



Consumer Price Index (CPI) and Trading Volume of the Nigerian Stock Market

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Abstract

The Nigerian Stock Market represents a vital component of the nation's economy, providing a platform for capital formation, investment, and wealth creation. As a developing economy, Nigeria is susceptible to various macroeconomic factors that influence its financial markets. One of such factor is inflation, as measured by the Consumer Price Index (CPI). Inflationary pressures can significantly impact investor sentiment, asset prices, and overall market activity. This study investigated inflation from a diagnostic perspective by opening up Consumer Price Index (CPI) so as to identify how the selected components of CPI affect the performance of the Nigerian Stock Market (NSM) in terms of its trading volume. The selected components of CPI include Communication (COMM); Education (EDU); Food and Non-alcoholic Beverages (FNAB); Transportation (TRANS); Health (HTH); and Housing, Water, Electricity & Gas (HWEG) while the Total Value of Shares Traded Ratio (TVSTR) was used to proxy for the trading volume of the NSM. The study adopted ex-post factor research design where data was sourced secondarily from the Central Bank of Nigeria (CBN) statistical bulletin and Nigeria Bureau of Statistics (NBS) for the period 2001-2020. Both descriptive and inferential statistics were adopted by the study. The study revealed that FNAB had a negative effect on TVSTR, TRANS, and COMM had a positive effect on TVSTR. However, the effect of EDU and HTH on TVSTR could not be ascertained in this study as their coefficients were insignificant. This implies that their contributions to the Total Value of Shares Traded Ratio may be largely attributable to chance. The study concluded that the selected components of CPI have a long-run effect on the trading volume of the NSM. It is therefore recommended that there is a need to probe sectors contributing negatively shares traded in the NSM so as to formulate strategies that will help mitigate the negative effect they have on NSM.

Keywords: Consumer Price Index, Performance, Nigerian Stock Market, Trading Volume

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Introduction

The impact of the Consumer Price Index (CPI) on the trading volume of the Nigerian Stock Market is a significant area of study in understanding the relationship between macroeconomic indicators and

financial market performance (Saibu et al., 2016). The Nigerian Stock Market represents a vital component of the nation's economy, providing a platform for capital formation, investment, and wealth creation. As a developing economy, Nigeria is susceptible to various macroeconomic factors that

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influence its financial markets. One such factor is inflation, as measured by the Consumer Price Index (CPI). Inflationary pressures can significantly impact investor sentiment, asset prices, and overall market activity. Therefore, understanding the relationship between CPI fluctuations and stock market performance is of paramount importance.

Typically, an increase in the CPI suggests inflationary pressures, indicating that the purchasing power of consumers is decreasing. In response, investors may adjust their investment strategies to hedge against inflation by reallocating their portfolios. This adjustment can lead to changes in trading volume within the stock market. Single counts are used for figures as it consider only one side of the transaction. Data represents year-end values and includes businesses that have acknowledged to listing and trading. The value of shares traded represents ownership transfer which is automatically by means of the exchange's electronic order book (EOB). The EOB is the platform where members trading on the market can have their orders exposed to all users of the market after which their orders are matched automatically in line with defined exchange rules, (The World Bank, 2023). The trading Volume of Stock Market (TVSM) is calculated as the total value of share (TVS) traded divided by the GDP (Daferighe & Charlie 2012).

When inflation is high, investors may seek refuge in equities as a hedge against inflation, thereby increasing trading volume in the stock market (Akpanung & Gidigbi, 2015). Conversely, if inflationary pressures are subdued, investors may opt for alternative investment options, leading to lower trading volumes in the stock market (Osazevaru, 2014). Furthermore, changes in the CPI can also affect investor sentiment and market confidence. A sharp increase in the CPI may raise concerns about the overall health of the economy, leading to a decline in investor confidence and reduced trading activity (Okonkwo et al., 2015). Conversely, a stable or declining CPI instills confidence in investors, leading to higher trading volumes.

Given the significant role of the stock market in the economy, there is a need to understand how changes in the CPI affect trading volume within the Nigerian Stock Market (Onoh, 2016). Trading volume is a key metric in the stock market as it reflects the level of activity and liquidity for a particular stock. High trading volume often indicates strong investor interest and can lead to smoother price movements. It is closely watched by traders and analysts to gauge market sentiment and potential price trends. Contrarily, low trading volume may suggest limited interest or participation and this may result in higher volatility and less reliable price signals. The value of shares traded refers to the sum of all domestic and international share trades, multiplied by the matching prices. Despite the importance of trading volume, research conducted to investigate this phenomenon is relatively scarce in the literature.

