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## **Environmental Factors Influencing Fluctuation of Share Prices on Nigeria Stock Exchange Market**

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### **Abstract**

*Financial markets could be money or capital markets. The commodities traded on these markets are financial instruments as equities. In Nigeria most quoted companies release their share prices on daily basis. The prices of equities fluctuate as a result of changes in the macro environment of the market from time to time. What are these environmental variables that affect the fluctuation of share prices in Nigeria? The objective of the research is the examination of macroeconomic variables that are responsible for share price fluctuation in Nigeria. Secondary data of Nigerian stock market share prices covering between 1980-2006 were used. Multiple regression was used to analyse the data. The results show inflation, money supply, total deficits index of industrial production, interest rate and GDP influence stock prices. It is recommended that in order to monitor and control stock prices in Nigeria through macroeconomic variables, emphasis should be given to money supply, GDP, and total deficits.*

### **Introduction**

The Nigerian financial system is made up of three major components, namely, the money, insurance and capital markets. Of these three, the

money and the insurance markets are quite popular and fairly well known, but very little is known about the capital market by a large proportion of the Nigerian people. As a matter of fact, trading in stocks which is an integral part of capital market operation is virtually not known a business to most Nigerians.

The capital market in Nigeria is the least known of the financial markets, yet its performance is the best measure of the heartbeat of the economy. In countries such as Britain, Japan, United States of America and Hong Kong, economic analysts pay attention to movements in the FTSE index, Nikkei, Dow Jones and Handseng respectively in order to form an opinion on the state of health of the related Economies. Even in Nigeria, the economic downturn of recent years due to liberalization and economic reconstruction has been captured by the Nigeria stock Exchange index. It therefore follows that a basic understanding of the working and operations of the capital market is important to understanding the state of an economy at any point in time.

The Capital market may be underdeveloped in which case it may be yearning for promotion and development. In some other cases, it may be developing like the case of Nigeria and in some other advanced economies, it may have been developed like in the US, Europe, Canada, Japan etc. Functionally, the Nigerian capital market helps to stimulate industrial as well as economic growth and development of the Nigeria economy.

To this end investors, government, companies and individuals make better investment decisions when they are aware of the stock market structure, stock behaviour and functions which will virtually promote the economy from undeveloped to developing and finally developed economy.

Originally, money came in as a medium of exchange in the formally organized market. However, the society later got highly developed and sophisticated that people, institutions and government needed funds to prosecute projects. There was a dire need for capital. Consequently money or funds, unconsciously, became a commodity in demand which had to be supplied by those who store it.

Therefore, the economy got polarized into the deficit and surplus sector and the invisible funds of the surplus needed to be channeled to the deficit

sector. In effect there was the need for a suitable meeting place where the surplus sector could sell and the deficit sector could buy funds simultaneously.

Consequently, the financial market evolved. The financial market could be money or capital market. The commodity traded on these markets is not cash and carry commodity but financial instruments as Equities like (ordinary shares and preference shares in case of companies, Debt-government bonds either Federal, State or local government and industrial loans, and Debentures stocks Bonds). Most of these equities form the investment of Nigerians. The equity prices fluctuate in the market from time to time. The research seeks to answer this question; what are the variables that affect fluctuation of share prices in Nigeria?

The objective of this research is to examine macroeconomic variables that are responsible for share price fluctuations in Nigeria.

### **Literature Review**

Stock market is viewed as a medium to encourage savings, help channel savings into productive investment, and improve the efficiency and productivity of investments. The emphasis on the growth of stock markets for domestic resource mobilization has also been strengthened by the need to attract foreign capital in non-debt creating forms.

Hence, the trend towards promoting stock markets in Nigeria in recent years may not be unconnected to developments in the world financial markets which have been characterized by increase securitization, financial liberalization and integration. These features have been encouraged by several factors including the rapid technological development, globalization of the stock market, Deregulation financial markets, the increasing role of the institutional pension fund and mutual fund investors.

However, despite the concern towards promoting stock market in Nigeria, it is important to examine role played by prices of stocks in encouraging investors to invest their surplus earnings in the stock market.

Kumar and Mohan (1975) identified dividends per shares and retained earnings as the major determinants of stock prices in India. They asserted that dividends per shares are relatively better explanatory variables for stock prices and that earnings play relatively a minor role. Also, Fische (1961)

examined share prices of first cross sectional samples. Equities quoted on the London stock exchange between 1940 and 1957. He examined the effects of four variables on the stock prices prevailing in the market for different companies. The variables are: The last declared dividends per shares, the last declared undistributed profit per share, the past average annual growth in dividends per share and the size of companies to which the share corresponds. The entire variable exercised significant influence on stock prices although at varying degrees.

