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# The Effects of Oil Price Volatility on Stock Market Development in Nigeria

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**Abstract:** *This study examines the effects of oil price volatility on stock market development in Nigeria from the period 1993 to 2019. Average annual oil price is used as a proxy to measure oil price in this study while Proxies for stock market development are stock market capitalization ratio (MCAP), Total value traded ratio (VTD), Turnover ratio. Secondary data was collected from Central Bank of Nigeria Statistical bulletin. This study employed an error correction model in estimating the relationship between oil price and stock market capitalization, while we used ARDL (autoregressive distributive lags) to analyse the effects/relationship between oil price and total value of shares traded as well as oil price and turnover ratio. Our decision to employ an error correction model was based on the outcome of our unit roots test, which was the Dickey-Fuller-GLS (ERS) method. The results of the findings showed that oil prices significantly and positively impact development in the stock market, because there was a significantly positive relationship between oil price and all proxy variables for stock market development. In other words, we conclude that the higher the price of oil, the higher the development in the Nigerian stock market. It is recommended therefore that government should embarks on genuine and encompassing diversification program, to help mitigate against the impact of oil prices on not just stock market indices, but on the entire economy as a whole. This would help mitigate against the overall effect of declining oil price on Nigeria's stock market indices.*

**JEL Classification:**
*B22; D32; E44.*

**Keywords:** *Oil Price Volatility; Stock Market Capitalization Ratio; Stock Market Development; Total Value Traded Ratio; Turnover Ratio.*

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## Introduction

In most economies of exclusively oil exporting nations like Nigeria, the most imperative commodity is crude oil, because it serves as a peculiar and fruitful resource endowment that have significance contribution on economic improvement through increase in economic growth, which account for about 35% of GDP and it also have significance efficacy on the state of financial market of a country exclusively oil exporting nations such as Nigeria, Saudi Arabia, USA etc. (Bakare, Quadry & Chowdhury, 2018). The oil sector is an indispensable sector particularly to a Monocultural economy like Nigeria. This sector account for 93.8% of the Nigeria total export revenue in Q4 2018 and also account for 90% Nigeria's foreign exchange earnings. Hence, slight change in oil price will definitely have a huge effect on the economy as a whole.

The current fluctuations in oil prices in the international benchmark (Brent) used by the OPEC are unexpected and unusual, as result of the Pandemic (Covid 19) which led fall in demand from most oil importing countries like China and India. Nigeria sold most of their crude oil unrefined and this make Nigeria has the only oil-exporting nation that doesn't gain from hike in oil price, because all the earnings Nigeria makes as at when crude oil price increase is lost as Nigeria pays subsidy for importing refined products. The responsiveness of oil prices is of ongoing concern because of its exceptional role as an input into manufacturing sector and other relevant sector of the economy (Akomolafe & Jonathan, 2014). Nonexistence of likelihood of a perfect shift of the burden of rise in oil price on the user of the commodity, the firm's dividends and profit are decrease, this possibly will lead to reduction in stock prices.

The effect of oil price instability would certainly be disparate in the situation of oil-exporting and importing nations. The value of oil-exporting nations currency appreciates when there is hike in the oil price but the value of oil-importing nations currency depreciates when oil price increase. Therefore, the trade between a nation that highly depend on oil importation and oil exporting nations like Nigeria and Saudi Arabia are known as a profitable trade (Kriskkumar & Naseem, 2019). Equity markets are vital to any economy's financial structure. It mobilises resources by connecting investors and savers, improving a country's GDP. Economic progress requires financial development. Research analysts, investors, economists, and policymakers are aware of the dynamic relationship between macroeconomic conditions and stock prices (Joshi & Giri, 2015).

The current trend in the crude oil market has attracted researchers' interest in the oil prices-stock market development long-run relationships. Various studies focused on the dynamic relationship between oil price and stock market development and are stated in Ankit, Sasmita, Harsh, Sujeet, Rohan and Vishwaroop, (2018), Kingsley and Paul, (2017) Also, Akinlo, (2014). These studies are carried out in different countries. The outcome of their investigations on the effects of oil prices on stock market development in both oil importing and exporting countries lead to mixed outcomes.

