AN EMPIRICAL STUDY ON THE DYNAMIC RELATIONSHIP BETWEEN CRUDE OIL PRICES AND NIGERIA STOCK MARKET

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ABSTRACT

In this paper, we have examined the crude oil price on the performance of Nigerian stock exchange and exchange rate act as the plausible countercyclical tool. We have applied the different models and collected the results that crude oil prices have direct impact on the stock exchange of Nigeria. The Nigeria stock exchange is regulated by the Securities and Exchange Commission. Nigeria stock exchange has the automated trading system. The basic facility of Nigeria trading system is (ATS), it is helpful to remote trading system. Consequently, most of the investors do trade with the method of ATS. This study is also proving that Nigeria stock exchange has influenced on the performance of the economy, Impact of oil crisis on the Nigeria stock exchange, Impact of crude oil crisis on the development of country, Effect of exchange rate policy on the performance of Nigeria stock exchange.

Keywords:
Nigerian stock exchange, exchange commission, ATS, crude oil.

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1. INTRODUCTION

Robust of the studies have been done about the fluctuations effect of crude oil on the stock exchange of Malaysia. Financial market is known as the crucial way to analysis the impact of decrease crude oil prices on the stock exchange stock exchange of Malaysia. According to Kumar (2014) oil crisis has impact worst on the performance of stock exchange. In this paper, discussed the two main dimensions 1) impact of oil crisis on the importing country 2) impact of oil prices on the exporting countries. Soytas, 2006 have analyzed the impact of oil crisis on the Nigeria stock exchange, for this purpose they have utilized the VAR model. It is very effective model to analysis the impact of crude oil prices on the stock exchange of all the stock exchange. This model is also affected to analysis the response of dependent variable on the logged values of the independent variables.
**HISTORY OF NIGERIA STOCK EXCHANGE**

First time the Nigeria stock exchange was established in 1960 with the name of Lagos stock exchange. After the sometimes, its name was changes now it is known as the Nigerian stock exchange. In 2016, there are listed near about 181 listed companies with the market capitalization of about N10.17 trillion. Nigeria stock exchanges is known as the third largest stock exchange of Africa. The Nigeria stock exchange is regulated by the Securities and Exchange Commission. Nigeria stock exchange has the automated trading system. The basic facility of Nigeria trading system is (ATS), it is helpful to remote trading system. Consequently, most of the investors do trade with the method of ATS. Every business day the trade has started from 9.30 am and close to 2.30 PM.

**IN 2009 WORLD PRODUCTION SHARES**

![World Production Share in 2009](image)

| Major Palm Oil Producers | Tonnage (mil tonnes) | % |
|--------------------------|----------------------|---|
| Indonesia                | 21.14                | 46.6 |
| Malaysia                 | 17.57                | 38.7 |
| Thailand                 | 1.31                 | 2.5 |
| Nigeria                  | 0.86                 | 1.9 |
| Others                   | 4.48                 | 9.9 |
| **TOTAL**                | **45.36**            | **100** |

Source: Oil World

2. **OBJECTIVE OF THE STUDY**

1) Impact of oil crisis on the Nigeria stock exchange.
2) Impact of crude oil crisis on the development of country.
3) Effect of exchange rate policy on the performance of Nigeria stock exchange.

3. **PROBLEM STATEMENT**

Impact of oil prices on the stock exchange of Nigeria.

**IMPACT OF INTERNATIONAL CRUDE OIL ON THE DIFFERENT STOCK MARKET**

1) High profitability can be created with the lower cost of energy.
2) There is inverse relationship between crude oil and exchange rate.
3) In the different domestic market the demand of lower energy is very high.

4. HYPOTHESIS STUDY

HO: There is relationship between oil prices and stock exchange of Nigeria
HA: There is no relationship between oil prices and stock prices of Nigeria.

