Investor Sentiment and Stock Return in the Nigerian Capital Market

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DOI: 10.56201/ijefm.v10.no9.2025.pg248.265

Abstract
This study examines investor sentiment and stock returns in Nigerian capital market, covering period 30/04/2019 to 02/06/2025, using daily secondary time series data with focus on impact of sentiment factor on stock returns and identifying most important sentiment factor that could influence stock returns. The study adopts Autoregressive Distributed Lag (ARDL) estimation technique to analyze the dynamic interactions between investor sentiment and stock performance. The study findings revealed exchange rate (EXR) and volatility index (VIX) as the most important sentiment factors, and both are statistically significant with positive coefficients to influence stock returns. Also, the study revealed stock returns and volatility have mean-reverting behaviour, which implies that irrespective of the market and economic conditions, stock returns and volatility can correct its mispricing. The result also showed the presence of long and short run effects, with EXR and VIX showing a positive influence on stock returns.

Keywords: *Investor Sentiment, Stock Return, Capital Market, Frontier Market, Emerging Market, Behavioral Finance.*
JEL Classification: G10, G11, G12, G14

1. Introduction

The global economy has transitioned to an information-based economy, and emerging markets are not exempt from the trend of sentiment consideration in investment decision. As a result, information sourcing and sharing have become a critical factor in decision-making for investment based on news, trends, happenings, mood, outlook, and emotions, which promote consideration of sentiment in investment decisions without considering traditional fundamentals and technicalities. To maximize returns and arbitrage gains, investors in the capital market tend to make irrational decisions, especially when information is asymmetric. Abdullahi, Oyedeko, Uthman, and Dangana (2022) opined that economic agents do not base their investment decisions solely on rational analysis but are also influenced by cognitive biases while Aftab, Rehman, and Anifowose (2016) believed psychological elements play a crucial role in shaping and sometimes distorting financial decision-making processes and the valuation of assets within practical world market environments. Beyond cognitive biases, attentional shifts, and intuitive judgments associated with investor

sentiment, market sentiment may also arise from factors such as heightened demand for specific stocks, instances of mispricing and subsequent corrections, increased interest in growth-oriented companies with high earning potential, and preference for old firms with a consistent history of strong returns. Zhang (2008) opined that investor sentiment arises because individuals incorporate potentially wrong information in updating their beliefs. The adoption of incorrect information that seems to be true in driving market behaviour and asset prices could be towards the market itself or towards investors, making sentiment in capital market to be in two folds and a critical risk factor in asset pricing.

The quest to make quick returns within the shortest possible time based on mood, belief, mental instinct, economic atmosphere, and Government policy direction has made investors forego the fundamentals and technical aspects of appraising stock selection, thereby resorting to appraising asset securities for investment with sentiments, irrational attitude, and attention. Osabuohien-Irabor (2021) asserted that sentiment is a critical psychological factor in decision-making, yet it remains challenging to measure directly due to the lack of a standardized measurement framework in existing studies, because for individuals to interpret and respond to events in their environment, attention must be given to underlying mood and beliefs. The presence of a substantial number of retail investors over institutional and foreign portfolio investors in Nigeria's capital market tends to promote irrational behaviours towards making quick returns, amplifying sentiments in the market, and making Nigeria an ideal place for this study. Bouteska, Sharif, and Abedin (2023) posited that institutional investors tend to exhibit more rational trading behavior and are comparatively more reliant on information than retail investors. The market's collective mood, the emotional outlook of market participants, the monetary policy outlook, global oil price fluctuation, financial sector outlook, global trade and supply chain outlook, and the macroeconomic outlook of the country's economy have increasingly become critical factors driving retail and institutional investor sentiments in understanding capital market dynamics for predicting stock returns in frontier and emerging markets. Ajibola, Oni, and Awolaja (2025) argued that investor sentiment plays a fundamental role in capital markets by shaping investor behavior and driving market dynamics, while Rembokowati (2025) believed that the sentiment and behavior of investors are likely largely influenced by the economic condition of a country.

Nigeria's capital market, the largest in West Africa and a key emerging market globally, has experienced considerable volatility over the past decades, driven by macroeconomic shocks, policy inconsistencies, exchange rate fluctuations, global oil price fluctuations, global economic shocks, shifts in the international trade and supply chain outlook, and investor sentiment swings. Nwanna and Olayiwola (2020) opined that capital market in Nigeria is characterized by lower liquidity, limited information dissemination, high turnover, and high number of retail investor participation, which makes sentiment-driven trading significantly impact stock returns. Investor sentiment is the sudden drive and attention towards a particular stock or market influenced by emotions, mood, news, and economic happenings in the country that could impact a stock price and market in a positive (overreaction) or negative (underreaction) way. High sentiment occurs when there is a sudden increase in stock prices over time, while low sentiment is when there is a sudden decrease in stock prices over time. Emmanuel and Ahmed (2020), and, Nabosu, M'ithiria, and Wepukhulu (2022) described investor sentiment as the general disposition of investors toward the financial market, which can impact their decision-making and encompasses a range of psychological factors such as feelings, attitudes, thoughts, judgments, moods, beliefs, and expectations, Haritha and Rishad (2020) described investor sentiment as investors' expectations regarding the return and risk related to investment, Park (2015) believed investor sentiment as investors' psychological state of

mind (optimism or pessimism), which guide their investment decisions, Fonou-Dombeu, Nomlala, and Nyide (2024) understood investor sentiment as the movement of security prices not affected by fundamental information.

