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EFFECTS OF OIL PRICE CHANGE ON CAPITAL STOCKS OF SELECTED COMPANIES IN AGRO-ALLIED INDUSTRY IN NIGERIA

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ABSTRACT

This study was carried out to determine the effect of oil price changes on capital stocks of agro-allied companies in Nigeria. Secondary data obtained from Nigerian Stock Exchange, Central Bank of Nigeria and Energy Information Administration were used. Panel data estimation technique was employed in analyzing the data. The panel data set up comprises of seven quoted agro-allied companies in the floor of Nigerian Stock Exchange over the period of 120 months (1997.1-2006.12). The result showed a significant positive relationship between oil price change and stock prices. This implies that oil price is a relevant factor in determining stock prices in oil producing and exporting countries like Nigeria. It is also revealed that inflation and interest rate on bank deposit exert a negative impact on stocks. Exchange rate has a positive significant relationship with capital stock. Based on the findings, it is recommended that the Federal Government of Nigeria should formulate and implement policies that will control the economic variables in favour of the stock market.

Keywords: oil price change, capital stocks, agro-allied industry, panel data, fixed effect, random effect, agriculture.

INTRODUCTION

Agriculture is an important sector in the Nigerian economy. Although the sector suffered a set back as a result of discovery of crude oil, yet it remains a major springboard for economic recovery. It provides food for the teeming population of Nigeria and supplies raw materials for the industries such as leather, textiles, pharmaceutical and food processing industries among others (Ajaikaiye, 1989). In addition, a viable agriculture provides employment for majority of the populace and improves inter-state trades based mainly on agricultural commodities. About 75% of the labour force was employed in agricultural sector in the seventies, making it the largest employer of labour among other sectors (FGN, 2001). In 2005, agricultural sector, apart from oil, agriculture contributed 41.7% of the total GDP and 53.4% of Non-oil GDP making it the highest among the other Non-oil sector (CBN, 2006). In term of foreign exchange generation agricultural sector is the second highest foreign exchange earner after crude oil.

A review of agro-allied structure and business in Nigeria revealed that government introduced many policies to encourage the industry to grow. The development stimulates the establishment of many fruit processing, flour milling, confectionery manufacturing and brewing, sugar, and beverage and tobacco industries (Ojo, 2007). These agro-allied industries contribute greatly to food culture and economy of Nigeria. Besides, various programmes and strategies were employed for mobilizing financial resources for development of industries in agricultural sector. Programmes such as Agricultural Guarantee Scheme, establishment of People's Bank of Nigeria, Nigerian Agricultural Cooperative and Rural Development Bank and Development banks which caters for both agricultural and non-agricultural sector were put

in place in the time past. Inspite of these programmes, it was difficult still to obtain funds to expand agro-business by private companies (Odioko et al., 2005). The Banks charge a high lending rate on the capital which still makes it difficult for some of these companies to access funds for their business. Due to this problem faced by these companies in obtaining loans from banks and other financial institutions, they had to explore the capital market to generate funds through the issuance of shares to the public. Since these companies were listed on the Nigerian Stock Exchange, have they been able to generate enough funds for expansion of their businesses.

In the recent years, it has been observed that the equity prices in the Nigerian Stock Exchange have been fluctuating. Many factors could be responsible for the instability since capital stocks react to external information. Such information could be oil price fluctuation. Oil price is an important factor in understanding fluctuation in stock prices (Jones and Kaul, 1996). There is a limited empirical work on the relationship between oil price and capital stocks in Nigeria, especially agro-allied sector. This study therefore seeks to answer the following questions: Is there any relationship between oil price and stock prices of agro-allied companies in Nigerian stock market, what are other economic variables that affect stock prices of agro-allied companies in Nigerian stock market.

