AMERICAN JOURNAL OF ECONOMICS AND BUSINESS MANAGEMENT

ISSN: 2576-5973
Vol. 7, No.2, February 2024

Stock Market Performance and Selected Macro Economic Variables in Nigeria

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Abstract: This paper examined the relationship between aggregate stock market performance as proxied by market capitalisation and some selected macroeconomic variables in Nigeria between the periods of 1981 to 2022. The extent and nature of these relationships are examined to aid policymakers and investment decisions. The study employed ex-post-facto research design. The time series data used covered the period 1981-2022. The data were obtained from the Annual Statistical Bulletin of the Central Bank of Nigeria. The population for this study consists of the national economic data that is pertinent to this research. The sample size is the 42years annual statistical report determined using purposive sampling technique. The model for this study is built on the assumptions of the APT model which is a multiple regression model. The APT model is built as a multi factor model hence the Multiple Linear Regression Estimation was used. Unit Root Test, Cointegration Test which shows long run relationships among selected variables which shows that only GDP has a uni-directional relationship with Market Capitalisation. Of all the selected variables, only GDP shows a positive and significant relationship with market capitalisation. Recommendations made was in favour of expansion of the country's GDP in order to further improve stock market performance as proxied by Market Capitalisation.

Keywords: Stock Market Performance, Market Capitalisation, Macroeconomic Variables, GDP.

1. INTRODUCTION

The Nigerian stock market serves as a crucial indicator of economic health and vitality, reflecting the collective performance of listed companies and investor sentiment. Hence, the relationship between stock market performance and selected macroeconomic variables in Nigeria is of paramount importance in understanding the dynamics of the country's financial landscape. Selected macroeconomic variables such as GDP growth, inflation rates, exchange rates, interest rates, and government policies play significant roles in influencing stock market movements and investor behavior. Understanding the interplay between these macroeconomic factors and stock market performance is essential for policymakers, investors, and analysts in making informed decisions and crafting effective strategies to promote sustainable economic growth and stability in Nigeria.

The nexus between stock market performance and macroeconomic variables in Nigeria is crucial for comprehending the nation's financial landscape. Ligocká (2024), emphasized the stock market's role in financial intermediation, mobilization of savings, and allocation of capital, which are pivotal for economic growth and efficiency. Scholars such as Bhama (2022) and Harcourt (2017), underscored the importance of the efficient market hypothesis in understanding how macroeconomic variables interact with stock prices, guiding policymakers in formulating effective strategies. Nnamdi et al. (2015) highlighted the increasing attention on the capital market's role in providing long-term funds, while Anjaly and Deo (2022), asserted the stock market's recognition as a leading indicator of economic activity. Nasradeen (2022), further supported the notion that stock market operations serve as reliable indicators of both current and future economic growth levels. Understanding this relationship is essential for policymakers, investors, and analysts to foster sustainable economic growth and stability in Nigeria.

The performance of the stock market can be assessed based on two key factors: market capitalization, which quantifies the overall size of the stock market, and stock market liquidity, which gauges the level of ease with which investors can trade securities. Additional examples are the All Share Index and the Turnover Ratio. Macroeconomic variables serve as indicators of the comprehensive condition of a nation's economy. The mentioned indicators encompass the Consumer Price Index, Inflation Rate, and Gross Domestic Product. They might be characterised as indicators or prominent markers that indicate the present developments in the economy.

1.2 Statement of Problem

The significance of the stock market in facilitating efficient capital formation and allocation underscores its pivotal role in driving overall economic development, as highlighted by Bhama (2022). Studies by Ligocká (2024); and Nasradeen (2022), indicated a consistent but nuanced relationship between macroeconomic indicators and stock market performance, with implications varying based on the economic context and level of development. Harcourt (2017) emphasizes the vulnerability of emerging market stock exchanges, including Nigeria's, to instability and shallowness, suggesting a pronounced sensitivity to macroeconomic shifts. This underscores the necessity, as proposed in this study, to assess the long-term interplay between market capitalization and selected macroeconomic variables, recognizing the country-specific nature of these relationships, as noted by Mohd-Idris (2023). Such insights are crucial for policymakers and investors alike, aiding in the formulation of conducive investment environments and informed decision-making processes.

