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The Effect of Foreign Exchange Fluctuations on Foreign Direct Investment Inflows In Nigeria

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ABSTRACT: This study investigates how changes in foreign exchange rates affect foreign direct investment (FDI) in Nigeria from 2005 to 2022. Using data from the Central Bank of Nigeria, the study examines variables like Foreign Direct Investment Inflows (FDII), Real Exchange Rate (RER), Nominal Exchange Rate (NER), and Official Exchange Rate (OER). Employing a Vector Autoregression (VAR) model, the study finds that fluctuations in exchange rates, including OER, RER, and NER, do not significantly impact FDI inflows. The study underscores the need for Policymakers to diversify investment promotion strategies, fortify economic fundamentals, engage in targeted marketing, and consider implementing hedging mechanisms to alleviate currency risk for potential investors.

Key words: Foreign exchange rate fluctuation, foreign direct investment inflow,

INTRODUCTION

Nigeria actively seeks foreign direct investment (FDI) to spur economic growth, but the nation grapples with challenges navigating foreign exchange rate fluctuations. The fluctuations in foreign exchange rates, referring to the unpredictable changes in the value of the national currency (Naira) relative to other currencies, pose significant challenges for attracting FDI (Adegoriola & Comfort, 2022).

FDI inflows, crucial for economic development, signify the capital and resources entering Nigeria from foreign investors for the purpose of establishing or expanding business operations (World Bank, 2021). These inflows bring not only financial resources but also technology, skills, and employment

opportunities. The dynamics of FDI inflows are influenced by various factors, with exchange rate fluctuations playing a pivotal role. Uncertainties introduced by fluctuations in exchange rates can either attract or deter foreign investors, shaping their risk assessments and decisions (Ehikioya, 2018).

Nigeria's heavy reliance on oil exports makes its economy sensitive to global economic conditions, contributing to observed fluctuations in the foreign exchange market. Exchange rate stability, crucial for Nigeria's perception as an investment-worthy destination, is central to understanding the complexities of attracting and retaining FDI (Asiedu, 2002).

Fluctuations in exchange rates, acting as significant deterrents for foreign investors and shaping their risk assessments, have an adverse impact on FDI inflows (Dhakal, Pradhan, & Upadhyaya, 2010). Ensuring stability in exchange rates is pivotal for attracting and sustaining foreign investment, playing a key role in Nigeria's overall economic growth

This background sets the stage for the study on the effect of fluctuations in foreign exchange rates on FDI inflows in Nigeria. It aims to dissect the intricate relationship between currency dynamics and investment decisions, emphasizing the study's focal point on "Fluctuations in Foreign Exchange Rates and Foreign Direct Investment Inflows in Nigeria."

Nigeria's pursuit of sustained economic development through foreign direct investment (FDI) faces a formidable challenge presented by the recurrent fluctuations in foreign exchange rates. As Dhakal, Pradhan, and Upadhyaya (2010) succinctly state, "the volatility in foreign exchange rates poses significant challenges for attracting foreign direct investment." This volatility is characterized by unpredictable shifts in the value of the Naira, the national currency, in comparison to other currencies.

The critical issue at hand is the adverse impact of these fluctuations on the investment landscape. According to Ehikioya (2018), "the uncertainties introduced by the volatile foreign exchange market act as significant deterrents for foreign investors, shaping their risk assessments and investment decisions." Foreign investors, pivotal for injecting capital, technology, and expertise into the Nigerian economy, are confronted with heightened uncertainties due to the unpredictable nature of exchange rate movements.

Compounding this challenge is Nigeria's economic reliance on oil exports, contributing

to observed fluctuations in the foreign exchange market. The sensitivity of the economy to global economic conditions further exacerbates the volatility, affecting the stability of the Naira and, consequently, the confidence of foreign investors.