METHODOLOGY

Source of data

The study made used of secondary data. The data were obtained from various issues of daily price lists of Nigerian Stock Exchange (NSE), various issues of statistical bulletins of Central Bank of Nigeria (CBN) and

Energy Information Administration (http://tonto.eia.doe.gov/dnav/pet/hist/rbteM.tm). Data variables such as crude oil price (international prices), share price, share volumes (quantities), exchange rate (U.S Dollar and Nigeria Naira), inflation rate and interest rate were collected. Seven companies in agro-allied, food and beverages sector of Nigerian Stock Exchange were selected over the period of 120 months (1997.1 - 2006.12). For a firm to be included in the sample, they must have been listed on the Nigerian Stock Exchange by 1997 and must have been consistently traded on the floor of the Exchange within the period of the study. The following quoted companies in Nigerian Stock Exchange were finally selected; Okomu Oil Palm Company Plc, Nestle Food Nigeria Plc, Cadbury Nigeria Plc, Nigeria Bottling Company Plc, Flour Mill Plc, PS Mandrill Plc and Union Dicon Salt Plc. The international crude oil is traded in U.S dollar. The price was converted to Naira using the prevalent exchange rates during the period of the study. Monthly data of share prices was obtained by finding the averages for each month. Where there are public holidays, the number of the trading days were used for calculation.

Method of analysis

Effects of oil price and other economic variables on stock price: an econometric framework

Panel data regression was used in the estimation. The term panel data refers to the pooling of observations on a cross-section such as firms, countries, etc., over several time periods (Baltagi 2005). The main advantage of panel data is that one can control for individual heterogeneity across the cross-sectional group. In panel data regression three models are possible:

a) Ordinary Least Square
b) Fixed effect and
c) Random effect models

The fixed or random effect model may be used with firm effects or time effects or with both firm and time effects. The appropriate technique depends upon the structure of error term, μ_{it}, and correlation between the components of error terms and independent variables (Baltagi, 2005). Since panel data is the combination of cross-sectional and time-series data, and it is known that cross-sectional data suffer from heteroscedasticity while time-series data suffer the problem of autocorrelation. It is therefore necessary to test for autocorrelation and heteroscedasticity in this study. Heteroscedasticity was tested by using White Heteroscedasticity test and corrected by using White cross-section standard errors and covariance. Serial correlation was examined using Durbin-Watson result from the software package and corrected by adding AR (1).

Model specification

In order to determine the effects of oil price and other economic variables on stock price, stock price was regressed on oil price, stock volume, exchange rate, inflation and interest rate.

$$SP_{it} = \alpha + \lambda_1\delta_1 + \lambda_2\delta_2 + \lambda_3\delta_3 + \lambda_4\delta_4 + \lambda_5\delta_5 + \lambda_6\delta_6 + \lambda_7\delta_7 + \theta_1 OP_{it} + \theta_2 V_{it} + \theta_3 EXC_{it} + \theta_4 INF_{it} + \theta_5 INT_{it} + \mu_{it} \quad (1)$$

Where,

$\lambda_1 - \lambda_7$ = intercept coefficients
δ_1 to δ_7 = dummy variables for firms
$\theta_1 - \theta_5$ = coefficients of independent variables μ_i is disturbance term
SP = Share price (₦)
V = Share volume
OP = Oil price (₦)
EXC = Exchange rate
INF = Inflation rate
INT = Interest rate
i = 1, 2, 3…… 7, t = 1, 2, 3…… 120.

Stock price is one of the major indicators used in measuring the stock market activities. Oil price and some economic variables had been suggested to have impact on stock price (Eryigit, 2009 and Jones and Kaul, 1996).

The first step in analyzing these data was to determine whether pooled regression is appropriate or random and fixed effects. We used the estimates of component variance of random effect result to decide. The following hypothesis was set up:

H_0: Pooled regression is appropriate
H_1: Pooled regression is not appropriate

Since ρ-value is significantly different from zero i.e. $\rho < 0.010$, the null hypothesis was rejected. We therefore concluded that random or fixed effect was appropriate.

The next step was to choose between random and fixed effects. The central assumption in random effect estimation is that there should be no correlation between unobserved individual effect and explanatory variables. If correlation exists between unobserved individual effect and explanatory variables, random effect will be inconsistent (Hill *et al.*, 2007 and Gujarati, 2004). To choose between random and fixed effects, the following hypothesis was set up:

H_0: There is correlation between unobserved individual effect and explanatory variables
H_1: There is no correlation between unobserved individual effect and explanatory variable.