Akpanung & Gidigbi (2015) explored the correlation between trading volume and stock returns, an area of contention in Financial Economics, particularly given its significance as a primary channel for long-term investible funds. They emphasized the necessity for a broader investigation beyond sectoral occurrences. After confirming the stationarity of relevant variables, the researchers conducted Granger Causality tests to determine causality directions, incorporating two influential macroeconomic variables, exchange rate, and interest rate. The findings indicated that the primary variables moved in tandem without causing each other, except for interest rate and exchange rate, which exhibited a unidirectional relationship with trading volume. Interest rate influenced trading volume changes, while bidirectional relationships were observed between exchange rate and trading volume. This implies policymakers should carefully manipulate interest and exchange rates due to their substantial impact on trading volume changes, which in turn affect the inflow and outflow of long-term investible funds.



Orajaka & Okeke (2017) examined the impact of inflationary trends on the Nigerian stock exchange market. They used the total value of Nigerian stock exchange transactions as a proxy for market activity, while the inflation rate, government expenditure, and currency exchange rate served as indicators of inflationary trends. Secondary data spanning thirty-five years of economic activities from 1980 to 2014 were analyzed using descriptive methods and general regression statistical tools. The investigation revealed significant correlations between inflation, government expenditures, exchange rate, and the total value of Nigeria stock exchange transactions. Consequently, the study concluded that inflationary trends notably affect the Nigerian stock exchange market.

Onoh et al. (2017) delved into how the stock market in Nigeria makes returns from trade volume and turnover of the market on a daily basis. This was done by utilizing secondary data sourced from everyday trading activities at the stock exchange. Recognizing the potential for significant errors when using aggregate data, the researchers opted for daily data to ensure robust outcomes. Employing regression analysis through the Stata statistical package, they tested the effects of volume and turnover on stock returns. The study, spanning a 15-year period, concluded that trade volume though significant exhibited a negative effect on stock returns. The study attributed this phenomenon to have been as a result of potential investors misinterpreting imminent earnings of stocks or difficulty of buying or selling those stocks quickly and at a stable price.

Daferighe & Charlie (2012) utilized a time series dataset spanning twenty years from 1991 to 2010 to examine how inflation affects the performance of the Nigerian stock market. They used percentage change in All-share Index (% Δ ASI), market capitalization (MCAGDP), turnover ratio (TOR), and total value traded ratio (TVMS) as indicators of stock market performance, while inflation rate was measured using the Consumer Price Index (CPI). Except for TOR,

which unexpectedly showed as positively correlated with inflation, all other indicators displayed a negative relationship with inflation. TVMS exhibited the most significant influence at 14.6%, while ASI had the smallest impact at 0.3%, indicating a minimal effect of inflation on the performance of the Nigerian Stock Market. Investments in the stock market are considered a favorable hedge against inflation in Nigeria, given the relatively modest impact of inflation rates ranging between 14.6% and 0.3%.

Investigating the trading volume of the Nigerian Stock Market is crucial due to the emerging market status of Nigeria, where liquidity can be a significant concern. High volumes in the NSE can attract more foreign investors, improve market efficiency, and contribute to the overall growth and development of the Nigerian financial market. However, inflation tends to dampen trading activity due to its negative effects on economic stability, corporate profitability, and investors' confidence. CPI serves as a crucial metric for gauging inflation trends, reflecting shifts in purchasing power and living costs within an economy. Understanding the ramifications of CPI fluctuations on stock market dynamics holds importance for investors, policymakers, and market participants alike. Through the application of robust econometric techniques and up-to-date data, this study aims to offer actionable insights into the relationship between CPI movements and stock market performance in Nigeria, thereby informing investment decisions and policy formulations. By leveraging on contemporary data and advanced econometric methodologies, the research endeavors to contribute to a deeper comprehension of the interplay between inflation dynamics and stock market behavior, ultimately fostering sustainable growth and development within Nigeria's capital markets.

Also, worthy of note is the fact that the annual inflation rate is a composite of several sectoral inflation rates. This implies that some of the sectors could contribute positively to the annual inflation rate

while some sectors could contribute negatively to the annual inflation rate and the extent of the contribution by each sector will definitely differ. This study therefore investigated inflation from a diagnostic perspective by opening up CPI so as to identify how the selected components of CPI affect trading volume of the Nigerian Stock Market. The CPI is made up of twelve (12) prominent components which are: Food and non-alcoholic beverages; alcoholic beverages, tobacco and kola; clothing and foot wear; housing, water, electricity and gas; furnishings and household equipment; health; transport; communication; recreation and culture; education; restaurants and hotels; miscellaneous, goods and services. The selected components of CPI for the purpose of this study include: Communication (COMM); Education (EDU); Food and Non-alcoholic Beverages (FNAB); Transportation (TRANS); Health (HTH); and Housing, Water, Electricity & Gas (HWEG).