1.3 Aim and Objectives of the Study

The role stock markets play in an economy cannot be overemphasized. The main aim of the study is to analyse and explore the nature of the relationship between selected macroeconomic variables and the performance of the stock market between 1980 and 2016.

The specific objectives of this study are

1. To determine the nature of the relationship between nominal GDP and market capitalisation.
2. To assess the nature of the relationship between exchange rate and market capitalisation.
3. To examine the extent to which the inflation rate influences market capitalisation.
4. To evaluate the nature of the relationship between interest rate and market capitalisation.
5. To examine the nature of the causal relationship that prevails between the selected macroeconomic variables and market capitalisation in Nigeria.

1.4 Hypotheses

Deriving from the above specific objectives and research questions, the following under-listed hypotheses are drawn, stated in their null form;

H_{01}: There is no significant relationship between nominal GDP and market capitalisation.

H_{02}: There is no significant relationship between exchange rates and market capitalisation.

H_{03}: Inflation rate does not constitute a significant explanatory variable of market capitalisation.

$H_{O4:}$ Market capitalisation in Nigeria is not a significant function of interest rates.

$H_{05:}$ Significant causal relationships do not prevail between the selected macroeconomic variables and Market capitalisation in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual review

2.1.1 Stock Market Performance and Macro Economic Variables

In Nigeria, macroeconomic variables refer to a set of important indicators that collectively indicate the overall economic well-being and performance of the country (Okpolosa et al., 2022). The factors commonly encompass gross domestic product (GDP), inflation rate, unemployment rate, exchange rate, interest rates, government fiscal policies, and foreign trade balances (Elhussein & Warag, 2020). Gross domestic product (GDP) functions as a metric for quantifying the overall economic production of a nation, whereas the inflation rate signifies the broad extent of price escalation in the economy throughout a defined timeframe, which influences the ability to buy goods and services and affects consumer patterns. The unemployment rate is a measure of the percentage of people in the labour force who are now unemployed. It provides insight into the effectiveness of labour markets and raises concerns about social welfare (Jayasundara et al., 2019). Exchange rates reflect the worth of a country's currency compared to other currencies from different countries, which in turn affects the ability to compete in international trade and the movement of financial resources. Monetary authorities' determination of interest rates impacts the expenses of borrowing, choices regarding investment, and the potential for inflationary effects. The fiscal policies implemented by the government, such as taxation, expenditure, and budget deficits, have an impact on both the total economic activity and the level of trust in the market. The external trade balances provide a measure of the magnitude of imbalances in international commerce and the level of reliance on foreign markets (Elhussein & Warag, 2020). Comprehending and tracking these macroeconomic indicators are crucial for policymakers, entrepreneurs, and investors to develop efficient economic plans, evaluate risks, and make well-informed choices to foster sustainable economic expansion and stability in Nigeria.

Stock market performance pertains to the general conduct and results of a stock exchange or market, commonly assessed using diverse indicators such as stock prices, market indexes (e.g., S&P 500, FTSE 100), trading volumes, and market capitalization (Amaresh et al. (2020). The stock market index represents the combined performance of publicly traded companies and the overall mood of investors in the market. A robust stock market performance frequently indicates favourable investor sentiment, prospects for economic expansion, and financial soundness, whereas a feeble performance may suggest uncertainty, economic contractions, or financial fragility. The stock market's performance is influenced by various factors, such as macroeconomic conditions, government policies, business earnings, investor mood, geopolitical events, and technological breakthroughs. Examining the performance of the stock market is essential for investors, policymakers, and analysts in order to comprehend market patterns,

evaluate investment prospects, and make well-informed choices on the distribution of assets, management of risks, and formulation of economic policies.

