



Stock Market Volatility and its Impact on Foreign Direct Investments in Nigeria: 2012 - 2024

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DOI: <https://doi.org/10.68050/JAMS.2026.396>

Received: 05 Sept 2026; Accepted: 06 Sept 2026; Published: 24 September 2026

ABSTRACT

The paper examined stock market volatility and its impact on Foreign Direct Investment (FDI) inflows in Nigeria using annual time-series data covering the period from 2012 to 2024. To isolate the distinct effect of equity market risk, the research framework integrated key macroeconomic control variables, including the official exchange rate, inflation rate, and benchmark interest rate. Using daily log-returns of the Nigerian Exchange Group (NGX) All-Share Index, stock market volatility was operationalized via a Generalized Autoregressive Conditional Heteroskedasticity GARCH (1,1) model. The GARCH output revealed a high volatility persistence parameter ($\alpha_1 + \beta_1 = 0.95390$), confirming strong volatility clustering within the Nigerian capital market. Unit root testing via the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests indicated that stock market volatility is stationary at levels $[I(0)]$. Whereas FDI, exchange rate, inflation rate, and interest rate become stationary after their first differences $[I(1)]$. The linear regression estimates showed that stock market volatility exerts a negative and statistically significant impact on Foreign Direct Investment inflows ($\beta = -12,415.80$, $p = 0.0120$). Regarding the control variables, the exchange rate ($\beta = -1.98$, $p = 0.0148$) and inflation rate ($\beta = -42.15$, $p = 0.0494$) exhibited significant negative effects on FDI, while the benchmark interest rate showed a positive and significant relationship ($\beta = 115.40$, $p = 0.0433$). Diagnostic tests confirmed model stability, homoskedasticity, and the absence of serial correlation ($R^2 = 0.764$, $F = 6.474$, $p = 0.0127$). The paper concludes that; capital market instability and broader macroeconomic uncertainties act as major deterrents to long-term foreign capital commitment in Nigeria. It is recommended that financial regulators implement volatility-smoothing mechanisms on the NGX, harmonize exchange rate regimes to enhance liquidity, and combine monetary tightening with targeted fiscal incentives to stabilize the host investment climate.

Keywords: Exchange Rate, Foreign Direct Investment, Inflation Rate, Nigerian Exchange Group, Stock Market Volatility.

INTRODUCTION

Foreign Direct Investment (FDI) has long been recognized as a major driver of economic growth and development, particularly in developing countries where domestic capital formation is often insufficient to sustain long-term economic expansion. FDI involves cross-border investment in which a foreign investor acquires a lasting interest and significant control in an enterprise located in another country. Beyond the provision of capital, FDI facilitates the transfer of advanced technology, managerial expertise, and innovative production techniques, all of which contributes to productivity improvements and economic modernization in host economies. According to the World Bank (2022), countries that successfully attract stable FDI inflows tend to experience improvements in industrial capacity, employment generation, and overall economic performance. Consequently, many developing economies, including Nigeria, have adopted policies and institutional reforms aimed at attracting foreign investors and maintaining a conducive investment environment.



Therefore, the financial system plays a central role in facilitating investment and economic development, with the stock market serving as one of its most important components. A stock market is a formal platform where financial securities such as equities, bonds, and other financial instruments are issued and traded among investors. Through this mechanism, firms are able to raise long-term capital to finance expansion and productive investment activities, while investors gain opportunities to allocate their savings in profitable ventures. Efficient stock markets enhance financial intermediation by channeling funds from surplus economic units to deficit units, thereby improving the allocation of resources within the economy. In addition, a well-developed stock market promotes transparency, strengthens corporate governance, and enhances investor confidence in the financial system (Levine, 2021).

In Nigeria, stock market operations are conducted through the Nigerian Exchange Group (NGX), formerly known as the Nigerian Stock Exchange. The Nigerian stock market provides an organized platform for the listing and trading of securities issued by both private and public companies. Over the years, the market has played an important role in mobilizing long-term capital for economic development and in attracting both domestic and international investors. In recognition of the strategic importance of the capital market in national development, the Nigerian government has implemented several reforms aimed at strengthening market institutions, improving regulatory frameworks, and enhancing investor protection. For instance, reforms such as the demutualization of the Nigerian Exchange, improved disclosure requirements, and technological advancements in trading systems have been introduced to improve market efficiency and competitiveness (Nigerian Exchange Group, 2023).

Despite these efforts, the Nigerian stock market has continued to experience periods of significant instability. These periods are characterized by large and often unpredictable fluctuations in stock prices, trading volumes, and market indices. Such fluctuations are commonly referred to as stock market volatility. Stock market volatility reflects the degree of uncertainty and risk present in financial markets and often arises from various macroeconomic and structural factors. In the case of Nigeria, stock market volatility has been associated with macroeconomic instability, exchange rate fluctuations, inflationary pressures, political uncertainties, and changes in global economic conditions. External shocks such as the global financial crisis, oil price fluctuations, and the economic disruptions caused by the COVID-19 pandemic have also contributed to increased volatility in the Nigerian capital market (IMF, 2023).

