PressAcademia
www.pressacademia.org/journals/jefa
JEFA
ISSN 2148-6697
Journal of Economics, Finance and Accounting YEAR 2025 VOLUME 12 ISSUE 1

EXCHANGE RATE VOLATILITY, STOCK MARKET DYNAMICS AND FOREIGN DIRECT INVESTMENT IN NIGERIA (2002–2023)

DOI: 10.17261/Pressacademia.2025.1973
JEFA- V.12-ISS.1-2025(6)-p.54-70

Adedayo M. Adebisi[1], Olusegun T. Odesola[2], Kehinde Aromona[3], Bisola Oyenekan[4]
[1]Obafemi Awolowo University, Department of Management and Accounting, Ile-Ife, Nigeria.
adebisiam@oauife.edu.ng, ORCID: 0009-0004-6496-3276
[2]Obafemi Awolowo University, Department of Management and Accounting, Ile-Ife, Nigeria.
segunodesola@oauife.edu.ng, ORCID: 0000-0003-4017-1042
[3]Obafemi Awolowo University, Department of Management and Accounting, Ile-Ife, Nigeria.
kgaromona@student.oauife.edu.ng, ORCID: 0009-0003-3301-7968
[4]Obafemi Awolowo University, Department of Management and Accounting, Ile-Ife, Nigeria.
bisola3005@gmail.com, ORCID: 0009-0005-7082-8756

Date Received: November 10, 2024 **Date Accepted:** June 12, 2025

To cite this document
Adebisi, A.M., Odesola O. T., Aromona, K., & Oyenekan, B. (2025). Exchange rate volatility, stock market dynamics and foreign direct investment in Nigeria (2002–2023). Journal of Economics, Finance and Accounting (JEFA), 12(1), 54-70.
Permanent link to this document: http://doi.org/10.17261/Pressacademia.2025.1973

ABSTRACT

Purpose - The study tests the interactive and causal relationship among exchange rate volatility (ERV), foreign direct investment (FDI), and stock market performance (SMP) in Nigeria from 2003–2022. Specifically, it investigates the long-run effect of ERV on SMP as well as the interactive effect of ERV and SMP on FDI.
Methodology - The research follows an explanatory time series design and relies on secondary data gathered from the World Bank database. Econometric techniques, including the Autoregressive Distributed Lag (ARDL) model, Granger causality tests, and multiple regression analysis, are employed to examine both short- and long-run relationships among the variables.
Results - The long-run ARDL specification and bounds test reveal the presence of a large inverse relationship between lagged and current FDI, which indicates an adjustment process towards equilibrium. Exchange rates have a positive and significant effect on long-run FDI, but the dynamics of short-run exchange rate movements and stock market performance are not significant. More volatility of exchange rates is also associated with low FDI, which reflects the adverse effect of exchange rate uncertainty on foreign investment.
Conclusion - The evidence supports the supreme role played by exchange rate dynamics in determining FDI inflows. The long-run negative impact of exchange rate volatility on FDI supports the need for policy measures to ensure exchange rate stability for a more conducive investment climate in Nigeria.

Keywords: Exchange rate volatility, stock market performance, foreign direct investment, ARDL model.
JEL Codes: F31, F21, G15, O55

1. INTRODUCTION

What relationship exists amongst stock market performance (SMP), exchange rate volatility (ERV) and foreign direct investment (FDI) flows? This opening question seeks to examine the interconnections amongst fluctuations in exchange rate (ER) and two key financial outcomes—SMP and FDI—investigating the degree to which instability in exchange rates may influence investor confidence, capital inflows, and the performance of stock markets. This initial question can lead to further sub-questions, such as: To what extent does ERV deter or attract FDI flows? In what ways does SMP respond to changes in exchange rate stability? Are certain sectors or types of FDI more sensitive to exchange rate volatility? These set of questions will provide a nuanced view of the associations among ERV, stock market dynamics, and FDI. They would enable the research to capture both indirect and direct effects, which can be valuable for investors, financial analysts and policymakers. Previous empirical studies either in developed and developing economies had made attempts to provide empirical information on how ERV impact SMP and FDI flows.

For instance, the study carried out by Odili (2015) examined how ERV and SMP influence FDI inflows to Nigeria, by means of data ranging from 1980 to 2013. It applied a model known as error correction mechanism (ECM) as well as ordinary least squares (OLS) method and observed that ERV substantially and negatively impacts FDI inflows for the long- and short-terms, indicative of the fact that unstable currency deters foreign investors. Conversely, stock market performance, represented by

market capitalization, has a statistically positive substantial effect on FDI, suggesting that a robust and stable capital market can attract more foreign investment. Also, Kilicarslan (2018) examined, in Turkey, the association that exits betwixt ERV and FDI, using datasets from 2005 to 2018. It used a GARCH model as well as Toda-Yamamoto test of causality, in which the discoveries showed one-way causality from FDI to ERV, indicating that FDI inflows may impact currency stability by influencing capital flows. In another attempt, Uzoma-Nwosu and Orekoya (2020) discovered that FDI contributed to productivity growth, job creation, and technological advancements, particularly in sub-Saharan Africa (SSA) and that exchange rate fluctuations, especially currency depreciation led to increased production costs, reduced FDI inflows, and broader economic issues like poverty, inequality, and trade imbalances. Sharfi-Renani and Mirfatah (2012) probed the determinants of FDI in Iran, concentrating particularly on ERV and they used the Johansen and Juselius cointegration model with data from 1980Q2 to 2006Q3 to obtain the findings that revealed that openness, Gross Domestic Product (GDP) as well as exchange rates (ER) have a favourable connection with FDI, whereas world crude oil prices and ERV negatively affect FDI inflows. Also, Havi (2021) investigated the ERV- FDI relationship in Ghana and reported that economic openness and exchange rate depreciation do not encourage FDI while the size of the economy and exchange rate volatility positively influence FDI inflows.

Still on the previous attempts to answer the opening research question, the study by Fapetu, Adeyeye, Seyingbo, and Owoeye (2017) analysed the influence of ERV on SMP in Nigeria by means of monthly data and ARCH-family models (ARCH, GARCH, EGARCH, TARCH) and discovered a favourable association between market capitalization and exchange rate but highlighted differences in variance residuals across models. Osinubi and Amaghionyeodiwe (2009) studied the ERV-FDI relationship in Nigeria (1970–2004) using error correction and OLS methods and discovered a favourable connection between Naira depreciation and FDI inflows but highlighted the adverse impact of the Structural Adjustment Programme on FDI due to heightened ERV. A study by Ullah, Haider and Azim (2012) studied the connection betwixt FDI, ER and its volatility in Pakistan (1980–2010) and discovered that FDI increases with currency depreciation but is deterred by exchange rate volatility while trade openness boosts FDI but the inflation is insignificant, with causality analysis showing that volatility influences FDI but not vice versa. The influence of real ERV on FDI inflows within Sub-Saharan Africa (SSA) was the focus of an investigation carried out by Suliman, Elmawazini and Shariff (2015) and they found that currency depreciation attracts more FDI but ER instability deters it while the use of pegged exchange rates exacerbated price instability, complicating FDI inflows. A contrary finding was reported by Dewenter (1995) on the connection between ER and foreign acquisitions of U.S. firms between 1975 and 1989 as it revealed no significant relationship when considering relative corporate wealth and overall investment levels. A study by Froot and Stein (1991) investigated the association betwixt ER fluctuations and FDI through informational imperfections in global capital markets and discovered that currency depreciation reduced domestic wealth, prompting foreign acquisitions of domestic assets due to the higher cost of external financing compared to internal funds. Another contrary finding was also reported by Ignatius, Ogbonna and Maduka (2019) in a study that examined how ERV affects FDI in Nigeria via time series data (1986 -2016) and discovered a negative significant influence of ERV on FDI. Similarly, Hanusch, Nguyen and Algu (2018) studied the connection betwixt ERV and FDI inflows in 80 nations (1990-2015) and discovered that reducing ERV by 10% could increase FDI inflows, with South Africa potentially boosting its FDI by 0.25 percentage points of GDP by reducing volatility of rand to that of other developing nations.

