significant, then the null hypothesis is rejected. The intuition here is that the sample is not normally distributed. If each variable is statistically significant, then the series is not normally distributed. Therefore, the rule of thumb is maintained by showing that the more the probability statistic of a variable is to zero, the lower the value of its Jarque-Bera statistic and the more normally distributed it is and vice versa (Hosking, 2006). From table 3, the Jarque-Bera tests shows that the null hypothesis is strongly accepted for all the distribution. Therefore, they can be described as to be normally distributed.

3.7. Unit Root Tests

The general process in time series analysis starts with the order of integration. The variables are investigated to ensure none of them do not get boasted or integrated at order I(2). The implication is ARDL-bounds test require that all the variables should be I(0) or I(1) or mixed with [I(0) and I(1)]. The stationarity tests is performed in levels and then in first difference. The traditional approach is adopted to test for order of integration. Therefore, the results of the ADF and PP stationarity tests in Table 1 shows that all the variables are integrated of order one I(1) with exception to inflation rate. With none of the variables integrated at order I(2), the ARDL estimations for the linear empirical relationship established in Eq. 1 offers unbiased coefficients of the variables in the model.

Table-4. Unit root test

	In level I(0)		**First difference I(1)**		
Variables	ADF	PP	ADF	PP	Result
lnrgdpc	0.5355	0.2542	-4.2583***	-4.2436***	I(1)
inskindex	-1.6016	-1.6016	-5.8895***	-5.9193***	I(1)
inoilp	-0.336	-0.1959	-6.2565***	-6.2704***	I(1)
lninfl	-3.0902**	-2.993**	-6.3013***	-8.705***	I(1)
lnopen	-2.2849	-2.4652	-60069***	-5.9940***	I(1)

Note: The asterisks indicate the rejection of the null hypothesis of unit root : ** Significance at 5% and *** Significance at 1%. All the variables are in the natural log form.

4. EMPIRICAL RESULTS

4.1. ARDL Co-Integration Results

The results of the co-integration test based on the ARDL-bounds testing method are presented in Table 3. Two specifications of model 1 are estimated to establish the robustness of this empirical analysis. Specification 1 is selected based on Schwarz information criterion (SC) while the selection of specification 2 is based on Akaike information criterion (AIC). The critical values for the evaluation of the null hypothesis are taken from Narayan (2005). The results of the two specifications indicate that the F-statistic is greater than the upper critical bound from Narayan (2005) at 5% and 1% significance level. The null hypothesis of no cointegration among the variables is therefore rejected in both specifications. This shows that there is a long-run causal relationship among the variables in Nigeria. This is in line with findings of Husain *et al.* (2015); Asaolu and Ilo (2012) who found long run relationship between economic growth, Nigerian stock market return and world crude oil price.

Table-5. ARDL bounds cointegration test results

Model: Frgdpc(rgdpc/skindex,oilp,infl,open)			
selection	ARDL	F-statistics	Result
SC: Schwarz information criterion	(1,0,0,1,2)	5.0328**	Cointegration
AIC: Akaike information criterion	(1,2,0,1,2)	6.1833***	Cointegration
Critical Value Bounds	1%	5%	10%
I0 Bound	4.093	2.947	2.46
I1 Bound	5.532	4.088	3.46

Source of critical value bounds: Narayan (2005) Appendix: Case II Restricted intercept and no trend for k = 4. *** indicate significance at 1% level respectively

4.2. Long-Run and Short-Run Estimates

Table 6 presents the long run and short run coefficients of the ARDL model. Interestingly the long run coefficients of the first specification using SC and the second specification using AIC are consistent. This establishes the robustness of this empirical study. From the long run coefficients, the influence of crude oil price economic growth in the long run is positive and significant. Specifically, a 1% increase in crude oil price increases the level of economic growth by about 0.32925 (see specification SC). The coefficients of the lnstindex1 and lninfl have positive but insignificant relation relationship with the economic growth (see specification SC), trade openness recorded negative and insignificant relationship with economic growth (specification SC significant).

