IMPACT OF OIL PRICE MOVEMENT ON THE NIGERIAN STOCK MARKET

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Abstract

This paper seeks to assess the effect of oil price movement on the Nigerian stock market. Multiple linear regression and vector auto-regression technique were employed to measure the extent to which the value of share traded in the Nigerian stock market was influenced. The result showed that oil price impacted on value of share traded significantly. Exchange rate and interest rate also had significant effect on value of share traded. Nigerian government should diversify and improve other sources of income in order to reduce her dependence on oil export and restore local refineries to full operation to satisfy the energy need of the country.

Keywords: Oil Price; Stock Market. Interest rate, GDP, Exchange rate

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Introduction

Given its importance in the supply of the world's energy, crude oil has become a major indicator of economic activities and Nigeria as an oil exporting nation has depended so much on oil price in making their annual budgets. From a moderate 26.3 per cent of the federally collected-revenue in 1970, reliance on this wasting resource rose to 82.1 per cent in 1974 and 83.0 per cent in 2008 largely on account of a rising crude oil prices at the international market. Since oil plays a prominent role in the Nigerian economy by providing the funds that drive the economy, it is argued that changes in oil price would most likely result to changes in stock prices. It is contended that an increase in oil prices will cause expected earning to increase in the case of oil exporting nations, and this would bring about an increase in stock price if the stock market effectively capitalizes the cash flow implications of the oil price increase.

Taofik and Omosola (2013) assert that the prices of stock determine how effective and efficient the stock market allocates shares and equities based on preference and availability of market information. Arguing further they submitted that an increase or decrease in price of stock creates uncertainty for the investors and in turn affects the demand and supply of stocks. Specifically they averred that, "general increase in price level may affect people's potential investor's investment decision which has a negative impact on the total returns on stocks in the economy at large".

Nigeria depends largely on oil export revenue and given the non-stylized movement in oil price in the world market, it is important to assess its effect on the Nigerian Stock market. The rest of the paper is organized into five sections. Section two is devoted to the review of the related literature. Section three presents the methodological framework while the discussion of results is in section four. The conclusion and recommendations are presented in section five.

Literature review

Theoretically, an oil-price increase leads to a transfer of income from importing to exporting countries through a shift in the terms of trade. The magnitude of the direct effect of a given price increase depends on the share of the cost of oil in national income, the degree of dependence on imported oil and the ability of end-users to reduce their consumption and switch away from oil. It also depends on the extent to which gas prices rise in response to an oil-price increase, the gas-intensity of the economy and the impact of higher prices on other forms of energy that compete with or, in the case of electricity, are generated from oil and gas. Naturally, the bigger the oil-price increase and the longer higher prices are sustained, the bigger the macroeconomic impact (Majidi, 2006 as reported in Apere and Ijomah, 2013).

Adaramola, (2012) re-echoed Abdelaziz et al. (2008) argument that the impact of oil prices on stock market differs from country to country depending on whether the country is an oil-exporter or oil-importer. In oil exporting countries, a rise in world oil prices improves the trade balance, leading to a higher current account surplus and an improving net foreign asset position. At the same time, increase in oil prices tends to increase private disposable income in oil-exporting countries. This increases corporate profitability, raises domestic demand and stock prices thereby causing exchange rate to appreciate.

As reported in Mordi and Adebiyi (2010), Bjørnland (2008) observed that a 10 percent rise in oil prices increase stock returns by 2.5 percent with robust results for linear and nonlinear measures of oil prices. He concludes that the Norwegian economy responds to higher oil prices by increasing aggregate wealth and demand, while emphasizing the role of monetary policy shocks, in particular, as driving forces behind stock price variability in the short run.

Mordi and Adebiyi (2010) reported Driesprong, *et al* (2003) findings which suggest that oil price changes significantly predict negative excess returns and that financial investors

seem to under-react to information in the oil price. They observe a strong linkage between monthly stock returns and lagged monthly changes in oil price.

Akpan (2009) explained that Nigeria relies heavily on crude oil export revenues, representing about 90 per cent of total export earnings and on average about 70 per cent of government revenues in annual budgets. He argued that it has severe implications for the Nigerian economy given the current, wide swings in oil prices in the international oil market.

According to Taofik and Omosola (2013), the advent of the oil boom in Nigeria in the early 1970's has led to the instability of stock prices. They explained that this has been attributed to many factors such as budget deficit monetization, inflow of foreign capital from crude oil sales and financial markets creation of excess private domestic credit.
Mordi and Adebiyi (2010), in a study of the asymmetric effects of oil price shocks on output and prices in Nigeria using a structural VAR model concluded that positive oil price shocks are associated with an increase in real GDP after two months, and that the impact of oil price shock on money supply and all-share index is asymmetric; it raises the all-share index and money supply immediately.

