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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

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 oil crisis has impact worst on the performance of stock exchange. In this paper, discussed the two main dimestions1) 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 (Figure 1).

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.

Problem Statement

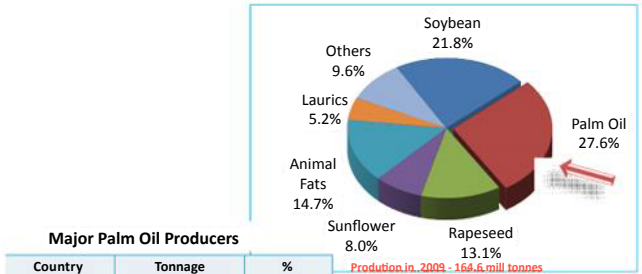
Impact of oil prices on the stock exchange of Nigeria.

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.



Major Palm Oil Producers

Country	Tonnage (mil tonnes)	%
Indonesia	21.14	46.6
Malaysia	17.57	38.7
Thailand	1.31	2.9
Nigeria	0.86	1.9
Others	4.48	9.9
TOTAL	45.36	100

Source: Oil World

Figure 1: In 2009 world production shares.

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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 (Figure 2).

Literature Review

Arouri, Lahiani and Nguyen 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, Engle and Wooldridge 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, Engle and Sheppard 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 and Khraief 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, Fattoum and Ftiti 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, Lee and Liu 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 and Khraief 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 [5,7-9].

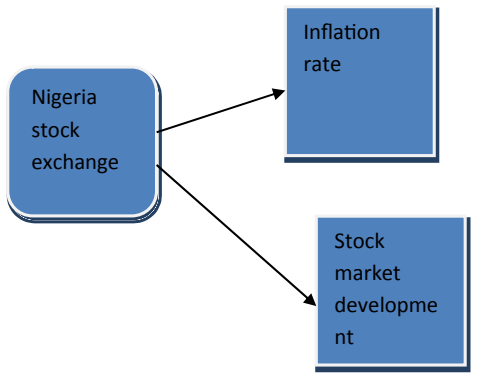

Figure 2: Theoretical framework.

Hung, Lee and Liu 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 [10-15].

Felipe and Diranzo 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 [16-22].

Engle 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 [23].

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.

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:

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

SP=a0+a1OP+a2 GDP+a3EXR+a4INV+a5MPR+μ1

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

μ1=Stochastic Error term

Dependenvariable:sp

Method: Leastsquare

Included observations: 31 (Tables 1-12).

In the Table 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.

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	-0.00466	0.001688	-2.76104	0.0108
EXR	-0.00111	0.001208	-0.92126	0.3662
INV	0.116203	0.032207	3.608137	0.0015
MPR	-0.01714	0.008975	-1.90946	0.0683
R-squared	0.800318	Mean dependent var		0.330334
Adjusted R-squared	0.758719	S.D. dependent var		0.412992
S.E. of regression	0.202864	Akaike info criterion		-0.17572
Sum squared resid	0.987684	Schwarz criterion		0.104526
Log likelihood	8.635712	Hannan-Quinn criter.		-0.08606
F-statistic	19.23832	Durbin-Watson stat		0.999702
Prob (F-statistic)	0			

Table 1: Model Specification.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.8386	12.68815	-1.01186	0.3218
OP	0.404382	0.177624	2.276628	0.0321
GDP	0.225637	0.072646	3.105998	0.0049
EXR	-0.0261	0.051999	-0.50189	0.6204
INV	-1.88583	1.386968	-1.35968	0.1867
MPR	0.144252	0.386456	0.373268	0.7123
R-squared	0.811832	Mean dependent var		11.552
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	-104.246	Hannan-Quinn criter.		7.439403
F-statistic	20.708	Durbin-Watson stat		2.115538
Prob (F-statistic)	0			

Dependent Variable: MC
Method: Least Squares
Sample: 1981 2008
Included observations: 31.

Table 2: The MC Equation.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.8386	12.68815	-1.01186	0.3218
OP	0.404382	0.177624	2.276628	0.0321
GDP	0.225637	0.072646	3.105998	0.0049
EXR	-0.0261	0.051999	-0.50189	0.6204
INV	-1.88583	1.386968	-1.35968	0.1867
MPR	0.144252	0.386456	0.373268	0.7123
R-squared	0.811832	Mean dependent var		11.552
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	-104.246	Hannan-Quinn criter.		7.439403
F-statistic	20.708	Durbin-Watson stat		2.115538
Prob (F-statistic)	0			

Dependent Variable: MC
Method: Least Squares
Sample: 1981 2008
Included observations: 31.

Table 3: The NLC Equation.