In light of these challenges, the lack of a comprehensive understanding of the intricate effects of fluctuations in foreign exchange rates on FDI inflows in Nigeria becomes evident. This knowledge gap impedes the development of effective strategies and policies aimed at mitigating the negative impact of exchange rate uncertainties and fostering a more conducive environment for foreign investment. This study therefore seeks to address the pressing issue of how fluctuations in foreign exchange rates impede FDI inflows in Nigeria.

However, the specific objectives are: to assess the effect of Official Exchange Rate on Foreign Direct Investment (FDI) Inflows; to evaluate the Effect of Real Exchange Rate on Foreign Direct Investment (FDI) Inflows, and to examine the Influence of Nominal Exchange Rate on Foreign Direct Investment (FDI) Inflows.

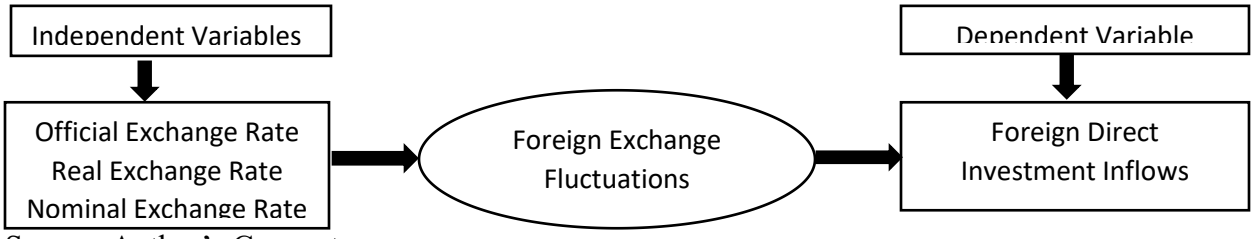
Research Hypothesis

1. **H_0 (Null Hypothesis):** Changes in the real exchange rate do not have a significant effect on the level and stability of foreign direct investment in Nigeria.
2. **H_0 (Null Hypothesis):** Changes in the official exchange rate do not have a significant effect on the level and stability of foreign direct investment in Nigeria.
3. **H_0 (Null Hypothesis):** Nominal exchange rate volatility has no significant effect on the magnitude and consistency of foreign direct investment inflows into the Nigerian economy.

LITERATURE REVIEW

Conceptual Framework

In the globalized economic landscape, the intricate dynamics between foreign exchange fluctuations and Foreign Direct Investment (FDI) inflows have profound implications for emerging economies like Nigeria. This conceptual framework elucidates the relationships and inter-dependencies among key variables, providing a comprehensive understanding of the mechanisms driving the impact of foreign exchange fluctuations on FDI inflows.



Source: Author's Concept

Foreign Exchange Fluctuations: Understanding the Dynamics of Currency Movements

Foreign exchange (FX) fluctuations represent the continuous and often unpredictable changes in the exchange rates between different currencies in the global financial markets. This concept is integral to understanding the dynamic nature of international trade, investment, and financial transactions. Delving into the intricacies of foreign exchange fluctuations provides insights into their causes, effects, and the broader implications for economies and businesses (Krugman & Obstfeld, 2009).

The Role of Official Exchange Rates

The official exchange rate serves as a primary indicator in the realm of foreign exchange fluctuations. It reflects the value of a country's currency as determined by its government or central bank (Frankel, 2010). This rate is subject to various influences, including economic conditions, interest rates, and government policies. Changes in the official exchange rate can significantly impact a nation's trade balance, affecting the competitiveness of its exports and the cost of its imports.

Real Exchange Rates: Adjusting for Inflation

Real exchange rates add a layer of complexity to the understanding of foreign exchange fluctuations. Adjusting the nominal exchange rate for inflation differentials between countries, the real exchange rate provides a more accurate representation of the relative purchasing power of currencies. This adjustment is essential for assessing the actual changes in competitiveness and trade balances (Blanchard & Sheen, 2013). As fluctuations in real exchange rates influence the relative cost of goods and services, they play a pivotal role in shaping international trade dynamics.