The fact that international oil prices have a significant impact on stock returns in Nigeria suggests that the Nigerian stock market might also be very sensitive to oil price volatility (Adaramola, 2011). The research presented in that paper cautions investors in the Nigerian stock market to be mindful of the trend of the global macroeconomic variables so that the risk of global economic meltdown as experienced between 2007 and 2009 can be reduced to its barest minimum.

As reported in Creti et *al.* (2013), Oil price can impact stock markets through several channels. First, the price of a share being equal to its discounted future cash flow, rising oil prices can increase the interest rate to limit inflationary pressure, tighten the cost of

doing business, put pressure on output prices thus decreasing profits (Jones et *al.*, 2004). High interest rates also make bond investments more attractive than stock ones (Chittedi, 2012 reported in Creti et *al.*, 2013). All these effects they explained generally trigger a negative relationship between oil and stock markets, which parallels the one between high oil prices and macroeconomic indicators.

Adaramola, (2012) specified a bi-variate model and empirical results showed a significant positive stock return to oil price shock in the short-run and a significant negative stock return to oil price shock in the long-run. He further explained that the Granger causality test shows strong evidence that the causation runs from oil price shock to stock returns; implying that variations in the Nigerian stock prices are explained by oil price volatility.

Asaolu and Ilo (2012) showed that the Nigerian stock market return and oil price are tied together in the long –run as anticipated given the dominance of the oil sector on the Nigerian economy. However, contrary to expectation, they assert that Nigeria, an oil exporting country still experiences the golden rule- "oil up, stock down" which should be applicable to oil importing countries. In their words, "this may be an indication the country's failure to translate its huge foreign exchange earnings from oil into improved industrial sector productivity. It also an indirect manifestation of the deleterious effect of huge annual foreign exchange expenditure on importation of petrol/diesel for energy supply bothering on the inability to locally refine a substantial part of its crude oil and the apparent collapse of power supply by the Power Holding Company of Nigeria (PHCN) for domestic and industrial use".

Adebiyi et al. (2009) empirical results showed immediate and significant negative real stock returns to oil price shock in Nigeria. The Granger causality test indicates that causation run from oil price shocks to stock returns, implying that variation in stock market is explained by oil price volatility. It is also interesting to know that causation

runs from stock returns to real exchange rate, which indicates that the authorities can focus on domestic economic policies to stabilize the stock market. Comparing the impacts of oil price shocks and interest rate shocks on the stock market, strong evidence is found that the impact of interest rate shocks on the stock market is greater than oil price shocks and thus monetary policy responds systemically to oil price shocks by raising the interest rates, leading to a decline in real stock returns.

Most literature in this area studies the effect of oil price shock on stock price in Nigeria. Little or no literature looks at the value of share traded as affected by change in oil price. This paper seeks to fill the gap.

Methodology

The study employed econometric analysis. The methods used were multiple regression and vector auto-regression. This was specified to help examine the influence of oil price movement on the Nigerian stock market.

We hypothesize that oil price movement has not significantly affected the Nigerian stock market.

This can be estimated using the model:

VST = f (OILP, INT, EXR, GDP, INF, COILP)

Therefore;

$$Y = B_o + B_1OILP + B_2INT + B_3EXR + B_4GDP + B_5INF + B_6COILP + U \ldots\ldots\ldots\ldots\ldots (1)$$

Where,

B_0 = constant variable

OILP = Oil Price

INT = interest rate

EXR = Exchange rate

GDP = Gross domestic product

INF = Inflation

COILP = Change in oil price

Y = VST = Value of share traded

U = error term

And;

$Yt = A_0 + £^p\ t = 1\ At - 1\ U_t$ …….. *(2)*

Where,

Yt = (Y_1+... Y_{kt}) is a column vector of observation on the current values of all variables in the model, A, is K x K matrix of unknown coefficients, A_0 is a column vector of deterministic constant terms, U_t is a column vector of errors with properties of $E(U_t) = O$ for all t, $E(U_S\ U_t) = \Omega$ if s = t; O if s ≠ t.

Discussions of findings

Evidence from data sourced from CBN statistical bulletin and Nigerian Bureau of Statistics as shown in the appendix revealed that oil price took a downward movement from 1980 to 1986 (i.e. from 37.42 to 14.64) at the same time value of share traded in Nigeria moved from 512.10 down to 494.00. A major shock in oil price was recorded in 2005, 2008 and 2010 when price of oil rose to 50.04, 91.48 and 71.21 respectively. At these corresponding periods, value of share traded in Nigeria also witnessed increase to 262, 929.60, 2,379,142.70 and 797,551.60. This can explain the direct relationship between oil price and value of share traded in Nigeria.

Unit root test

The Augmented Dickey-Fuller test for unit root and stationarity conducted at 1st difference showed that observed t-statistics are all greater than the critical values. Therefore, we conclude that there is no unit root problem with the data.