This study builds on the findings of Abdelaziz, Georgios, and Andrea (2008) and Olomola and Adejumo (2006), in which it was found that the influence of a reduction in oil prices on stock market development depended on whether a country is an oil exporter or importer (Abdelaziz et al., 2008). According to Akinlo (2014), oil price has a transient beneficial effect on the stock market, and stock market development in Nigeria is highly dependent on oil price fluctuations (oil exporter). Generally, it is argued that, for net exporting nations, a price increase immediately boosts real national revenue through increased export earnings. For countries that are net importers, however, rising prices may result in inflation, increased input costs, decreased demand, and less capital formation. Olomola and Adejumo, (2006) extended the research by discovering that the increasing volatility of oil prices (OLPs) is a phenomenon that poses a significant challenge to policymakers across nations, and it is therefore essential to assess the impact of oil prices (OLPs) volatility on stock market growth in Nigeria.

## Literature Review

Oil prices, like those of any other commodity, are controlled by the basic economic equation of supply and demand. Crude oil demand is a strong indicator of a country's economic health. The price of petroleum has a history of cyclical price increases and decreases, and is currently experiencing one of the larger price drops in its history. Some have called this one of the most significant changes to the global economy in the last two years. Recent declines in crude prices can be attributed to a number of factors, including weak demand from many countries as a result of sluggish economic activities due to lockdown in most European countries and also from the two largest importers of oil, China and India, due to the Pandemic, especially in China (Sathyanarayana, Harish & Sudhindra, 2018)

Even though the shale boom in the United States has increased crude oil production, major oil exporters like Saudi Arabia, Iran, Russia, etc., have not reduced their production capacity out of concern for losing market share. However, OPEC+ (an alliance of major oil exporting OPEC countries like Algeria, Angola, Congo, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, the United Arab Emirates, and Venezuela) has increased its output. To put pressure on nations with low compliance, including Nigeria and Iraq, the OPEC+ (Saudi Arabia and Russia) have agreed on a preliminary arrangement to extend oil production restrictions by one month (Ilugbemi & Fawehinmi, 2020).

Even if the oil production limit is extended by a month, it will only be on the condition that countries that did not completely comply in May make even further cutbacks in the months to come to make up for their overproduction. For major crude importers such as India, European countries, and Japan, the drop in oil prices represents a welcome incentive and an opportunity to bolster their fiscal position. On the other side of the coin are countries such as Nigeria, whose primary export is crude oil, and which saw the benchmark oil price drop to its all-time low on March 8th, 2020, losing roughly 90% of its market value for the year 2020. Further, India, the second largest buyer of Nigerian crude oil, has drastically decreased its demand for the commodity (Olumide, 2020).

There are typically three distinct kinds of oil shocks identified in the literature that discuss the origin of the shock and its impact on stock markets and the economy. First is an oil supply shock, which is an exogenous shift in the oil supply curve that causes the oil price and oil production to move in the opposite direction (Kilian and Park, 2009, as referenced in Akinlo, 2014). Political developments in OPEC countries, like as armed conflicts or cartel action, have often been the driving force behind these shocks. Next, we have an aggregate demand shock as our second category of unexpected event. This is a demand-side shock that will lead to a drop in oil supply and a corresponding rise in oil prices. This is typical during an oil demand shock caused by economic activity, as opposed to an endogenous oil demand surge caused by changes in macroeconomic activity that inherently stimulate increased demand for all commodities. One such instance is the recent rise in oil consumption from emerging economies like China and India. As for the third type of shock, we have speculation-driven rises in demand for oil rather than general economic activity. This is due to speculators' worries about the stability of the oil supply and the potential for price hikes. Last but not least, numerous empirical researchers have used very similar concepts of oil price shocks. A few examples are the works by Salisu, Gupta and Demirer, (2022); Ekhlas, Al-hajj, Al-Mulali and Solarin (2018); and Sreenu (2018). The study adopts the oil price shock definition, which zeroes in on the responses in output to oil price fluctuations, to account for the varying viewpoints on oil price volatility.