The price performance of common stock was examined by Ibbotson (1975). The author studied the initial and after market performance measured by risk-adjusted returns, on newly issued common stocks which were offered to the public during the 1970s, the result confirm that average initial performance is positive, while the distribution of return is skewed so that the subscriber of a single random new issue offering has about an equal chance for gain or loss. The results are generally consistent with market efficiency the study also indicates that new issue offerings are under priced.

In a study of stock behaviour, King (1966), argued for the hypothesis that market and industry factors explain co-movement in stock prices. The implication of this is that stock prices of similar market or industry will tend to move at a somewhat related direction. Long (1974), employed capital market equilibrium to examine the consumer's reaction to uncertainty about shift in commodity prices and how this reaction is reflected in portfolio choices and equilibrium stock prices.

The dynamics of the real exchange rate and the price of equity for a small open economy were analyzed by Murphy (1989), who used an optimizing model in which the process of capital accumulation entails adjustment costs. The analysis demonstrated how changes in fiscal policies or interest rate generate sustained movements in equity prices supply because investment requires scarce resources. The result indicated that a stable and consistent set of fiscal policies can help reduce unnecessary volatility in real exchange rates and equity prices.

More so, the relation between distributed earnings and common stock prices for large listed corporations was examined by Harkavy (1955). He concluded that there is a tendency for stock prices to vary directly with the proportion of earnings distributed, at a given time. Over a period of years, the stocks of corporations retaining the greater proportion of earnings tend to exhibit the greater share appreciation. Udegbonam and Oaikhenan (1999) studied the

theoretical and empirical relation between stock prices and fiscal deficits in Nigeria. They used simple stock price model which in addition to fiscal deficits include better of other variables (control variables) as estimated using annual data covering the period (1979-1999). Their findings, suggest that inflation, output, growth, interest rate, industrial production, money growth and financial deregulation are driving forces that generate significant changes in stock prices in Nigeria.

Also Randall and Yeung (2001), In their own case when asked to predict activity in the stock market, they replied that “stocks in the emerging markets tends to move in the same direction while those in developed markets tend to follow divergent paths. They support their prediction with modern finance theory. That stocks of successful, well run or lucky companies rises while those of unsuccessful, misgoverned and unlucky companies fall.

However, one important conclusion that can be drawn from these studies looking both the theoretical and empirical reasoning, is that macroeconomic environment has significant influence on stock prices. By implication, policies that affect the economic environment will tend to have impact on the behaviour of stock prices. The direction will depend largely on both the nature of the environment and the pattern of influence. This underscores the need for enabling macroeconomic policies.

Following Rozeff, 1984; Fama and French 1989; Engel and Morris 1991 and Udegbunam and Eriki 2001, stock prices will vary with changes in expected stream of dividends, expected future prices of stock, and expected return/variance of return on stocks. In other words, stock prices vary with variation in fundamentals. But since corporate earnings vary with economics prosperity and output growth, factor such as productivity, labour force and capital stock, that determine economic growth, also affect corporate earnings and prices (Golob and Bishop 1996). Other factors that affect stock prices are inflation and unanticipated policy shocks and events. Thus, stock prices may deviate from their fundamental values due to bubbles created by these extraneous factors (Ohanian 1996; Diba and Grossman 1988).

### **Methodology**

The literature reviewed emphasized the relationship between stock prices and expected changes in the fundamental variables of the market. However, investors also react to factors unrelated to market fundamentals. Thus, the empirical model follows the model of Udegbunam and Oaikhenan (1999) which is given as

$$SP = a_0 + a_1 INF + a_2 GDP + a_3 M1 + a_4 DEF + a_5 IPD + a_6 INT + a_7 FDD + a_8 SP_{-1} + e \text{ ----- (i)}$$

Where

- SP = Index of stock prices
- INF = Inflation rate
- GDP = Real gross domestic product
- MI = Money aggregate narrowly defined (money supply)
- DEF = Total deficit, which is decomposed into active  
Passive Deficits (Fiscal deficit)
- IPD = Index of industrial production
- INT = Long-term rate of interest
- FDD = Financial deregulation dummy which takes the value of one  
for years of deregulation, and zero for otherwise
- SP<sub>1</sub> = One period lagged value of SP (stock price)
- E = White noise error term

As our modification, the model of the study becomes;

$$SP = \beta_0 + \beta_1 INF + \beta_2 GDP + \beta_3 M1 + \beta_4 TD + \beta_5 IIP + \beta_6 IR + U \text{ ----- (ii)}$$

Where

- TD is total deficit
- IIP is index of industrial production
- IR is interest rate
- U is error term

While other variables are as defined in equation 1 above.