Empirical Result

Observing the detailed estimation in the appendix, we conclude that there is significant effect of oil price, exchange rate and interest rate on the Nigerian stock market (Value of share traded).

The multiple regression result shows that all coefficients had positive effect on the value of share traded except coefficient of inflation rate and interest rate. Looking closely we discover that coefficient of oil price and exchange rate had positive and statistically significant effect on the value of share traded while interest rate had a negative and statistically significant effect on the dependent variable. This follows the a priori expectation. The expectation is that an increase in interest rate discourages borrowing and drives quoted companies to sell shares in the stock market in order to raise funds. This will in turn reduce the price and value of share traded in the stock market.

Among all three statistically significant coefficients, exchange rate showed to have more effect on value of share traded as shown in the result.

The vector auto regression result shows that only the coefficient of interest rate had statistically significant effect on value of share traded. Its effect as revealed in the regression result is negative. This however does not mean that other variables did not affect the Nigerian stock market, it only means that in the Nigerian context and the period under study, interest rate is directly and deeply connected to the Nigerian stock market. However, we deduce from the result of the VAR that oil price increase positively affects inflation and inflation negatively affect interest rate and interest rate negatively affect value of share traded.

Observing the F-statistics i.e. f*, which is 57.78629 for multiple linear regression and 3.332240 for VAR, we conclude that the independent variables had a significant effect on value of share traded [$f^* > f_{0.05}$ i.e. (57.78629 & 3.332240 > 2.59)].

Given the coefficient of multiple determination, R^2 (53.83% & 91.9%) for VAR and multiple regression respectively, we conclude that the regression is a good fit and that variations in the dependent variable could be attributed to variations in the independent variables.

Furthermore, the Durbin-Watson test for auto-correlation show that auto-correlation is present in the model [d* < du i.e. (1.699936< 1.82)]. The result is unbiased.

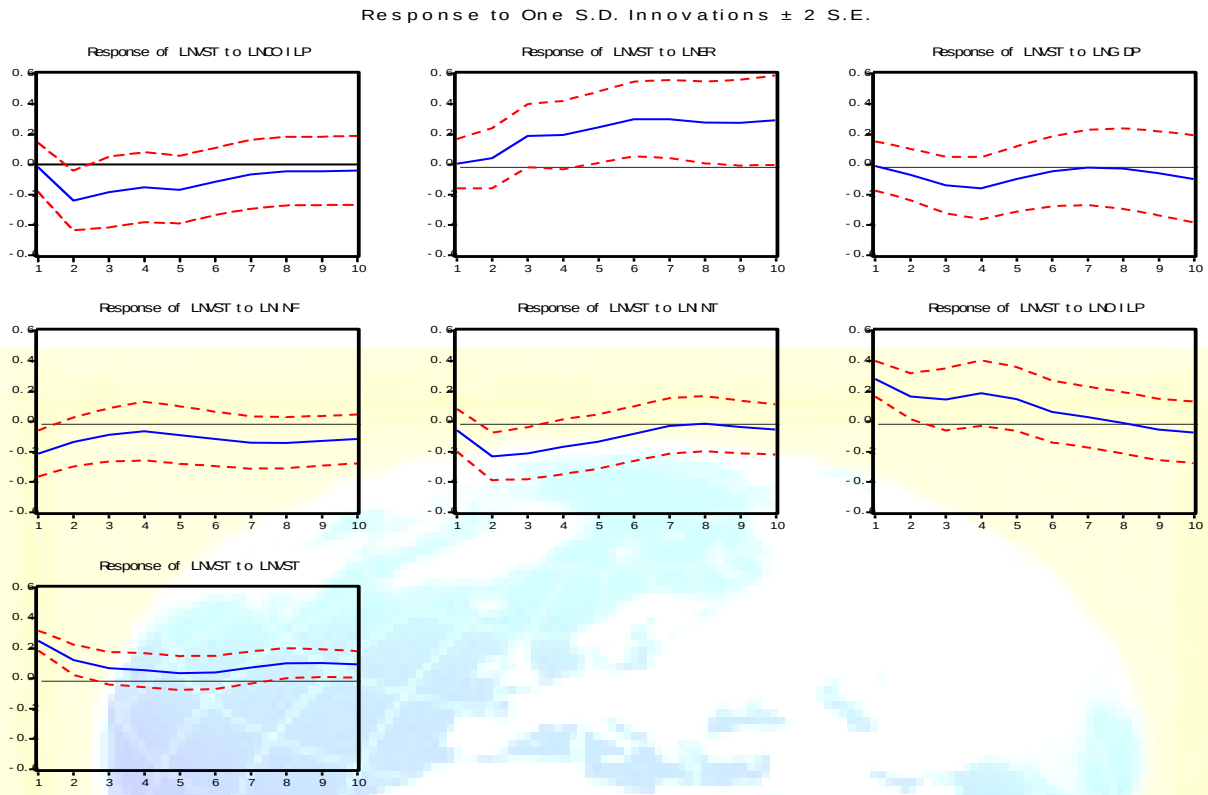
Test of hypothesis

H_0: Oil price movement has not significantly affected the Nigerian stock market.