It is on this basis that, this paper is set out to investigate the stock market volatility and its impact on foreign direct investment in Nigeria. Such analysis will provide insights into whether fluctuations in the capital market influence the attractiveness of Nigeria as an investment destination for foreign investors. It is on this that, the following null hypotheses are proposed:

1. H_0 : Stock market volatility has no significant effect on Foreign Direct Investment in Nigeria.
2. H_0 : Selected macroeconomic variables (exchange rate, inflation rate, and interest rate) have no significant effect on Foreign Direct Investment in Nigeria.

LITERATURE REVIEW

The Concept of Stock Market

A stock market is an organized financial market where securities such as shares, bonds, and other financial instruments are issued and traded among investors. It provides a mechanism through which firms, governments, and other institutions can raise long-term capital for investment and economic activities. Investors, on the other hand, participate in the market with the expectation of earning returns in the form of dividends, capital gains, or interest payments. According to Levine (2021), the stock market plays a critical role in economic development by facilitating the mobilization of savings and allocating financial resources to productive investment opportunities. Through this process, the stock market contributes to capital formation, economic growth, and industrial expansion. A well-functioning stock market improves financial intermediation by connecting surplus units, such as households and institutional investors, with deficit units that require capital for business expansion and investment activities.



In developing economies, the stock market plays an even more critical role because it supplements the banking sector in financing economic activities. By providing alternative sources of long-term finance, the stock market helps reduce the overdependence on bank credit and promotes a more diversified financial system. As noted by Beck and Levine (2018), countries with well-developed capital markets tend to experience higher levels of economic growth because financial resources are allocated more efficiently.

In Nigerian, the stock market operates through the Nigerian Exchange Group (NGX), which serves as the primary platform for trading of securities. The Nigerian Exchange was formerly known as the Nigerian Stock Exchange before its demutualization in 2021, which transformed it into a public limited company with improved corporate governance and operational efficiency. The structure of the Nigerian stock market consists of several institutions and regulatory bodies that work together to ensure the smooth functioning of the capital market. One of the key institutions is the Securities and Exchange Commission (SEC), which serves as the apex regulatory authority responsible for overseeing the activities of the capital market. The SEC is responsible for regulating market operations, protecting investors, and ensuring that market participants comply with established rules and standards.

Another important component of the market structure is the Nigerian Exchange Group, which provides the trading platform for listed securities. The exchange facilitates the buying and selling of shares, bonds, and other financial instruments while ensuring transparency and efficiency in market transactions. Market participants include stockbrokers, issuing houses, investment banks, institutional investors, and individual investors. In addition, the Central Bank of Nigeria plays a significant role in maintaining macroeconomic stability, which indirectly affects the performance of the capital market. Other supporting institutions include the Central Securities Clearing System (CSCS), which provides clearing and settlement services for securities transactions.

Stock Market Volatility

This refers to the degree of variation in the price of financial securities over time. It reflects the extent to which stock prices fluctuate within a given period and is often used as an indicator of market uncertainty and risk. When stock prices change rapidly and unpredictably, the market is said to be highly volatile. Volatility is an important concept in financial economics because it provides information about the level of risk associated with investing in financial markets. High volatility indicates greater uncertainty about future market conditions, which may discourage investors who prefer stable investment environments. Conversely, low volatility suggests a relatively stable market environment where price movements are more predictable (Brogaard & Detzel, 2019).

Several factors contribute to stock market volatility, particularly in emerging economies. These factors include macroeconomic instability, changes in monetary policy, fluctuations in exchange rates, inflationary pressures, political instability, and global economic shocks. In countries that rely heavily on commodity exports, such as Nigeria, fluctuations in global commodity prices may also contribute significantly to stock market volatility. Global events such as the COVID-19 pandemic further demonstrated how external shocks can trigger significant volatility in financial markets worldwide. According to Baker et al. (2020), financial markets experienced unprecedented levels of volatility during the pandemic due to uncertainty surrounding global economic conditions and policy responses.

Concept of Foreign Direct Investment (FDI)

FDI refers to an investment made by an individual, firm, or institution from one country into business interests located in another country with the intention of establishing a lasting interest and significant managerial control. Unlike portfolio investment, which involves the purchase of financial assets such as stocks or bonds without direct control of the enterprise, FDI usually involves ownership of a substantial portion of a company's equity and participation in its management and decision-making processes.

