



Effect of Selected Macroeconomic Variables on Share Price Performance in the Nigerian Banking Industry.

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Abstract

This study was conducted to examine the effect of selected macroeconomic variables on share price performance in the Nigerian Banking industry. The selected macroeconomic variables which represents the independent variable were exchange rate, inflation rate, and interest rate while the actual closing share prices on the Nigerian Exchange Limited (NGX) in the banking sector was used as dependent variable. Information from the annual time series covering the period between 2007 and 2021 was used for data analysis. The analysis started with examining the characteristics of each time series by testing their normality and correlation. Hypotheses were tested and results and findings from the study using Panel Least Squares Regression method of data analysis with *e-views 10* shows that inflation rate has a strong significant effect on share price performance in DMBs in Nigeria during the period studied. While, interest rate and exchange rate showed a weak & insignificant result on share price performance. This implies that these two variables cannot be used to explain variations in share price performance in the banking sector of Nigeria. Based on these findings, the study recommended that there is need to promote domestic production and diversification of the economy, to control inflation, while further studies may focus on finding out more relevant macroeconomic variables that affect share price movement of Nigerian banks.

Keywords: Exchange Rate, Inflation Rate, Interest Rate, Share Price, Performance.

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I. Introduction

Share price performance is a significant part of every stock market, and is an indication of the extent to which the market is active. Shares whose prices remain static over a period are regarded as dormant stocks and this reflects the perception held towards the issuer of the shares by the participating public. Share prices can move either downwards or upwards depending on the forces driving the shift at any point in time. With an active market, investors can either gain or lose substantial proportions of their investment within a couple of minutes due to sudden price movements. A number of factors ranging from market sentiments to macroeconomic variables determines these movements in share prices. These factors transmit into the share prices through the mechanism of price discovery that is based on the economic theory of demand and supply.

Macroeconomic variables are the indices and figures generated from the day-to-day business transactions at the micro business levels. These variables are collated, summarized and stored by the relevant authorities. The variables are veritable pictures of the volume and characteristic of the business transactions in the system and how they emanate. Macroeconomic variables comprise interest rate, exchange rates, inflation rates, money supply and gross domestic product.

This study was based on the apriori expectation that macroeconomic variables affect the share price movement in the Nigerian banking sector. The variables of interest in this work are exchange rate, interest rate and inflation rate.

Exchange rate is the value (worth) of one currency in terms of a unit of another currency. It is the purchasing power of a nation's currency when compared with the currency of another nation. Interest rates are the direct costs of borrowing money, otherwise known as the cost of capital and they affect the solvency of individuals. An increase in interest rates means higher loan installments amounts to be paid by borrowers.

Generally, interest rates become higher during a period of high inflation, high demand for business/consumable loans, strict monetary policy, or due to higher reserve requirements for deposit money banks. Inflation is an indicator of price stability and it affects the solvency of individuals and the corporate entities. High inflation rates affects the real value of money thereby diminishing the purchasing power. In periods of rising prices, people find it difficult to meet their daily consumption needs as a result of the decline in the purchasing power of money in their hands.

The effect of macroeconomic variables on share price performance and stock market behavior have drawn substantial research attention in the past. Fama (1965), Chen, Roll and Ross (1986), Binswanga (2000), and Acikalin, Aktas and Unal (2008) were among the early works. Musa and Ibrahim (2014), Asekome and Agbonkhese (2015), and Lawal, Somoye, Babajide and Nwanji (2018) all concluded that the stock market volatility is sensitive to changes in the selected macroeconomic variables. On the contrary, Inyiama and Nwoha (2014), Okoro (2017) including Udoka, Nya and Bassey (2018) discovered that macroeconomic variables cannot be used to determine share price movement. The divergence in research findings call for further examination on this subject as recommended by Okoro (2017).

The objective of this study therefore is to examine whether interest rate, inflation rate and exchange rate affects share price performance in banks as listed on the Nigerian Exchange Limited between 2007 and 2021. The paper has been arranged in order of sequence starting from introduction, literature review, methodology, data analysis and results while section five discusses the conclusion and recommendations.