2.2 Theoretical review

2.2.1 The Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT), introduced by Steven Ross in 1970, emerged as a multi-factor model aiming to address the limitations of the Capital Asset Pricing Model (CAPM) by considering the influence of multiple macroeconomic variables on asset returns. Ross (1976) identified factors such as inflation, GDP, investor confidence, and yield curve shifts as significant in explaining stock performance. Empirical studies, including Chen et al. (1986), reinforced the notion that economic forces impact discount rates and future cash flows, indicating a long-term equilibrium between stock prices and macroeconomic variables. Hening (2023) describes APT as a multifactor model, asserting that the expected return on an asset depends on various factors and the asset's sensitivity to these factors, supported by Moneyzine's intuitive interpretation. Harcourt (2017) suggests APT's utility in analyzing systemic risk factors affecting future returns, despite empirical evidence indicating short-run relationships between macroeconomic variables and stock prices. Additionally, the Present Value Model (PVM), supported by Harcourt (2017), emphasized the influence of macroeconomic factors on future cash flows and discount rates, thereby affecting stock prices and market performance.

2.3 Empirical review

Okoyeuzu et al. (2022) studied the relationship between the stock market and macroeconomic variables in Nigeria. They found a significant negative short-run relationship between the stock market and the minimum rediscounting rate (MRR), suggesting that a decrease in MRR improves market performance. Long-term exchange rate stability also improved market performance. The study suggests that achieving low inflation and maintaining low monetary policy rates could be effective in improving Nigeria's stock market performance. The study suggests that stable exchange rates and low monetary policy rates could be effective in achieving these outcomes.

In their study, Rasheed et al. (2020), examined the relationship between interest rate and stock market capitalisation rate using Regression Analysis. They discovered that the prevailing interest rate has a positive influence on the stock market capitalisation rate. They also indicate that government development stock rate has a negative effect on the stock market capitalisation rate. Also prevailing interest rate has a negative influence on government development stock rate".

Elhussein and Warag (2020) study examines "the relationship between the Khartoum Stock Exchange all-share price index (KSI) and various micro and macroeconomic factors in Sudan. The study, covering 2003-2017, uses Multivariate Time Series Regression Analysis to estimate short-run relationships, Soren Johansen's Cointegration Test and Vector Error Collection Model to identify long-run equilibrium relationships, and Toda-Yamamoto Granger Causality Test to estimate causal relationships. The study finds that KSI performance is significantly influenced by both micro and macroeconomic factors.

In their time series investigation, Shamsudin et al. (2021) utilised a Vector Auto Regression (VAR) model to ascertain the presence of a correlation between the price of stocks and macro-economic factors in Japan. The study utilised a multivariate methodology, incorporating the variables of the rate of inflation, the rate of interest, the industrial production index, and a proxy for stock market development. The study findings demonstrate a correlation amongst the price of shares and the chosen macroeconomic factors. The findings additionally indicated that the causal relationship flows from macroeconomic indicators to the stock market.

Alam (2020) conducted a study on the impact of macroeconomic shocks on the Nigerian Capital Market from 1984 to 2007. The study employed the Augmented Dickey Fuller test and Error Correction Model. The study revealed that the All Share Index of the stock exchange demonstrates greater sensitivity to fluctuations in inflation rate, exchange rate, money supply, and real production. This suggests that all the interconnected variables experience large and simultaneous impacts in both the short and long term.

Amaresh et al. (2020) conducted a study to examine the influence of macroeconomic variables on the performance of the stock market. They analysed 120 monthly observations spanning from 2009 to 2018. The analysis revealed a positive correlation between inflation and stock market performance, and a negative correlation between interest rate and GDP. The study additionally discovered that around 75% of the fluctuation in the All-Share Price Index can be accounted for by the three macroeconomic variables: GDP, TB, and WPI. The report recommends that measures be taken to enhance the performance of the stock market.