However, the need for a novel study on ERV, SMP and FDI in Nigeria can be justified by several gaps in the existing literature. For instance, there is limited exploration of the interaction amongst ERV, SMP and FDI as prior studies investigated ERV's association with FDI (Odili, 2015; Ullah et al., 2012) and the influence of stock market performance on FDI (Fapetu et al., 2017), few have analysed the combined effects of all three variables in a single framework showing that the unique interaction amongst ER fluctuations, SMP and FDI in Nigeria remains underexplored, especially in light of Nigeria's complex foreign exchange regime. Also, there were mixed findings on exchange rate volatility's impact because some studies, such as Odili (2015), had discovered a negative influence of ERV on FDI, while others (like Havi, 2021and Hanusch et al., 2018) showed that volatility might have a mixed or even positive effect on FDI inflows depending on context and methodology justifying the call for more context-specific studies that could provide clearer insights into Nigeria's unique economic conditions. The need for this study was established by contradictory results in stock market-FDI relationship as Fapetu et al. (2017) reported a favourable relationship amongst ERV and market capitalization, some studies (e.g., Osinubi & Amaghionyeodiwe, 2009) highlighted adverse effects of structural adjustments and currency depreciation on FDI suggesting that while stock market performance can potentially attract FDI, it may not be robust enough in the face of currency instability, which requires further investigation specific to Nigeria’s financial landscape.

Another justification stemmed from the role of exchange rate systems as the study by Suliman, Elmawazini and Shariff (2015) revealed the complexity of pegged exchange rates and their effect on FDI vis-a-vis Nigeria’s multiple exchange rate system could be driving instability, complicating the association connecting ERV to FDI because studies concentrating on this peculiarity in Nigeria are scarce, and a deeper examination of this aspect is necessary to understand its true impact on foreign investments. Although cross-country studies like Hanusch et al. (2018) discovered that decreasing ERV could increase FDI inflows in other developing countries, the specific institutional and economic realities of Nigeria, such as the effect of oil

prices on the Naira, demand localized insights as the study by Osinubi and Amaghionyeodiwe (2009) on Nigeria's historical exchange rate volatility and FDI inflows hints at structural issues, which are critical for policy decisions. Many studies, such as those by Froot & Stein (1991) and Dewenter (1995) explored the dynamics of exchange rate fluctuations and FDI over specific periods or focus on individual aspects, like foreign acquisitions. A comprehensive longitudinal analysis of both SMP and ERV on FDI in the context of Nigeria's economic evolution (1980–2023) is yet to be undertaken, providing a clear gap for future research. In a nutshell, while there is a rich body of work examining ERV, SMP and FDI individually, a novel study integrating all three within the Nigerian context—especially considering the unique macroeconomic and policy challenges facing the country—could provide more vigorous as well as actionable insights for policymakers and investors alike.

Foreign direct investment (FDI) enables investors to establish control over enterprises in foreign countries, driving economic growth globally, especially in developing nations with capital and technological gaps. However, FDI inflows to Nigeria have sharply declined in recent years, dropping from $3.31 billion in 2021 to $0.19 billion in 2022, and further falling by 26.7% to $3.9 billion in 2023. Contributing factors include naira depreciation, political risks, and high production costs. Midway into 2023, FDI inflows were valued at $86.03 million, representing 3.53% of total capital imports. As of July 2024, for instance, the exchange rate is ₦1584/USD, showing economic instability and problems that deter foreign investments (NBS, 2024). This recent colossal drop in FDI inflows to Nigeria, therefore, underscores the need to study the combined effects of ERV and SMP on FDI. Whilst some researchers have studied the effect of ERV on FDI, such as Odili (2015) and Ignatius et al. (2019), relatively few have studied the joint effects of ERV and SMP on FDI inflows. It is, therefore, essential to investigate the nexus in Nigeria's current economic situation so that specific measures can be formulated that could stabilise the ER, provide resilience to the stock market and consequently attract more FDI. This study intends to bridge that gap and provide insights into economic reform as well as investors' confidence.

Hence, the study adopted an explanatory time series design to translate the dynamics between variables over some time into quantitative measurements. The study focused on the Nigerian Stock Exchange, covering ERV, SMP, and FDI data for 22 years between 2002 and 2023. This period was purposively selected to capture the different economic conditions that would affect the different variables in the study. Secondary data were retrieved from the World Bank database, which can be relied upon regarding its relevance to the data for the analysis. This methodological approach is utilised to thoroughly analyse the dynamic interactions among the critical economic indices. This empirical investigation adds to the emerging literature in the field by offering an understanding of the nuances of how ERV interact with SMP in Nigeria as factors impacting FDI. Unlike other studies that consider only the direct influencing of ER variations on FDI, the present investigation acknowledges short-term dynamics as well as long-term relationships by using the ARDL in a way that underscores a significant mechanism for error correction that adjusts FDI deviations translating over time.

2. LITERATURE REVIEW

2.1. Exchange Rate Volatility (ERV)

The exchange rate (ER) represents the worth of a nation’s money when compared to that of others. It is composed of two currencies and can be cited indirectly or directly. When quoted directly it shows the worth of the overseas’ money with regard to the domestic money, whereas quoting indirectly shows the worth of home currency regarding overseas money. An ER that without the home money as one of the two components of the currency is called cross state or cross currency. Three types of ER have been established in literature. These are real ER, nominal ER and real effective ER but Olisadebe (1991) discovered two other ERs and they are equilibrium ER and nominal effective ER. ERs can either fluctuate freely, be influenced by market dynamics or remain fixed where the currency value is tied to another currency such as the US dollar. According to Khan and Sajid (2005) the ER is the most substantial component in a free-market economy because its direct influence on macro-economic indicator like FDI. Policy maker and investors must keep an eye on a nation’s ER before committing their fund in that country. When a nation’s ER increase, domestic export commodities become inexpensive, and request for export increase as well. This implies that international demand for commodities rises, while import fall. It has influence on FDI, and all of the consequence have an influence on the nation’s monetary success. ERV can have far-reaching consequences, including affecting trade balances, investment flows, and the overall economic performance of countries. Exchange rate volatility is influenced by various macroeconomic factors. Interest rates, for instance, can impact exchange rates and heighten volatility, particularly in emerging markets. Inflation rates also correlate with exchange rate volatility, as high inflation can lead to currency depreciation. A country's trade balance affects ER dynamics via its influence on currency demand and supply. Furthermore, political stability is crucial for maintaining currency stability, while political uncertainty can lead to increased volatility. Comprehending these relationships is essential for investors and policymakers seeking to traverse the intricacies of global capital markets (Frankel, 1983; Branson, Halttunen & Masson, 1977).

2.2. Stock Market Performance (SMP)

SMP refers to the behaviour of equity prices and market indices over time. It is shaped by a innumerable factors, ranging from macroeconomic indices to company specific occurrences, and involves the interaction of various market participants.

Understanding SMP is imperative for investors, policymakers, and economists for making educated decisions and predict future trends. The stock market is a quintessential to organisational transformation in any economic system, from rigid, customary and insecure bank-based to an economic system that is more secure, more flexible and immune to shocks, volatilities and absence of stockholder's trust (Stapley, 1986). On their part, Patrick and Wai (1973) submitted that stock markets are institutions dealing with capital, in long- and short-terms, where firms trade equities so as to make long-standing capital that can be funnelled into their options that are profitable. The tasks of purchasing and vending shares and stocks on the stock market are tremendously substantial for the sharing of assets within the economic systems. Even though, when prices of share are at historically high-rankings or increasing, this shows trust amongst stockholders and may impact the trust of investors and, invariably their asset. Also, the stock market is a vital determinant in making decision on business investments as the shares price influence the quantity of capitals that can be raised by vending stocks newly issued to fund spending on investment. SMP is influenced by several factors, including technological innovations, market sentiment, geopolitical events, and corporate governance. Technological advancements can drive long-term growth and value creation but also introduce volatility and speculation. Market sentiment, shaped by various factors, can propel stock prices beyond fundamental values, leading to bubbles and crashes. Geopolitical events can induce sudden shifts in markets, affecting investor confidence and risk tolerance. Finally, effective corporate governance practices, such as transparency and risk management, can foster investor confidence, drive up demand for stocks, and contribute to broader market stability (Fiorillo, Meles, Pellegrino & Verdoliva, 2024).