II. Literature Review

2.1. Conceptual Review

Share Price: Share price is simply the value or worth of a unit of shares of an entity on a particular date. Determination of Share price for listed entities is simply obtained from the Daily Official List of the relevant Exchange where the Company is listed. Share price refers to the present value of shares rather than the nominal book value at which the shares are registered at the Corporate Affairs Commission. Therefore, the concept being explained here is that of the Current Market Price of shares. According to Udenwa and Uwaleke (2015), the current market price is the price at which the last deal was done at the Stock Exchange on a particular trading day, while the public quotation price is the nominal value per share into which the company have divided its total shares and is useful mainly for accounting balance sheet purposes. Udoka, Nya and Bassey (2018) examined the influence of gross domestic product, exchange rate, interest rate and inflation rate on average stock price.

The work by Chen, Roll and Ross (1986) conceptualized on impact of macroeconomic indices on the stock market behavior by testing the effect of movement in selected variables on expected dividends, discount rates and stock prices. Similarly, Fama (1981) confirmed that a long run association exist between macroeconomic variables and stock market in United States of America. This work follows the same pattern with the expectation that interest rate, inflation rate and gross domestic product can have significant effects on movement in the general price of equities shares with particular reference on the Nigerian banking sector.

Interest Rate: Interest rates are the direct costs of borrowing money, otherwise known as the cost of capital. Put in a simple way, interest rate is an amount charged or paid for the use of money and is always expressed in annual percentage terms. It is calculated by dividing the amount of interest by the amount of principal. Lawal et al (2018) argued that one of the transmission mechanisms of the government's monetary policy to the capital market is through the 'interest rate channel'. This means that increase in interest rate will lead to increase in a Company's cost of capital thereby altering its present value of future cash flows and transmit into lower stock prices. They added that upward shifts in interest rate limits the level of a Company's investment, which in turn reduces the present value of its future cash flows, reduce its wealth and capital formation, thereby transmitting to a fall in its share price.

Inflation Rate: Inflation is an indicator of price stability. Inflation rate affects the purchasing power of individuals, families, companies and economies. In periods of high prices of goods and services, people find it difficult to meet their daily consumption needs as a result of the decline in the purchasing power of money in their hands. Olofin (2001) stated that inflation means a persistent rise in the general level of prices of goods and services. Chen et al. (1986) argued that the relevant macroeconomic variables that affect transactions in the stock market are aggregate production, inflation, short-term interest rates, the maturity risk premium and default risk premium. Two basic causes of inflation exist in economic literature viz: Demand-Pull inflation and Cost-Push Inflation. Chen et al (1986) listed inflation among the determinants of stock market transaction levels.

Exchange Rate is known as the worth of one currency in terms of a unit of another currency. It can also be explained to mean the real purchasing power of one country's currency when compared with the currency of another nation. Adegbite (2007) defined exchange rates as a means of effecting trade and capital flows across international borders.

2.2 Theoretical Review

The Arbitrage Pricing Theory (APT)

This study adopted the Arbitrage Pricing Theory (APT) that has been proved empirically over the years as an effective way of linking macroeconomic variables and stock market behavior. Under the APT, multiple risk factors can be used to describe the features of stock values (Ross, 1976). The emergence of APT in finance literature was necessitated as a result of the fact that the Capital Asset Pricing Model (CAPM) which preceded it assumes the existence of only one risk factor which is not realistic.

Nkechukwu, Onyeagba and Oko (2015) used APT model and explained that the model is premised on a multi-factor assumption where investors are likely to leverage on arbitrage opportunities in the stock market. Therefore, the return on an asset is measured as the opportunity cost of return on other assets while giving due consideration to several other risk elements. The justification of using the APT can be found in the conceptual framework of this study where several risk factors of the APT are indexed by the five macroeconomic variables (exchange rate, interest rate, inflation rate, crude oil price and foreign portfolio investment) which are theorized to impact the stock market movement in Nigeria. Many studies have been based on the APT, including those of Kuwornu and Owusu-Nantwi (2011), Adu (2012), Carino et al (2013), Tripathy and Kumar (2015), Islam and Habib (2016), Worlu and Omodero (2017), Kolapo et al (2018), Ditimi et al (2018), Adesanmi (2018), John (2019), and Olaolu and Nwankpa (2021)..