With increasing financial inclusion and market participation by retail investors through easy access to the capital market via technology and Fintech companies in Nigerian capital market, understanding sentiment becomes crucial for developing resilient capital markets in Nigeria. The presence of a significant number of retail investors over institutional and foreign portfolio investors in Nigeria's capital market tends to promote irrational behaviours towards making quick returns, amplifying sentiment in the market, and making Nigeria an ideal place for this study. Zubairu (2015) asserted that while the Nigerian Exchange (NGX) plays a vital role in the nation's economy, there remains limited understanding of the extent to which behavioral biases affect investor decision-making within the market. The volatility, information asymmetry, foreign portfolio investors, institutional investors, and inefficiencies of the Nigerian capital market raise questions about the drivers of asset prices in this market beyond traditional fundamentals and technical indicators. Busari, Awotundun, and Anifowose (2025) argued that high level of volatility in capital market has made asset evaluation and portfolio selection increasingly challenging for investors in Nigerian capital market. Despite the growing relevance of behavioral finance and high participation of retail investors, there is insufficient understanding of how investor sentiment influences stock returns in Nigeria at both retail and institutional investor levels. This limits the ability of investors, policymakers, and analysts to incorporate sentiment measures into stock return prediction, risk management, and forecasting models. Consequently, this study seeks to address the following research questions: What is the nature of the relationship between investor sentiment and stock returns in the Nigerian capital market? Which investor sentiment indicators significantly influence stock returns in this market? Accordingly, the study aims to investigate the relationship between investor sentiment and stock returns in Nigeria and to identify and empirically assess the key sentiment indicators that impact stock performance.

The existing literatures on investor sentiment remains relatively inconclusive due to variations in data sources, methodologies, and sentiment measures. Xia (2022) noted that while investor sentiment has attracted significant scholarly attention, especially regarding its relationship with stock returns, there is still no unified standard system or theoretical framework guiding this area of research. Empirical evidence from developed markets, such as the studies by Ryu, Ryu, and Yang (2018), Brown and Cliff (2005), and Baker and Wurgler (2006), generally supports that investor sentiment can predict stock returns. Similarly, studies focused on the Nigerian market, Ayinuola and Adetiloye (2023) and Emmanuel and Ahmed (2020), suggest that investor sentiment serves as a risk factor for stock returns, aligning with findings from developed markets. However, to the best of researchers' knowledge, most existing studies on investor sentiment in Nigeria rely on sentiment indices and factors derived from developed market frameworks, often overlooking the unique characteristics of the Nigerian market. This study seeks to fill that gap by identifying and analyzing sentiment indicators that specifically reflect the behaviors of both institutional and retail investors within the Nigerian context. Busari, Awotundun, and Anifowose (2024), believed that the yearn for optimal investment decision, return maximization and utility maximization have given rise to pricing of assets using different factors ranging from market factors, non-market factors, cognitive factors, social and ethical factors, to get returns that satisfies the investors preferences and utility. This study offers an empirical insight into the influence of investor sentiment on stock returns in Nigeria. Its findings are valuable to several key stakeholders: Investors, for developing sentiment-informed trading strategies that enhance decision-making in

volatile market conditions; Portfolio Managers and retail investors, for incorporating behavioral factors into asset allocation models to optimize portfolio performance; Regulators, for understanding sentiment-driven market dynamics and formulating policies that mitigate overreactions, reduce herd behavior, and promote market stability and investor confidence; and Academic, as a meaningful contribution to growing body of behavioral finance research in context of emerging markets.