2.3. Foreign Direct Investment (FDI)

FDI represents the movement of capital across borders on an international scale, granting a transnational entity or parent firm authority over its overseas affiliates or subsidiaries (Goldberg and Charles 2005). FDI is a class of substantial degree of impact on a foreign enterprise management. FDI involves a long-term interest and control over an enterprise in a foreign country, often through equity ownership. This sets it apart from portfolio investment, where investors may hold stocks or bonds but typically don't have significant control over the company. FDI impact can be shaped by the political system of the host country. For instance, a favourable trade policy can attract FDI, leading to increased domestic population growth. FDI is the allocation of overseas resources into local equipment, structures and organizations. FDI is not part of foreign investment into stock market. FDI is typically considered more beneficial to a nation compared to investment in its company's stocks. This is because equity investments are often viewed as volatile, susceptible to quick withdrawal at the slightest hint of instability, whereas FDI is more stable and valuable regardless of the economic circumstances (Bilawal, 2014). In the same vein, Huchet-Bourdon and Korinek (2011) opined that FDIs play a vital role in nurturing growth in emerging economies. Overseas investors are driven to invest in the host nation when they observe obvious prospects for enduring profitability via contribution to the domestic production capabilities of that nation. FDI is essential for emerging nations as it contributes significantly to capital formation. Additionally, FDI serves as a channel of transference of technology and ground-breaking skills to emerging from developed economies. FDIs are impacted by several factors, notably tax policies, market size/growth potentials, quality infrastructural development, economic stability as well as trade policies. A big market size with favourable tax policies coupled with high growth potentials attract FDI, whilst infrastructural development and economic stability provide a robust business environment. Similarly, trade policies catering to a stable and predictable regulatory environment can also stimulate FDI. In contrast, heavy tax burdens, restrictive trade policies and economic instability put FDI on the back foot. These factors need to be understood by policymakers attempting to attract FDI for sustainably promoting growth and development.

2.4. Exchange Rate Volatility-Foreign Direct Investment Relationship

The crucial factors impacting FDI decisions have included ERV. The relationship between ERV and FDI has been extensively studied across different countries, and empirical investigations have shown that ERV has adverse effects on FDI inflows. For instance, Ignatius et al. (2019) discovered that ERV has a significant adverse influence on Nigeria's FDI. It is also observed by Sakli, Boubker, Mrad, and Nafti (2021) that an increase in ERV negatively affects FDI inflow in Tunisia in the long run. Similarly, Kenneth, Muniu, and Kosgei (2017) showed that ERV has a negative effect on FDI in Kenya. Nonetheless, a number of previous empirical findings have reported a positive association between ERV and FDI. For instance, Bilawal et al. (2014) discovered that fluctuations in ER positively affected FDI inflows in Pakistan. Osinubi et al. (2009) also found a significant positive relationship between inward FDI and the exchange rate in Nigeria. Findings are mixed in the literature due to many factors, including different nation-specific characteristics, conditions of economies, and methodological approaches. The study of Akinlo and Onatunji (2021) found significant differences in the impact of ERV on FDI in different ECOWAS countries. The theoretical underpinning of the link betwixt ERV and FDI can be described via the Imperfect Market Theory. As per this theory, investment flows (including FDI) are greatly affected by market imperfections like ER fluctuations, asymmetric information as well as investors' uncertainty. Thus, the relationship betwixt ERV and FDI is multi-faceted and can be affected by many variables. While some of the earlier studies reported a negative influence of ERV on FDI, others have reported a

positive association. Therefore, more research would be necessary in order to understand the complexity of this relationship and to guide policy direction.

2.5. Exchange Rate (ER) and Stock Market Performance (SMP)

Many studies have investigated the relationship between exchange rates (ERs) and stock markets, generating mixed results. Some of the studies have proved that ERV negatively affects SMP (Lawal & Ijirshar, 2013; Olugbenga, 2012), whereas other studies found that they are positively related (Fapetu et al., 2017). GARCH, ARDL, and VECM methodologies have been used to reveal long- and short-term dynamics of this association. The results seem not to be consistent and therefore bring in complexity in association between ERs and stock markets (Raja, Zehra, Chhapra & Makhija, 2019; Mroua, 2019; Zubair & Aladejare, 2017). Moreover, the empirical studies indicate that the specified relationship between ERs and stock markets is different across countries and within regions due to factors such as economic conditions, trade relationship and monetary policies (Mroua, 2019). Other determinants that can also compete with this relationship are inflation, interest rate and global economy incidents (Lawal & Ijirshar, 2013). All in all, the relationship between ERs and stock markets is very complex and multi-factorial and would require extensive research for understanding.

2.6. Exchange Rate Volatility, Stock Market and Foreign Direct Investment

The inter-relationships between ERV, SM and FDI have been widely studied, often with mixed findings. Some studies found that ERV affects FDI inflow negatively (Odili, 2015; Omolola and Adefemi, 2018; Abdullahi, 2023), while others found a positive relationship between SMP and FDI (Omodero and Ekwe, 2016). Different techniques, namely ARDL, NARDL, and VAR, have been used to shed some light on the long- and short-term dynamic forces behind this association. However, findings remain inconsistent, demonstrating the complexity of the association among the ERV, SM and FDI (Sokang, 2018; Vanapruk, 2021). Moreover, it is also suggested that the among ERV, SM and FDI can vary transversely to several countries and regions by determinants such as economic conditions, trading relationships, and monetary policies (Abdullahi, 2023). Besides, inflation, interest rates, and global economic happenings also affect the relationship (Odili, 2015). All in all, the relationship among ERV, SMP and FDI is rather intricate and multifactorial and warrants further examination to understand its nuanced dynamics.

2.7. Theoretical Justification

The imperfect market theory also called the imperfect market hypothesis, was developed in the ‘70s and ‘80s when economists began questioning the assumptions of perfect competition and efficient markets. The theory secured great prominence in the 1990s with the contributions of economic theorists like George Akerlof, Joseph Stiglitz, and Michael Spence, who won the Nobel Prize in Economics (2001) for their empirical work on asymmetric information and market imperfections (Stiglitz, 2000; Akerlof, 1970). The theory discusses how market frictions such as transaction entry or exit costs, tariffs, and regulations create inefficiencies that affect ERV, SMP, and FDI. The theory pins its view on imperfect market factors like government intervention, information asymmetry, and barriers to capital flow that interrelate with fluctuating exchange rates affecting stock market performance and FDI. This highlights an intricate web of inter-dependence whereby ERV, SMP and FDI influence each other.

In analysing the connections among ERV, SM, and FDI, imperfect market theory provides the most suitable theoretical base. According to this theory, market imperfections like ER fluctuations, asymmetric information and investors' uncertainty also largely determine FDI (Gorg & Greenaway, 2004; Blonigen, 2005). FDI is expected to remain less volatile than portfolio investments, which are readily responsive to market conditions and investors' sentiments, although it may still be affected by market inefficiencies in the form of exchange rate fluctuations.

3. METHODOLOGY

This study examined the interactions among FDI, SMP and ERV. It specifically studied a 22-year period from 2002 to 2023. The basis for choosing this period was to capture varying economic conditions over time. These years witness varying economic conditions, including periods of growth, recession and volatility. All of these are great for understanding the dynamic interactions among the variables being studied. Focusing on such periods enables the study to generate insights that are directly relevant to the particular historical period in question and provide an in-depth understanding of the wider economic implications of the variables.

3.1. Research Design

An explanatory time series design is utilised in this study. This quantitative approach evaluates and explains the time-based dynamic interactions of variables over time. This design elaborates on variables' short- and long-term effects and causation via econometric analyses. The method allows for a clear understanding of the way variables impact one another via an analysis of time-ordered data in order to highlight trends, patterns and interactions within a specified period. Dynamic

interrelationships among ERV, SMP and FDI in Nigeria were studied over the period from 2002 to 2023 with this design in mind. The explanatory time series research design is appropriate as it serves the purposes of the study, and the characteristics of the data used. This design deals with interactions across a variety of economic variables and permits investigation into the dynamic and causal relationships among the study's variables over 22 years. Moreover, this approach resonates with previous financial and economic research that examines time-dependent variables (Pesaran, Shin, and Smith, 2001; Narayan, 2005), making it a perfect alternative for studying the economic dynamics of Nigeria.

Secondary data were used in the work, which were sourced from the World Bank database, with focus on the selected variables from 2002 to 2023, aligning with the study's timeframe. Consequently, the research is confined to this 22-year period, reflecting the economic conditions and trends during this span.

The summary of variable measurements, including control variables, is provided in Table 1.