We dropped the lagged value of stock price to avoid serial multicollinearity. This is to allow us to make use of ordinary least squares (OLS) techniques in estimating our model.

Based on a priori expectation, we expect negative relationship between inflation rate (INF), index of industrial production (IIP), interest rate (IR) and stock price while the remaining variables gross domestic product, (GDP), money supply ( $M_1$ ) and total deficit (TD) are expected to be positively related to stock prices. In other words, stock price increase as inflation rate, index of industrial production and interest rate decline. On the other hand, as gross domestic product, total deficit, and money supply increase the current stock prices also increase.

The empirical model is estimated using the traditional ordinary least squares (OLS) method as a modification to that of Udegbunan and Oaikhanan (1999).

In this study secondary data were used. The data used are time series data and are collected from various sources. Mainly data from various issues of Central Bank of Nigeria (CBN) statistical bulletin, Federal office of statistic annual review, world development indicators, stock market reports of various years, annual report of Nigerian stock exchange and the internet.

The research setting is the Nigerian stock market and the determinants of stock price in the market. The research covered the performance overview of the market for 1980 to 2006 (26 years) as this will allow for better analysis of the behaviour of the observed variables.

### **Analyses of Data**

The results of regression analysis are shown in table 4. 1 below.

Table 4.1 Multiple Regression Analysis between share price fluctuation and its Determinants

Variable I	Coefficient II	F-Statistics III	Probability IV
Constant	831.245	1.372	0.207
INF	-0.071	-1.977	0.083
$M_1$	0.644	5.782	0.000
IIP	-0.08	-1.152	0.283
IR	0.01	0.323	0.755
TD	0.144	3.365	0.010
GDP	0.299	2.952	0.018

Source: SPSS Output

$$R^2 = 0.994$$

F	=	209.019
D-W	=	1.598
$R^2$	=	0.989

As shown in table 4. 1 above, the variables of the model are shown in column I, the estimated coefficients are shown in column II. Column III and IV shows the F-statistics and the probabilities of significance respectively. At the lower part of the table, the R square, F-statistics, Darbin-Waston statistics, and the Adjusted R square are also shown.

The estimated equation is given as below and the t–statistics are reported in parenthesis.

$$\begin{aligned} \text{SP} &= 831.245 - 0.071 \text{ INF} + 0.644 \text{ M}_1 \\ (1.372) & \quad (-1.977) \quad (5.782) \\ -0.08 \text{ IIP} &+ 0.01 \text{ IR} + 0.144 \text{ TD} \\ (-1.152) & \quad (0.323) \quad (3.365) \\ &+ 0.299 \text{ GDP} \\ & \quad (2.952) \end{aligned}$$

It is interesting to note that the overall fitness of the model measured by  $R^2$  and Adjusted  $R^2$  is impressive. The highly impressive  $R^2$  which ranges from 0.989 to 0.994, indicate that the model is able to explain about 99 percent of the systematic variations in the stocks prices. The F-statistics which also measure the overall significance of the model indicates that the model is good fit.

It is observed from the result that three of the explanatory variable that is ( $M_1$ , TD and GDP) are statistically significant at 5 percent significant level. One of the variables (INF) could only be significant at 9 percent significant level; while the remaining two variables (IIP and IR) are not statistically significant even at 10 percent.

All the variables except interest rate came out with the right signs. In other words, all variables of the model except one (IR) are consistent with a prior expectation.

Consequently, inflation rate and index of industrial production are negatively related to stock prices while the remaining variables (interest rate, gross

domestic product, money supply and total deficit) are evidenced to be positively related to stock prices.

The result suggests that the Nigerian stock market reacts strongly to macroeconomic imbalances and other extraneous variable unrelated to the market fundamentals produced by these stocks consequently, the stock market price could over shoot the securities fundamental values.

### **The Implication of Results to Stock Market Reaction to Total Deficit**

It is establish that any increase in government borrowing to finance budget deficits, increases the aggregate demand for credit and interest rate. To finance deficit by issuing debt, government must enter the capital market to compete for the available loanable funds, and with scarcity of funds, interest rate will rise to the detriment of private investment. The evidence provided by our result appears to run counter to the almost universal fear that debt-financed budget deficits crowds out private investment and, therefore, depresses stock prices through its negative impact on output growth.

The negative relationship between stock prices and inflation is in accordance with a priori expectation. The explanation for the inverse relationship between stock prices and inflation is that inflation adversely affects firm's profitability and, therefore, the value of stocks. The implication of this is that during periods of high and persistent inflation, investors will be less willing to invest in stocks except at much lower prices that reflect the anticipated risks associated with the inflation.