2.3 Empirical Review

Hasanzadeh and Kianvand (2012) examined the effects of some macroeconomic variables on the stock market index in Iran. The study used secondary data from 1996 – 2008, co-integration and vector error correction method analyses. Tehran Stock Exchange Index was regressed on five variables which are gross domestic product, nominal effective exchange rate, money supply, gold coin price and investment in housing sector. The result showed that the five variables are co-integrated while stock prices showed significantly negative relationship with nominal effective exchange rate. This was interpreted to imply that depreciation of domestic currency has a positive effect on export –oriented firms because it leads to increase returns to the firm's stock prices. Money supply showed a significantly positive relationship with Tehran Stock Exchange.

Inyama and Nwoha (2014) examined the relationship between macroeconomic variables and the movement of share prices in Nigeria brewery industry, with emphasis on Nigeria Breweries Plc. Between 2000-2012, Nigerian Breweries Plc share price was the dependent variable while the explanatory variables are exchange rate, interest rate and inflation rate. The ordinary least squares result indicated an insignificant relationship for all the variables. The test was not robust enough because based on the R-Squared, only 13% of the variations in share price could be explained by the independent variables. The paper recommends that macroeconomic variables should be seriously considered in setting monetary and fiscal policies because of its multiplier effect on the economy.

Asekome and Agbonkhese (2015) conducted a study aimed at examining the variables that contributed to the Nigerian stock market bubble, its consequent melt-down and gradual recovery during the period between 2007 – 2013. The work relied on Ordinary Least Square ((OLS) regression technique adopting five different variables: gross domestic product, broad money supply, exchange rate, capacity utilization and inflation as proxy for the independent variables; while the dependent variable is represented by All Share Index as proxy. Based on the results, only gross domestic product and broad money supply were significant, hence exchange rate, capacity utilization and inflation rate were insignificant. The paper observed that some government policies contributed to the gradual recovery witnessed in the stock market after the melt-down.

Okoro (2017) conducted an ex-post facto work in investigating the effect of selected macroeconomic proxies on Nigeria all-share index using the ordinary least squares and spanning the years 1986-2015. Non of the variables (gross domestic product, money supply, interest rate, inflation rate and exchange rate) proved to exert any effect on the dependent variable as they all returned as insignificant coefficients.

In India, Kedia and Vashisht (2017) studied to check the relationship between the Bombay Stock Exchange Index as the regressand while inflation rate, interest rate and exchange rate were used as the regressors between 2005 – 2014. The analysis was conducted through multiple ordinary least squares regression estimation. There was no proof of a strong relationship between the dependent and independent variables that was interpreted to mean that changes in interest rate, inflation rate and exchange rate does not affect movement in Bombay Stock Exchange Index.

Mbah, Okoli and Amassoma (2017) investigated the impact of macroeconomic variables on stock price movements in Nigeria using VAR model and granger causality tests to analyse the long run and short run dynamics of stock price movement and the macroeconomic variables with time series data spanning from 1981 – 2014. The study tested the hypothesis that: Macroeconomic variables (exchange rate, interest rate, inflation rate, industrial production index, broad money supply and gross domestic product) does not granger cause all share index. The Johansen cointegration shows revealed a long run equilibrium relationship between all share index and the explanatory variables. The Granger causality test revealed a uni-directional causality running from

exchange rate, industrial production index, real gross domestic product to all share index and from all share index to broad money supply respectively, but there is no causality running from interest rate and inflation rate to all share index. The study timeframe stopped at 2014 but the current paper will be extended to the year 2019 that will be more relevant for policies to date.