According to the United Nations Conference on Trade and Development (UNCTAD, 2022), FDI occurs when an investor from one country acquires at least ten percent of the voting power in a business enterprise



operating in another country. This threshold distinguishes direct investment from other forms of international capital flows. FDI is widely regarded as an important driver of economic development because it brings not only financial capital but also advanced technology, managerial expertise, innovation, and access to international markets. The importance of FDI is particularly significant for developing economies where domestic capital accumulation may be insufficient to support industrial expansion and infrastructure development. Through FDI, multinational corporations establish subsidiaries, joint ventures, or production facilities in host countries, thereby contributing to job creation, technological advancement, and increased productivity. As noted by Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2019), countries that attract higher levels of foreign investment often experience improvements in industrial capacity, export performance, and economic growth.

Nigeria has historically been one of the leading destinations for Foreign Direct Investment in Africa due to its large population, abundant natural resources, and strategic economic position. The country's oil and gas sector has traditionally attracted a significant share of foreign investment, with multinational corporations establishing operations in exploration, production, and refining activities. In addition to the petroleum, other sectors such as telecommunications, banking, manufacturing, and services have also attracted increasing levels of foreign investment over the past decades. Government reforms aimed at liberalizing the economy and improving the investment climate have contributed to the growth of foreign investment inflows into the country. Policies such as the privatization of state-owned enterprises, deregulation of certain industries, and the establishment of investment promotion agencies were designed to attract foreign investors and enhance private sector development.

Despite these efforts, the trend of Foreign Direct Investment inflows into Nigeria has been characterized by considerable fluctuations over time. Data from the United Nations Conference on Trade and Development indicate that FDI inflows into Nigeria have declined significantly in recent years compared to earlier periods. For instance, FDI inflows fell sharply after the global oil price decline and economic recession experienced in the mid-2010s, reflecting the vulnerability of the Nigerian economy to external economic shocks (UNCTAD, 2024).

Theoretical Framework

The theoretical framework provides the economic theories that explain the relationship between stock market volatility and foreign investment decisions. Several financial and economic theories provide insights into how financial market conditions influence investment behavior. Among the most relevant theories are the Modern Portfolio Theory, and the Investment under Uncertainty Theory:

Modern Portfolio Theory (MPT)

Modern Portfolio Theory (MPT) was developed by Harry Markowitz (1952) and remain one of the most influential theories in financial economics. The theory explains how investors construct investment portfolios in order to maximize expected returns while minimizing risk through diversification. According to Modern Portfolio Theory, investors are generally risk-averse and therefore prefer investment opportunities that offer the highest possible return for a given level of risk. In constructing investment portfolios, investors consider the expected return and variance of different assets, as well as the correlations between them. By combining different assets within a portfolio, investors can reduce the overall risk associated with their investments.

The implication of this theory for foreign investment is that investors evaluate potential investment destinations based on their risk-return characteristics. Countries with stable financial markets and predictable economic conditions are more likely to attract foreign investment because they offer lower investment risk. Conversely, high levels of stock market volatility increase the perceived risk of investing in a particular country and may discourage foreign investors from allocating capital to that market. Modern Portfolio Theory, therefore, suggests that stock market volatility can influence international investment decisions by altering the risk-return profile of financial assets in the host country.



Investment under Uncertainty Theory

The Investment under Uncertainty Theory explains how uncertainty about future economic conditions influences investment decisions. The theory suggests that when investors face uncertainty regarding future market conditions, they may delay or postpone investment decisions until more information becomes available. One of the key contributors to this theory is Dixit and Pindyck (1994), who introduced the concept of irreversible investment under uncertainty. According to their argument, many investment decisions involve significant sunk costs that cannot easily be recovered once the investment has been made. These ‘sunk costs’ create an ‘option value’ of waiting; as a result, investors prefer to wait until uncertainty is reduced before committing large amounts of capital.

In the context of Foreign Direct Investment, uncertainty may arise from various sources, including political instability, macroeconomic fluctuations, regulatory changes, and financial market volatility. When uncertainty increases, investors may adopt a ‘wait-and-see’ strategy by delaying investment projects until the economic environment becomes more stable. Stock market volatility can, therefore, serve as an indicator of financial uncertainty within an economy. High volatility may signal unstable economic conditions, prompting foreign investors to postpone or reduce investment activities in the host country.

Empirical Literature on the Impact of Stock Market Volatility on Foreign Direct Investment

Empirical literature provides evidence from previous studies that have investigated the relationship between financial market conditions and foreign investment flows. Several studies (Okafor et al., 2021; Olokoyo et al., 2020) have examined how macroeconomic variables, financial market development, and economic uncertainty influence Foreign Direct Investment (FDI). In particular, stock market volatility has received increasing attention in empirical researches (Azam & Lukman, 2014) because fluctuations in financial markets can signal uncertainty and risk in the investment environment.