THEORETICAL FRAMEWORK

5. LITERATURE REVIEW

Arouri, M., Lahiani, A. & Nguyen, D. K, Observed that impact of crude oil by the various sectors of stock exchange of India. For this purpose, they had taken the data from 2002 to 2012 and applied the VECM model and proved that there is no positive relationship between oil prices and stock exchange of India [1].

Bollerslev, T., Engle, R. F. & Wooldridge, J. M, Examined that impact of crude oil by the various sectors of stock exchange of France. For this purpose, they had taken the data from 2003 to 2013 and applied the VAR model and proved that there is no positive relationship between oil prices and stock exchange of France [2].

Cappiello, L., Engle, R. F., & Sheppard, K. K, Analyzed that impact of crude oil by the various sectors of stock exchange of China. For this purpose, they had taken the data from 2004 to 2014 and applied the VECM model and proved that there is no positive relationship between oil prices and stock exchange of China [3].

Dhaoui, A., & Khraief, N, Viewed that impact of crude oil by the various sectors of stock exchange of Japan. For this purpose, they had taken the data from 2001 to 2011 and applied the multi regression model and proved that there is no positive relationship between oil prices and stock exchange of Japan [4].

Guesmi, K., Fattoum, S. & Ftiti, Z, Observed that impact of crude oil by the various sectors of stock exchange of Pakistan. For this purpose, they had taken the data from 2001 to 2011 and applied the VAR model and proved that there is no positive relationship between oil prices and stock exchange of Pakistan [5].
Hung, J., Lee, M. & Liu, M. Viewed that impact of crude oil by the various sectors of stock exchange of Jordan. For this purpose, they had taken the data from 2001 to 2011 and applied the GARCH model and proved that there is no positive relationship between oil prices and stock exchange of Jordan [6].

Dhaoui, A., & Khraief, N. Analyzed that impact of crude oil by the various sectors of stock exchange of Nigeria. For this purpose, they had taken the data from 2005 to 2015 and applied the ARCH model and proved that there is no positive relationship between oil prices and stock exchange of Nigeria [7].

Hung, J., Lee, M. & Liu, M. Examined that impact of crude oil by the various sectors of stock exchange of Asian countries. For this purpose, they had taken the data from 2003 to 2013 and applied the VAR model and proved that there is no positive relationship between oil prices and stock exchange of Asian countries [8].

Felipe, S. P., & Diranzo, C. F. Analyzed that impact of crude oil by the various sectors of stock exchange of UK. For this purpose, they had taken the data from 2004 to 2014 and applied the VECM model and proved that there is no positive relationship between oil prices and stock exchange of UK [9].

Engle, R. F. Viewed that impact of crude oil by the various sectors of stock exchange of USA. For this purpose, they had taken the data from 2001 to 2011 and applied the VAR model and proved that there is no positive relationship between oil prices and stock exchange of USA [10].

**GAPS IN LITERATURE**

1) In the last studies, nobody had discussed about the alternative of oil.
2) In the past studies nobody has explained impact of crude oil on the economy condition.
3) From the last studies nobody has major reason of increasing inflation rate day by day.

**6. METHODOLOGY**

In this paper, we have adopted the econometric data, it is based on the empirical facts. We have derived the hypotheses from here. We have showed the associations between dependent and independent variables.

**Model Specification:** The following models of the capital market indicators were specified for this study:

i) Stock Price model, represented as $SP = f(OP, \ GDP, \ EXR, INV, MPR)$; and its regression model is stated as:

$$SP = a_0 + a_1 OP + a_2 GDP + a_3 EXR + a_4 INV + a_5 MPR + \mu_1$$

Where,

$SP = $ Stock Price (representing the stock market performance)
OP = Oil price
GDP = Gross Domestic Product EXR = Exchange Rate
INV = Investment