John (2018) modelled the effect of money supply, interest rate, exchange rate and inflation rate on Nigerian stock market capitalization using annual time series data from 1981 to 2016. The ex-post facto research design was conducted by Augmented Dickey-Fuller (ADF) and Ordinary Least Squares (OLS) tests and found that money supply has a significant positive effect; interest rate has a significant negative effect; whereas, exchange rate and inflation rate have no statistically significant effect on stock market performance in Nigeria. The study suggested that further researches should capture other factors, which may be determining factor in this linkage.

Udoka, Nya and Bassey (2018) examined the influence of gross domestic product, exchange rate, interest rate and inflation rate on average stock price using the augmented dickey fuller unit root test and autoregressive distributed lag models in testing secondary data covering between 1986 – 2014. The study model revealed no long run relationship between the explanatory and explained variables, and therefore suggested policies that will promote capital market investment in the country.

Omodero and Mlanga (2019) investigated the macroeconomic determinants of Nigeria stock market performance using annual time series data in an ex-post facto study covering a period from 2009 to 2018. The results from the Ordinary Least Squares (OLS) regression analysis indicated that exchange rate and interest rate do not have significant effect on all share price index. On the other hand, inflation (negative) and gross domestic product (positive) were found to be the determining factors in this circumstance.

Akinmulegun (2018) measured the impact of capital market development(indexed by market capitalization, all share index, gross domestic product, exchange rate and interest rate) on foreign portfolio investment(FPI) in Nigeria between and including the years 1985 and 2016. The study methodology was ex-post-facto while the estimation method was the Vector Error Correction Mechanism (VECM) and Granger Causality tests. Though the Granger causality test revealed the absence of causality between the variables, the study concluded that capital market significantly determines FPI inflow in Nigeria because the VECM produced significant coefficients for market capitalization and all share index.

Kolapo, Oke and Olaniyan (2018) unraveled the impact of six macroeconomic fundamentals on all share index in Nigeria between 1986 – 2015. The macroeconomic fundamentals used as explanatory proxies were gross domestic product, money supply, interest rate, inflation rate and exchange rate. The study hypothesized that there is no significant relationship between macroeconomic fundamentals and stock market performance in Nigeria. Autoregressive distributed lag model was used to test secondary time series data under the ex-post fact research design. Only gross domestic product and money supply were found to significantly affect stock market performance, but the cointegration analysis showed presence of a long run association between the explanatory variables and all share index. It was recommended that government should make policies aimed at reducing poverty and unemployment rates while promoting capital formulation.

Assagaf, Murwaningsari, Gunawan and Mayangsari (2019) tested the effect of macroeconomic variables on the Indonesian stock market returns over the period November 2016 – June 2018. The study regressed inflation rates, interest rates, money supply, and foreign exchange rates on the Indonesian composite stock price index being the proxy for the stock market returns through the method of ordinary least squares(OLS). All the explanatory indices returned significant coefficients and this made the authors to recommend that similar research should be done with an extended period of time of up to 5 to 10 years timeframe to make the test more robust.

Mahmah and Kandil (2019) explored the impact of oil price variations on fiscal consolidation in the United Arab Emirates (UAE) between 1980 – 2015 adopting Ordinary Least Squares technique. The dependent variables comprised bank's liquidity, domestic credit, foreign direct investment and non-oil GDP growth. The work proved that oil price movements significantly affects bank's liquidity, domestic credit and foreign direct investment. However, its effect on non-oil GDP growth was insignificant.

Agu, Ogu and Ezeanyejì (2019) modelled an Ordinary Least Squares (OLS) and Autoregressive Distributed Lag (ARDL) to measure the implications of movement in Foreign Portfolio Investment (FPI), exchange rate and interest rates on Stock Market Returns (proxied by market capitalization) in Nigeria between 1986 and 2017. Based on the test output, exchange rate and FPI were significantly positive while the coefficient of interest rate was insignificant and negative.