In the Table 2 is showing the MC equation and showing that GDP are significant with the values of 0.0321 and 0.0049 respectively.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.8386	12.68815	-1.01186	0.3218
OP	0.404382	0.177624	2.276628	0.0321
GDP	0.225637	0.072646	3.105998	0.0049
EXR	-0.0261	0.051999	-0.50189	0.6204
INV	-1.88583	1.386968	-1.35968	0.1867
MPR	0.144252	0.386456	0.373268	0.7123
R-squared	0.811832	Mean dependent var		11.552
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	-104.246	Hannan-Quinn criter.		7.439403
F-statistic	20.708	Durbin-Watson stat		2.115538
Prob (F-statistic)	0			
			t-Statistic	Prob.
Augmented Dickey-Fuller test statistic			-3.41698	0.0186
Test critical values:	1% level		-3.67932	
	5% level		-2.96777	
	10% level		-2.62299	

0.0025, 0.0003, 0.0000 and 0.0124 respectively.
Null Hypothesis: SP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=0).
For the MC equation.

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

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SP(-1)	-0.18569	0.054344	-3.41698	0.0021
C	0.015356	0.028921	0.530956	0.5999
R-squared	0.301888	Mean dependent var		-0.04759
Adjusted R-squared	0.276034	S.D. dependent var		0.141108
S.E. of regression	0.120066	Akaike info criterion		-1.3351
Sum squared resid	0.389218	Schwarz criterion		-1.24081
Log likelihood	21.35898	Hannan-Quinn criter.		-1.30557
F-statistic	11.67578	Durbin-Watson stat		1.977997
Prob (F-statistic)	0.002022			

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SP)
Method: Least Squares
Sample (adjusted): 1981 2009
Included observations: 29 after adjustments.

Table 5: MacKinnon (1996) one-sided p-values.

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.58265	0.4785
Test critical values:	1% level	-3.67932	
	5% level	-2.96777	
	10% level	-2.62299	

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

Table 6: Augmented Dickey-Fuller Unit Root Test on MC.

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.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MC(-1)	-0.1898	0.119864	-1.58265	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	-110.981	Hannan-Quinn criter.		7.821315
F-statistic	2.504777	Durbin-Watson stat		1.599451
Prob(F-statistic)	0.125147			

Exogenous: Constant,
Lag Length: 0 (Automatic - based on SIC, maxlag=7).

Table 7: Null Hypothesis: NLC has a unit root.

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.95816	0.7554
Test critical values:	1% level	-3.67932	
	5% level	-2.96777	
	10% level	-2.62299	

*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.

Table 8: Augmented Dickey-Fuller test statistic.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NLC(-1)	-0.04987	0.052048	-0.95816	0.3466
C	12.06895	8.079408	1.493791	0.1469
R-squared	0.032885	Mean dependent var		4.724139
Adjusted R-squared	-0.00294	S.D. dependent var		13.72667
S.E. of regression	13.74678	Akaike info criterion		8.145958
Sum squared resid	5102.303	Schwarz criterion		8.240257
Log likelihood	-116.117	Hannan-Quinn criter.		8.175493
F-statistic	0.918068	Durbin-Watson stat		2.439743
Prob(F-statistic)	0.346486			

Included observations: 28 after adjustments,
Standard errors in ( ) and t-statistics.

Table 9: Sample (adjusted): 1982 2009.

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.

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).

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 there is inverse relationship between oil prices and stock exchange. It is seen

	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)	-0.06341	-3.10081	-7.81972
	-0.19834	-15.7976	-15.8697
	[-0.31971]	[-0.19628]	[-0.49276]
MC(-1)	0.000981	0.286044	-0.14246
	-0.00363	-0.28832	-0.28964
	[0.27078]	[0.99213]	[-0.49188]
MC(-2)	-0.00265	-0.14072	0.0786
	-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)	-0.00136	-0.07794	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	-19.8763	20.64314
	-0.16345	-13.0187	-13.0881
	[0.13842]	[-1.526762	[1.58838]
R-squared	0.870554	0.795904	0.96494
Adj. R-squared	0.825247	0.724468	0.951419
Sum sq. resids	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	-99.1483	-99.3759
Akaike AIC	-1.10194	7.653448	7.672564
Schwarz SC	-0.72131	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		-172.845	
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.

Table 10: Schwarz criterion.

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 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.

Table 11: Trace test.

Hypothesized	Eigenvalue	Max-Eigen	0.05	Prob.
No. of CE(s)		Statistic	Critical Value	
None *	0.568427	22.68855	21.13163	0.04
At most 1	0.306709	9.890223	14.26461	0.3192
At most 2	8.65E-06	0.002336	3.841467	0.8594

Table 12: Hypothesized.

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.

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.

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