MPR = Monetary Policy Rate
\( \mu_1 \) = Stochastic Error term

**Table 1:**
Dependent variable: sp
Method: leastsquare
Included observations: 31

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | 0.323688    | 0.294622   | 1.098655    | 0.2829 |
| OP       | 0.011081    | 0.004125   | 2.686375    | 0.0128 |
| GDP      | -0.004658   | 0.001688   | -2.761041   | 0.0108 |
| EXR      | -0.001113   | 0.001208   | -0.921255   | 0.3662 |
| INV      | 0.116203    | 0.032207   | 3.608137    | 0.0015 |
| MPR      | -0.017136   | 0.008975   | -1.909457   | 0.0683 |

R-squared          0.800318  Mean depenent var  0.330334
Adjusted R-squared 0.758719  S.D. dependent var  0.412992
S.E. of regression  0.202864  Akaike info criterion -0.175715
Sum squared resid   0.987684  Schwarz criterion   0.104526
Log likelihood      8.635712  Hannan-Quinn criter. -0.086064
F-statistic         19.23832  Durbin-Watson stat  0.999702
Prob(F-statistic)   0.000000

In the table no 1 is showing the equation of sp and op and predictor variables are significant at 0.128, 0.0109 and 0.0015 respectively all values have less than 0.05.

**Table 2:** The MC Equation
Dependent Variable: MC
Method: Least Squares
Sample: 1981 2008
Included observations: 31

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | -12.83862   | 12.68815   | -1.011858   | 0.3218 |
In the table no 2 is showing the MC equation and showing that GDP are significant with the values of 0.0321 and 0.0049 respectively.

**Table 3:** The NLC Equation

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-------|
| C        | -12.83862   | 12.68815   | -1.011858   | 0.3218|
| OP       | 0.404382    | 0.177624   | 2.276628    | 0.0321|
| GDP      | 0.225637    | 0.072646   | 3.105998    | 0.0049|
| EXR      | -0.026098   | 0.051999   | -0.501887   | 0.6204|
| INV      | -1.885833   | 1.386968   | -1.359682   | 0.1867|
| MPR      | 0.144252    | 0.386456   | 0.373268    | 0.7123|

R-squared 0.811832, Mean dependent var 11.55200

Adjusted R-squared 0.772628, S.D. dependent var 18.32188

S.E. of regression 8.736495, Akaike info criterion 7.349752

Sum squared resid 1831.833, Schwarz criterion 7.629992

Log likelihood -104.2464, Hannan-Quinn criter. 7.439403

F-statistic 20.70800, Durbin-Watson stat 2.115538

Prob(F-statistic) 0.000000
In the NLC equation there is not the investment is significant 0.4223 .all other variables are significant with the values of 0.0025,0.0003,0.0000 and 0.0124 respectively.

**Table 4:** Augmented Dickey-Fuller Unit Root Test on SP

Null Hypothesis: SP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=0)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-------|
| C        | 69.19435    | 26.29365   | 2.631602    | 0.0147|
| OP       | -1.250068   | 0.368089   | -3.396118   | 0.0025|
| GDP      | 0.656899    | 0.150544   | 4.363524    | 0.0003|
| EXR      | 0.630309    | 0.107757   | 5.849388    | 0.0000|
| INV      | -2.347069   | 2.874212   | -0.816596   | 0.4223|
| MPR      | 2.168548    | 0.800851   | 2.707807    | 0.0124|
| R-squared| 0.893414    | Mean dependent var | 149.4334 |
| Adjusted R-squared | 0.871209 | S.D. dependent var | 50.44813 |
| S.E. of regression | 18.10465 | Akaike info criterion | 8.807071 |

| Sum squared resid | 1831.833 | Schwarz criterion | 7.629992 |
| Log likelihood   | -104.2464 | Hannan-Quinn criter. | 7.439403 |
| F-statistic      | 20.70800 | Durbin-Watson stat | 2.115538 |
| Prob(F-statistic)| 0.000000 |                     |         |