Nominal Exchange Rates: Direct Impact on Transactions

Nominal exchange rates, on the other hand, represent the straightforward exchange rate without accounting for inflation (Ozkan, 2005). These rates directly impact the cost of transactions for businesses and consumers engaged in international trade. Nominal exchange rates are crucial for pricing decisions, affecting the competitiveness of products in global markets. Fluctuations in nominal exchange rates have immediate and tangible effects on the profitability of cross-border transactions.

Foreign Direct Investment Inflows

Foreign Direct Investment (FDI) inflows represent the monetary resources, technology, and expertise that flow into a country from foreign entities, typically in the form of investments in businesses, projects, or assets. This form of investment involves a long-term interest and a degree of influence or control by the foreign investor in the host country's economic activities. Linking this concept to the study, the stability and attractiveness of Nigeria as a destination for FDI are significantly influenced by the dynamic nature of foreign exchange fluctuations. Investors often consider the risks associated with currency volatility when deciding to invest in a particular country (Krugman & Obstfeld, 2012).

Theoretical Framework

The theoretical framework for the study on the effect of foreign exchange fluctuations on foreign direct investment (FDI) inflows, with FDI inflows as the dependent variable and official exchange rate, real exchange rate, and nominal exchange rate as the independent variables, is the Market Power Theory (Bain, 1956)

Market Power Theory: Market Power Theory, often associated with industrial organization economics, suggests that firms invest internationally to gain and exploit market power. In the context of FDI, this theory posits that companies engage in foreign investments to establish a competitive advantage, increase market share, and enhance their overall market power.

Applying Market Power Theory to our study:

Official Exchange Rate and Competitive Advantage: The official exchange rate can affect the competitiveness of a country's goods and services in the global market. A favorable official exchange rate may provide a competitive advantage to foreign investors, encouraging higher FDI inflows as companies seek to exploit this advantage for increased market power.

Real Exchange Rate and Cost Competitiveness: The real exchange rate, adjusted for inflation, influences the cost competitiveness of goods and services. A favorable real exchange rate can reduce production costs for foreign investors, leading to increased market power through lower prices or improved profit margins.

Nominal Exchange Rate and Strategic Positioning: The nominal exchange rate, representing the straightforward exchange rate without adjusting for inflation, can impact the strategic positioning of firms. A lower nominal exchange rate may attract FDI by allowing companies to establish a strategic position in the market, potentially leading to increased market power.

By employing Market Power Theory, the study can explore how fluctuations in official, real, and nominal exchange rates influence the market power dynamics of foreign investors in Nigeria. It allows for an analysis of how these exchange rate fluctuations impact the strategic decisions of firms regarding FDI, aiming to enhance their market share and competitive position in the host country.

Empirical Review

Udoh and Egwaikhide (2008) conducted a comprehensive study spanning from 1970 to 2005 to explore the influence of exchange rate volatility and inflation uncertainty on foreign direct investment (FDI) in Nigeria. Employing a diverse set of variables including FDI inflows, GDP, trade openness, and government size, the researchers utilized the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model alongside regression analysis. Their findings revealed a noteworthy negative and significant impact of both exchange rate volatility and inflation uncertainty on FDI inflows.

In a study conducted by Osinubi and Amaghionyeodiwe (2009) spanning from 1970 to 2004, the researchers delved into the intricate relationship between exchange rate volatility and foreign direct investment (FDI) inflows in Nigeria. The study employed a diverse set of variables including real inward FDI, exchange rate, exchange rate volatility, interest rate, real gross domestic product (GDP), and a dummy variable for the Structural Adjustment Program (SAP). Utilizing an Error Correction Model (ECM) alongside Ordinary Least Squares (OLS) regression, the researchers uncovered a significant and negative impact of exchange rate volatility on FDI inflows in Nigeria.