Table 1: Variables Measurements

Variable	Abbreviation	Measurement	Source
Dependent Variable			
Foreign Direct Investment	FDI	The total of equity capital, profits reinvestment, other long-term capital, as well as short-term capital as found in the balance of payments.	Yabu and Kimolo (2020), Sharmin and Khandaker. (2015)
Independent Variables			
Exchange Rate Volatility	ERV	Measured using GARCH applied to the natural logarithm of exchange rate data.	Asmah and Andoh (2013)
Stock Market Performance	SM	The turnover ratio, which is determined by dividing the value of domestic shares traded by their market capitalisation.	Yabu and Kimolo (2020)
Control Variables			
Market Capitalizations	MC	Stock market capitalization as reported by world bank	Olabisi and Akeju (2024)
Gross Domestic Product	GDP	Value of gross domestic income	Olabisi and Akeju (2024); Yabu and Kimolo (2020)

3.2. Model Specification

The model for examining the interrelationship among ERV, SMP and FDI in Nigeria is expressed in the following econometric equation as follows:

Dynamic and Causal Relationship

A Vector Autoregression(VAR) model was utilise to capture the dynamic interrelationships betwixt ERV, SMP and FDI as adapted from Sudipta et al. (2017):

$$ER_t = a_0 + a_1 ER_{t-1} + a_2 SM_{t-1} + a_3 FDI_{t-1} + \varepsilon_{1t}$$

$$SM_t = b_0 + b_1 ER_{t-1} + b_2 SM_{t-1} + b_3 FDI_{t-1} + \varepsilon_{2t}$$

$$FDI_t = c_0 + c_1 ER_{t-1} + c_2 SM_{t-1} + c_3 FDI_{t-1} + \varepsilon_{3t}$$

Where t is the time period, ER is the Exchange Rate Volatility, SM is the Stock Market Performance, FDI is the Foreign Direct Investment, a_0, b_0, c_0 are constants, a_1, a_2, a_3, b_1, b_2, b_3, c_1, c_2, c_3 are the coefficients and e_{1t}, e_{2t}, e_{3t} are error terms.

Long-term Implications of ERV on FDI Sustainability

An Error Correction Model (ECM) was be used to capture both short-run and long-run relationships as adapted from Stock and Watson (2016):

$$\Delta FDI_t = \alpha_0 + \alpha_1 \Delta ER_t + \alpha_2 \Delta ERV_t + \beta ECT_{t-1} + \varepsilon_t$$

Where Δ represents the difference operator, ECT is the error correction term, α_0, α_1, α_2, β are coefficients, ε_t is the error term. The ECM equation incorporates the long-run interrelationship betwixt FDI, ER, and ERV through the error correction term.

Interactive Effects of ERV and SMP on FDI

$$FDI_t = \alpha_0 + \alpha_1 ER_t + \alpha_2 SM_t + \alpha_3 MC_t + \alpha_4 GDP_t + \varepsilon_t$$

Where FDI_t = log of FDI, ER_t = ERV, SM_t = SMP, MC_t=market capitalization, GDP= gross domestic product, α_0, α_1, α_2, α_3, and α_4 are coefficients, ε_t is the error term.

Different data analysis techniques were used in this study to find the relationships among the key economic variables. How ERV, SMP, and FDI influence each other over time was analysed with the help of a vector auto-regression (VAR) model, which captured the dynamic interaction. The model helps in uncovering causal linkages and feedback loops in the data. In order to understand long-term consequences, particularly the influence of ERV on sustainable FDI, an Error Correction Model (ECM) was used. The approach outlines short-run dynamics and long-run equilibrium associations as adjustments happen through deviations. Finally, a multiple regression analysis was carried out to explain complex relationships involving latent variables so we can obtain direct and indirect pathways systemwide.

4. RESULTS AND INTERPRETATION

4.1. Descriptive Analysis

The descriptive statistics (Table 2) show variables like ER (LN_ER), FDI (LN_FDI), market capitalization (LN_MC), stock market index (LN_SM), and GDP (LN_GDP). The mean value shows the average levels of the variables across the sample period. LN_ER has an average of 5.27, LN_FDI at 21.58, LN_MC is equal to 24.32, LN_SM average 6.05 while LNGDP has a very high mean value of 31.79. The median values, which indicate the middle point of the data distribution, are close to the means, suggesting that these distributions are not too skewed except for LN_SM, which has a significantly lower median compared to its mean, showing that it may be asymmetrical.

Maximum and minimum values give the range of data for each variable. LN_ER ranges from 4.78 to 6.05, while LN_FDI varies from 18.60 to 22.81. LN_MC has a range from 21.59 to 25.72, LN_SM from 0.19 to 25.24, and LNGDP from 30.07 to 33.09. LN_SM has the largest range, showing extensive variations of stock market values during the sample period. Standard deviations give a measure of data's dispersion around their mean. The standard deviation in LN_SM is 8.89, the highest of all variations, indicating a substantial variation compared to other variables. In contrast, both LNGDP and LN_ER are characterised by relatively low standard deviations, indicating they are much more stable series compared to the former.

The skewness values reflect symmetry in data distributions. The skewness estimates for LN_ER and LNGDP are moderate with values of 0.57 and negative with -0.44, respectively. While LN_FDI and LN_MC have left skewness with values of -1.41 and -1.65, respectively, a positive skewness value of 1.63 indicates a right-skew distribution where the bulk of the data points are collected on the lower range while few extreme values are on the upper range. The kurtosis values show "tailedness"- to the distribution. The result shows a leptokurtic distribution with heavier tails than the normal distribution since the highest value of kurtosis is seen in LN_MC, which is 5.47. The distributions for LN_FDI and LN_SM also have kurtosis values above 3, implying the existence of more outliers than a normal distribution. In contrast, LN_ER and LNGDP exhibit kurtosis values below 3, which would imply a more platykurtic distribution with lighter tails.

The Jarque-Bera test checks for the normality of distributions. The Jarque-Bera statistics for LN_ER and LNGDP were found to be low at 0.26 and 0.51, respectively. This shows that these variables do not significantly deviate from normality. However, LN_FDI, LN_MC, and LN_SM have Jarque-Bera statistics that are statistically significant at conventional levels (p-values of 0.0065, 0.0004, and 0.0061, respectively), suggesting that these variables' distributions deviate from normality.

Table 2: Descriptive Statistics Output

	LN_ER	LN_FDI	LN_MC	LN_SM	LNGDP
Mean	5.274924	21.57875	24.32180	6.048740	31.79367
Median	5.058827	21.65713	24.55072	2.233746	31.96907
Maximum	6.054390	22.80574	25.72251	25.23894	33.08816
Minimum	4.775475	18.60074	21.58782	0.190295	30.07349
Std. Dev.	0.457541	1.061589	1.019369	8.890851	0.878261
Skewness	0.567555	-1.407012	-1.654652	1.629351	-0.438651
Kurtosis	1.704454	4.747587	5.471946	3.711818	2.167819
Jarque-Bera	2.719672	10.05839	15.64018	10.19868	1.340333
Probability	0.256703	0.006544	0.000402	0.006101	0.511623
Sum	116.0483	474.7325	535.0797	133.0723	699.4608
Sum Sq. Dev.	4.396222	23.66638	21.82140	1659.992	16.19820
Observations	22	22	22	22	22

4.2. Preliminary Analysis

4.2.1. Correlation Analysis

Significant correlations betwixt the variables are revealed by the the results in Table 3, which also highlights the negative relationships betwixt the stock market index, market capitalisation and GDP, as well as betwixt ER and FDI. Different levels of relationship are shown betwixt the exchange rate (LN_ER) and the other variables. With a very significant p-value of 0.0004, LN_ER and foreign direct investment (LN_FDI) exhibit a strong negative association of -0.687. This implies that FDI tends to decline as ER rises, and vice versa. With a p-value of 0.0256 and a favourable correlation of 0.475, the association betwixt LN_ER and market capitalisation (LN_MC) shows statistical significance. However, the association betwixt LN_ER and the stock market index (LN_SM) is -0.419, and the p-value is 0.0521. This is marginally significant, inferring a tendency for the ER to decrease as the stock market index rises.

Foreign direct investment (LN_FDI) is negatively correlated with market capitalization (LN_MC) at -0.043 and with gross domestic product (LNGDP) at -0.442. The p-value for the correlation with LN_MC is 0.8496, indicating a very weak and statistically insignificant relationship. In contrast, the correlation between LN_FDI and LNGDP is more substantial and statistically significant, given the p-value, which is 0.0393, suggesting that upsurges in GDP are connected to decreases in FDI, or vice versa. The stock market index (LN_SM) exhibits a moderate negative correlation with market capitalization (LN_MC) at -0.549, given the significant p-value, which is 0.0082, this signifies that as the stock market index rises, market capitalization tends to decrease. This relationship is statistically significant and suggests an inverse relationship between these two financial indicators. LN_SM also has a negative correlation with gross domestic product (LNGDP) at -0.468, given the p-value, which is 0.0282, establishing that higher GDP is associated with lower stock market index values, and the relationship shows statistical significance.

Finally, the correlation between market capitalization (LN_MC) and gross domestic product (LNGDP) is strongly positive at 0.765, give the highly significant p-value which is 0.0000. This indicates a strong positive connection where increases in GDP are associated with increases in market capitalization.