From the result, ρ-value is 0.9179 i.e. ρ-value > 0.01, the null hypothesis is accepted and we concluded that random effect model is not appropriate. Fixed effect model is therefore used for this study.

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RESULTS AND DISCUSSIONS

The results in Table-1 shows that R-square was about 0.8993 and the adjusted R^2 was 0.8939 which implied that oil price and other economic variables accounted for about 89 percent of variation in stock prices of agro-allied industry in Nigeria. F-statistic showed that the model used in this study was relevant and significant at 1% level. The Durbin-Watson statistic of the model was 2.3189 which suggested that the analysis was free from the problem of autocorrelation.

Table-1. Estimates of the effect of oil price and other economic variables on stock price.

Explanatory variable	Coefficient	Std. Error	t-statistic
Constant	8.4832	9.3434	0.9079
OILPcad	0.0006	0.0011	0.5926
OILPfmil	0.0037	0.0009	3.9452***
OILPnstl	0.0161	0.0023	6.9705***
OILPngbt	0.0002	0.0013	0.2194
OILPpsman	0.0001	9.39E-05	1.1786
OILPokmu	0.0025	0.0005	4.5185***
OILPunon	-0.0007	0.00034	-2.2099**
VOLcad	2.91E-06	1.68E-06	1.7300*
VOLfmil	1.47E-06	1.97E-06	0.7496
VOLnstl	3.40E-07	1.11E-05	0.0306
VOLnbc	-3.47E-06	5.60E-06	-0.6196
VOLpsman	3.94E-07	8.43E-07	0.4674
VOLokmu	-1.05E-06	9.98E-07	-1.0508
VOLunon	-2.50E-08	2.87E-06	-0.0086
EXCcad	0.726527	0.1465	4.9582***
EXCfmil	-0.1186	0.0681	-1.7424*
EXnstl	1.0513	0.4334	2.4254**
EXCnbc	0.6364	0.1992	3.1949***
EXCpsman	-0.0137	0.0124	-1.1032
EXCokmu	-0.1564	0.0491	-3.1843***
EXCunon	-0.6849	0.0493	-13.8829***
INFcad	-0.0134	0.0070	-1.9094**
INFfmil	-0.0165	0.0186	-0.8880
INFnstl	-0.0435	0.0287	-1.5134
INFnbc	0.0067	0.0158	0.4254
INFpsman	-0.0003	0.0004	-0.7369
INFokmu	-0.0112	0.0109	-1.0341
INFunon	0.0083	0.0041	2.0229**
INTcad	-1.3176	0.6126	-2.1508**
INTfmil	0.0926	0.2531	0.3658
INTnstl	-2.7606	0.9779	-2.8229*
INTnbc	-1.9202	0.8085	-2.3749**
INTpsman	-0.1386	0.0717	-1.9321**
INTokmu	-0.1485	0.1319	-1.1259
INTunon	-0.7273	0.2449	-2.9691***
R^2	0.8993		
Adjusted R^2	0.8939		
F-statistic	167.9992***		
DW	2.3189		

*** ** * represent statistical significant at 1%, 5% and 10% level. Cad represents Cadbury plc, fmil represents Flourmill, nstl represents Nestle plc, nbc represents Nigerian Bottling Company, psman represents PSmandrill plc, okmu represents Okomu oil palm, unon represents Union Dicon salt.

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Effects of oil price on stock price

The effect of oil price and economic variables on the stock prices varied from firm to firm. Table-1 revealed that oil price showed a significant positive relationship with the stock prices of Flourmill, Nestle, Okomu and Union Dicon Salt, while a non-significant effect was shown on the stock prices of Cadbury, Nigerian Bottling Company and PSmandril. On a general note, oil price had a positive effect on the stock price which implies that the higher the international oil price, the more the revenue that will be generated by oil-exporting country likes Nigeria. The increase in the national revenue is expected to translate to an increase in revenue or income of the citizens and thereby have more funds to invest in shares or save. This result agrees with Eryigit (2009) who found a positive significant relationship between oil price change and stock indices of tourism, food, beverages, chemical and leather in Turkey.