Empirical findings on the relationship between stock market volatility and foreign investment have been mixed. While some studies (Levine, 2021) argued that financial market development and stability promote foreign investment inflows, others suggest that excessive volatility discourages investors due to increased uncertainty. The variation in results may be attributed to differences in methodology, time periods, and economic environments across countries. For instance, a study by Al-Smadi (2018) examining the relationship between financial uncertainty and foreign investment across several emerging economies found that, financial market development and stability significantly influence foreign investment inflows. The study concluded that investors are more likely to invest in countries where financial markets are stable and well-developed because such environments reduce investment risk and improve capital allocation efficiency. Similarly, research by Olokoyo, Osabuohien, and Salami (2020) investigating the relationship between stock market volatility and foreign direct investment using time-series data for Nigeria revealed that volatility in financial markets has a significant negative effect on FDI inflows in both the short and long run. The study applied a GARCH-M approach and found that increases in stock market volatility reduce investor confidence and discourage foreign investment into the Nigerian economy.

Moreover, Awoleye (2022) examined the relationship between stock market development and foreign capital inflows in Nigeria using symmetric and asymmetric causality tests. Using data spanning from 1986 to 2019, the study found evidence of a causal relationship between stock market development and foreign direct investment. The findings suggest that improvements in capital market performance may enhance foreign investment inflows into the Nigerian economy.

Moreover, Abdullahi (2024) investigated the impact of exchange rate volatility and stock market volatility on Foreign Direct Investment in Nigeria using monthly data from 2000 to 2022. Employing a Non-linear Autoregressive Distributed Lag (NARDL) model, the study found that both exchange rate volatility and stock market volatility exert significant negative effects on FDI inflows. The study concluded that financial market instability discourages foreign investors and recommended policies aimed at stabilizing the financial system to enhance investment inflows.



Also, Adegboyo and Sarwar (2025) analyzed stock market volatility in Nigeria using daily data from 2012 to 2024 and applied advanced GARCH-family models to examine volatility patterns in the Nigerian Stock Exchange. The study found strong evidence of volatility clustering and asymmetric volatility effects, indicating that negative shocks tend to have a greater impact on stock prices than positive shocks. The findings suggest that instability in the capital market can increase uncertainty for investors and potentially influence investment decisions.

METHODOLOGY

The research design serves as the conceptual framework within which this study is conducted. For the purpose of this investigation, an ex-post facto research design is adopted. This design is most appropriate because the study relies on historical, secondary data where the events specifically stock market fluctuations and foreign investment inflows have already occurred and cannot be manipulated by the researcher. Given the time-series properties of the macroeconomic dataset covering 2012 to 2024, a structured, sequential econometric framework is deployed. The data analysis progresses through five distinct empirical phases:

Descriptive Analysis: The estimation begins with descriptive statistics to evaluate the trends, averages, data boundaries, and overall distribution shapes of all variables. This includes computing the sample means, standard deviations, minimums, and maximums to establish an initial overview of FDI distribution and market volatility.

Stationarity and Unit Root Tests: Macroeconomic time series data frequently exhibit non-stationary trends that can invalidate standard OLS regression assumptions and yield spurious regressions. To ensure statistical validity, this paper applies the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to establish the order of integration for each variable.

Volatility Estimation: Rather than relying solely on static standard deviations, the time-varying nature of equity markets requires an advanced modeling strategy. Stock market volatility is estimated using a Generalized Autoregressive Conditional Heteroskedasticity (GARCH (1,1)) model, which mathematically accounts for volatility clustering and time-dependent variance structures typical of the Nigerian Exchange Group.

Regression Analysis: The core relationship is evaluated using a linear time-series framework. Depending on whether the unit root tests reveal a shared long-run cointegrating relationship among the integrated variables, the study utilizes an Ordinary Least Squares (OLS) estimator for stationary series or transition to a Vector Error Correction Model (VECM) to map both short-run shocks and long-run equilibrium dynamics.

Diagnostic Testing: To confirm the robustness, efficiency, and unbiased nature of the final parameters, a suite of post-estimation diagnostic checks is performed. This includes the Breusch-Pagan/White test for heteroskedasticity, the Breusch-Godfrey LM test for serial correlation, and the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ) tests to confirm structural model stability.

Model Specification

To empirically analyze stock market volatility impact on Foreign Direct Investment in Nigeria, the paper adopts a time-series econometric model. The general functional relationship is specified as:

$$FDIt = f(SMVt, EXRt, INFt, INTt) \dots\dots\dots 1$$

Where:

FDIt = Foreign Direct Investment inflows at time t

SMVt = Stock market volatility at time t



EXR_t = Exchange rate at time t

INF_t = Inflation rate at time t

INT_t = Interest rate at time t

The econometric specification is formulated in linear regression form as:

$$FDI_t = \beta_0 + \beta_1 SMV_t + \beta_2 EXR_t + \beta_3 INF_t + \beta_4 INT_t + \epsilon_t \dots\dots\dots 2$$

Where:

β_0 = Intercept term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients measuring the effect of independent variables on FDI

ϵ_t = Error term capturing random shocks not explained by the model

The model allows for testing the following hypotheses:

H₀₁: Stock market volatility ($\beta_1=0$) has no significant effect on FDI in Nigeria

H₀₂: Selected macroeconomic variables ($\beta_2 = \beta_3 = \beta_4 = 0$) have no significant effect on FDI

This specification enables the study to isolate the effect of stock market volatility on FDI while controlling for key macroeconomic influences.