The study by Jayasundara et al. (2019) examined the impact of macroeconomic factors on the All Share Price Index (ASPI) of the Colombo Stock Exchange in Sri Lanka between 2006 and 2016. The findings showed that interest rates, industrial production index, and civil conflict negatively affected the ASPI. However, the ASPI positively impacted the US Dollar exchange rate and real GDP growth rate. Despite external uncertainty, Sri Lanka successfully attracted foreign investment to its capital market.

The Cyprian (2017), study found that a combination of five macroeconomic factors, including GDP, money supply, interest rate, inflation rate, and exchange rate, cannot predict Nigeria's stock market performance. The study suggests firms should focus on improving profitability to attract investors and suggests future research to explore the best macroeconomic variables that positively impact Nigeria's stock market performance.

Onwukeme and Isiaka (2017), studied the link between stock market development and economic growth using Africa. They found that stock market development indicators significantly impact economic growth. They recommend policymakers encourage greater stock market development through sound macroeconomic policies and proper regulation to ensure market integration and reduce distortions that hinder market efficiency.

2.4 Gap in literature

There are various indicators of stock market performance as used by different researchers and the literature review has considered all. The study attempts to examine the relationship between stock market performance and selected macroeconomic variables which include GDP, Exchange rate, Inflation rate and bank lending rate specifically for the Nigerian economy. These variables were selected as a result of the ease of sourcing these data and their availability. Also, another gap to be covered by this study is that the measure of stock performance for this study is the market capitalisation while other studies used all share index as the indicator of stock market performance. Also, the period used is longer and also includes the most recent data.

3. METHODOLOGY

The study employed ex-post-facto research design. The time series data used covered the period 1981-2022. The data were obtained from the Annual Statistical Bulletin of the Central Bank of Nigeria. The population for this study consists of the national economic data that is pertinent to this research. The sample size is the 42years annual statistical report determined using purposive sampling technique. The model for this study is built on the assumptions of the APT model which is a multiple regression model. Tests like the Unit Root test, and Cointegration Tests were carried out to check the long run relationships as well as the direction of causality among variables. All descriptive and econometric

calculation were done using the econometric software known as Eviews 10. The functional relationship between the dependent and independent variables is given as follows:

MCAP = f (GDP, EXR, INF, BLR) ---------- (3.1)

For estimation purposes, equation 3.1 can be written as:

$MCAP = \beta_0 + \beta_1 GDP + \beta_2 EXR + \beta_3 INF + \beta_4 BLR + \mu_t$ ---------- (3.2)

where

MCAP = Market Capitalisation rates

GDP = Gross Domestic Product rates

EXR = Foreign Exchange

INF = Inflation

BLR = Bank Lending Rate

β_0 = Constants

$\beta_1 - \beta_4$ = Coefficients of the variables

μ_t = stochastic error term

4. RESULTS AND DISCUSSION

Summary of Phillips-Perron (PP) Unit root test

Table 4.1: The output of the stationarity test for all study variables

		Critical Values @			PP Test Statistic
Variable	**Order of Integration**	**1%**	**5%**	**10%**	
D(MCAP)	I(1)	-3.653730	-2.957110	-2.617434	-16.28352
D(GDP)	I(1)	-3.646342	-2.954021	-2.615817	-9.018691
D(EXR)	I(1)	-3.639407	-2.951125	-2.614300	-3.669103
D(INF)	I(1)	-3.639407	-2.951125	-2.614300	-8.625680
D(BLR)	I(1)	-3.639407	-2.951125	-2.614300	-9.402858

Source : Author's Computation with E-views

The study analyzed Nigeria's Market Capitalization, GDP, Exchange rate, Inflation rate, and Prime lending rate. The variables exhibited stationarity at first difference and had a PP test statistic that exceeded Mackinnon's critical values at 1%, 5%, and 10% significance levels. These variables were integrated of order one, denoted as I (1), and were suitable for future studies without significant false effects.