Considering the result of the t-statistics (3.345121, 7.362184, and -3.333099), representing oil price, exchange rate and interest rate respectively are all greater than the $t_{0.025}$ (2.056). We reject the null hypothesis and accept the alternative.

Impulse response

The response of value of share traded to oil price was positive until period 8 and declined through period 9 and 10. The response of value of share traded to interest rate, inflation, change in oil price and GDP was negative throughout the period. However, the response of value of share traded to exchange rate remained positive and continued to rise above zero (0) line for all periods. Although impulse response of value of share traded to GDP, interest rate, inflation rate, and change in oil price remained negative, it is interesting to note the response trend through the movement.



Impulse response graph

Conclusion

Findings of this research reveal that oil price significantly affect the Nigerian stock market through value of share traded. This does not imply that only value of share traded is affected by oil price. According to Adaramola (2012), oil price exerts significant shock on stock prices both in the short run and in the long-run. He further explains that in the short-run, oil price has a positive significant impact on stock prices in Nigeria.

The effect of oil price on value of share traded in the Nigerian stock market was positive in the first and second year and in the third year it became negative. Notwithstanding, in the second and third year, its effect was insignificant.

A greater share of Nigeria's gross domestic product comes from oil export. Notwithstanding, she spends huge funds importing fuel, kerosene, gas etc. Given the

influence of oil price on the Nigerian stock market, these imports will reduce the positive effect of the oil price movement on the stock market and economy at large. It is therefore recommended that Nigeria diversify and improve other sources of income in order to reduce her dependence on oil export. We also recommend that government restore local refineries to full operation and build more if necessary to satisfy the energy need of the country.

Research limitations and direction for further research

The research adopted value of share traded as capturing the Nigerian stock market. Further studies should be done employing all indices of Nigerian stock market in order to show an individual effect of oil price movement on specific indices of the market.

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Appendix

year	oil price	interest rate	real gdp	Inflation	value of share traded	exchange rate	change in oil price
1979	25.1	7.50	29.9	11.6	261.9	0.6	
1980	37.42	7.50	31.5	10	512.1	0.55	24.64
1981	36	7.75	205.2	21.4	332.1	0.62	2.84
1982	31.55	10.25	199.7	7.2	214.8	0.67	8.9
1983	29	10.00	185.6	23.2	397.9	0.72	5.1
1984	27.5	12.50	183.6	40.7	418.2	0.79	3
1985	26.5	9.25	201	4.7	319.6	0.89	2
1986	14.64	10.50	206	5.4	494	1.75	23.72
1987	17.5	17.50	204.8	10.2	348	4.02	5.72
1988	14.87	16.50	219.9	38.3	137.6	4.54	5.26
1989	18.33	26.80	236.7	40.9	521.6	7.36	6.92
1990	23.19	25.50	267.5	7.5	265.5	8.04	9.72
1991	20.19	20.01	265.4	12.9	136.2	9.91	6
1992	19.25	29.80	271.4	44.5	313.5	17.3	1.88
1993	16.74	18.32	274.8	57.3	402.3	22.07	5.02
1994	15.66	21.00	275.5	57	569.7	22	2.16
1995	16.75	20.18	281.4	73.1	1838.8	21.9	2.18
1996	20.46	19.74	293.7	29.1	7062.7	21.88	7.42
1997	18.97	13.54	302	8.5	11072	21.89	2.98
1998	11.91	18.29	310.9	10	13572.4	21.89	15.12
1999	16.55	21.32	312.2	6.6	14027.4	92.34	9.28
2000	27.4	17.98	329.2	6.9	28154.6	101.7	21.7
2001	23	18.29	357	18.9	57637.2	111.23	8.8
2002	22.81	24.85	433.2	12.9	60088.7	120.58	1.28
2003	27.69	20.71	477.5	14	120703	129.22	9.76
2004	37.41	19.18	527.6	10.1	225820.5	132.89	19.44
2005	50.04	17.95	561.9	11.5	262929.6	131.27	25.26
2006	58.3	17.26	595.8	8.6	470253.8	128.65	9.52

2007	64.2	16.94	634.3	6.6	2086294.59	125.81	11.8
2008	91.48	15.14	672.2	15.1	2379142.7	118.55	54.56
2009	53.56	18.36	718.9	12.1	684451.2	148.9	75.84
2010	71.21	17.59	775.5	11.8	797551.6	150.3	35.3

Source: Central Bank of Nigeria bulletin; Nigerian Bureau of Statistics.