## Theoretical Issues

The equilibrium theory that Ross (1976) established is called the Arbitrage Pricing Theory (APT). Capital asset pricing models (CAPMs), the focus of earlier research, are a type of advanced theory also known as global asset pricing models. According to Arbitrage Pricing Theory (APT), other macroeconomic factors like inflation, interest rate, exchange rate, etc., or actual economic ones like production, oil prices, etc., affect asset return in addition to undiversifiable risk. The theoretical foundation of this research comes from the Arbitrage Pricing Theory, which postulates that numerous risk variables might account for observed patterns in asset returns. It is also applied to the stock market as a whole, where a shift in one macroeconomic variable may be seen as signalling a shift in one of the systemic risk factors that ultimately determines future stock market returns. According to a recent study (Molefhi, 2021).

For our purposes here, APT is instructive since it postulates that in a competitive market, asset returns should be a linear reflection of a number of parameters. The theory aids in predicting how changes in macroeconomic variables would affect stock market returns (Ross, 1976). Therefore, APT with three or more components is an extension of the specification known as multifactor APT. Based on their investigation in Indonesia, Herwany, Omar, Meera, and Febrian (2014) conclude that APT is insufficient for identifying the components which are regularly included in estimating stock price. That's because regional economies have their own unique traits, and APT still has some serious flaws when it comes to adapting to change. A study that discovered a positive association between return and risk in one economy may have found no meaningful relationship between return and risk in other countries due to differences in economic factors.

According to Roll and Ross (1980), there are three ways to assess whether or not an APT can be reliably applied to a security's expected return: (a) examining the APT's relationship to return, (b) calculating the residual's correlation with the APT, and (c) taking into account the differences in the factor structures of the various securities. APT can utilise a single element, the market portfolio, and a multifactor model to examine its impact on stock returns, whereas CAPM is limited to using a single factor to evaluate the systematic risk of investments. However, the magnitude of the factor or index model is unknown, which is a significant drawback of APT. In light of this, testing by statistical methods or economic (Benakovic and Posedel, 2010).

## Empirical Issues

Ekhlas, Usama, and Sakiru (2018) evaluated whether Oil Price, Interest Rate, Exchange Rate, Industrial Production, and Inflation have the same influence on stock market returns from January 1990 to November 2016 and for the aggregate, May 2000 to November 2016 for the sectors. The dependent variable was the stock market index, whereas the independent variables were oil price, interest rate, consumer price index, real effective exchange rate, and industrial production index. Using the asymmetric co-integration test and nonlinear autoregressive distributed lag (nonlinear ARDL), the researchers observed that oil price shocks have a negative influence on stock market returns in most situations, regardless of the direction of the shock. The study advised Malaysia create a wealth fund to manage oil price spike earnings.

Junior and Goodness (2018) examined the relationship between oil price volatility and South Africa's macroeconomic indices from 1990 to 2015. Industrial production index, Inflation, Trade balance, Money (M2) currency, real effective exchange rate, and short term interest rate were used as proxies for the dependent variable, whilst daily WTI crude oil prices were the independent variable. The SVAR study utilised Generalised Impulse Response Functions (GIRF) analysis and Generalised Forecast Error Variance Decompositions (GFEVDs) analysis.

They discovered that oil price uncertainty shocks proxied by realised volatility have a significant influence on output and inflation for the majority of variables. According to the study, South Africa's monetary authority should be more watchful with regard to price stability. Given South Africa's reliance on nonrenewable sources, renewable energy could mitigate oil price volatility.