In concluding the empirical review, all the works reviewed are different in terms of their methodology, nature of data, location, timeframe and findings. Inyiyama and Nwoha (2015) studied the effect of macroeconomic variables on share price movement in the Nigerian brewery industry. Udoka, Nya and Bassey (2018) used average share price as dependent variable for a study on the effect of macroeconomic variables on share price performance of the entire listed stocks. Agu, Ogu and Ezeanyejì (2019) modeled an Autoregressive

Distributed Lag (ARDL) to measure the implications of movement in selected variables on Stock Market Returns (proxied by market capitalization) in Nigeria between 1986 and 2017.

This study is peculiar because it focused on the banking sector and relied on quarterly data for a period of 15 years. It used actual share prices of Nigerian Banks and macroeconomic variable figures on the 17th day of February, May, August and November in each year. Panel regression analysis method was employed and the work is very current as it captured data up to the first quarter of the year 2021.

III. Methodology

This study adopted *ex-post facto* research design which fits well to address the study objective, The population comprised all the eleven deposit money banks listed on the floor of Nigerian Exchange Limited & selected for this study. Sampling was not needed because the required data was extracted with ease on aggregate basis from the reliable database, covering the 15 years period from 2006 – 2020. The sources of data were the Central Bank of Nigeria (CBN) 2020 Statistical Bulletin which was obtained from CBN website, and information sourced from the Nigerian Exchange (NGX) database and Factbooks.

The data was subjected to tests for normality, descriptive statistics and correlation. After the preliminary tests followed the Panel regression test to determine the relationships between the variables. E-views 10 software was used to run the analysis.

The model used for this study is stated as follows:

$$CSP = F (INT, INF, EXR) \dots\dots\dots(i)$$

The model is stated econometrically as:

$$CSP_t = \beta_0 + \beta_1INT_t + \beta_2INF_t + \beta_3EXR_t + \varepsilon_t \dots\dots\dots(ii)$$

Where:

CSP_t = Closing Share Price of Nigerian Banks listed on the Nigerian Exchange at time t

INT_t = Interest Rate at time t

INF_t = Inflation Rate at time t

EXR_t = Exchange Rate of Naira to the United States Dollar at time t

ε = error term

β₀ = Intercept of the regression line

β₁-β₃= Coefficient of the independent variables

Table 1: Variable Measurement

Variable	Notation	Nature of Data	Measurement
Share Price	SP	Dependent Variable	The Closing Share Price of Banks that are traded on the floor of the Nigerian Exchange on the 17 th february/May/August/November each year.
Interest Rate	INT	Independent Variable	Cost of borrowing money proxied by the weighted average lending(Prime) rate of deposit money banks in February/May/August/November each year.
Inflation Rate	INF	Independent Variable	Consumer Price Index Inflation represented by the 12-month average inflation rate as at the months February/May/August/November in each year.
Exchange Rate	EXR	Independent Variable	Exchange rate of Nigerian Naira to the United States Dollars on the 17 th of February/May/August/November of each year.

Source: Field Survey, October 2021.

4.1. Data Analysis and Results

Table 2: Panel Least Squares Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	33.94168	9.751272	3.480743	0.0005
EXCHANGE_RATE	-0.005139	0.014153	-0.363126	0.7166
INFLATION_RATE	-1.935276	0.358623	-5.396402	0.0000
INTEREST_RATE	0.066321	0.581120	0.114126	0.9092
R-squared	0.318846			
Adjusted R-squared	0.303393			
Durbin-Watson Statistic	1.215158			

Source: Authors Computation from E-Views Software, 2021 (Eview-10)

The analysis shows that a one Naira increase in exchange rate leads to reduction of share prices by 0.005 kobo, an increase of 1% in inflation rate results to a decline N1.93 in share prices, while an increase of 1% in interest rate leads to an increase of 0.07 kobo in the share prices of Nigerian banks during the period under study from January 2007 to March 2021. The constant term in the regression equation returned a value of 33.94. With this result, the line of best fit for predicting the future share prices of banks in Nigeria is stated as follows: $Share\ Price = 33.94 - 0.01EXR - 1.94INF + 0.07INT$. The analysis shows that the R-squared measured as the coefficient of determination is 0.3188 which implies that 31.88% of the total variations in Nigeria banks share price is represented by the explanatory variables which are EXR, INF, and INT, while the remaining 68.12% accounts for the changes in the dependent variables, which were not included in the equation.