Table-6. Long run and short run estimates

	Long run Coefficients			**Short run Coefficients**	
	SC	AIC		SC	AIC
C	10.703***	10.477***	*ecm(-1)*	-0.3029***	-0.2492***
	[21.404]	[14.506]		[-5.3755]	[-5.8517]
lnskindex	0.0805	0.1905	*Δ(lnskindex)*	0.0095	0.0192
	[0.9145]	[1.0525]		[0.5158]	[1.0772]
lnoilp	0.3292***	0.2481**	*Δ(lnskindex(-1)*		-0.0413**
	[4.8818]	[2.0879]			[-2.2137]
lninfl	0.1491	0.2081	*Δ(lnoilp)*	0.0690*	0.0292*
	[1.1737]	[1.0982]		[1.7640]	[1.8310]
lnopen	-0.02507	-0.0486	*Δ(lninfl)*	0.00653	0.00576
	[-0.8565]	[-1.0326]		[0.4926]	[0.4547]
			Δ(lnopen)	0.04768	0.0464
				[1.3678]	[1.3998]
			Δ(lnopen(-1)	0.1019***	0.0893***
				[3.4881]	[3.1854]
Diagnostic Tests					
Adjusted R-squared				0.96488	0.9661
Durbin-Watson Statistic				2.0506	2.1372
Breusch-Godfrey serial correlation LM test				0.0671(0.7955)	0.503(0.4541)
ARCH test for heteroscedasticity				0.0013(0.9712)	0.0601(0.8063)
Ramsey RESET test				0.0472(0.8298)	0.0201(0.8886)

Note: *, **, and *** indicate significance at 10%, 5% and 1%, respectively t-statistics in [ ]

In the short run the lagged values of stock market index (stindex1) is found significant but however negative. This means that a 1% increase in financial sector development will cause 0.0413% a fall in the real per capita income. The presence of oil price maintained positive and statistically significant in both specifications. Indeed, this an indication of dominant roles crude oil price to Nigeria economy. In the short run inflation and trade openness recorded positive and insignificant effect of rgdpc whereas, the lagged value of trade openness exacts position and significant influence on rgdpc that is significant (at 1% level) with a 1% increase in trade openness at lagged (-1) will cause about 0.1019% increase in the level of rgdpc in the short run.

The coefficients of ECM (-1) in the two specifications in Table 6 are negative and significant at 1% level. The coefficients suggest that approximately 30% of the short-run disequilibrium is corrected in the long run in specification SC while in specification AIC 24% is corrected. The diagnostic test results in Table 6 showed no evidence of serial correlation, no ARCH effect, model well specified (Ramsey reset) and no heteroscedasticity in the two ARDL models estimated. The CUSUM and CUSUMSQ are within the critical boundaries for the 5% significance level indicating that the coefficients of the estimated ARDL model are stable