Olamide, Rita and Sunday (2017), examined the impact of Crude oil price volatility on stock market performance in Nigeria, from the period 1985-2014. ASI (All Share Index) was used as a proxy for the dependent variable, while (Inflation rate) COP and (Exchange rate) EXR served as the Independent variable. The adopted techniques in the study were the time plots, unit root tests and co-integration analysis., they found out that there exists a long-run relationship amongst ASI, COPs and EXR at 5% level of significance. The study suggested that the Nigerian stock market regulatory agencies should take steps that will allow and encourage Oil and Gas companies to be listed on the market, so that they can have more direct impact on the economy

Okere and Ndubuisi (2017) evaluated the relationship between crude oil price, stock market development, and economic growth in Nigeria. 1981-2014 GDP per capita (LCU), Stock market composite index, Trade openness, Inflation (INFLA), Oil price were utilised as proxies for the dependent variable (OILP). The study used autoregressive distributed lag approach (ARDL), ADF tests, and the Phillips–Perron test. They discovered that crude oil price affects Nigeria's real GDP per capita. The study found that crude oil prices dominate resource mobilisation and allocation in Nigeria, whereas the stock market is weak. The study stated that oil exporting countries should monitor crude oil prices for sustainable economic development and stock market performance.

Otieno, Ngugi and Wawire (2017) investigated macroeconomic variables, stock market returns, and their co-integrating residuals between 1993 and 2015. The rate of return on stocks was the dependent variable, whereas the rates on 3-month Treasury Bills and lending were independent. Using Granger Causality Tests, the researchers determined that the 3-month Treasury Bills rate, loan rate, and stock market returns are fractionally integrated, which means that shocks to the variables persist but gradually diminish. The study concluded that ARFIMA-based EML test results support long memory in all the individual variables and co-integrating residuals, and that Kenyan stock market arbitrageurs can regularly create above-average returns.

## Methodology

This study employed a descriptive research approach that relies on secondary data collected after the occurrence of the event, over which the researcher has no influence. To analyse the impact of oil price volatility on Nigeria's stock market growth, both inferential and descriptive data are employed. Inferential statistics aid in establishing a causal relationship between the variables of the study, while descriptive statistics aid in describing and understanding the properties of the variables utilised in the study. The study utilised time series data from 1993 to 2019.

## Model Specification

This section will present the model for testing the research hypothesis formulated. Given the nature of the study, three (3) mathematical models were constructed to achieve the objectives of examining the effect of oil price volatility on stock market development in Nigeria. These models are adapted from the study of Hamilton (1983), stock market development variables are

expressed as a function of oil price volatility and macroeconomic factors set as control variables and this is expressed by the equation below:

$$\text{LMCAP} = \beta_0 + \beta_1 LOLP_t + \beta_2 LGDPC_t + \beta_3 LCPS_t + \beta_4 LTS_t + \mu_t \quad (1)$$

$$\text{LVST} = \beta_0 + \beta_1 LOLP_t + \beta_2 LGDPC_t + \beta_3 LCPS_t + \beta_4 LTS_t + \mu_t \quad (2)$$

$$\text{LTUN} = \beta_0 + \beta_1 LOLP_t + \beta_2 LGDPC_t + \beta_3 LCPS_t + \beta_4 LTS_t + \mu_t \quad (3)$$

Where:
LMCAP = Stock Market Capitalization ratio at time t;
LVST = Total value traded ratio at time t;
LTUN = Turnover ratio at time t;
$\beta_0$ = is the constant term of the model;
$\beta_1$ -$\beta_4$ = specify the coefficients of the independent variables;
$LOLP_t$= oil price at time t;
$LGDPC_t$ = Gross Domestic Product at current market prices at time t;
$LCPS_t$= Credit to Private sector at time t;
$LTS_t$ = Total Savings at time t;
$\mu_t$ is the disturbance term.

Note however that the "L" in the denotation above stands for natural logarithm of the variables. The reason for using logarithms of the independent and dependent variables is because log-log model can reduce the gap of the data between the variable. Gurjarati, (2009, pg160).

The suitability of this estimated OLS model is then tested with the Autoregressive Conditional Heteroskedasticity (ARCH) test.

## Data Analysis and Discussion of Results

The average values of the variables are positive from Table 1. GDPC (gross domestic product at current market prices) has the highest average value (30.5162) while TUN has the least average value (1.831525). The maximum and minimum values indicate the highest and lowest value of each time series data respectively. GDPC has the highest maximum value (32.6023) while TUN has the least maximum value (3.54933). GDPC has the highest minimum values (27.7169) while TUN has the least minimum value (0.067659). Median is the middle value of the series when the values are arranged in ascending or descending order. From Table 1 the median value for MCAP, VST, TUN, LOP, GDPC, TS and CPS are 29.26435, 26.26329, 1.822935, 3.884857, 30.55228, 28.1847 and 28.45984.