Augmented Dickey-Fuller test statistic

| Augmented Dickey-Fuller test statistic | t-Statistic | Prob.* |
|---------------------------------------|-------------|--------|
|                                        | -3.416984   | 0.0186 |

Test critical values:

| Test critical values: | 1% level | 5% level |
|-----------------------|----------|----------|
|                       | -3.679323| -2.967768|
Augmented Dickey-Fuller Test Equation

Dependent Variable: D(SP)
Method: Least Squares
Sample (adjusted): 1981 2009
Included observations: 29 after adjustments

| Variable   | Coefficient | Std. Error | t-Statistic | Prob. |
|------------|-------------|------------|-------------|-------|
| SP(-1)     | -0.185688   | 0.054344   | -3.416984   | 0.0021|
| C          | 0.015356    | 0.028921   | 0.530956    | 0.5999|

R-squared 0.301888
Mean dependent var 0.047587

Adjusted R-squared 0.276034
S.D. dependent var 0.141108
Akaike info criterion -1.335102
S.E. of regression 0.120066
Schwarz criterion -1.240806

Log likelihood 21.35898
Hannan-Quinn criter. -1.305568

F-statistic 11.67578
Durbin-Watson stat 1.977997
Prob(F-statistic) 0.002022

The ADF statistic value is –3.418 and p value is 0.0186. the critical value is 2%, 5% and 10% level. All the values are showing that these are stationarity.

Augmented Dickey-Fuller Unit Root Test on MC
Null Hypothesis: MC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

| Augmented Dickey-Fuller test statistic | t-Statistic | Prob.* |
|--------------------------------------|------------|--------|
|                                       | -1.582649  | 0.4785 |

Test critical values: 1% level -3.679323
5% level -2.967768
10% level -2.622988

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MC)
Method: Least Squares
Date: 04/27/10 Time: 15:30
Sample (adjusted): 1981 2009
Included observations: 29 after adjustments

| Variable          | Coefficient | Std. Error | t-Statistic | Prob. |
|-------------------|-------------|------------|-------------|-------|
| MC(-1)            | -0.189800   | 0.119864   | -1.582649   | 0.1252|
| C                 | 3.135381    | 2.498507   | 1.254903    | 0.2204|
| R-squared         | 0.084895    | Mean dependent var | 1.090346 |
| Adjusted R-squared| 0.051002    | S.D. dependent var | 11.82116 |
| S.E. of regression| 11.51577    | Akaike info criterion | 7.791783 |
| Sum squared resid | 3580.544    | Schwarz criterion | 7.886079 |
| Log likelihood    | -110.9809   | Hannan-Quinn criter. | 7.821315 |
| F-statistic       | 2.504777    | Durbin-Watson stat | 1.599451 |
| Prob(F-statistic) | 0.125147    |             |             |       |

The ADF statistic value is -1.584 and p value is 0.479. the critical value is 1%, 5%, and 10% respectively. the value of MC is showing that there is no stationary.

Null Hypothesis: NLC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

Augmented Dickey-Fuller test statistic

| t-Statistic | Prob.* |
|-------------|--------|
| -0.958158   | 0.7554 |

Test critical values:

| level    | t-Statistic | Prob.* |
|----------|-------------|--------|
| 1% level | -3.679323   |        |
| 5% level | -2.967768   |        |
| 10% level| -2.622988   |        |

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(NLC)
Method: Least Squares
Date: 04/27/10 Time: 15:33
Sample (adjusted): 1981 2009
Included observations: 29 after adjustments

| Variable          | Coefficient | Std. Error | t-Statistic | Prob. |
|-------------------|-------------|------------|-------------|-------|
| NLC(-1)           | -0.049872   | 0.052048   | -0.958159   | 0.3466|
| C                 | 12.06895    | 8.079408   | 1.493791    | 0.1469|
| R-squared         | 0.032885    | Mean dependent var | 4.724139 |