Table 4.2 Co-Integration Test

Date: 01/15/24 Time: 07:27
Sample (adjusted): 1981 2022
Included observations: 42 after adjustments
Trend assumption: Linear deterministic trend
Series:D MCAP DGDP DEXR DINF DBLR
Lags interval (in first differences): 1 to 1

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Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.701373	84.28005	69.81889	0.0023
At most 1	0.529545	45.60616	47.85613	0.0801
At most 2	0.334745	21.47640	29.79707	0.3286
At most 3	0.181236	8.433659	15.49471	0.4203
At most 4	0.061612	2.034939	3.841466	0.1537

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.701373	38.67389	33.87687	0.0124
At most 1	0.529545	24.12976	27.58434	0.1303
At most 2	0.334745	13.04274	21.13162	0.4483
At most 3	0.181236	6.398720	14.26460	0.5626
At most 4	0.061612	2.034939	3.841466	0.1537

Max-eigenvalue 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

The results indicate the presence of one co-integrating equation, providing evidence of significant long-term linkages among the variables under study. This presents persuasive data to support the claim that there is a substantial long-term correlation between market capitalization and the chosen macroeconomic indicators.

Table 4.3 Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	26.16454	32.27951	0.810562	0.4247
DGDP	2.818386	0.907590	3.105351	0.0044
DEXR	0.028089	0.105423	0.266436	0.7919
DINF	-0.493009	0.632608	-0.779327	0.4426
DBLR	-2.663572	1.995705	-1.334652	0.1931
ECM(-1)	-0.098942	0.237374	-2.416818	0.0305
R-squared	0.939409	Mean dependent var		4253.134
Adjusted R-squared	0.928962	S.D. dependent var		6294.024
S.E. of regression	1677.543	Akaike info criterion		17.84285
Sum squared resid	81610327	Schwarz criterion		18.10948
Log likelihood	-306.2499	Hannan-Quinn criter.		17.93489
F-statistic	89.92350	Durbin-Watson stat		1.780468
Prob(F-statistic)	0.000019			

Source: Author's Computed from E-views 10

Based on the provided table, it is evident that, over time, the combination of all predictor variables collectively explains 92.8 percent of the fluctuations in market capitalization (MCAP). This results in the endorsement of the model and offers proof that the chosen macroeconomic variables significantly contribute to the performance of the stock market, as indicated by market capitalization. The ECM exhibits the expected negative sign. The coefficient of 0.098942 represents the rate at which the market capitalization returns to its equilibrium level following temporary disruptions caused by certain macroeconomic factors. It is important to mention that out of all the explanatory variables chosen, only GDP is statistically significant at a significance level of 0.05. However, the F-statistics indicate that the test is often significant.

Test of Hypotheses.

In summary, we only reject the null hypothesis for GDP meaning that for all selected variables, only GDP has a significant and positive relationship with MCAP. All other selected variables have insignificant relationships with MCAP.

Test of Hypothesis I

H_{01}: There is no significant relationship between nominal GDP and market capitalisation.

H_{A1}: There is a significant relationship between nominal GDP and market capitalisation.

Decision: Since the probability value is 0.0044 which is lower than 0.05% critical value, therefore we reject the null hypothesis and accept the alternative hypothesis which suggests that there is a significant relationship between nominal GDP and market capitalisation.

Test of Hypothesis II

H_{02}: There is no significant relationship between exchange rates and market capitalisation.

H_{A2}: There is a significant relationship between exchange rates and market capitalisation.

Decision: Since the probability coefficient which is 0.7919 is greater than 0.05 critical value, then there is no significant relationship between foreign exchange rate and market capitalisation, therefore we fail to reject the null hypothesis.

Test of Hypothesis III

H_{03}: Inflation rate does not constitute a significant explanatory variable of market capitalisation.

H_{A3}: Inflation rate constitutes a significant explanatory variable of market capitalisation

Decision: Since the probability value is 0.4426 which is greater than 0.05%, then we fail to reject the null hypothesis which states that the inflation rate does not constitute a significant explanatory variable of market capitalisation, therefore there is no significant relationship between inflation rates and market capitalisation.