Effects of share volumes on stock price

The share volumes are non-significant to the stock prices of any of the firms except Cadbury Plc. In term of relationship, the share volume showed a positive relationship with the stock prices of Cadbury, Flour mill, Nestle and PS mandrill. This implies that the more the stocks of these firms are patronized, the higher their prices move. It also indicates that most of the shareholders of these companies sell their shares as soon as price increases and make instant profit rather than waiting for the dividends. A negative non-significant relationship existed between the volumes and prices of the stocks of Nigerian Bottling Company, Okomu, and Union Dicon salt. This agrees with the law of demand which states that the quantity demanded of a commodity is inversely proportional to its price. This indicates that the shareholders of these firms hold their shares for dividends. Only the volume of Cadbury is positive and significant at 10% level.

Effects of exchange rate on stock price

The exchange rate is expected to have either positive or negative effect on stock prices. The result below shows a significant effect on the stock prices of all the firms except PS mandril. A positive impact of exchange rate on stock prices of Cadbury, Nestle and Nigeria bottling company implies that the profit made by these firms increased due to appreciation in local currency. When the local currency appreciates, input cost will reduce and therefore increase profit. Increase in profit may lead to increase in dividend payment to the shareholders. The stock price of flourmill, Okomu and Union Dicon Salt react negatively to exchange rate.

Effects of Inflation rate on stock price

Inflation rate is expected to show a negative significant relationship with capital stock of the firms. In line with *a priori* expectation of sign, inflation rate showed a negative effect on the stock prices of Cadbury, Flour mill, Nestle, Psman and Okomu. This implies that

increase in inflation rate will reduce the patronage to stock market which is reflected through the stock price. When inflation increase the cost of living will increase and people spend more and have no or little fund to invest, some will even withdraw their shares in order to have money to spend since their expenditure has increased. In term of magnitude, inflation rate is significant in determining the stock prices of Cadbury and Union Dicon salt at 5% level.

Effects of interest rate on stock price

The interest rate had a negative effect on the stock prices of all the firms except flourmill and okomu. This implies that as the interest rate on bank deposit increases, investors will prefer to invest in banks than to invest in the stock market. This is in line with Ologunde *et al.* (2006) who stated that as interest rate increases stock price reduces. The reason is that investors will want to invest in business with good profit and quick turnover. The intercept values of all the companies differ from one another. This may be due to the differences in their managerial styles and company policies.

CONCLUSION AND POLICY RECOMMENDATIONS

The purpose of this study was to determine the effect of oil price changes on stock of agro-allied industry of Nigerian Stock Exchange. A significant positive relationship was found between oil price and stock prices which indicates that international oil price is relevant in oil producing and exporting countries like Nigeria. If the revenue generated from the export of crude oil is well managed, citizens will have more funds to invest in stocks and industries will be able to generate more funds to expand.

Also exchange rate shows a significant positive effect on share price. Inflation rate shows a negative relationship with the stock prices. This implies that increase in inflation rate will reduce the patronage to stock market which is reflected through the stock price. It increases the cost of living and reduces the fund available for investment. Interest rate has a negative significant effect on share price of the sector. This implies that people tend to be encouraged to save in bank when the interest rate on bank deposit is high Ologunde *et al.*, 2006.

Based on the findings of this study, the following policy recommendations were suggested:

a) Federal government should ensure that the gains from oil export translate into the wealth of the citizens. This will encourage more investment in shares;

b) Since a negative relationship exists between interest rate and stock indices, the government should favourably control interest rate so as to aid the growth of capital market;

c) Federal government should make and implement a policy that will reduce inflation to bearest minimum. A very low inflation rate gives more opportunity for savings and investments;

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d) Government should put in place measures that will ensure stable exchange rate system so as to attract investors;

e) The authority of the Nigerian Capital market should make policies that will favour the incorporation of more agro based companies into stock market; and

f) Lastly, there should be more public enlightenment about the existence of stock exchange and opportunities offered, especially that of agro-allied sector, so that people can divert their excess funds into the sector.

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