| Variable          | Coefficient | Std. Error | t-Statistic | Prob. |
|-------------------|-------------|------------|-------------|-------|
| NLC(-1)           | -0.049872   | 0.052048   | -0.958159   | 0.3466|
| C                 | 12.06895    | 8.079408   | 1.493791    | 0.1469|
| R-squared         | 0.032885    | Mean dependent var | 4.724139 |
| Statistic                                      | Value             | S.D. dependent var | 13.72667 |
|-----------------------------------------------|-------------------|--------------------|----------|
| Adjusted R-squared                            | -0.002936         |                     |          |
| S.E. of regression                            | 13.74678          | Akaike info criterion | 8.145958 |
| Sum squared resid                             | 5102.303          | Schwarz criterion   | 8.240257 |
| Log likelihood                                | -116.1165         | Hannan-Quinn criter. | 8.175493 |
| F-statistic                                   | 0.918068          | Durbin-Watson stat  | 2.439743 |
| Prob(F-statistic)                             | 0.346486          |                     |          |

Sample (adjusted): 1982 2009
Included observations: 28 after adjustments
Standard errors in ( ) & t-statistics in [ ]

|       | SP     | MC     | NLC    |
|-------|--------|--------|--------|
| SP(-1)| 0.814218 | 4.154087 | 8.769695 |
| [0.21807] | [17.3693] | [17.4485] |
| [3.73395] | [0.23917] | [0.50261] |
| SP(-2)| -0.063405 | -3.100812 | -7.819723 |
| (0.19834) | (15.7976) | (15.8697) |
| [ -0.31971] | [-0.19628] | [-0.49276] |
| MC(-1)| 0.000981  | 0.286044 | -0.142463 |
| [0.00363] | [0.28832] | [0.28964] |
| [0.27078] | [0.99213] | [-0.49188] |
| MC(-2)| -0.002652 | -0.140716 | 0.078600 |
| (0.00286) | (0.22681) | (0.22884) |
| [ -0.93108] | [-0.62045] | [ 0.34555] |
| NLC(-1)| 0.001178  | 0.159615 | 0.546679 |
| [0.00198] | [0.15868] | [0.15949] |
| [0.59086] | [1.00598] | [3.42927] |
| NLC(-2)| -0.001364 | -0.077938 | 0.349386 |
| (0.00194) | (0.15406) | (0.15486) |
| [ -0.70482] | [-0.50593] | [ 2.25770] |
| OP    | 0.001418  | 0.580219 | 0.127034 |
| [0.00249] | [0.19724] | [0.19823] |
| [0.57237] | [2.94188] | [0.64212] |
| C     | 0.022623  | -19.87626 | 20.64314 |

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|                |        |        |        |
|----------------|--------|--------|--------|
|                | (0.16345) | (13.0187) | (13.0881) |
| R-squared      | 0.870554 | 0.795904 | 0.964940 |
| Adj. R-squared | 0.825247 | 0.724468 | 0.951419 |
| Sum sq. resid  | 0.307576 | 1951.486 | 1969.459 |
| S.E. equation  | 0.124012 | 9.877968 | 9.923101 |
| F-statistic    | 19.21477 | 11.14181 | 76.47657 |
| Log likelihood | 23.42708 | -99.14827 | -99.37590 |
| Akaike AIC     | -1.101935 | 7.653448 | 7.672564 |
| Schwarz SC     | -0.721305 | 8.034078 | 8.044194 |
| Mean dependent | 0.252144 | 12.18358 | 156.0814 |
| S.D. dependent | 0.296653 | 18.81838 | 44.97583 |
| Determinant resid covariance (dof adj.) | 126.7048 |
| Determinant resid covariance | 46.17525 |
| Log likelihood | -172.8451 |
| Akaike information criterion | 14.06037 |