In a comprehensive study spanning from 1980 to 2003, Kyereboah-Coleman and Tirivayi

(2008) focused on unraveling the impact of exchange rate volatility on foreign direct investment (FDI) inflows in Ghana. The researchers incorporated a set of crucial variables including exchange rate volatility, FDI inflows, GDP, trade openness, and institutional quality to provide a nuanced understanding of the relationship. Employing sophisticated analytical tools such as ARCH and GARCH models, co-integration, and Error Correction Model (ECM), the study revealed a noteworthy finding. Exchange rate volatility exhibited a negative and statistically significant impact on FDI inflows in Ghana.

In a study spanning the period from 1996 to 2011, Azhar, Ullah, and Malik (2015) delved into the relationship between exchange rate volatility and foreign direct investment (FDI) inflows in SAARC countries. The research incorporated a comprehensive set of variables including foreign direct investment, exchange rates, terrorism, consumer price index, and gross domestic product to provide a holistic understanding of the dynamics at play. Utilizing sophisticated analytical techniques such as panel regression analysis and unit root tests, the study arrived at a significant conclusion. The findings indicated that inconsistency in exchange rates had a detrimental impact on foreign direct investment across SAARC countries.

Chaudhary and Shah (2012) conducted an extensive examination of the impact of exchange rate volatility on foreign direct investment (FDI) inflows in selected Asian economies during the period from 1980 to 2010. Focusing on key variables such as exchange rate volatility and FDI inflows, the study employed sophisticated econometric methods, including Autoregressive Distributed Lag (ARDL) and Generalized Autoregressive Conditional Heteroscedasticity (GARCH) models. The comprehensive analysis yielded a noteworthy finding: exchange rate volatility exerted a negative and statistically significant influence on FDI inflows in the selected Asian economies.

Qamruzzaman and Karim (2019) delved into the dynamics between exchange rates and foreign direct investment (FDI) in Bangladesh over the extensive period from 1974 to 2016. In their investigation, they considered critical variables such as FDI, exchange rates, money supply, and real government expenditure. Employing a Nonlinear Autoregressive Distributed Lag (ARDL) model and Granger-Causality tests, the study unveiled an intriguing aspect of the relationship. Exchange rates demonstrated a nonlinear, asymmetric connection with FDI inflows in Bangladesh. The findings indicated that

positive shocks to the exchange rate had a more pronounced negative impact on FDI

inflows compared to negative shocks.

Schmidt and Broll 2008), conducted a comprehensive empirical analysis investigating the impact of exchange rate risk on US foreign direct investment (FDI) from 1984 to 2004. The study focused on the key variables of FDI and real exchange rate, employing variable specifications outlined by Cushman (1988). The findings revealed that exchange rate volatility exerted a discouraging effect on FDI flows across various industries. Moreover, the study indicated that real exchange rate appreciation had a positive influence on FDI.

Adegoriola and Comfort (2022), embarked on a study to scrutinize the relationship between exchange rate fluctuation and foreign direct investment (FDI) in Nigeria over the period from 1986 to 2020. The study considered multiple variables, including FDI, interest rate, exchange rate, gross capital formation, and inflation. To analyze these dynamics, the researchers applied rigorous statistical methods, including unit root tests, co-integration tests, and the Autoregressive Distributed Lag (ARDL) model. The study's outcomes unveiled a compelling narrative, indicating that exchange rate fluctuation wielded a negative and significant impact on FDI inflows in Nigeria.

Unugbro (2007) conducted a comprehensive investigation into the impact of exchange rate fluctuation on capital inflows in Nigeria over the period from 1980 to 2003. The study incorporated several key variables, including FDI, exchange rate fluctuation, GDP, and inflation. Employing the Cochrane-Orcutt method, the researcher sought to unravel the intricate dynamics of these factors. The findings of the study revealed a compelling narrative, indicating that exchange rate fluctuation exerted a negative and significant impact on capital inflows.

Mbanasor and Obioma (2017) delved into an examination of the impact of exchange rate fluctuation on foreign private investment in Nigeria, spanning the years from 1981 to 2015. The study incorporated variables such as Foreign Private Investment, Exchange Rate Fluctuations, Export Rate (EXPR), and Import Rate (IMPR). Utilizing a Two-stage Least Square (2LS) analysis and Granger Causality test, the researchers aimed to unravel the complex relationship between these factors. The study's narrative unfolded with the revelation that exchange rate fluctuations had a negative and nonsignificant impact on Nigeria's foreign private investment.