Skewness is the measure of asymmetry of a series around the mean. The skewness of a normal distribution is zero. The values of skewness from Table 1 shows that all the distributions are skewed to the left, i.e. negatively Skewed (less than zero), this was however due to the logged values of the variables. The values of Kurtosis, which is the degree of peakedness or flatness of a data set showed that the following variables: MCAP, LOP, GDPC, TS, VST and CPS all show symptoms of flatness because the value of Kurtosis for each of them was less than 3; while only TUN showed signs of peakedness because its values for Kurtosis was greater than 3.

**Table 1.** Presentation of Descriptive Statistics Results

| | MCAP | VST | TUN | LOP | GDPC | TS | CPS |
|---|---|---|---|---|---|---|---|
| Mean | 28.54506 | 25.5246 | 1.831525 | 3.746471 | 30.5162 | 28.07862 | 28.53951 |
| Median | 29.26435 | 26.26329 | 1.822935 | 3.884857 | 30.55228 | 28.1847 | 28.45984 |
| Maximum | 30.88489 | 28.48538 | 3.54933 | 4.601865 | 32.6023 | 30.46663 | 30.84681 |
| Minimum | 24.584 | 19.93844 | 0.067659 | 2.668616 | 27.7169 | 25.16625 | 25.56838 |
| Std. Dev. | 2.000743 | 2.485525 | 0.777761 | 0.631531 | 1.472386 | 1.820256 | 1.83106 |

*Table 1 (cont.)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Skewness | -0.47366 | -0.79105 | -0.40042 | -0.17827 | -0.15973 | -0.19216 | -0.18472 |
| Kurtosis | 1.818799 | 2.502483 | 3.392262 | 1.636933 | 1.837706 | 1.533287 | 1.537826 |
| Jarque-Bera | 2.579233 | 3.094368 | 0.894613 | 2.233207 | 1.634604 | 2.586311 | 2.558748 |
| Probability | 0.275376 | 0.212846 | 0.639348 | 0.32739 | 0.441622 | 0.274404 | 0.278211 |
| Sum | 770.7166 | 689.1641 | 49.45119 | 101.1547 | 823.9374 | 758.1226 | 770.5668 |
| Observations | 27 | 27 | 27 | 27 | 27 | 27 | 27 |

*Source:* Author's construct using E-Views 9.

## Unit Root Test

Most macroeconomic variables have their Time series data to be non-stationary at level. This was confirmed in this study using the Dickey Fuller-GLS (ERS) Test. The Dickey Fuller-GLS (ERS) Test was chosen above the other regular tests for unit roots (like the augmented Dickey-Fuller and Philips-Perron) because it has been proven through simulation studies that the method of selecting lag length using the sequential t-test in the ADF regression of GLS-detrended series performs the best in most cases. It has also been proven that Unlike Ng and Perron (2001), as well as various other unit roots tests, the DF-GLS (ERS) method of selecting lag length remains the most detailed and thus provides the most accurate results with less doubt.

From the results obtained from the DF-GLS test and presented in Table 2, the following time series data sets appeared to be stationary at 1st difference: MCAP, LOP, GDPC, TS and CPS; while TUN and VST were stationary at level.

**Table 2.** Unit Root Test Using Dickey Fuller-GLS Test Results

| Variable | DF-GLS test statistics | Critical value at 5% | Equation Specification | Level of Stationarity | Order |
|---|---|---|---|---|---|
| MCAP | 5.240274* | 1.955020 | Intercept | 1st Difference | 1(1) |
| VST | 2.275861* | 1.954414 | Intercept | Level | 1(0) |
| TUN | 2.228164* | 1.954414 | Intercept | Level | 1(0) |
| LOP | 5.313843* | 1.955020 | Intercept | 1st Difference | 1(1) |
| GDPC | 3.117882* | 1.955020 | Intercept | 1st Difference | 1(1) |
| TS | 4.094151* | 1.955020 | Intercept | 1st Difference | 1(1) |
| CPS | 3.047627* | 1.955020 | Intercept | 1st Difference | 1(1) |

*, ** and *** connotes 1%, 5% and 10% respectively.