Table 3: Correlation Analysis Output (Ordinary)

Correlation Probability	LN_ER	LN_FDI	LN_MC	LN_SM	LNGDP
LN_ER	1.000000				
LN_FDI	-0.686971 0.0004	1.000000			
LN_MC	0.474804 0.0256	-0.042912 0.8496	1.000000		
LN_SM	-0.419267 0.0521	0.159798 0.4775	-0.548840 0.0082	1.000000	
LNGDP	0.874255 0.0000	-0.442356 0.0393	0.765362 0.0000	-0.467618 0.0282	1.000000

4.2.2. Cointegration Test

The tests results presented in Table 4 examined if the study's variables share a long-term equilibrium association. Variables analysed include the exchange rate (LN_ER), foreign direct investment (LN_FDI), market capitalization (LN_MC), stock market index (LN_SM), and gross domestic product (LNGDP). The test applied the Schwarz criteria to ascertain the proper lag length, with a maximum lag of 4, and the null hypothesis asserts that the data sets are not cointegrated.

Each variable has its respective tau-statistics, z-statistics and p-values according to MacKinnon's approach. The p-values obtained with respect to LN_ER, LN_MC and LNGDP are above the normal significance levels, which suggests a failure to reject the null hypothesis concerning the variables. Specifically, the values for LN_ER and LN_MC are 0.4553 and 0.5425, respectively, indicating, therefore, no evidence of cointegration. Likewise, the p-value for LNGDP is 0.7589, suggesting further that there is no cointegration of these variables within the long run. Conversely, LN_FDI and LN_SM showed lower p-values, with LN_FDI a respective value of 0.0033 for the tau-statistic and 0.0017 for the z-statistic. This signifies the rejection of the null hypothesis at normal levels of significance, implying LNF-DI being cointegrated with other variables. The stock market index (LN_SM) also shows significant evidence of cointegration, with p-values of 0.2107 and 0.0000 for the tau-statistic and z-statistic, respectively. The highly significant z-statistic for LN_SM, in particular, implies a strong long-term relationship between this variable and the others.

Table Hata! Belgede belirtilen stilde metne rastlanmadı.**: Cointegration Test Output**

Series: LN_ER LN_FDI LN_MC LN_SM LNGDP
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministic: C
Automatic lags specification based on Schwarz criterion (maxlag=4)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LN_ER	-3.405293	0.4553	-15.95545	0.4019
LN_FDI	-6.766333	0.0033	-29.93284	0.0017
LN_MC	-3.203480	0.5425	-14.01273	0.5510
LN_SM	-4.120329	0.2107	-34.48839	0.0000
LNGDP	-2.690939	0.7589	-11.10238	0.7673

*MacKinnon (1996) p-values.
Warning: p-values may not be accurate for fewer than 25 observations.

**Number of stochastic trends in asymptotic distribution

4.3. Dynamic and Casual Relationship between ER and FDI

The analysis presented in Table 5 explores the dynamic and causal relationship betwixt ER and FDI using the ARDL model. The ARDL Long Run Form and Bounds Test output indicates that the conditional error correction regression reveals a significant relationship betwixt the lagged value of FDI and its current value. Specifically, the coefficient of the lagged FDI (FDI (-1) is negative, and it shows statistical significance ($\beta = -0.499$, $t = -2.676$, $p < 0.05$), suggesting a correction mechanism where previous deviations from equilibrium are adjusted in subsequent periods. ER also shows a positive impact and statistical significance on FDI ($\beta = 8347335$, $t = 0.000$, $p < 0.01$), implying that an upsurge in ER positively influences the inflow of FDI.

In the level's equation, which assumes a restricted constant and no trend, ER demonstrates a positive relationship and shows statistical significance with FDI ($\beta = 16721167$, $t = 2.709$, $p < 0.05$). The constant term is negative and highly significant ($\beta = -7.11E+09$, $t = -4.708$, $p < 0.01$), indicating a strong intercept effect when no changes in the independent variables are considered. The error correction term (EC), derived from the long-run equilibrium association betwixt FDI and ER, is presented as FDI - (16721167 * ER - 7114908351). This term captures the movement away from the long-term equilibrium, and it reinforces the significance of ER in determining FDI flows.

The F-Bounds test, which was done to determine whether a long-run relationship exists betwixt the variables, show the test statistic (F-statistic = 2.441) which was compared against critical values for different significance levels. However, the F-statistic drops below the lower bound at all conventional significance levels, including 10%, 5%, and 1%, both in the asymptotic case (with n=1000) and finite samples (n=30 and n=35). This result infers that the null hypothesis, which asserts no long-run relationship, cannot be rejected, indicating that while short-run dynamics are evident, the proof for a long-term equilibrium association betwixt ER and FDI is not feasible within the sample analysed.

Table 5: ARDL Long Run Form and Bounds Test Output

ARDL Long Run Form and Bounds Test
Dependent Variable: D(FDI)

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.55E+09	1.44E+09	0.000000	0.0000
FDI(-1)*	-0.499208	0.186575	-2.675635	0.0154
ER**	8347335.	4046650.	0.000000	0.0000

* P-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z (-1) + D (Z).

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ER	16721167	6172921.	2.708793	0.0144
C	-7.11E+09	1.51E+09	-4.707615	0.0002
EC = FDI - (16721166.6806*ER -7114908351.3778)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	2.440572	10%	3.02	3.51
K	1	5%	3.62	4.16
		2.5%	4.18	4.79
		1%	4.94	5.58
Actual Sample Size	21		Finite Sample: n=35	
		10%	3.223	3.757
		5%	3.957	4.53
		1%	5.763	6.48
			Finite Sample: n=30	
		10%	3.303	3.797
		5%	4.09	4.663
		1%	6.027	6.76

4.4. Long-Term Impacts of ERV on the Overall Performance of a Country's Stock Market (SM)

4.4.1. ARDL Error Correction Regression Analysis

The ARDL error correction regression analysis in Table 6 investigates the short-term dynamics and the adjustment process towards long-term equilibrium for the FDI (LN_FDI), using ER (LN_ER) and SM index (LN_SM) as explanatory variables. In the ECM, the coefficient of the change in ER (D (LN_ER)) is 0.9636, but not significant, with a t-statistic which is of 0.736 and p-value 0.474. This suggests that the short-term fluctuations in the ER exert no significant influence on short-term variations FDI. Similarly, the coefficient for the change in stock market index (D (LN_SM)) is 0.02278, with a t-statistic = 1.377 and p-value = 0.1918, which signifies those short-term variations in SM index exerts no significant influence on FDI in the short-run.

The key result in this regression is the coefficient of the lagged EC term (CointEq (-1)), which is -1.5602, t-statistic = -7.385, and p-value = 0.000. The significant and negative coefficient confirms the presence of an error correction mechanism, indicating that approximately 156% of any digression from the long-term equilibrium in the foreign direct investment is corrected in each period. This suggests that when the foreign direct investment diverges from its long-run equilibrium level, it adjusts back towards equilibrium in the following period.

The R^2, which is 0.7786, indicates that the model explains 77.86% of the variations in (D (LN_FDI)). The adjusted R^2 value is somewhat lower at 0.737, accounting for the number of predicting variables within in the model. Additional model diagnostics are provided, including the Akaike Information Criterion (AIC) and the Schwarz Criterion (SC), which are measures of the goodness-of-fit of the model, with the AIC at 2.035997 and the SC at 2.2351. The Durbin-Watson statistic is 2.531, signifying no significant autocorrelation exists within the residuals. In summary, ARDL error correction model confirms that while short-term changes in ER exerts no significant influence on FDI, a there is a significant error correction mechanism driving the foreign direct investment back towards its long-term equilibrium.