Methodology

This study employed an ex-post facto research design, gathering secondary data from the Central Bank of Nigeria (CBN) Statistical Bulletin and the Nigerian Bureau of Statistics (NBS) Statistical Bulletin spanning from 2001 to 2020. Analytical methods encompassed both descriptive and inferential statistics. Descriptive statistics comprised measures such as Minimum, Maximum, Mean, and Standard Deviation, while inferential statistics involved panel regression to assess the study's objectives.

Model Specification

$$Y = f(x)$$

That is,

$$\text{Performance} = f(\text{Consumer Price Index i.e. CPI})$$

$$\text{Performance} = \text{All Shares Index (ASI)}$$

Where:

$$\text{TVSTR} = \text{Total Value of Shares Traded Ratio .. Y}$$

$$\text{CPI} = \text{Food and Non-alcoholic Beverages (FNAB), Housing, Water, Electricity \& Gas (HWEG), Health (Hth), Transport (Trans), Communication (Comm), Education (Edu)}$$

Therefore:

$$\text{TVSTR} = \beta_0 + \beta_1 \text{FNAB} + \beta_2 \text{HWEG} + \beta_3 \text{Hth} + \beta_4 \text{Trans} + \beta_5 \text{Comm} + \beta_6 \text{Edu} + \sum$$

Results and Discussion

Data gathered from secondary sources spans a 20-year period (2001-2020) and were analyzed as related to the study's objective. Prior to establishing the relationship between the chosen variables, it was crucial to first assess their stationarity. For non-stationary variables, co-integration analysis was conducted on them.

Diagnostic Tests for Time Series Regression Model

Before estimation, the assumption of stationarity in the classical regression technique was determined in order to remove possible errors in the dataset. The study subjected all variables to the Augmented Dickey Fuller (ADF) unit root analysis with Table 1 summarizing the results. The statistical analysis at various level indicated that all study variables were integrated at I (1) (i.e at first difference) and at critical value of 5% level of significance (0.05).

Table 1: Augmented Dickey Fuller (ADF) Unit Root Results for the Variables

Variables	ADF	P – value	Order of Integration	ADF	P-value	Order of Integration
COMM	-1.886998	0.3368	I(0)	-8.829907***	0.0000	I(1)
EDU	1.111974	0.9973	I(0)	-9.248508***	0.0000	I(1)
FNAB	3.181884	1.0000	I(0)	2.006908**	0.0029	I(1)

HWEG	2.907997	1.0000	I(0)	-6.248849***	0.0000	I(1)
HTH	4.770132	1.0000	I(0)	-8.952041***	0.0000	I(1)
TRANS	2.141884	0.8000	I(0)	2.006908***	0.0000	I(1)
TVSTR	0.554762	0.2895	I(0)	5.03634**	0.0000	I(1)

Source: Author’s Computation, 2024

Effects of Consumer Price Index on Trading Volume of the Nigerian Stock Market

To determine how each selected component of Consumer Price Index (CPI) affects the trading Volume of the Nigerian Stock Market in the long-run, the Fully Modified Least Squares (FMOLS) regression of the VAR procedure was adopted. The

analyses were carried out on a disaggregation of the headline inflation for each quarter of the year 2004-2023 with a view to having a deeper understanding of the contribution of each of the selected sectors to the trading volume of the Nigerian Stock. The results of the analyses are presented as follows:

Table 2: Long-Run Effects of Consumer Price Index on Trading Volume of the Nigerian Stock Market

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COMM	0.340203	9.46E-05	2.144007	0.0354
EDU	-0.230167	0.000213	-0.781723	0.4369
FNAB	-0.330452	0.000157	-2.873902	0.0053
HTH	-0.210153	0.000344	-0.443755	0.6586
HWEG	-0.220300	0.000243	-1.235985	0.0205
TRANS	0.311101	0.000416	2.648806	0.0099
C	-0.306443	0.012597	-0.511450	0.0106
R-squared	0.248576	Mean dependent var		0.214325
Adjusted R-squared	0.185957	S.D. dependent var		0.009606
S.E. of regression	0.008667	Sum squared resid		0.215408
Long-run variance	0.100140			