*Source:* Author's construct using E-Views 9.

## Error Correction Model

The error correction model was used to estimate the long run and short run effects of the exogenous variables on the endogenous variable because all the exogenous variables for Model 1 were stationary at 1st difference The Error correction model (ECM) also shows the speed at which a dependent variable returns to equilibrium after a change in other variables, or after a change in any of the independent variables. Table 3 shows our summarized results from our ECM also proved that the probability value of the error term was less than ".05", the model was therefore stable and not explosive; this is evident in the negative significant value of the error term.

**Table 3.** Error Correction Model Estimates for the First Hypothesis

Dependent Variable: Log (MCT)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.056281 | 0.149778 | 0.375762 | 0.7113 |
| D(LOP) | 0.010156 | 0.004629 | 2.1938 | 0.0409 |
| D(LOG(GDPC(-1))) | 0.041418 | 0.332531 | 0.124555 | 0.9022 |
| D(LOG(CPS)) | 1.084555 | 0.618033 | 1.754852 | 0.0954 |
| D(LOG(TS)) | -0.24529 | 0.628094 | -0.39053 | 0.7005 |
| ECM(-1) | -0.57893 | 0.2756 | -2.10063 | 0.0493 |

| | | | |
|---|---|---|---|
| R-squared | 0.722539 | Mean dependent var | 0.238697 |
| Adjusted R-squared | 0.144260 | S.D. dependent var | 0.330951 |
| S.E. of regression | 0.306150 | Akaike info criterion | 0.676083 |
| Sum squared resid | 1.780833 | Schwarz criterion | 0.968613 |
| Log likelihood | -2.451032 | Hannan-Quinn criter. | 0.757218 |
| F-statistic | 1.809181 | Durbin-Watson stat | 1.645130 |
| Prob(F-statistic) | 0.159168 | | |

*, ** and *** connotes 1%, 5% and 10% respectively.

*Source:* Author's construct using E-Views 9.

The Autoregressive distributive model (ARDL) was applied in model 2 because there was a mix of integration orders among the variables. While the endogenous variable- VST (value of shares traded) was stationary at level, the independent variables were all stationary at 1st difference. In lagging the variables, we adopted maximum values of 1 in our ARDL model and our results summarised in the Table 4. The results show a positive and significant relationship between values of shares traded (VST) and oil price (LOP).The model also showed an approximate R squared value of 93%. This means that roughly 93% of changes in the dependent variable can be explained by changes in the independent variables. The Durbin Watson statistic at approximately 1.6 also showed that there was minimal traces of autocorrelation but this was not a problem as the value was greater than 1.5.

**Table 4.** ARDL Estimates for model 2

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| LOG(VST(-1)) | 0.821884 | 0.204526 | 4.018478 | 0.0007 |
| LOG(LOP) | 1.245807 | 0.472405 | 2.637157 | 0.0158 |
| LOG(GDPC) | 0.095158 | 0.655967 | 0.145066 | 0.8861 |
| LOG(CPS) | 1.978308 | 1.466617 | 1.348892 | 0.1924 |
| LOG(TS) | -2.42726 | 1.351536 | -1.79593 | 0.0876 |
| C | 8.85881 | 5.535939 | 1.600236 | 0.1252 |

| | | | |
|---|---|---|---|
| R-squared | 0.927838 | Mean dependent var | 25.73945 |
| Adjusted R-squared | 0.909797 | S.D. dependent var | 2.264672 |
| S.E. of regression | 0.680166 | Akaike info criterion | 2.266214 |
| Sum squared resid | 9.252510 | Schwarz criterion | 2.556544 |
| Log likelihood | -23.46078 | Hannan-Quinn criter. | 2.349818 |
| F-statistic | 51.43077 | Durbin-Watson stat | 1.549011 |
| Prob(F-statistic) | 0.000000 | | |

*Source:* Author's construct using E-Views 9.