Hypotheses Testing :

The study tested the following hypotheses:

Hypothesis One (H₀₁): Interest rate has no significant effect on Share Price Performance in Nigerian Banks.

The empirical result shows a weak and insignificant effect of interest rate on share price performance in Nigerian Banks. The result in table 2 above clearly showed that the p-value of 0.9092 fell outside the acceptable region of 5% level of significance. Hence the null hypothesis of was accepted. The interpretation of this result is that whatever effect interest rate exerts on Nigerian Banks share price is inconsequential and does not really matter. Focus should therefore be on other important variables instead of interest rate. This finding is in agreement with the works of Okoro (2017) and of Akwe, Garba and Dang (2018) where interest rate was found to be insignificant in affecting share prices in Nigeria.

Hypothesis Two (H₀₂): Inflation rate has no significant effect on share price performance in Nigerian Banks

The empirical result shows that there is strong significant effect of inflation rate on share price performance in Nigeria. Considering the result output in table 2 above, the p-value of 0.0000 is comfortably sitting within the region of acceptable error of 5% level of significance and this underscores the level of importance of inflation rate on banking sector shares performance in Nigeria. Hence, the study rejected the null hypothesis and accepts the alternate hypothesis which states that “inflation rate has significant effect on share price performance in Nigerian Banks”. This implies that share price of banks in Nigeria decreases with increase in inflation rate. The explanation for this is that a rise in inflation rate raises the living cost and shifts productive resources from investments to consumption. This gives rise to a reduction in demand for financial instruments (particularly, ordinary shares), which in turn brings about decrease in the share prices due to the interplay of demand-supply forces. The result is in agreement with theoretical prediction and empirical findings of Akwe *et al* (2018), and Udoka *et al* (2018).

Hypothesis Three (H₀₃): Exchange rate has no significant effect on share price performance in Nigerian Banks

The empirical result also shows a weak & insignificant effect of exchange rate on share price performance in Nigeria Banks. The result output in table 1 above indicates that the p-value of 0.7166 is outside the acceptable 5% level of significance. Hence, this study accepts the null hypothesis and this implies that the effect of exchange rate on Nigerian Banks share price is not important in this study. Focus should therefore be on other important variables instead of exchange rate. This result contradicts the work of Hasanzadeh and Kianvand (2012) in which stock prices showed significant nominal effect on exchange rate in Tehran. It however aligns with the result of Okoro (2017).

5.1. Conclusion and Recommendations

Many studies have been conducted to explore the effect of selected macroeconomic variables on the stock market especially on share price performance. However, few of the studies have focused on specific sectors as most studies examined the entire stock market. The results of these studies vary greatly regarding the effect of changes in selected macroeconomic variables on share price behaviour. For this study, the findings showed that inflation rate have significant effect on the share price performance in Nigerian Banks while exchange rate and interest rate returned a weak & insignificant coefficient. The panel regression showed that 31.88% of the total variations in Nigeria banking sector share prices are represented by the explanatory variables which are INT, INF and EXR while the remaining 68.12% accounts for the changes in the dependent variable which were not included in the equation.

Based on the findings above, the study recommends that investment advisers and investors in the Nigeria stock market should consider the systematic risks revealed by inflation when structuring portfolios and diversification strategies. In addition, those regulatory authorities should focus more on encouraging domestic production of goods and services and diversification of the economy. This has the capacity to reduce inflation rate, stimulate growth and economic activities, particularly in the capital market. While future empirical

investigations by other researchers should consider models aimed at finding out other macroeconomic variables apart from inflation rate that impact significantly on share price movement in the banking sector in Nigeria.

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