Test of Hypothesis IV

H_{04}: Market capitalisation is not a significant function of interest rates

H_{A4}: Market capitalisation is a significant function of interest rates

Decision: Since the probability value is 0.1931 which is greater than 0.05% critical value, then we fail to reject the null hypothesis which states that market capitalisation is not a significant function of interest rates, therefore there is no significant relationship between interest rates and market capitalisation.

Test of Hypothesis V

H_{05}: Significant causal relationships do not prevail between the selected macroeconomic variables and Market capitalisation in Nigeria.

H_{A5}: Significant causal relationships prevail between the selected macroeconomic variables and market capitalisation in Nigeria.

Decision: Since there is a causal relationship between GDP and Market capitalisation, we accept the alternative hypotheses specifically for GDP.

Discussion of Findings

i. Nominal Gross Domestic Product (GDP): Based on the findings presented in table 4.2.4, it is evident that the probability value of GDP is 0.0044, which is lower than the critical value at 5%. This indicates a significant relationship between GDP and MCAP. Additionally, the coefficient value supports the initial expectation, suggesting that for every one percent increase in GDP, MCAP increases by 2.818386%. These results align with the research conducted by Harcourt (2017) and Cyprian (2017). This increase arises because investors see the GDP of an economy as the mirror which shows the general performance of the economy so where it is high, it is perceived that the economy is doing well. In summary, GDP has a positive and significant relationship with MCAP.

ii. Exchange Rate (EXR): It was seen that a positive (coefficient of 0.028089) and insignificant relationship (P-value of 0.7919) was identified between EXR and MCAP, this means that for every one per cent increase in EXR there is an increase of about 0.028089% in MCAP, this result is in line with the apriori expectation, and also the findings of Okoyeuzu et al. (2022) Rasheed et al. (2020),

iii. Inflation rate: From the analysis carried out, a negative (a coefficient of -0.493009) and an insignificant relationship (P-value of 0.4426) was identified between INF and MCAP, this means that for every 1% increase in INF, there's a decrease of about 0.493009% in MCAP. This is in line with the apriori expectation and the findings of Cyprian 2017 and Harcourt 2017.

iv. Bank Lending Rate: From the analysis carried out, a negative (a coefficient of -2.663572) and an insignificant relationship (p-value of 0.1931) was identified between BLR and MKT CAP, this means that for every 1% increase in PLR, there's a decrease of 2.663572% in MKT CAP, this is in line with the apriori expectations and supported by Cyprian (2017), and Harcourt (2017).

5. CONCLUSION AND RECOMMENDATIONS

The study investigated the nature of the relationship between selected macroeconomic variables and the stock market's performance as proxied by market capitalisation. The study was carried out using data from 1980 to 2016. There were four hypotheses to be tested. The OLS regression technique and Granger causality tests were used to analyse the data. The explanatory variables also referred to as the independent variables, include some selected macroeconomic variables (nominal GDP, exchange rate, inflation rate, lending rate). The explained variable which is the stock market performance is proxied by the market capitalisation. The theory upon which this work is built is the Arbitrage pricing theory. The APT model was used which posits that stock prices are a result of the interplay of various economic forces (macroeconomic variables). Also, a review of related literature was carried out to see the various perspectives and outcomes of other researchers. From the results of this study, it is concluded that among the variables of study, only market GDP is reliable in predicting Nigeria's market capitalisation while interest rate, inflation and exchange rate are not reliable. Only GDP promotes or supports the growth of market capitalisation. Based on the outcome of the study, the following policy recommendations are made

1. Measures such as subsidies for young industries, low-interest loans for SMEs, diversification of the economy, and reduced importation of substitutes are proposed to boost production levels and consequently increase GDP, making the country more attractive to investors due to its reflective nature of the economy's activity.
2. A depreciation of the Nigerian currency negatively impacts the import-driven economy, driving prices upward and hindering savings for investment, highlighting the necessity of increasing production levels to bolster the currency's value and meet both local and foreign demand.
3. Also measures should be put in place to ensure price stability and also curb inflation.

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