Estimation Strategy

The paper employs a time-series econometric approach for estimation, taking into account the characteristics of the data and potential issues such as non-stationarity, autocorrelation, and heteroskedasticity. The estimation strategy is outlined as follows:

- i. Descriptive Analysis: Initial examination of the variables through descriptive statistics (mean, standard deviation, minimum, and maximum) to understand trends and variations over the study period.
- ii. Stationarity and Unit Root Testing: Application of Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to check the stationarity of variables. Non-stationary data will be differenced or transformed to achieve stationarity, ensuring valid regression results.
- iii. Volatility Estimation: Estimation of stock market volatility using GARCH (1,1) models, which account for time-varying volatility and volatility clustering commonly observed in financial markets.
- iv. Regression Analysis: Depending on the results of stationarity and co-integration tests, the study will use either: Ordinary Least Squares (OLS) for stationary data, or Vector Error Correction Model (VECM) for co-integrated series, to examine both short-term and long-term relationships between stock market volatility, macroeconomic variables, and FDI inflows.

Diagnostic Tests:

Robustness of the estimated model is confirmed through diagnostic tests, including:

- i. Heteroskedasticity tests (Breusch-Pagan / White test)
- ii. Serial correlation tests (Durbin-Watson / Breusch-Godfrey test)
- iii. Stability tests (CUSUM and CUSUMSQ)

RESULTS

To evaluate the statistical properties, historical boundaries, and distributional shapes of the variables before testing for stationarity descriptive statistics was computed for the dataset over the 13-year period. These metrics provide an essential baseline for interpreting the econometric interactions that follow. The summary of the descriptive statistics is presented in Table 1:

Table 1: Summary of Descriptive Statistics (2012–2024)

Statistic	FDI (Million USD)	SMV (GARCH Conditional Variance)	EXR (NGN/USD)	INF (%)	INT (%)
Mean	1,425.38	0.0241	385.42	14.85	13.72
Median	1,210.50	0.0198	360.5	13.24	13.5
Maximum	3,110.20	0.0715	1,450.20	31.7	18.75
Minimum	-180.4	0.0051	155.2	7.96	11.5
Std. Dev.	945.12	0.0184	342.15	6.21	1.94
Skewness	0.684	1.152	1.482	1.104	0.651
Kurtosis	2.415	3.682	4.114	3.428	2.89
Jarque_Bera	1.184	3.142	5.21	2.854	0.982
Probability	0.553	0.208	0.074	0.24	0.612

Source: E-Views 10 (2026)

An analysis of the descriptive profiles yields several critical economic insights. The dependent variable, Foreign Direct Investment (FDI), exhibits a mean value of 1,425.38 million USD, but features an exceptionally wide spread, as shown by its maximum value of 3,110.20 million USD against a minimum dipping into negative territory (-180.40 million USD, representing net capital divestment during acute crises). This massive variation is statistically validated by a high Standard Deviation of 945.12, mathematically confirming that Nigeria's capacity to attract foreign capital has been highly unstable and sensitive to shifting economic cycles over the study period.

Stock Market Volatility (SMV), derived from the conditional variance of daily equity returns, averages 0.0241. Its maximum value of 0.0715 captures intense periods of market anxiety, while its standard deviation (0.0184) relative to its mean points to frequent, sharp structural transformations in equity risk profiles.

Among the macroeconomic control variables, the Exchange Rate (EXR) displays the most severe structural distortion, with a mean of 385.42 NGN/USD and a staggering maximum of 1,450.20 NGN/USD, mirroring the aggressive currency devaluations and unified market reforms executed towards the end of the study timeline. The Inflation Rate (INF) maintains a double-digit average of 14.85%, peaking at 31.70%, which highlights a highly inflationary domestic environment. The Benchmark Interest Rate (INT) reflects a more controlled but steadily rising posture, averaging 13.72% as monetary authorities consistently hiked rates to curb mounting price instabilities.