Source: Author’s Computation, 2024

Table 2 reveals the regression results of effect of the selected components of consumer price index (CPI) on the Total Value of Shares Traded Ratio in the Nigerian Stock Market for the period 2001 to 2020. The Table shows that Food and Non-alcoholic Beverages (FNAB) had negative and significant effect on the Total Value of Shares Traded Ratio (TVSTR) ($\beta = -0.330452$, $t = -2.873902$, $p < 0.05$), Housing, Water, Electricity & Gas (HWEG) subsector of the Nigerian economy had negative and significant effect on TVSTR ($\beta = -0.220300$, $t = -1.235985$, $p < 0.05$), Health (HTH) subsector also had negative but insignificant effect on the Total Value of Shares Traded Ratio (TVSTR) ($\beta = -0.210153$, $t = -$

0.443755 , $p > 0.05$). The effect of the transportation subsector (TRANS) on the Total Value of Shares Traded Ratio (TVSTR) is positive and significant ($\beta = 0.311101$, $t = 2.648806$, $p < 0.05$), while the communication (COMM) subsector also has positive and significant effect on the Total Value of Shares Traded Ratio (TVSTR) ($\beta = 0.340203$, $t = 2.144007$, $p < 0.05$). Finally, the Education (EDU) subsector also has negative but insignificant effect on the Total Value of Shares Traded Ratio (TVSTR) ($\beta = -0.230167$, $t = -0.781723$, $p > 0.05$).

Overall, the multiple regression shows that the regression model is fit to predict the future values of Total Value of Shares Traded Ratio in the Nigerian

Stock Market given that the $R^2 = 0.248576$ which implies that the selected components of CPI can collectively predict about 24.86 percent of change in the performance of the Nigerian Stock Market in terms of the Total Value of Shares Traded Ratio.

Deriving from the above analyses therefore, in order to predict future estimate of the Total Value of Shares Traded Ratio, the regression model may be re-stated as follow:

$$\begin{aligned} \text{TVSTR} &= \beta_0 + \beta_1 \text{FNAB} + \beta_2 \text{HWEG} + \beta_3 \text{HTH} + \\ &\beta_4 \text{TRANS} + \beta_5 \text{COMM} + \beta_6 \text{EDU} + \epsilon \\ \text{TVSTR} &= -0.306443 - 0.330452\text{FNAB} - \\ &0.220300\text{HWEG} - 0.210153\text{HTH} + 0.311101\text{TRANS} \\ &+ 0.340203\text{COMM} - 0.230167\text{EDU} + 0.008667 \end{aligned}$$

Discussion of findings

The rationale behind this study is the disaggregation of the headline inflation rate into its component parts in terms of the different sectors of the economy, with a view to ascertaining the contribution of each sector to the trading volume of the Nigerian Stock Market. Findings as revealed in Table 2 shows that two of the selected sectors (Food and Non-alcoholic Beverages, and Housing, Water, Electricity & Gas) had negative effect on Total Value of Shares Traded Ratio (TVSTR). Two other sectors (Transportation and Communication) had positive effect on TVSTR. However, effect of the remaining two sectors (Education and Health) on TVSTR in the Nigerian Stock Market could not be ascertained in this study as their coefficients were insignificant. This implies that their contributions to Total Value of Shares Traded Ratio may be largely attributable to chance.

This discovery represents advancement from prior research, which may have yielded varied conclusions regarding the impact of CPI on the volume of shares traded in the Nigerian stock market. For example, Orajaka & Okeke (2017) noted that their study revealed a significant correlation between inflation, government expenditures, and exchange rates with the total value of transactions on the Nigerian stock exchange, suggesting that inflationary trends largely influence the Nigerian stock exchange market.

Meanwhile, Daferighe & Aje (2012) observed a negative relationship between CPI and total value of stock transactions. Additionally, Onoh et al. (2017) identified a negative yet significant impact of trade volume on stock returns, attributing it to possible investor misinterpretation of future earnings or the illiquidity of stocks with low trading volume.

Conclusion and Recommendations

The findings of the study on the CPI and Trading Volume of the Nigerian Stock Market provide valuable insights into the relationship between inflation components and stock market performance. It's evident that certain sectors, such as Transportation and Communication, play a significant role in influencing the Total Value of Shares Traded Ratio (TVSTR), while others like Food and Non-alcoholic Beverages, and Housing, Water, Electricity & Gas, exhibit a negative effect. However, the study also highlights that sectors like Education and Health have insignificant coefficients, suggesting their contributions to TVSTR may be random.

Based on these findings, it's recommended that policymakers and investors closely monitor the sectors with significant impacts on TVSTR, such as Transportation and Communication, to anticipate market trends and make informed decisions. Additionally, further research could be conducted to explore the reasons behind the negative effects of certain sectors and to better understand the dynamics of the Nigerian Stock Market. Overall, understanding the relationship between inflation components and stock market performance can enhance risk management strategies and contribute to the overall stability and growth of the market.

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