In the study conducted by Chukwudi and Madueme (2010), the primary objective was to scrutinize the impact of dollar exchange rate volatility on foreign direct investment (FDI) in Nigeria, focusing on the period from 1981 to 2008. The key variables under consideration were Foreign Direct Investment (FDI) and nominal exchange rate. The researchers employed Time Series Data and an ARCH Model-Based Measurement to delve into the intricacies of exchange rate volatility and its repercussions on FDI. The narrative of their findings unfolded, revealing a nuanced relationship. Exchange rate volatility, stemming from the depreciation of Nigeria's currency, was identified as an attraction for FDI. Conversely, volatility resulting from the appreciation of the host country's currency was found to discourage FDI.

Muhammad, and Azu (2018) embarked on a comprehensive investigation aiming to discern the effect of real exchange rate fluctuation and its volatility on the inward flow of Foreign Direct Investment (FDI), with Nigeria as the focal country. The study spanned a significant historical period, ranging from 1970 to 2014, providing a robust foundation for their analysis. The key variables central to their research were the Inward Flow of Foreign Direct Investment (FDI), Real Exchange Rate Fluctuation, Real Exchange Rate Volatility, and the Political Regime (specifically, Democracy and Military rule). The researchers employed a GARCH (1,1) model and an Autoregressive Distributed Lag (ARDL) model to unravel the dynamics of exchange rate movements and their impact on FDI. Their findings unveiled a clear relationship between real exchange rate fluctuations and FDI inflows. The study revealed that these effects were more pronounced in the short run. Specifically, while devaluation was associated with an increase in the inflow of FDI, volatility emerged as a factor that made foreign investors more cautious, fostering skepticism amidst rising uncertainty.

Efiong, Ayuk, and Imong (2018) delved into a thorough examination of the effects of exchange rate fluctuations on Foreign Direct Investment (FDI) in Nigeria, focusing on the critical timeframe between 2001 and 2015. Their study encompassed a diverse set of variables, including Exchange Rate Fluctuations, FDI, GDP Growth, Inflation, and Political Stability. Utilizing the robust Ordinary Least Squares (OLS) regression analysis, the researchers sought to unravel the intricate relationships between these variables and FDI dynamics in the Nigerian context. The findings painted a nuanced picture,

revealing that exchange rate fluctuations exerted a negative and statistically significant impact on FDI in Nigeria.

Chukwue (2019) conducted a comprehensive examination of the intricate relationship between exchange rates and Foreign Direct Investment (FDI) inflows in Nigeria, spanning the expansive period from 1980 to 2017. The study incorporated a diverse set of variables, including Exchange Rate, FDI Inflow, GDP Growth, Inflation, and Government Expenditure. Employing the Autoregressive Distributed Lag (ARDL) model, the research aimed to unravel the dynamics shaping FDI inflows concerning these crucial factors. The findings illuminated a clear pattern, indicating that exchange rates exerted a negative and statistically significant impact on FDI inflows in Nigeria.

Okonkwo, Osakwe and Nwadibe (2021) embarked on a thorough exploration of the impact of Real Exchange Rate (RER) and Nominal Exchange Rate (NER) on Foreign Direct Investment (FDI) within the Nigerian context, spanning the extensive period from 1981 to 2018. The study revolved around critical variables such as FDI, Real Exchange Rate, and Nominal Exchange Rate. A battery of tests, including Unit Root Test, Stationarity Test, Multi-collinearity analysis, Co-integration Relationship examination, Error Correction Model (ECM), and Granger Causality Test, formed the methodological arsenal to unravel the complex relationships among these variables. The research's nuanced findings revealed that both the Real Exchange Rate and Nominal Exchange Rate exhibited a negative and statistically significant impact on Foreign Direct Investment in Nigeria.