2. Literature Review

Classical finance theory assumes asset prices are solely driven by utility-maximizing motives and availability of information, with no consideration for investor sentiment. Investor sentiment evolves from one of limitations of market efficiency (efficient market hypothesis, EMH) that says accessibility and timely information cannot be available at all times to market participants. Investor sentiment has garnered increasing attention as a non-fundamental risk factor affecting asset pricing and return predictability. Fama (1970), Classical finance theory posits that stock prices reflect fundamental information. However, behavioral finance highlights the deviation from rational expectations due to investor emotions, biases, and heuristics (Barberis, Shleifer, and Vishny, 1998). According to Prasad, Mohapatra, Rahman, and Puniyani (2022), investor sentiment refers to the collective attitude and attention of investors toward a particular event or piece of information. This sentiment, often shaped by emotions and perceptions rather than fundamentals, plays a significant role in influencing market behavior and price movements. When investor sentiment is optimistic, it tends to drive prices upward, a condition commonly described as bullish. Conversely, when sentiment is pessimistic, it often leads to a downward trend in prices, referred to as bearish sentiment. Barberis and Thaler (2003), Brown and Cliff (2005), and Baker and Wurgler (2006) emphasized that investor sentiment has become increasingly prominent in the discourse of behavioural finance, reflecting its growing relevance in understanding market behavior. This growing interest is due to its substantial influence on asset returns, financial risk, and market anomalies. Their studies emphasize how investors' beliefs, emotions, and psychological biases shape their expectations about future cash flows and perceived investment risks, ultimately affecting market outcomes. Baker and Wurgler (2006) documented investor sentiments can be viewed from the lens of microeconomic and macroeconomic approach. They believed the microeconomic approach assesses investor sentiment from a micro level, depending on individual mood, attention, attitude, personal belief, emotions, and biases. At the same time, the macroeconomics view investor sentiment from the aggregate level, focusing on the market and economy. Zhou (2018) provides a comprehensive overview of the methodologies used to measure investor sentiment and evaluates their effectiveness in financial research. The study categorizes sentiment measures into two broad groups: direct measures, such as investor surveys, texts and indirect or market-based measures, such as trading volume, volatility, and sentiment indices constructed from financial data. Zhou (2018) emphasizes the strengths and limitations of each approach, highlighting challenges such as measurement noise, data frequency, and subjectivity in interpretation. The study also discusses the application of sentiment measures in explaining asset pricing anomalies, stock return predictability, and market dynamics. Zhou (2018) concludes that while sentiment is difficult to quantify precisely, advancements in data analytics and access to alternative data sources (social media and news sentiment) are improving the robustness and relevance of sentiment metrics in empirical finance while Nguyen, Ngo, Pham, and Van Nguyen (2025) observed that social media has evolved from a mere communication platform into a vital tool for conducting sentiment analysis in the field of finance. Bouteska, Sharif, and Abedin (2023)

documented that investor sentiment can be broadly categorized into: direct, indirect, and Meta. They highlighted that direct measure of investor sentiment deals with surveys and textual analysis to directly measure market participants', psychological attributes, intelligence, and confidence to ascertain their level of biases, emotions, and attitudes, as evidenced in Brown and Cliff (2004, 2005). The indirect measure is the market-based investor sentiment, which can be linked to how financial market responds to investor trading activities, as evidenced in Baker and Wurgler (2006, 2007). The meta measure contains a mix of survey and market-based sentiments as evidenced in Baker, Jeffrey, and Yu (2012) and Sun, Zeng, Zhou, Zhao, Thomas, and Hu (2021). This measure is a composite investor sentiment that captures a broad range of investor sentiments that may likely affect both the investor and the market to get a robust result. Also, Bouteska, Sharif, and Abedin (2023) highlighted that there are two sides to investor sentiments: investor optimism and macroeconomic environments. Osabuohien-Irabor (2021) found that internet search activities, whether through Google or Wikipedia, for information related to firms and stock trading are not reliable predictors of stock returns. This suggests that while such searches reflect investor attention and time commitment to specific topics, they do not necessarily translate into accurate return forecasts. His study relied on the role of attention in the form of online searches as a basis for implied sentiments. Baker and Wurgler (2007) pioneered using sentiment indices in explaining cross-sectional stock returns. Their findings show that sentiment-driven mispricing is more pronounced for stocks that are difficult to value or arbitrage. Similarly, Brown and Cliff (2005) and Lemmon and Portniaguina (2006) document significant associations between sentiment proxies (such as consumer confidence, trading volume) and market performance. In Nigeria, market reactions to macroeconomic announcements and socio-political developments reflect the strong presence of investor mood. According to Okonkwo and Nwanna (2019), investor overreaction to news contributes to short-term volatility in the Nigerian Stock Exchange. Yet, studies remain limited in applying rigorous econometric tools to model these effects across time. Zhang (2008) noted that the term investor sentiment is employed variably across economic researchers, professional traders, and the media, with its interpretation and application often carrying multiple meanings depending on the context. He opined that investor sentiment has contextual issues in its meaning and application in the area of: theoretical issues of defining and modeling sentiment, definition of investor sentiment relative to fundamental indicators or cognitive indicators, and how to measure investor sentiment.