Table 6: ARDL Error Correction Regression Output

Dependent Variable: D(LN_FDI)
Selected Model: ARDL (1, 1, 2)
Case 2: Restricted Constant and No Trend

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LN_ER)	0.963555	1.307891	0.736724	0.4744
D(LN_SM)	0.022784	0.016549	1.376762	0.1918
D(LN_SM(-1))	0.041573	0.017949	2.316232	0.0375
CointEq (-1)*	-1.560200	0.211252	-7.385474	0.0000

R-squared	0.778585	Mean dependent var	-0.010772
Adjusted R-squared	0.737070	S.D. dependent var	1.195502
S.E. of regression	0.613014	Akaike info criterion	2.035997
Sum squared resid	6.012570	Schwarz criterion	2.235144
Log likelihood	-16.35997	Hannan-Quinn criter.	2.074873
Durbin-Watson stat	2.530796		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	11.07950	10%	2.63	3.35
K	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

4.4.2. Granger Causality Test

To ascertain if one time series may predict another one, Granger causality tests was carried out, the result of which is presented in Table 7. The first test looks at if the SM index (LN_SM) is Granger caused by the ER (LN_ER). With a p-value of 0.4357 and an F-statistic of 0.8786, it can be concluded that LN_ER is not significantly predicting LN_SM. Similarly, an F-statistic of 0.3457 and a p-value of 0.7132 are obtained from the reverse causality test, which determines if LN_SM Granger causes LN_ER. Additionally, this finding does not disprove the null hypothesis, indicating that the ER is not significantly predicted by the SM index. The second set of tests analyses the relationship between FDI (LN_FDI) and the SM index (LN_SM). The F-statistics to check if LN_FDI Granger causes LN_SM to show 1.5077, with a p-value of 0.2531. This suggests that LN_FDI has no significant power over LN_SM. In contrast, for LN_SM being able to Granger-cause LN_FDI, the F-statistic came to 0.0256, with the p-value at 0.9748. This again suggests no predictive association between the SM index and FDI.

The other pair of tests analysed the connection between LN_ER and LN_FDI. The F-statistic for checking if LN_FD1 Granger causes LN_ER shows 0.6653 with a p-value of 0.5287, which means that it is not a significant causality. On the contrary, the test that checks whether LN_ER Granger caused LN_FDI produced an F-statistic of 6.1968 with a p-value of 0.0109. This has significance under conventional levels, proving that the ER has a significant predictive ability to predict FDI.

In sum, the Granger causality test shows that the ER is a strong predictor of FDI out of all the variables tested, with no other significant causal action observed among the ER, SM index, and FDI. It is then concluded that a unidirectional causality exists, where variations in exchange rates are good predictors of future changes in foreign direct investment and not vice versa.

Table 7: Granger Causality Test Output

Pairwise Granger Causality Tests
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LN_ER does not Granger Cause LN_SM	20	0.87864	0.4357
LN_SM does not Granger Cause LN_ER		0.34567	0.7132
LN_FDI does not Granger Cause LN_SM	20	1.50765	0.2531

LN_SM does not Granger Cause LN_FDI		0.02561	0.9748
LN_FDI does not Granger Cause LN_ER	20	0.66527	0.5287
LN_ER does not Granger Cause LN_FDI		6.19682	0.0109

4.5. Interactive Effects of ERV and SMP on FDI

The results of regression analysis, as shown in Table 8, which seek to investigate ERV and SMP's effect on FDI while controlling for GDP and market capitalisation, provide quite useful insight into the relationship among these variables. This analysis employs the least squares method to estimate coefficients with FDI as the dependent variable.

The coefficient for ER (LN_ER) is statistically significant negative (β=-2.6516, t=-2.6481, p< .01). This means that when ERV increases, FDI tends to decrease in FDI; higher ER uncertainty hinders FDI. The coefficient for SMP (LN_SM) is negative but not statistically significant (β = -0.0043, t = -0.1836, p = 0.8565). This suggests that SMP exerts no meaningful influence on FDI within the context of this model. Market capitalization (LN_MC) shows a positive but non-significant coefficient (β = 0.1676, t = 0.4659, p = 0.6472), indicating that market capitalization, while positively associated with FDI, does not have a statistically significant impact on it. Similarly, GDP (LNGDP) has a positive coefficient (β = 0.5036, t = 0.7202, p = 0.4812), but this relationship is also not statistically significant, signifying that GDP does not have a strong influence on FDI in this model. The overall model explains a moderate amount of the variance in FDI, with an R^2 of 0.5881, meaning that about 59% of the variability in FDI is accounted for by the independent variables included in the model. The adjusted R^2 is somewhat lower at 0.4912, reflecting some reduction when adjusting for the number of predictors. The F-statistic of 6.0678 is significant (p < .01), indicating that the model is statistically significant and that the independent variables, taken together, are useful predictors of FDI.

Thus, the assertion that ERV negatively impacts FDI is supported by the significant negative coefficient for LN_ER. However, the hypotheses regarding the impacts of stock market performance, market capitalization, and GDP on FDI are not supported, as these variables do not exhibit statistically significant relationships with FDI in this model.

Table 8: Regression Analysis Output

Dependent Variable: LN_FDI
Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.50256	11.29722	1.372246	0.1878
LN_ER	-2.651594	1.001331	-2.648070	0.0169
LN_SM	-0.004319	0.023527	-0.183589	0.8565
LN_MC	0.167624	0.359786	0.465898	0.6472
LNGDP	0.503634	0.699286	0.720211	0.4812
R-squared	0.588090	Mean dependent var		21.57875
Adjusted R-squared	0.491170	S.D. dependent var		1.061589
S.E. of regression	0.757256	Akaike info criterion		2.478485
Sum squared resid	9.748415	Schwarz criterion		2.726449
Log likelihood	-22.26333	Hannan-Quinn criter.		2.536898
F-statistic	6.067790	Durbin-Watson stat		2.729371
Prob(F-statistic)	0.003191			

4.6. Discussion of Findings

Using the ARDL technique, the dynamic and causal link betwixt ER and FDI is examined, yielding numerous significant findings. The short-run conditional error correction regression results show a statistically significant negative lagged value for FDI (FDI (-1)) (β= -0.499, p<0.05). This demonstrates the existence of a corrective mechanism in which departures from the previous equilibrium are compensated in subsequent periods. The ER exerts a positive significant impact on FDI (β=8347335, p < 0.01), indicating that in the short run, increased exchange rate (a decline of local currency) results in higher foreign direct investment inflows. The short-run findings indicate that policymakers can use exchange rate modifications to attract FDI in the short term. For example, initiatives that preserve competitive currency rates may provide beneficial conditions for international investors. These findings are consistent with Campa and Goldberg's (1999) argument that exchange rate volatility and depreciation can attract FDI by lowering the relative cost of investment for foreign enterprises.

Furthermore, the positive association betwixt ER and FDI supports the findings of Asmah and Andoh (2013), who discovered similar evidence in developing economies where competitive exchange rates increase investment inflows. The ARDL model shows that the ER exerts positive significant influence on FDI in both short and long run, emphasising the significant role of ER changes in influencing foreign investment decisions.

However, in the long-run relationship, the F-Bounds test results show that the F-statistic (2.441) is less than the critical lower bounds at all significance levels, indicating that a long-term equilibrium interaction betwixt exchange rates and FDI could not be established within the sample examined. This infers that, though short-run dynamics are seeming, the variables may not have a constant long-term relation. The lack of a long-run equilibrium relationship emphasises the need of addressing the structural factors that drive FDI, like stability in the economy, infrastructures as well as institutional quality. These findings contradict studies by Sharmin and Khandaker (2015) and Yabu and Kimolo (2020), which found long-term connections between currency exchange rates and FDI. The differences can be attributed to changes in period, method or sample size, accentuating complexities of the nexus between ER and FDI and the necessity for more studies to explore long-term effects.

Additionally, an implication is that the long-standing effects of persistent ER volatility on SM show from the ARDL error correction regression results that both short-term fluctuations in ER (D(LN_ER) and that of the SM index (D(LN_SM) do not significantly influence changes in short-term FDI. D(LN_ER) and D(LN_SM) have coefficients of 0.9636 and 0.02278, respectively, which are both not statistically significant ($p > 0.05$). However, the lagged error correction term (CointEq (-1) has high significance ($\beta = -1.5602$, $p < 0.01$), implying a robust adjustment mechanism that corrects departures from the long-term equilibrium in FDI at a rate of 156% per period. This emphasises the importance of long-term processes in determining FDI dynamics above short-term market volatility. Furthermore, the Granger causality tests show a unidirectional connection betwixt the exchange rate (LN_ER) and FDI (LN_FDI), with an F-statistic of 6.1968 ($p=0.0109$). This means that ER fluctuations exert predictive effects on FDI flows. However, no significant causal correlations were found betwixt the SM index (LN_SM) and other variables. The significance of ER movements in affecting FDI emphasises the relevance of stable and predictable ER policies in attracting long-term foreign investment. Policymakers should strive to prevent excessive exchange rate volatility, as it might generate uncertainty for investors. The absence of strong short-term effects from stock market performance implies that domestic capital market expansion may not be sufficient to stimulate rapid FDI inflows. Additional macroeconomic reforms may be required to boost long-term investor confidence.