The results from Table 5 show a positive and significant relationship between turnover ratio (TUN) and oil price (LOP). It also showed a negative relationship between GDPC (gross domestic product at nominal prices) and TUN (turnover ratio), albeit insignificant. The regression model had an R-squared of 80%, which is a good value for a strong model. The

Durbin Watson statistic was 1.7 (greater than 1.5), indicating the absence or negligible case of serial autocorrelation in the regression analysis.

**Table 5.** ARDL Estimates for model 3

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| LOG(TUN(-1)) | 0.642215 | 0.204365 | 3.142493 | 0.0051 |
| LOG(LOP) | 0.553535 | 0.256471 | 2.158276 | 0.0432 |
| LOG(GDPC) | -0.07302 | 0.446054 | -0.16369 | 0.8716 |
| LOG(CPS) | 0.508855 | 0.815728 | 0.623804 | 0.5398 |
| LOG(TS) | -0.56856 | 0.720889 | -0.78869 | 0.4395 |

*Source:* Author's construct using E-Views 9.

| | | | |
|---|---|---|---|
| R-squared | 0.802287 | Mean dependent var | 1.888754 |
| Adjusted R-squared | 0.752859 | S.D. dependent var | 0.732901 |
| S.E. of regression | 0.364349 | Akaike info criterion | 1.017766 |
| Sum squared resid | 2.655005 | Schwarz criterion | 1.308096 |
| Log likelihood | -7.230953 | Hannan-Quinn criter. | 1.101370 |
| F-statistic | 16.23138 | Durbin-Watson stat | 1.715663 |
| Prob(F-statistic) | 0.000002 | | |

The reason for adopting an ARDL approach was also borne of the order of stationarity of the time series data. While the dependent variable was stationary at level, the independent variables were stationary at 1st difference.

## Conclusion and Recommendations

The study employed the use of time series data from the period 1993 – 2019 (which would have been broader, but for the availability of older data sets for our interested variables). Our unit root tests revealed stationarity of all data sets at 1st difference with respect to our first regression, supporting the adoption of an error correction model (ECM). The unit root tests showed a mix of integration order, with respect to our other regressions, prompting the use of ARDL models.

The findings of this study concludes that there is a positive and significant relationship between average annual oil prices and stock market development in Nigeria. This is evident in the positive and significant relationship between average annual oil prices and all the proxy variables used to capture stock market development in Nigeria, i.e. Stock market capitalization, value of shares added and turnover ratio. The study agrees with Olufisayo (2014), who studied the relationship between oil price change and stock market in Nigeria using VECM (vector error correction) and Granger causality and concluded that oil price has a significant positive impact on stock market in Nigeria. The findings of this study also conform to those of Bhar and Nikolova (2010), who investigated the relationship between global oil price and equity returns in Russia; with conclusions that global oil price returns have significant impact on equity returns and volatility.

The findings of this study however disagree with Miller and Ratti (2009), who studied the relationship between World price oil price and international stock markets. The results of their analysis showed that stock market indices responded negatively to increases in oil price in the long run. However, their study further proved that the pattern appeared to disintegrate from the beginning of the year 2000. Our findings also contradict Chen (2010), who concluded that an increase in oil prices led to a higher probability of the emergence of a Bearish market (i.e. falling stock market). The findings of our study also do not conform to those of Hammoudeh and Aleisa (2004), who concluded following an empirical analysis, that there was a bidirectional relationship between stock returns and oil price changes in Saudi Arabia. The study

recommends that government provides investors (particularly, stock market investors) with appropriate incentive, especially in burst cycles or periods were international oil prices are down. This would help mitigate against the overall effect of declining oil price on Nigeria's stock market indices. Most importantly, the study recommends that government embarks on genuine and encompassing diversification program, to help mitigate against the impact of oil prices on not just stock market indices, but on the entire economy as a whole. This recommendation is borne from the concern that international oil prices are not easily controllable by local economic policies, hence any shock any or sudden change in oil price might greatly affect the Nigerian stock market as well as other economic indices.

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