Empirical Review

Osabuohien-Irabor (2021) examined how investors attention impact on Nigeria stock market activities. Findings revealed the volume of Google and Wikipedia searches related to firms and stock trading activities neither explains contemporaneous stock returns nor serves as a reliable predictor of trading volume and volatility dynamics. Nabosu, M'ithiria, and Wepukhulu (2022) examined Investor Sentiment and Stock Market Return of Non-Financial Firms Listed on the Nairobi Securities Exchange and findings showed investor sentiment plays a significant role in influencing stock market performance, particularly in enhancing the predictability of returns. Kim, Ryu, and Yang, (2019) investigated Investor sentiment, stock returns, and analyst recommendation changes: The KOSPI stock market. The findings revealed that investor sentiment responds more strongly to upgrade announcements than to downgrade announcements, suggesting that analyst reports provide valuable trading signals, particularly for uninformed investors. Ryu, Ryu, and Yang, (2018), the findings indicated that investor sentiment indicators may help explain cross-sectional variations in stock and portfolio returns and serve as a significant factor in understanding

asset price movements. Ayinuola and Adetiloye (2023) Investigated the Nexus Between Investor Sentiment and Stock Return Volatility in Nigeria. The results demonstrated a negative and significant relationship between the sentiment index and stock return volatility. Additionally, exchange rates were found to amplify stock market volatility, while inflation had a reducing effect. In contrast, interest rates exhibited an insignificant impact on volatility. Zubairu (2015) examined the Influence of Investors Sentiment on Stock Market Returns in Nigeria. The results indicated that investor sentiment has a statistically significant relationship with equity prices in Nigeria, both in the short run and the long run. Emmanuel, and Ahmed (2020), the analysis revealed a positive correlation between changes in certain sentiment predictors and stock market returns, indicating that individual investor sentiment can influence stock prices. However, the extent of this influence appears to be moderated by the presence of arbitrage forces. Njogo, Jaiyeoba and Mabinuori (2020) examined Investors' Sentiment and Stock Trading in the Nigerian Capital Market. The results revealed that investor sentiment has a significant impact on the stock trading activities of the firms examined and influences stock trading across different industries in Nigeria in varying ways. Alajekwu, Obialor, And Okoro (2017) investigated Effect of Investor Sentiment on Future Returns in the Nigerian Stock Market. The results demonstrated that investor sentiment has a significant positive effect on stock market returns, even after controlling for fundamental factors such as the Industrial Production Index, Consumer Price Index, and Treasury Bill Rate. Furthermore, the analysis revealed a unidirectional causality from changes in investor sentiment (ΔCCI) to stock market returns (Rm). John, Abdullahi, and Abdulkadri (2022) revealed Stock returns on the Nigerian Exchange (NGX) are influenced by both direct and indirect investor sentiment indicators. Nnoje, Okonkwo, and Anachedo (2021). The findings suggested that investors in the Nigerian equity market are more responsive to market sentiment and exchange rate information than to interest rate movements when making investment decisions in shares.

Theoretical Framework

Nosie Trader Risk Theory (De Long, Shleifer, Summers, And Waldmann 1990)

The Noise Trader Risk Theory, developed by De Long, Shleifer, Summers, and Waldmann (1990), provides a behavioral framework that challenges traditional Efficient Market Hypothesis (EMH). Markets are influenced not only by rational investors but also by noise traders, investors who trade based on irrational beliefs, misinformation, or emotional reactions rather than fundamental analysis. These traders create "noise" in the market, which lead to persistent mispricing and volatility in asset prices. The core assumptions of Noise Trader Risk Theory include: coexistence of rational and irrational (noise) traders in the market, Noise traders act on systematic but incorrect beliefs, such as market rumors or herd instincts, Sentiment can drive demand for assets beyond what fundamentals justify, Rational arbitrageurs face risks and limitations that prevent them from correcting mispricing immediately.

The theory posits that investor sentiment shaped by psychological factors, emotions, and market mood plays crucial role in asset pricing. When sentiment is excessively optimistic, it can inflate asset prices above their intrinsic value. Conversely, negative sentiment can depress prices below fundamental levels. This leads to return predictability, where assets that are sentiment-driven in one period may experience corrections or reversals in subsequent periods (Baker and Wurgler, 2006; Brown and Cliff, 2004).

In the context of Nigerian capital market, Noise Trader Risk Theory is particularly relevant. Market is characterized by dominance of retail investors, relatively low institutional investor participation, and frequent reliance on informal information sources such as media speculation, political

narratives, and social influences. These factors contribute to a trading environment where sentiment-driven decisions can exert significant impact on price movements and return volatility (Oni, Ajibola, and Awolaja, 2025).