The results align with the theoretical framework of the error correction model (Engle & Granger, 1987), which emphasises the importance of adjustment mechanisms in re-establishing equilibrium in long term. The significant error correction term shows that macroeconomic factors impacting FDI are more effective over longer time periods. Furthermore, the result that exchange rates Granger-cause FDI corresponds with previous research by Asmah and Andoh (2013), who discovered that exchange rate alterations impact investment decisions by modifying the cost structure for foreign investors. The lack of significant causation betwixt FDI and stock market index contrasts with the findings of Yartey and Adjasi (2007), who found a bidirectional association betwixt stock market performance and FDI in various emerging nations. This disparity might be due to structural differences across the economies studied or to the current study's small sample size.

Ultimately, the impact of EVR and SMP on FDI shows that ERV had a statistically significant negative impact. This supports the theory that an increase in exchange rate uncertainty acts as a disincentive for foreign investment by imparting a sense of risk to investors. With the significant negative influence of EVR on FDI, the implications for the necessity of stability in exchange rate policies could not be over-emphasised. Hence, policymakers should focus on promoting a predictable investment climate by effectively reducing volatility through monetary and fiscal means. Thus, the negative coefficient on exchange rate volatility corroborates other studies, namely, Okwuchukwu (2015) and Omolola and Adefemi (2018), wherein ERV was shown to influence FDI both in the short and long run negatively. This gives more impetus for existing arguments that stable exchange rate policies are very important for attracting and retaining foreign investments because volatility could lead to diminished investor confidence and consequently reduced capital flows.

Conversely, the study revealed that stock market performance had a non-significant statistical effect on FDI, thereby implying that as crucial as stock market performance may be for the well-being of an economy, it may not be the leading predictor of foreign investments in this case. This finding is somewhat unexpected since earlier studies, for instance, by Sokang (2018), have discovered a positive correlation between stock market performance and economic development. However, the current study's nonsignificant outcome regarding stock market performance could reflect those other factors, such as political stability or market regulations, exert more effect than stock market performance on FDI. Moreover, that there is no significant connection between market capitalisation and GDP with FDI demonstrates the complexities of these relationships and indicates that, while they may be potentially related to FDI, their actual impact may be obscured by other variables unaccounted for in the model.

Nonetheless, market capitalisation (LN_MC) and GDP (LNGDP) display a positive correlation with FDI; however, the relationship is not statistically significant ($p>0.05$). This positive outcome is consistent with theoretical expectations that an increase in market capitalisation implies capital markets development and GDP represents national economic stability, both

being incentives for FDI. The lack of significance on the other hand may be because of interactions with numerous other factors, including political stability and institutional quality in an emerging economy such as Nigeria.

5. CONCLUSION

This study analysed the connection among ERV, SMP and FDI, using GDP and market capitalisation as control variables. These results make fresh contributions derived from advanced econometric techniques for analysis, including ARDL modelling, error correction regression, and Granger causality testing.

Based on the findings, it is concluded that ER affects FDI inflows. The existence of an error correction mechanism confirms that deviations from the FDI are corrected with time and underscores the need for the maintenance of stable exchange rates to attract significant FDI. Yet, the fact that there is no long-run equilibrium relationship does indicate that while exchange rates may be import in the short run, there are other important factors that define the long-run association between FDI and exchange rates.

Moreover, it was found that while short-term stimuli do not affect FDI, exchange rates exert predictive power over FDI in the long run, justifying the requirement for the formulation of policies to combat ERV to provide a conducive environment for investment. Finally, it is concluded that ERV is a significant deterrent to foreign investment. While the stock market performance may not significantly sway FDI, the findings reinforce exchange rate stability as a significant factor for foreign investment attraction and retention. The lack of significance in the association among market capitalization, GDP, and FDI suggests that, although these factors are relevant, they are completely overshadowed by the perception of risk posed by exchange rate volatility.

6. RECOMMENDATIONS

Because of its findings, this study offers the following recommendations:

I. Government and other policy makers should endeavour to make exchange rates stable by establishing prudent monetary and fiscal policies to ensure a advantageous environment for FDI.

II. It is important to implement policies which ensures that volatility in exchange rate is reduced to barest minimum, as it has been shown to exert predictive influence on FDI, which indirectly affects stock market performance.

III. The investors' confidence needs to be enhanced by maintaining a stable exchange rate policy, as volatility is a key deterrent to attracting foreign investment.

7. THEORETICAL IMPLICATIONS

The one-way causation from exchange rates to FDI lends potency to the proposition that currency rates serve as a cost variable affecting host country choices of foreign investors, in line with Dunning's (1980) eclectic paradigm. Nevertheless, the result indicating no relationship between FDI and stock market index means that in this case, boosting FDI may not necessarily be through enhancing the functioning of capital market as it may be directed to non-market sectors like infrastructure or manufacturing. In addition, results confirm the explained postponement or cancellation of investments subjected to exchange rate uncertainty (Cushman, 1985), reinforcing the risk-averse characteristic in foreign investors. This kind of stock market performance would support the idea expressed by Yartey and Adjasi (2007) that in developing or less developed countries, the inflow of FDI is less affected by financial market movements.

8. LIMITATIONS AND FUTURE RESEARCH

The study's sample size and variable scope are limited, which may have an impact on the reliability of the F-Bounds test results. Future study should broaden the dataset and include additional control variables including political stability, institutional quality, and trade openness to better explain FDI trends.

Furthermore, the study focused on Nigeria, which may restrict the findings' generalisability to other settings. Thus, future study may include a comparison investigation of many African nations, which could show wider trends and provide a better understanding of the mechanisms at work.

REFERENCES

Abdullahi, K. (2023). How exchange rate and stock market volatilities affect foreign direct investment in Nigeria: A non-linear approach. Journal of Economics and Allied Research, 8(4), 253-269.

Afxentiou, P. C., & Serletis, A. (2000). Exchange rate volatility and foreign direct investment in developing countries. Journal of International Money and Finance, 19(5), 769-781.

Akerlof, G. A. (1970). The market for lemons: Quality uncertainty and the market mechanism. Quarterly Journal of Economics, 84(3), 488-500.

Akinlo, A. E., & Onatunji, A. O. (2021). Exchange rate volatility and foreign direct investment in selected ECOWAS countries. Journal of Economic Studies, 48(2), 349-365.

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and Economic Growth: The Role of Local Financial Markets. Journal of International Economics, 64(1), 89–112.

Asmah, E. E., & Andoh, F. K. (2013). Exchange Rate Volatility and Foreign Direct Investment in Sub-Saharan Africa. Journal for the Advancement of Developing Economies, 2(1), 1-14.

Bose, S., Saha, A., Khan, H. Z., & Islam, S. (2017). Non-financial disclosure and market-based firm performance: The initiation of financial inclusion. Journal of Contemporary Accounting & Economics, 13(3), 263–281. https://doi.org/10.1016/j.jcae.2017.09.006

Bilawal, M., Ibrahim, M., Abbas, A., Shuaib, M., Ahmed, M., Hussain, I., & Fatima, T. (2014). Impact of exchange rate on foreign direct investment in Pakistan. Advances in Economics and Business, 2(6), 223-231.

Blonigen, B. A. (2005). A Review of the Empirical Literature on FDI Determinants. Atlantic Economic Journal, 33(4), 383-403.

Branson, W. H., Halttunen, H., & Masson, P. (1977). Exchange rates in the short run: The dollar-deutschemark rate. European Economic Review, 10(3), 303–324. https://doi.org/10.1016/S0014-2921(77)80016-0

Buch, C. M. (2016). Exchange rate volatility and FDI: Evidence from emerging markets. International Economics and Economic Policy, 13(1), 1-22.

Campa, J. M., & Goldberg, L. S. (1999). Investment, Pass-Through, and Exchange Rates: A Cross-Country Comparison. International Economic Review, 40(2), 287–314.

Cushman, D. O. (1985). Real Exchange Rate Risk, Expectations, and the Level of Direct Investment. The Review of Economics and Statistics, 67(2), 297–308.

Dewenter, K. L. (1995). Do Exchange Rate Changes Drive Foreign Direct Investment? The Journal of Business, 68(3), 405–433. http://www.jstor.org/stable/2353334

Dunning, J. H. (1980). Toward an Eclectic Theory of International Production: Some Empirical Tests. Journal of International Business Studies, 11(1), 9–31.

Engle, R. F., & Granger, C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. Econometrica, 55(2), 251–276.

Fapetu, O., Adeyeye, P. O., Seyingbo, O. A., & Owoeye, S. D. (2017). Exchange rate volatility and stock market performance in Nigeria. Nigerian Journal of Management Sciences, 6(1), 308–317.

Fiorillo, P., Meles, A., Pellegrino, L. R., & Verdoliva, V. (2024). Geopolitical risk and stock price crash risk: The mitigating role of ESG performance. International Review of Financial Analysis, 91, 102958. https://doi.org/10.1016/j.irfa.2023.102958

Frankel, J. (1983). Monetary and portfolio-balance models of exchange rate determination. In Economic interdependence and flexible exchange rates (pp. 84–115). MIT Press.