As expected, the coefficient of the level of economic activity proxied by GDP is positive. The observed positive relationship between stock prices and the level of economic activity suggests that with increasing level of economic activity, investors anticipate increase in firm profitability and future returns to investment. Thus, any pattern of output behaviour overtime will be reflected in the behaviour of stock prices because output growth is one of the fundamental factors that drive stock prices.

In accordance with our expectation, the estimated coefficient of money supply (M1) is positive and significant. it implies that money supply causes stock prices to rise in Nigeria. That is, securities prices are higher during expansive monetary periods than during restrictive periods. This evidence conforms with theoretical expectation, which says that expansive monetary

policy, through its effects on interest rates (lowering of interest rates) and output growth, increase stock prices.

Although the estimated negative coefficient of the index of the industrial production variable (IIP) is consistent with the priori expectation, it does not pass the statistical significance test. In other words, the estimated coefficient of IIP is not significant though it came out the with right sign. It is expected that increase in industrial production will be associated with increase in supply of securities. Such increase in supply is expected to cause prices of stock to fall, at least in the short run. The insignificance of the estimate may not be unconnected with large control of interest rates experienced in Nigeria. The implication is that increases, even in the face of increasing deficits, would not have any significant effect on stock prices.

Surprisingly, the positive coefficient of interest rate does not conform with the universal view that stock prices are inversely related to interest rates. Our result on interest rate does not only fail to conform to a prior expectation but is also highly insignificant. This result may not be unconnected to the fact that interest rate in Nigeria are closely controlled.

It will be of interest to us to compare our findings with the results of past studies. The general behaviour of the model, that is, stock prices responding to macroeconomic variables conforms to the arguments by economists that market psychology and extraneous factors have significant influence on stock market see (Leroy and Porter 1981, Shiller 1981, Sill 1993, Ohanian 1996).

The negative relationship between stock prices and inflation as evident in our result is consistent with earlier empirical findings, in various studies using different empirical methodologies (see Nelson 1976, Pearce and Rolog 1988) Defina 1991, Kaul and Seyhun 1990, Udegbumam and Eriki 2001). The positive relationship we found in our result between GDP and stock prices is consistent with the published results of several researchers including Fama and French 1989, Fama 1990, Cochrane 1994; Jensen and Johnson 1995; and Jesen et al 1996, found a positive relationship between money supply MI and stock prices as in our own findings. On the other hand, Rozeff 1984; Campbell and Shiller 1988, and Kaul 1987 had found contrary results that MI is inversely related to stock prices.

### **Summary and Conclusion**

The research shows a list of macroeconomic variables that influence stock prices. The variables include, inflation, money supply, total deficit, index of industrial production, interest rate, and GDP.

The paper adopted the model of Udegbumam and Oikhenam (1999) with little modification as an empirical model for the study. Thus, the paper examined the impact of six macroeconomic variables on stock prices. A macroeconomic model is use and ordinary least square (OLS) techniques is used in estimating the model. The estimation is done with SPSS computer software.

The findings were consistent with the theoretical expectation except one of the variables that came out wrong sign Although, three of the variables are statistically significant at 5 percent significant level while one of the remaining three is significant only at 10 percent and the rest are not significant, the study made the following inferences; the results shows that, inflation rate and index of industrial production are negatively related to stock prices, while money supply, interest rate, total deficit and gross domestic product are positively related to stock prices. In other words, increase in inflation rate and index of industrial production will lead to decrease in stock prices. On the other hand increase in money supply, interest rate, total deficit and gross domestic product will lead to increase in stock prices. The performance of the macro-model equally, indicated that the stock prices do response to macroeconomic variables outside the market variables.

From the empirical evidence, the following inferences are made: It is evident that macroeconomic variables outside the fundamental market variables have significant impact on stock prices.

Stock prices move in the same direction with GDP, money supply, total deficits and interest rate while it move in opposite direction with inflation rate and index of industrial production.

The evidence from the study suggested that stock prices respond to macroeconomic variables. Therefore, it is important to monitor variables outside the market variables, in order to be able to adequately track the fluctuation in stock prices.

Given the significant strong relationship between stock prices and GDP as evidenced in the study, stock prices could serve as an important indices to measure the performance of the economy. In other words, a rising stock prices implying improvement in the general economic performance. On the other hand, falling stock prices would mean a recession in the economy. Hence, falling stock prices is an “economic bad” while rising stock prices is an “economic good”.

The result suggested that inflation rate, index of industrial production and interest rate have little influence on stock prices while money supply, total deficit and gross domestic product have more influence on stock prices. It is therefore recommended that in order to monitor and control stock prices in Nigeria via the macroeconomic variables, emphasis should be given to money supply, GDP and total deficit.

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