In their study, Uzoma-Nwosu and Orekoya (2019) undertook a comprehensive examination of the intricate relationship between exchange rate volatility (ERV) and foreign direct investment (FDI) within the Nigerian context, spanning the extensive period from 1981 to 2017. The study incorporated key variables such as FDI, Exchange Rate, Poverty, Inequality, and Underdevelopment. To unravel the complexities of this relationship, the researchers employed rigorous statistical methodologies. These included the Augmented Dickey-Fuller (ADF) test, Johansen cointegration test and the Granger Causality test to understand the directional causality between the variables. The findings of this study conveyed a clear message: exchange rate volatility has a negative and statistically significant impact on foreign direct investment in Nigeria.

Chidimma and Okonkwo (2020) delved into the intricate dynamics between exchange rates and foreign direct investment (FDI) in Nigeria over an expansive temporal span from 1981 to 2018. Their study encompassed key variables such as Foreign Direct Investment (FDI), Real Exchange Rate, and Nominal Exchange Rate. Employing a robust analytical framework, the researchers subjected their data to a battery of tests including the Unit Root Test, Multi-collinearity analysis, Co-integration Relationship examination, Error Correction Model (ECM), and Granger Causality Test. The study's findings succinctly conveyed a significant and negative relationship between both real and nominal exchange rates and foreign direct investment in Nigeria.

Aderemi, Oladele, and Omogboye (2019) embarked on an insightful investigation to scrutinize the ramifications of exchange rate volatility on foreign capital inflows in Nigeria during the extensive time frame from 1990 to 2016. Their study encompassed key variables such as Foreign Capital Inflows, Exchange Rate Volatility, FDI Inflows, Remittances, and External Debt.To scrutinize the dynamics among these variables, the researchers judiciously applied rigorous statistical methods, including Unit Roots Test, Johansen Cointegration, and Vector Error Correction Model (VECM). The study's findings revealed a noteworthy and negative impact of exchange rate volatility on foreign capital inflows in Nigeria.

Agugua, Onuoha, and Nwaeze (2021) conducted a comprehensive investigation into the intricate relationship between exchange rate depreciation and foreign direct investment (FDI) inflows in Nigeria over the extensive period from 1981 to 2018. Their study considered vital variables, including Foreign Direct Investment (FDI) Inflow, Exchange Rate Depreciation, Real Gross Domestic Product (RGDP), Inflation Rate, External Debt (EDET), and Degree of Openness. Employing a rigorous analytical framework, the researchers applied various statistical tests such as the Augmented Dickey Fuller Test, Vector Error Correction Test, Granger Causality Test, and Impulse Response Analysis. The findings of the study unveiled significant insights into the determinants of foreign direct investment in Nigeria. Exchange rate depreciation emerged as a pivotal factor influencing FDI inflows, underscoring the importance of a stable and favorable exchange rate environment.

Keifa, Dire, and Udy (2023) embarked on a comprehensive examination of the intricate relationship between exchange rates and foreign direct investment (FDI) in Nigeria,

spanning a substantial period from 1981 to 2020. The study meticulously considered key variables, including Exchange Rate, FDI, Gross Domestic Product (GDP), Trade Openness, and Inflation. Utilizing a robust analytical framework, the researchers employed sophisticated econometric tools such as the Johansen Co-integration Test, Granger Causality Test, and Vector Error Correction Model (VECM). The findings of the study underscored a significant negative impact of exchange rates on foreign direct investment in Nigeria.

Kenneth, M. K., Muniu, J., and Kosgei, M. (2017) conducted a meticulous investigation into the multifaceted effects of exchange rate volatility on foreign direct investment (FDI) in Kenya. Spanning the period from 1998 to 2014, their study delved into both the short-run and long-run dynamics of this relationship. The researchers employed a comprehensive analytical approach, employing an Error Correction Model for the short run and Multiple Regression for the long run. The outcomes of their study revealed a compelling narrative: exchange rate volatility exerted a consistently negative and statistically significant impact on FDI in Kenya, irrespective of the time horizon.