3. Methodology

This section outlines research methodology employed to examine relationship between investor sentiment and stock return in Nigerian capital market. It details research design, data sources, population and sample, model specification, estimation techniques and robustness tests for data validity and reliability. This study adopts quantitative research design, daily time series secondary data from 30/04/2019 to 02/06/2025. The design is appropriate for examining trading activities, patterns and causal relationships between investor sentiment and stock returns in Nigeria capital market. Given existing literatures on investor sentiments, Zhou (2018) and Zhang (2008) categories the methodological approaches to investor sentiments into two broad categories: direct measurement and indirect measurement. This study would adopt indirect measurement of investor sentiments based on available data and proxies for measuring investor sentiments to know if trading activities in the market promote sentiment for investors who do not have access to available information to make investment decisions in capital market. The adoption of these sentiment proxies (trading volume, volatility index, all share index, interest rate and exchange rate) for indirect measurement points to the unique nature of Nigeria's capital market as institutional investors and foreign portfolio investors trading activities signal trading pattern in which retail investors rely upon to invest in the capital market. The study uses secondary data sourced from Nigerian Exchange (NGX) for all share index and trading volume, and the Central Bank of Nigeria (CBN) for macroeconomic indicators (exchange rate and 10-year bond rate). The study population consists of all listed financial and non-financial stocks on Nigerian Exchange during the period 30/04/2019 to 02/06/2025, and a purposive sample of all active trading stocks is selected based on data availability and relevance to both institutional and retail investors. The explained variable is the daily stock return proxy by all share index, while the explanatory variables are proxies for trading volume, and volatility index, moderated with macroeconomic indicators (exchange rate and interest rate). The explanatory variable proxies are carefully selected as they reflect the trading activities in response to market and investor behaviours. The sentiment variables would be in three parts: aggregate investor sentiment proxy (trading volume- log difference between today's trading volume and previous day trading volume, and aggregate market sentiment proxy (changes in all share index with 3-day rolling over), and macroeconomic sentiment proxy (changes in macroeconomic factors). The anchor theory for this study is Noise Trader Theory by De Long et al. (1990), which explains how sentiment-driven investors can influence asset prices away from their intrinsic values, particularly in inefficient markets like Nigeria.

Model Specification

The study model's empirical analysis would be anchored on Nawar (2024), The Effect of Investor Sentiment on Stock Returns: Evidence from a Frontier Market. The study focuses on Dhaka stock exchange, and findings showed stock-specific investor sentiment has a significant positive influence on stock returns, while market-wide sentiment does not. This model is adapted because it focuses on the frontier market and also analyzes investor and market behaviours. The explained variable used for the study (Nawar, 2024) is yearly stock return, while the explanatory variables are logarithm difference of share index representing market wide sentiment, logarithm difference of trading volume representing individual stock specific sentiment, firm specific control variables

(market Capitalization, sales growth, earnings per share, Price-to-NAV ratio), and macroeconomic control variables (inflation, 91-day treasury bill rate). For dynamic nature of Nigeria as an emerging market and peculiarity of market participants (retail investors, portfolio investors, and institutional investors), the study would adapt Nawar (2024) by modifying the explanatory variables to trading volume (aggregate investor sentiment), volatility index (aggregate market sentiment), interest rate and exchange rate (macroeconomic control variable). The adoption of this model is unique to this study, as it captures sentiment factors related to individual investors, the aggregate market, and macroeconomic factors. To conduct empirical analysis for this study, the model would be

$R_{it} = \beta_0 + \beta_1\, TVOL_{it} + \beta_2\, VIX_{it} + \beta_3\, EXR_{it} + \beta_4\, INTR_{it} + \varepsilon_{it}$

$ECT_{it-1} = R_{it-1} + \beta_0 + \beta_1\, TVOL_{it-1} + \beta_2\, VIX_{it-1} + \beta_3\, EXR_{it-1} + \beta_4\, INTR_{it-1} + \varepsilon_{it}$

Where: R_{it} is the stock market return (all share index), $TVOL_{it}$ trading volume (market activity sentiment), VIX_{it} Volatility index (uncertainty/fear sentiment), $INTR_{it}$ interest rate-10yr bond rate (macroeconomic sentiment), EXR_{it} exchange rate (macroeconomic sentiment), it is time interval ε_{it} the error term.

4. Results and Discussion

Introduction

This chapter presents empirical findings of relationship between investor sentiment factors and stock returns in Nigerian capital market, based on daily time series data analysis from 30/04/2019 to 02/06/2025. The data analysis is conducted using EViews, and results are discussed in line with research questions.

Descriptive Statistics

Table 1 present descriptive statistics for all the variables. All variables have positive average mean values and standard deviation with VIX having the highest mean value 0.0842 and standard deviation value 0.0772 indicating that high variability leads to high stock return. R, EXR, and INTR show relatively low volatility compared to TVOL (0.2171) and VIX (0.0772) with relatively high volatility implying high sentiment relative to stock return. TVOL has the highest standard deviation value, 0.2171, with a relatively low mean value, 0.000254, implying that the variability in transaction volume does not influence stock return and prices and trading volume is not a sentiment factor. Skewness and kurtosis for stock return R (0.62) (10.54) shows large positive returns relative to small losses with extreme returns indicating presence of crashes and booms sentiment driven in returns, TVOL (0.10) (6.09) shows extreme trading volume indicating panic buying/selling or speculative bubbles sentiment driven, VIX (2.09) (9.18) shows presence of uncertainty and fear relative to high kurtosis indicating presence of uncertainty, fear, mood as sentiment driven factors, EXR (3.14) (51,84) shows extreme exchange rate fluctuations relative to a very high kurtosis indicating exchange rate can cause market instability, INTR (-1.08) (45.61) shows frequent rate cuts and monetary policy adjustment causing extreme imbalance interest rate. The Jarque-Bera for all the variables shows extreme values indicating non-normal distribution, which can be attributed to the presence of sentiment-driven factors for all the variables.