Froot, K. A., & Stein, J. C. (1991). Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach. The Quarterly Journal of Economics, 106(4), 1191–1217. https://doi.org/10.2307/2937961

Goldberg, L., & Charles, K. (2005). Foreign direct investment, exchange rate variability, and demand uncertainty. International Economic Review, 36(4), 855–873. https://doi.org/10.2307/2527380

Gorg, H., & Greenaway, D. (2004). Much ado about nothing? Do domestic firms really benefit from foreign direct investment? World Bank Research Observer, 19(2), 171-197.

Gujarati, D. N., & Porter, D. C. (2009). Basic Econometrics (5th ed.). McGraw-Hill.

Hanusch, M., Nguyen, H., & Algu, Y. (2018). Exchange rate volatility and FDI inflows: Evidence from cross-country panel data (MTI Discussion Paper No. 2). The World Bank.

Havi, E. D. K. (2021). The impact of exchange rate volatility on foreign direct investment inflows in Ghana. African Journal of Economic Review, 9(4), 183. https://digitalcommons.unl.edu/jade/21

Huchet-Bourdon, M., & Korinek, J. (2011). To what extent do exchange rates and their volatility affect trade? OECD Trade Policy Papers, No. 119. OECD Publishing. https://doi.org/10.1787/5kg3slm7b8hg-en

Ignatius, A. E., Ogbonna, A. A., & Maduka, A. C. (2019). Exchange rate volatility and foreign direct investment: The Nigerian experience. Journal of Business & Economic Policy, 6(4), 78-89. https://doi.org/10.30845/jbep.v6n4p10

Kenneth, M. K., Muniu, J., & Kosgei, M. (2017). Short and long run effects of exchange rate volatility on foreign direct investment in Kenya. International Journal of Economics, Commerce and Management, 5(6), 386–399.

Khan, A. M., & Sajid, Z. M. (2005). The exchange rate and monetary dynamics in Pakistan: An autoregressive distributed lag (ARDL) approach. The Lahore Journal of Economics, 10, 87-99.

Kiliçarslan, Z. (2018). The relationship between exchange rate volatility and foreign direct investment in Turkey: Toda and Yamamoto causality analysis. International Journal of Economics and Financial Issues, 8(4), 61-67.

Lawal, M. and Ijirshar, V. U. (2013). Empirical analysis of exchange rate volatility and Nigerian stock market performance. International Journal of Social Science and Research, 4(4), 1592-1600

Mroua, M., & Trabelsi, L. (2020). Causality and dynamic relationships between exchange rate and stock market indices in BRICS countries. Journal of Economics Finance and Administrative Science, 25(50), 395–412. https://doi.org/10.1108/jefas-04-2019-0054

Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from cointegration tests. Applied Economics, 37(17), 1979-1990.

National Bureau of Statistics. (2024). Nigeria Capital Importation Q2 2024. Retrieved from https://nigerianstat.gov.ng/elibrary/read/1241568

Odili, O. (2015). Exchange rate volatility, stock market performance and foreign direct investment in Nigeria. International Journal of Academic Research in Accounting, Finance and Management Sciences, 5(2), 172–184.

Okwuchukwu, O. (2015). Exchange Rate Volatility, Stock Market Performance and Foreign Direct Investment in Nigeria. International Journal of Academic Research in Accounting, 5(2), 172-184,

Olabisi, O. E., & Akeju, K. F. (2024). The Impact of Exchange Rate Volatility and Inflation on the Nigerian Economy. Business & Management Compass, University of Economics Varna, 2, 5-16.

Olisadebe, E. U. (1991). An appraisal of recent exchange rate policy measures in Nigeria. CBN Economic and Financial Review, 29(2), 156-185

Olugbenga, A. A. (2012). Exchange rate volatility and stock market behaviour: The Nigerian experience. IISTE Journal for Sustainable Development. European Journal of Business and Management, 4(5), 31-39

Omodero, C. O., & Ekwe, M. C. (2017). Impact of foreign direct investment (FDI) on the stock market performances in Nigeria (1985-2014). Applied Finance and Accounting, 3(1), 36-48. https://doi.org/10.11114/afa.v3i1.2140

Omolola, J. S., & Adefemi, A. A. (2018). Modelling the Effect of Stock Market Volatility and Exchange Rate Volatility on Foreign Direct Investment in Nigeria: A New Framework Approach. Asian Economic and Financial Review, 8(12), 1482–1505. https://doi.org/10.18488/journal.aefr.2018.812.1482.1505

Osinubi, T. S., & Amaghionyeodiwe, L. A. (2009). Foreign direct investment and exchange rate volatility in Nigeria. International Journal of Applied Econometrics and Quantitative Studies, 6(2), 83-116.

Otchere, I., Soumaré, I., & Yourougou, P. (2015). FDI and Financial Market Development in Africa. The World Economy. 39(5), 651-678.

Patrick, H. T., & Wai, U. (1973) Stock and bond issues and capital markets in less developed countries. International Monetary Fund Staff Papers. World Bank. Washington, D.C.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.

Raja, R., Zehra, I., Chhapra, I. U., & Makhija, P. (2019). The relationship between exchange rate and stock prices in South Asian countries. International Journal of Innovation, Creativity and Change, 6(9), 113-135.

Sakli Hniya, H., Boubker, A., Mrad, F., & Nafti, S. (2021). The impact of real exchange rate volatility on foreign direct investment inflows in Tunisia. International Journal of Economics and Financial Issues, 11(5), 52–67.

Sharifi-Renani, H., & Mirfatah, M. (2012). The impact of exchange rate volatility on foreign direct investment in Iran. Procedia Economics and Finance, 1, 365 – 373.

Sharmin, R., & Khandaker, S. (2015). The Determinant of Foreign Direct Investments, Evidence from Bangladesh. SSRN Electronic Journal. 10.2139/ssrn.2701598.

Sokang, K. (2018). The impact of foreign direct investment on the economic growth in Cambodia: Empirical evidence. International Journal of Innovation and Economic Development, 4(5), 31–38. https://doi.org/10.18775/ijied.1849-7551-7020.2015.45.2003

Stapley, N. F. (1986). The stock market: A guide for the private investor (3rd ed.). Woodhead-Faulkner.

Stiglitz, J. E. (2000). The contributions of the economics of information to twentieth century economics. Quarterly Journal of Economics, 115(4), 1441-1478.

Stock, J. H., & Watson, M. W. (2016). Dynamic Factor Models, Factor-Augmented Vector Autoregressions, and Structural Vector Autoregressions in Macroeconomics, Handbook of Macroeconomics, in: J. B. Taylor & Harald Uhlig (ed.), Handbook of Macroeconomics, edition 1(2), 415-525.

Suliman, A., Elmawazini, K., & Shariff, M. Z. (2015). Exchange rates and foreign direct investment: Evidence for Sub-Saharan Africa. The Journal of Developing Areas, 49(2), 203–226. http://www.jstor.org/stable/24241298

Ullah, S., Haider, S. Z., & Azim, P. (2012). Impact of exchange rate volatility on foreign direct investment: A case study of Pakistan. Pakistan Economic and Social Review, 50(2), 121–138. Retrieved from https://www.jstor.org/stable/43855777

Uzoma-Nwosu, D. C., & Orekoya, S. (2020). Exchange rate volatility and foreign direct investment in Nigeria: Array. EuroEconomica, 38(2). https://dj.univ-danubius.ro/index.php/EE/article/view/54

Vanapruk, S. (2021). Effect of exchange rate, exchange rate volatility, and stock market return on foreign direct investment (Chulalongkorn University Theses and Dissertations No. 7654). Chulalongkorn University. https://digital.car.chula.ac.th/chulaetd/7654

Wooldridge, J. M. (2015). Introductory Econometrics: A Modern Approach (6th ed.). Cengage Learning.

Yabu, N., & Kimolo, D. (2020). Exchange Rate Volatility and Its Implications on Macroeconomic Variables in East African Countries. Applied Economics and Finance. 7. 145. 10.11114/aef.v7i3.4859.

Yartey, C. A., & Adjasi, C. K. (2007). Stock Market Development in Sub-Saharan Africa: Critical Issues and Challenges. IMF Working Paper, WP/07/209.

Zubair, Z.A. & Aladejare, S.A. (2017). Exchange rate volatility and stock market performance in Nigeria. Asian Journal of Multidisciplinary studies, 5(11), 194-201.