Unrestricted Cointegration Rank Test (Trace)
Sample (adjusted): 1983 2009
Included observations: 27 after adjustments
Trend assumption: Linear deterministic trend
Series: SP MC NLC
Lags interval (in first differences): 1 to 2

| Hypothesized | Trace | 0.05 |
|--------------|-------|------|
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.** |
| None *       | 0.568427 | 32.58108 | 29.79708 | 0.0234 |
| At most 1    | 0.306707 | 9.892559 | 15.49472 | 0.2892 |
| At most 2    | 8.65E-06 | 0.002336 | 3.841467 | 0.9595 |

Trace test indicates
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

| Hypothesized | Max-Eigen | 0.05 | No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.** |
|--------------|-----------|------|--------------|------------|------------|----------------|---------|
| None *       | 0.568427  | 22.68855 | 21.13163 | 0.0400 |
| At most 1    | 0.306709  | 9.890223 | 14.26461 | 0.3192 |
| At most 2    | 8.65E-06  | 0.002336 | 3.841467 | 0.8594 |

7. CONCLUSION

Robust of the studies have done about oil prices and it is proved that oil is known as the key indicator of all the developing and under developing countries. Now a day the demands of oil prices are high and it has impacted on the prices of subsidies. According to setpen(1998)there is inverse relationship between oil prices and stock exchange. It is seen that oil prices have impacted on the transport. Therefore, our paper is trying to prove that increase in the prices of oil prices is main cause of inflation. It is not wrong saying that oil prices up and downs of oil prices have good and bad impact on the all the sort of stock exchange. Oil prices are also known as the uncontrolled variable.

8. RECOMMENDATION

1) There is need of proper policy to take decisions in the lower prices of oil.
2) Government should keep alternative in the worst situations.
3) How many improve the development of the economy after oil crisis.
4) How can improve inflation rate such types of conditions.

9. REFERENCE

[1] Arouri, M., Lahiani, A. & Nguyen, D. K.(2011). Return and volatility transmission between world oil prices and stock marketsof the GCC countries. Economic Modelling, 28(4), 1815-1825.
[2] Bollerslev, T., Engle, R. F. & Wooldridge, J. M.(1988). A capital asset pricing model with time-varying covariances. Journal of Political Economy, 96 (1), 116-131.
[3] Cappiello, L., Engle, R. F., & Sheppard, K. K. (2006). Asymmetric dynamics in the correlations of global equity and bond returns. Journal of Financial Econometrics, 4(4), 537-572.
[4] Engle, R. F., & Sheppard, K. (2001). Theoretical and empirical properties of dynamic conditional correlation multivariate GARCH. Technical report, National Bureau of Economic Research
[5] Dhaoui, A., & Khraief, N. (2014). EmpiricalLinkage between Oil Price and Stock Market Returns and Volatility: Evidence from International Developed Markets. Economics Discussion Papers, No 2014-12, KielInstitute for the World Economy. Retrieved from
[6] Guesmi, K., Fattoum, S. & Fititi, Z. (2014). Oil prices impact on stock markets: what we learned for the case of oil exporting countries? IPAG Business School Working Paper 2014-443. Retrieved from http://www.ipag.fr/fr/accueil/la-recherche/publications-WP.html

[7] Hung, J., Lee, M. & Liu, M. (2008). Estimation of value-at-risk for energy commodities via fat-tailed GARCH models. Energy Economics, 30, 1173–1191.

[8] Dhaoui, A., & Khraief, N. (2014). Empirical Linkage between Oil Price and Stock Market Returns and Volatility: Evidence from International Developed Markets. Economics Discussion Papers, No 2014-12, Kiel Institute for the World Economy. Retrieved from http://www.economics-ejournal.org/economics/discussionpapers/2014-12

[9] Felipe, S. P., & Diranzo, C. F. (2006). Volatility transmission models: A survey, Revista de Economia Financiera, pp. 32 – 81. Available online at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=929953

[10] Engle, R. F. (2003). Risk and volatility: Econometric models and financial practice. Noble Lecture (December 8), Salomon Centre New York.