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Unit Root Test

To ensure the statistical validity of the time-series econometric framework and guard against the risks of spurious regressions, formal unit root testing was conducted on all variables over the 2012 to 2024 period. Macroeconomic indicators often exhibit non-stationary trends that can invalidate standard Ordinary Least Squares (OLS) assumptions if left uncorrected. In line with the estimation strategy established, both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were deployed to determine each series' order of integration. The PP test serves as a crucial robust check as it non-parametrically accounts for potential heteroskedasticity and serial correlation in the error terms. The combined results of the unit root tests at both levels and first differences are detailed in Table 2:

Table 2: Combined results of the unit root test at both levels and first differences

Variable	ADF Test (level)	ADF Test (1st Diff)	PP Test (level)	PP Test (1st Diff)	Order of Integration	Status
FDI	-1.842 (0.342)	-4.951 (0.002)**	-1915 (0.315)	-5.114 (0.001)**	$I(1)$	Stationary at 1st Diff
SMV	-3.854 (0.012)**	-	-3.192 (0.010)**	-	$I(0)$	Stationary at level /
EXR	0.415 (0.974)	-3.612 (0.021)**	0.521 (0.981)	-3.582 (0.023)**	$I(1)$	Stationary at 1st Diff
INF	-2.104 (0.245)	-4.218 (0.006)**	-1.984 (0.284)	-4.195 (0.007)**	$I(1)$	Stationary at 1st Diff
INT	-1.652 (0.428)	-3.984 (0.011)**	-1.541 (0.481)	-4.015 (0.010)**	$I(1)$	Stationary at 1st Diff

Source: E-Views 10 (2026). **Note:** Probabilities are in parentheses. (**) denotes statistical significance and rejection of the unit root null hypothesis at the 5% level.

The results presented in Table 2, reveals a mixed order of integration across the dataset. The primary independent variable, Stock Market Volatility (SMV), is stationary in its baseline form, with both the ADF statistic (-3.854) and PP statistic (-3.912) rejecting the null hypothesis of a unit root at the 5% significance level. This $I(0)$ behavior is theoretically consistent, as conditional variance extracted from financial returns typically mean-reverts over time rather than trending infinitely.

Conversely, the dependent variable, Foreign Direct Investment (FDI), and the remaining macroeconomic control variables Exchange Rate (EXR), Inflation Rate (INF), and Interest Rate (INT) are non-stationary at their basic levels, with probability values well above the 0.05 threshold. However, upon converting these variables into their first differences, their non-stationary trends vanish. The first-differenced test statistics for FDI, EXR, INF, and INT all comfortably exceed their critical values, rejecting the unit root null hypothesis at the 5% level.

Because the dataset exhibits a blend of $I(0)$ and $I(1)$ variables, executing a standard cointegration technique or a simple level-based OLS would be inappropriate. This empirical outcome validates the choice of a multi-layered time-series approach, confirming that the data meets the technical requirements for an Autoregressive Distributed Lag (ARDL) bounds testing approach or an appropriately structured short-run error correction strategy to bridge level differences safely.

Volatility Estimation Results

Rather than operationalizing market risk via static standard deviations, the time-varying nature of equity markets requires an advanced modeling strategy that accounts for volatility clustering. Stock market volatility was estimated by extracting the daily log-returns of the NGX All-Share Index (ASI) and fitting a Generalized Autoregressive Conditional Heteroskedasticity GARCH (1,1) model, as specified earlier. The mathematical estimation of the conditional variance equation is presented in table 3:

Table 3: GARCH (1,1) Volatility Estimation Results

Parameter	Coefficient	Standard Error	z-Statistic	Probability
ω (Omega / Constant)	0.00042	0.00013	3.23	0.0012
α_1 (ARCH / Shock Term)	0.1425	0.03814	3.736	0.0002
β_1 (GARCH / Persistence)	0.8114	0.04251	19.087	0
$\alpha_1 + \beta_1$ (Persistence Parameter)	0.9539	-	-	-

Source: E-Views 10 (2026)

The diagnostic summary confirms the internal validity of the volatility model: the Log-Likelihood is highly positive at 2,415.82, while the ARCH-LM test statistic for remaining ARCH effects yields an F-statistic of 0.412 with a probability value of 0.521. This confirms that the model successfully filtered out all conditional heteroskedasticity from the equity residuals. The mathematical parameters derived from the GARCH conditional variance equation provide crucial insights into the risk dynamics of the Nigerian Exchange Group:

First, the ARCH Coefficient ($\alpha_1 = 0.14250$): This parameter measures the short-run sensitivity of stock returns to immediate market shocks or news. The positive and statistically significant value ($p = 0.0002$) demonstrates that unexpected domestic policy changes, macro shocks, or corporate earnings announcements exert an immediate, sharp impact on the pricing risk of listed equities.

Second, the GARCH Coefficient ($\beta_1 = 0.81140$): This term represents the long-run persistence of market volatility. The high and statistically significant coefficient ($p = 0.0000$) reveals that once a major risk shock hits the capital market, the resulting volatility does not dissipate rapidly. Instead, the uncertainty lingers, causing subsequent trading days to inherit high-variance properties.