Table 1. Descriptive statistics of variables

	R	TVOL	VIX	EXR	INTR
Mean	0.000877	0.000254	0.084294	0.001106	0.000208
Maximum	0.060478	1.156049	0.625878	0.311849	0.203526
Minimum	-0.05033	-1.029763	0.001766	-0.18602	-0.2049
Std. Dev.	0.008205	0.217199	0.077213	0.025113	0.018763
Skewness	0.621505	0.102421	2.087076	3.140182	-1.08171
Kurtosis	10.54049	6.087379	9.184224	51.84333	45.61313
Jarque-Bera	3608.881	591.5852	3439.83	149851.8	112495.4
Probability	0	0	0	0	0
Observations	1483	1483	1483	1483	1483

Unit Root Test

Table 2 shows all variables are stationary at level form I(0) and do not contain unit root by employing Philip-perron and Augmented dicker fuller stationarity test.

Table 2. Philip-Perron and Augmented Dicker fuller Unit root test

Philip-perron (PP)		Augmented dicker fuller (ADF)	
With Constant & Trend		With Constant & Trend	
t-Statistic	Prob.	t-Statistic	Prob.
-32.8966	0	-9.2683	0
-198.3995	0.0001	-14.8427	0
-17.2728	0	-8.1107	0
-50.0972	0	-9.57	0
-41.8496	0	-6.8634	0

Correlation

Table 3 reveals that all variables exhibit weak correlations because their values are close to zero, except VIX, with a positive weak correlation value of 0.13 to stock return, which suggests a slight linear relationship between volatility (fear, uncertainty, mood) and stock return. Also, INTR has negative correlation with all variables except stock return R, suggesting an inverse relationship with trading volume TVOL, volatility index VIX and exchange rate EXR. This also suggest that interest rate cannot be used to predict stock return concerning the sentiment-driven factor.

Table 3. Correlation Matrix

	R	TVOL	VIX	EXR	INTR
R	1	0.02832	0.131304	0.03309	0.023002
TVOL	0.02832	1	0.021213	0.019552	-0.04823
VIX	0.131304	0.021213	1	0.049387	-0.00117
EXR	0.03309	0.019552	0.049387	1	-0.00321
INTR	0.023002	-0.04823	-0.00117	-0.00321	1

ARDL Test

Table 4 presents the ARDL test. The table shows that stock return R is statistically significant for the lagged returns R(-1), R(-2), suggesting that past returns influence current returns, implying the presence of mean reversion and autoregressive returns. Mean reversion shows that returns can correctly adjust to normal returns after spikes. Volatility index (VIX) is statistically significant at current level VIX and lagged VIX(-2), which implies presence of past and present volatility (uncertainty, fear, attention) can influence stock return and prices. Exchange rate is also statistically significant at EXR and EXR(-1), implying that exchange rate fluctuation and portfolio institutional investors' activities in the current and past can influence stock return, indicating both phenomena can drive sentiment and trading strategies. R-squared: 0.0975 implies 9.75% of the variation in stock return is explained by the model, F-statistic: 17.66 with p-value = 0.0000, indicating the model is statistically significant overall, and Durbin-Watson stat: 1.99, which is close to 2 implies no autocorrelation in residuals, so the model's assumption is sound.

Table 4. ARDL Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
R(-1)	0.220795	0.025927	8.516149	0
R(-2)	0.093652	0.025936	3.610881	0.0003
TVOL	0.000788	0.000942	0.836193	0.4032
VIX	0.007439	0.00358	2.077796	0.0379
VIX(-1)	-0.00272	0.004414	-0.61656	0.5376
VIX(-2)	0.007666	0.003576	2.143514	0.0322
EXR	0.017487	0.00843	2.074246	0.0382
EXR(-1)	0.025369	0.008427	3.010377	0.0027
INTR	0.011793	0.010894	1.082489	0.2792
C	-0.0005	0.000336	-1.47343	0.1408
R-squared	0.09749			
Adjusted R-squared	0.091968			
Durbin-Watson stat	1.993621			
F-statistic	17.6554			
Prob(F-statistic)	0			

ARDL Long Form and Bound Test

The model F statistics 96.14 is greater than 5% significance level, indicating presence of a long-run relationship between variables and stock returns. At long run, both VIX and EXR are positively significant, implying a unit increase in VIX will increase returns by 1.80% and EXR, a unit increase will increase returns by 6.25%. TVOL and INTR have no statistically significant long-run effect on stock return.