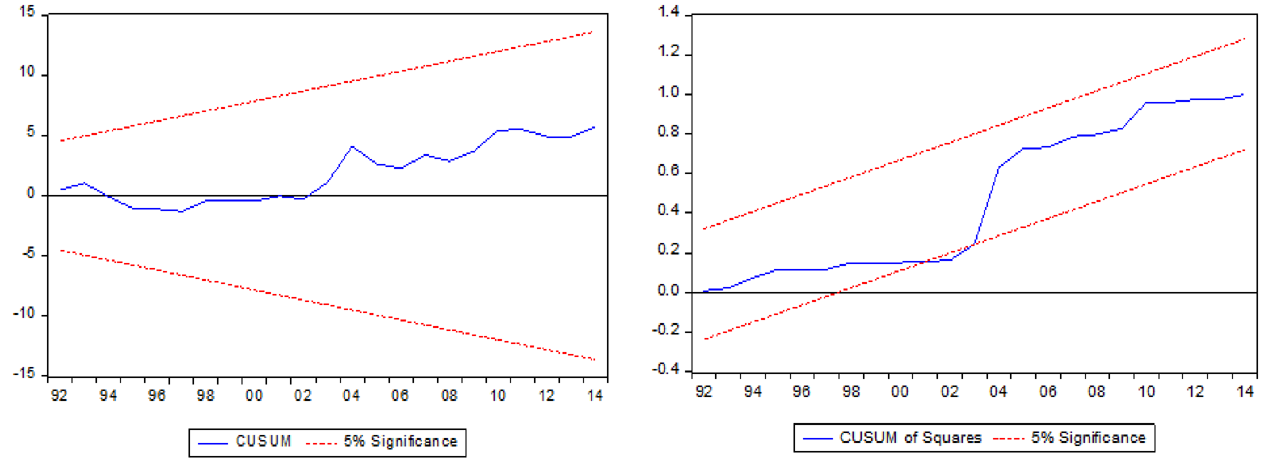

Figure-1. Plot of CUSUM and CUSUMQ for Specification SC

Source: Eview9

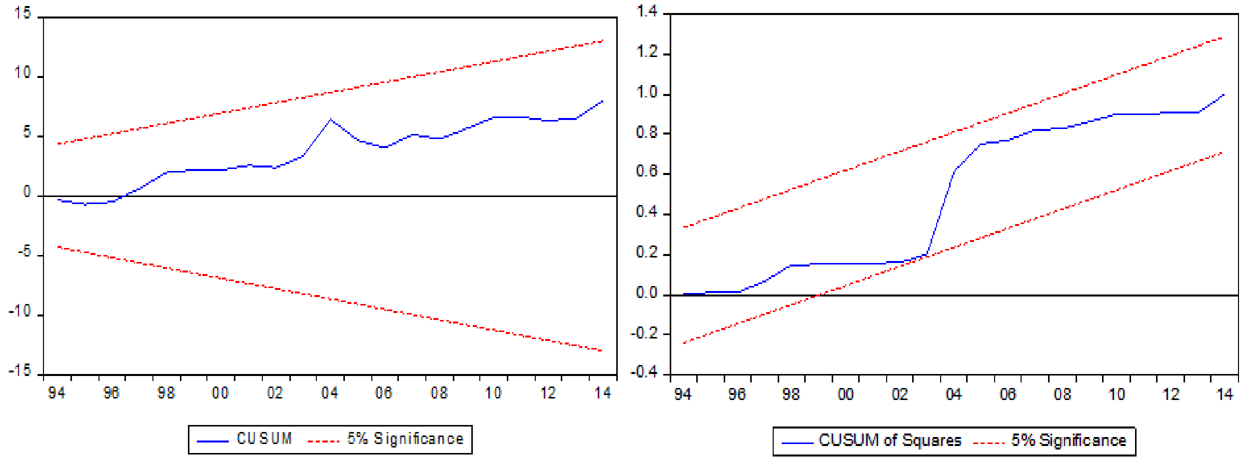

Figure-2. Plot of CUSUM and CUSUMQ for Specification AIC

Source: eview9

5. SUMMARY, DISCUSSION OF FINDINGS AND POLICY IMPLICATION

Controlling for the possible influence of inflation and trade openness, this study examines the short and long-run relationship between crude oil price movement and stock market performance in economic growth of Nigeria using ARDL cointegration analysis over period 1981-2014. The result revealed that crude oil price is a determining factor on economic activities (real gdp per capita) in Nigeria. A positive and significant long-run relationship between real gdp per capita and crude oil price coexit with a positive short run relationship, highlighting the main role of crude oil prices on the economic activities in OPEC countries like Nigeria. The positive significant long-run effect crude oil price on real gdpc is an indication of over reliability of economic activities in oil-exporting countries on crude oil price. The result suggest that an increase in crude oil price will provide resources for short term economic activities in the Nigeria economy. However, with crude oil price significantly influenced numerous economic and political factors in the international market rather than domestic market, Dogah (2015) therefore a fall in the crude oil price will exact negatively on the real gdpc and indeed on economic activities. For instance, Alley *et al.* (2014) interpret the impact of oil shock on economic growth and concluded that while oil price significantly improves economic growth of the country, its shock insignificantly impedes economic growth. In sum, the finding are in line with the assertions from the relevant studies.

The positive insignificant long run effect of stock market development of on the economic activities (rgdpc) in Nigeria confirms that the Nigerian economy is yet exploit the stock market. The results suggest that stock market development are not significant drivers of economic growth in Nigeria. Our result could be compared to what Naceur and Ghazouani (2007) for the Middle East and North Africa (MENA) region but slightly different from what Kurronen (2015) opined on the role of stock market development on economic performance of oil-exporting countries. The results could be linked to some oil-exporting countries like Nigeria where economic activities are significantly driven by the oil prices and returns.

This study provides analysis of the long and short run effects of crude oil price and stock market development on economic growth in a developing oil-exporting economy. Our results hold some important policy implication based on the continuous decrease in the oil in Nigeria and other developing oil-exporting countries. Given the high level of dependency in crude oil price, Nigerian government would reduce systemic risk exposure of economic growth and development through a well-structure economic diversification policy. Also, for government to achieve sustainable economic development and maximize stock market performance, policy maker in oil exporting countries should monitor the movement of crude oil prices

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