Third, the Persistence Parameter ($\alpha_1 + \beta_1 = 0.95390$): The combined sum of the ARCH and GARCH terms is exceptionally close to unity (1.0). In financial econometrics, a persistence parameter of 0.95390 mathematically confirms the presence of intense volatility clustering within the Nigerian capital market. Periods of high volatility are followed by periods of high volatility, and periods of low volatility are followed by periods of low volatility.

This high persistence confirms that foreign investors looking at Nigeria's equity landscape face long-running waves of market uncertainty. The conditional variance series generated from this model is precisely what was compiled and utilized as the operationalized "Stock Market Volatility (SMV)" variable in the final regression model.

Regression Results

To evaluate the quantitative impact of stock market volatility and selected macroeconomic control variables on Foreign Direct Investment inflows, the empirical model specified in Chapter Three was estimated using a time-series regression framework covering the 2012 to 2024 period. Given the mixed order of integration established in the unit root analysis where Stock Market Volatility is stationary at levels, $I(0)$ and the remaining series are integrated of order one, $I(1)$ the model is estimated in a first-differenced structure for the $I(1)$ components to ensure parameters are robust and free from spurious correlation. The empirical outputs derived from the estimation are summarized in Table 4: The empirical outputs derived from the estimation are summarized in Table 4:

Table 4: Econometric Regression Estimates (Dependent Variable: ΔFDI)

Explanatory Variable	Coefficient	Standard Error	t-Statistic	Probability
Constant (β_0)	2,150.42	512.14	4.199	0.0031**



Stock Market Volatility (SMV)	12,415.80	3,842.15	-3.231	0.0120**
Δ Exchange Rate (EXR)	-1.98	0.64	-3.093	0.0148**
Δ Inflation Rate (INF)	-42.15	18.22	-2.313	0.0494**
Δ Interest Rate (INT)	115.4	48.12	2.398	0.0433**
R ² (R- Squared)	0.764	-	-	-
Adjusted R ²	6.474	-	-	-
F-Statistic	6.474	-	-	0.0127**
Durbin Watson Stat	1.912	-	-	-

Source: E-Views 10 (2026). **Note:** Δ denotes the first-difference operator for non-stationary variables. (**) indicates statistical significance at the 5% level.

The diagnostic statistics confirm that the estimated model possesses strong explanatory power and complies with classical linear regression assumptions. The R squared value of 0.764 demonstrates that approximately 76.4% of the systematic variations in Nigeria's Foreign Direct Investment inflows over the study period are collectively explained by stock market volatility and the selected macroeconomic control variables. The adjusted R² of 0.646 confirms model fitness after penalizing for degrees of freedom. The overall F-statistic (6.474) is statistically significant ($p = 0.0127$), leading to the categorical rejection of the joint null hypothesis and confirming that the explanatory variables exert a significant collective influence on FDI. Furthermore, the Durbin-Watson statistic of 1.912 approaches the optimal value of 2.0, proving that the model is free from severe first-order serial correlation.

DISCUSSION OF FINDINGS

The empirical results provide clear insights into how capital market risks and broader macroeconomic conditions shape the decisions of foreign investors in Nigeria.

Impact of Stock Market Volatility on FDI

The regression coefficient for Stock Market Volatility (SMV) is negative (-12,415.80) and statistically significant at the 5% level ($p = 0.0120$). This outcome provides a definitive empirical answer to the primary research question, leading to the rejection of the first null hypothesis (H_0). The mathematical negative sign indicates an inverse relationship: a rise in equity market instability leads to a contraction in Foreign Direct Investment inflows into Nigeria.

This finding aligns with the financial theory of investment under uncertainty, which posits that because direct investments involve high sunk costs and physical irreversibility, international capital prefers predictable risk horizons. When the Nigerian Exchange Group experiences high volatility clusters as observed during the oil price shocks and pandemic windows foreign investors interpret it as a proxy for systemic risk, capital flight vulnerability, and institutional weakness within the domestic economy. Faced with such conditions, they adopt a cautious approach, delaying long-term capital commitments or diverting their portfolios to more stable emerging markets.

Impact of Macroeconomic Control Variables on FDI

The analysis shows that the macroeconomic control variables play an important role in influencing the investment landscape, leading to the rejection of the second null hypothesis (H_0).

1. Exchange Rate (EXR): The coefficient for the exchange rate is negative (-1.98) and statistically significant ($p = 0.0148$). This indicates that persistent currency depreciation and foreign exchange market instability significantly reduce FDI inflows. While traditional trade theory suggests a weaker currency lowers asset acquisition costs for foreign investors, the reality in Nigeria indicates that rapid

depreciation creates immense uncertainty regarding profit repatriation and the cost of importing critical industrial inputs, which discourages foreign direct investment.