Table 5. ARDL Bound Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TVOL	0.001149	0.001373	0.836504	0.403
VIX	0.018063	0.004615	3.913823	0.0001
EXR	0.062513	0.019886	3.143523	0.0017
INTR	0.017202	0.015935	1.079492	0.2805

EC = R - (0.0011*TVOL + 0.0181*VIX + 0.0625*EXR + 0.0172*INTR)

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	96.14691	10%	2.45	3.52
k	4	5%	2.86	4.01
		2.50%	3.25	4.49
		1%	3.74	5.06

Error Correction Model

The ECM shows short run dynamics with error correction term CointEq(-1) value -0.6855, indicating stock return has 68% adjustment after short run dynamics, that is, stock return can correct itself at the rate 68% after every spike in return and prices, confirming a stable long run relationship. Lagged D(R(-1), D(VIX(-1) shows negative coefficient implying at short run return can correct itself, and the volatility index may reverse after 1 period while D(VIX) and D(EXR) positively influence stock returns.

Table 6. Error Correction Model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0005	0.000204	-2.4212	0.0156
D(R(-1))	-0.09365	0.025591	-3.65961	0.0003
D(VIX)	0.007439	0.003261	2.280838	0.0227
D(VIX(-1))	-0.00767	0.003252	-2.35697	0.0186
D(EXR)	0.017487	0.005143	3.400357	0.0007
CointEq(-1)*	-0.68555	0.031225	-21.9555	0
R-squared	0.387034			
Adjusted R-squared	0.384956			

Durbin-Watson stat	1.993621
F-statistic	186.2666
Prob(F-statistic)	0

Robustness Test

Autocorrelation Test

The Breusch-Godfrey Serial Correlation LM Test reveals no evidence of autocorrelation in residuals of the ARDL model up to second lag (F-statistic = 0.738, p = 0.4784; Obs*R-squared = 1.486, p = 0.4758). Furthermore, the Durbin-Watson statistic (2.003) closely approximates the ideal value of 2, corroborating absence of first-order serial correlation. These findings validate the model's dynamic specification and confirm that the residuals are independently distributed, strengthening reliability of the parameter estimates.

Table 7. Autocorrelation Test.

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.737582	Prob. F(2,1469)	0.4784
Obs*R-squared	1.485723	Prob. Chi-Square(2)	0.4758

Heteroskedasticity Test.

The results of Breusch-Pagan-Godfrey test reveal statistically significant heteroskedasticity in residuals of the ARDL model (F-statistic = 6.25, p < 0.005). This indicates that variance of error terms is not constant, violating homoskedasticity assumption of classical OLS regression. Specifically, trading volume (TVOL) and volatility index (VIX) significantly contribute to the heteroskedasticity, implying that market activity level and investor sentiment levels influence the uncertainty in return predictions. While heteroskedasticity does not bias coefficient estimates, it renders standard errors inefficient, thereby affecting reliability of inferential statistics.

Table 8. Heteroscedasticity Test.

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	6.253253	Prob. F(9,1471)	0
Obs*R-squared	54.57391	Prob. Chi-Square(9)	0
Scaled explained SS	270.4531	Prob. Chi-Square(9)	0

Discussion of Findings

The descriptive statistics suggest high standard deviation, skewness, and high kurtosis in variables such as VIX and TVOL. This aligns with the theory that investor sentiment introduces irrational or emotional factors into trading behavior**,** impacting returns unpredictably. High variation in trading volume (TVOL), which reflects market activity and speculative interest, suggests the presence of emotional trading or herding behavior, yet it does not have a direct impact on returns. In contrast, spikes in the Volatility Index (VIX) indicate fear-driven reactions that significantly influence both stock returns and prices. Given the high Jarque-Bera stats, investor sentiment plays significant role in shaping abnormal stock return patterns. Also, given the high standard deviation of VIX in relation to high stock return, this implies VIX is a strong investor sentiment indicator that could influence stock return.

The correlation matrix reveals that stock returns (R) exhibit a modest positive relationship with market volatility (VIX: 0.131), supporting VIX as a behavioral and sentiment factor where fear, emotions, attention, herding, and mood drives price swings. Exchange rate (EXR) has a modest positive relationship with stock return, trading volume and volatility index suggesting fluctuations in exchange rate is a sentiment factor which drives trading activities especially for institutional and foreign portfolio investors and can be relied upon as an investment factor to be relied upon in Nigeria's capital market. Trading volume (TVOL), however, shows negligible correlation with returns (0.028), suggesting it may be a noisy sentiment proxy in which cannot be relied upon as a sentiment factor and trading strategy to influence stock return in Nigeria's market.