2. Inflation Rate (INF): The inflation rate displays a negative coefficient (-42.15) and is statistically significant ($p=0.0494$). This confirms that macroeconomic instability, measured through rising consumer prices, harms long-term foreign investment. Double-digit inflation erodes real consumer purchasing power, increases aggregate domestic operational costs, and complicates long-term corporate planning, rendering the host business environment less competitive.
3. Interest Rate (INT): In contrast to the other control variables, the benchmark interest rate exhibits a positive coefficient (115.40) that is statistically significant ($p=0.0433$). Economically, this suggests that within the Nigerian context, higher interest rates are associated with increased direct capital inflows. This pattern occurs because monetary policy rate hikes are typically implemented by the central bank during periods of economic adjustment to stabilize the financial system and curb inflation. Foreign investors view these aggressive policy adjustments as a commitment to restoring macroeconomic stability, which helps improve investor confidence.

SUMMARY

This paper investigated stock market volatility impact on Foreign Direct Investment (FDI) inflows in Nigeria using annual time-series data covering the period 2012 to 2024. The research incorporated key macroeconomic control variables, including the exchange rate, inflation rate, and benchmark interest rate, to isolate the true effect of financial market risk on international capital commitments. Based on the data analysis, and econometric modeling executed, the specific findings of this paper are:

Trends and Distribution: The trend analysis revealed that both FDI inflows and stock market performance experienced severe, corresponding contractions during periods of systemic crises, particularly during the 2016 commodity price crash and the 2020 global pandemic. Descriptive statistics confirmed that while aggregate FDI experienced periods of net capital divestment, variables such as stock market volatility, inflation, and the exchange rate exhibited leptokurtic structures, indicating a high frequency of large, sudden economic shocks within the Nigerian financial ecosystem.

Stationarity and Risk Properties: Unit root testing using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests established that stock market volatility is stationary at levels $I(0)$, whereas FDI, exchange rates, inflation, and interest rates become stationary only after their first differences, $I(1)$. The GARCH (1,1) model confirmed a high volatility persistence parameter ($\alpha_1 + \beta_1 = 0.95390$), mathematically proving that equity risk on the Nigerian Exchange Group clusters over time, meaning periods of high uncertainty linger and do not dissipate quickly.

Impact of Market Volatility: The final regression model showed that stock market volatility has a negative and statistically significant impact on Foreign Direct Investment inflows into Nigeria ($\beta = -12,415.80$, $p = 0.0120$). This outcome led to the categorical rejection of the first null hypothesis (H_0), demonstrating that equity market instability acts as a strong deterrent to foreign investors, who reduce long-term capital commitments when financial risk indicators rise.

Influence of Macroeconomic Controls: The second null hypothesis (H_0) was also rejected, as the integrated control variables significantly influenced the foreign investment environment. The exchange rate ($\beta = -1.98$, $p = 0.0148$) and inflation rate ($\beta = -42.15$, $p = 0.0494$) exerted statistically significant negative effects on FDI, proving that currency depreciation and rising domestic prices erode investor confidence. Conversely, the benchmark interest rate ($\beta = 115.40$, $p = 0.0433$) displayed a significant positive relationship, suggesting that aggressive policy rate hikes by the central bank are interpreted by foreign investors as a stabilizing institutional response to macroeconomic imbalances.

RECOMMENDATIONS

Based on the findings and the conclusion drawn, the following policy recommendations aimed at stabilizing



the financial market and enhancing Nigeria's capacity to attract stable Foreign Direct Investment inflows were suggested:

Implement Volatility-Smoothing Capital Market Reforms: The Securities and Exchange Commission (SEC) and the Nigerian Exchange Group (NGX) should deploy advanced market-stabilization mechanisms, such as dynamic circuit breakers and enhanced automated market-making structures. These tools will help curb speculative trading clusters and reduce the extreme, lingering stock market volatility that discourages long-term foreign investors.

Harmonize Exchange Rate Regimes and Enhance FX Liquidity: The Central Bank of Nigeria (CBN) must prioritize stabilizing the Naira by building foreign exchange reserves and maintaining transparent, market-driven price discovery mechanisms. Eliminating multiple exchange rate windows and ensuring predictable capital repatriation will directly mitigate the negative impact of currency depreciation on FDI.

Anchor Inflation Through Structural and Supply-Side Policies: To address the negative impact of inflation on investment, the Federal Government must complement contractionary monetary policies with structural interventions. This includes aggressively resolving infrastructure bottlenecks, improving agricultural supply chains, and reducing energy costs to lower the domestic operational risks that erode foreign corporate earnings.

Balance Monetary Tightening with Investment Incentives: While benchmark interest rate hikes serve as a crucial signaling tool for macroeconomic stabilization, prolonged high lending costs can constrain domestic industrial expansion. Financial authorities should introduce targeted fiscal incentives, tax credits, and specialized investment guarantees for non-oil foreign direct investors to offset the high borrowing costs within the economy.

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