The ARDL model confirms a significant relationship exists between investor sentiment indicators and stock return in Nigeria, particularly through VIX (current and lagged) which shows that sentiment-related volatility affects returns implying behavioural factors like fear, attention, mood can drive stock return and stock prices and EXR (exchange rate), both current and lagged values affect returns, suggesting economic and investor confidence factors are important for determining stock returns and stock prices while Stock returns are autoregressive, indicating that past return behavior influences current returns. VIX and EXR are the most influential investor sentiment indicators as seen in the ARDL model because they are statistically significant with positive coefficient values while TVOL and INTR do not significantly influence returns, at least in the short run. Table 5 ARDL bound test shows VIX and EXR have a long-run effect and positively statistically significant implying at long run, both factors can be relied upon as a trading strategy with sentiment for possible continuous stock returns in the future. Also Table 6, error correction model suggest presence of short implying that lagged returns D(R(-1) and lagged volatility D(VIX(-1) has the ability to quickly revert and correct itself at the rate of 68% in short run whenever there is a boom/crash or bear/bullish market condition. The lagged value of stock returns, D(R(−1)), confirms presence of mean-reverting behavior in the market, whereby past negative performance is typically followed by a subsequent rebound in returns. The Breusch-Godfrey LM test ($p > 0.05$) confirms no serial correlation in ARDL residuals, ensuring unbiased estimates. This validates the model's lag selection and supports the conclusion that volatility (VIX) and exchange rates (EXR) are key drivers of Nigerian stock returns, independent of past residual effects. The Breusch-Pagan-Godfrey test ($p < 0.05$) detects heteroskedasticity, driven primarily by market volatility (VIX) and trading volume (TVOL). This suggests that sentiment-induced uncertainty exacerbates return variability.

5. Summary, Conclusion, and Recommendations

Summary of Findings

This study investigates the impact of investor sentiment on stock returns and most important sentiment factor in Nigerian capital market using daily secondary time series data actively traded stocks from both financial and non-financial sectors. The key sentiment indicators analyzed include trading volume, volatility index, exchange rate and interest rate which represent investor sentiment factors that comprise sentiment factors from aggregate market trading activities, individual and institutional investor sentiment factors, macroeconomic sentiment factor. The study results showed that Volatility index and exchange rate are the most important sentiment factors in Nigeria market with positive coefficient and statistically significant. Also, the result showed presence of both long run and short run effect implying that at long run, both volatility and exchange rate can influence stock return positively at long run while at short run, volatility and stock return has both negative and positive influence suggesting a mean reverting behaviour implying that irrespective of market and economic conditions, stock return and stock prices has the ability to correct and adjust itself in relation to market and economic conditions. The Robustness tests confirmed the model is stable and reliable, free from autocorrelation and multicollinearity, while heteroscedasticity test revealed that volatility index and trading volume contribute to the heteroscedasticity status of the model which underscore both factors signal sentiment trading behaviour presence in the market. Hence, these findings underscore the relevance of behavioral finance theories, particularly Noise Trader Theory and prospect theory**,** in explaining market anomalies and sentiment in Nigeria.

Conclusion

Investor sentiment plays significant role in determining stock market performance in Nigeria, while conventional financial models focus on fundamental and technical values, this study has shown that behavioral, psychological, and emotional factors, as proxied by aggregate market activity, retail, and institutional investor activity, positively influence stock returns and asset prices in an emerging market context, such as Nigeria. The evidence supports the argument that non-fundamental sentiment variables, such as uncertainty, optimism, confidence, and market trading herding should not be ignored in understanding return dynamics, particularly in markets like Nigeria where retail investor dominance and weak information efficiency prevail. The study also provides evidence that exchange rate fluctuations influence investor sentiment in Nigerian market, highlighting importance of effective exchange rate management as a strategic tool for enhancing capital market development and performance. Similarly, managing market volatility is crucial for understanding stock return dynamics and improving overall performance in Nigerian capital market.

Recommendations

Based on study findings, the following recommendations are suggested:

- Investor**s** can incorporate sentiment indicators into trading and portfolio strategies in relation to monitoring trading volume and investor confidence indices which can improve trading and risk management.
- Policymakers and Regulators can develop and publish a local investor sentiment index dashboard to guide market participants in identifying and preventing panic trading to manage the market volatility.

- Analysts and Financial Adviser can **c**ombine technical, fundamental, and sentiment analysis when forecasting stock performance for better trading strategy

Policy Implications

Understanding investor sentiment provides a behavioral lens through which Government and regulatory authorities can anticipate speculative bubbles, market overreactions, or irrational pessimism. These responses can be improved by: implementing early warning systems based on sentiment thresholds, effective communication policies during high-volatility periods and strengthening market transparency to reduce information gaps that fuel sentiment-driven mispricing.

Suggestions for Future Research

Investor sentiment is a broad area of focus in portfolio construction and optimization, emphasizing the behavioral tendencies of market participants and their influence on overall market performance**.** Future research could lean towards adoption of text-based analysis of local news and social media sentiment using machine learning, artificial intelligence, or NLP techniques. Within Nigeria context, the emergence of several Fintech applications that ease access to stock trading and proliferation of personal finance experts that offers financial literacy advise via social media necessitate a future study to know their impact on trading activities in the Nigeria capital market. Also, future study could lean towards investigating sentiment impact at the firm or sector level to provide insights, especially for portfolio optimization.

Declaration:

Availability of data and material:

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests:

The authors declare that they have no competing interests

Funding:

Not Applicable

Authors' contributions:

All authors contributed, read and approved the final manuscript

Acknowledgements:

Not Applicable

Ethics approval and consent to participate:

Not Applicable

Consent for publication:

All the authors consented to this publication

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