Summary of the Empirical Review

Negative Impact of Exchange Rate Volatility on FDI in Nigeria:

Udoh and Egwaikhide (2008); Osinubi and Amaghionyeodiwe (2009); Adegoriola and Comfort (2022); Chukwue (2019); Uzoma-Nwosu and Orekoya (2019); Chidimma and Okonkwo (2020)

Negative Impact of Exchange Rate Volatility on FDI in Other African Countries:

Kyereboah-Coleman and Tirivayi (2008) (Ghana); Mbanasor and Obioma (2017) (Nigeria); Agugua, Onuoha, and Nwaeze (2021) (Nigeria)

Mixed Effects of Exchange Rate Volatility on FDI:

Schmidt and Broll (2008) (US) - Discouraging effect on FDI flows

Qamruzzaman and Karim (2019) (Bangladesh) - Asymmetric relationship, positive shocks have a stronger negative impact

Impact of Exchange Rate Fluctuation on FDI in Nigeria:

Unugbro (2007) - Negative impact on capital inflows

Muhammad and Azu (2018) - Short-term increase with devaluation, but volatility raises skepticism

Efiong, Ayuk, and Imong (2018) - Negative impact

Okonkwo, Osakwe, and Nwadibe (2021) - Both real and nominal exchange rates negatively impact FDI

Chukwue (2019) - Negative impact

Other Findings:

Azhar, Ullah, and Malik (2015) - Exchange rate inconsistency is detrimental to FDI across SAARC countries.

Chaudhary and Shah (2012) - Exchange rate volatility negatively influences FDI in selected Asian economies.

Aderemi, Oladele, and Omogboye (2019) - Exchange rate volatility negatively impacts foreign capital inflows in Nigeria.

Keifa, Dire, and Udy (2023) - Exchange rates have a significant negative impact on FDI in Nigeria.

Kenneth, Muniu, and Kosgei (2017) - Exchange rate volatility consistently negatively impacts FDI in Kenya in the short and long run.

Gap in Literature

Integration of Official, Real, and Nominal Exchange Rates:

The existing literature have gaps in studies that holistically integrate official, real, and nominal exchange rates. This research could explore how these different dimensions of exchange rates collectively influence FDI, providing a more comprehensive understanding of their combined impact.

METHODOLOGY

The study utilized an ex-post facto research design to investigate the effect of foreign exchange fluctuations on foreign direct investment inflows in Nigeria. Ex-post facto research, also known as retrospective or causal-comparative research, is a non-experimental design that explores the relationship between variables after they have naturally occurred. In this design, the researcher lacks control over the independent variable but retrospectively analyzes its effects on the dependent variable(s). The data for this research were obtained from the Central Bank of Nigeria Statistical Bulletin, spanning 18 years period, specifically from 2005 to 2022, creating a time series of annual data.

Table 1. Variable Definition and Measurement Units

S/N	Variables	Measurement and Explanation	Appriori Expectation
1	Foreign Direct Investment Inflows (FDII)	Dependent Variable	Dependent Variable
2	Real Exchange Rate (RER)	Independent Variable	Negative
3	Nominal Exchange Rate	Independent Variable	Negative
4	Official Exchange Rate (OER)	Independent Variable	Negative

Source: Author's Concept

Model specification

To analyze the relationship between foreign exchange fluctuations and foreign direct investment inflows, a regression model has been developed.

General model:

Foreign Direct Investment Inflows = $\beta 0 + \beta 1$ * Foreign Exchange Fluctuations + ε

In this model:

Foreign Direct Investment Inflows (FDII) represents the dependent variable and Foreign Exchange Fluctuations represents the independent variable (Real Exchange rate- RER, Nominal Exchange rate- NER, Official Exchange rate- OER).

$\beta 0$ and $\beta 1$ are the regression coefficients representing the intercept and the slope, respectively, and they quantify the relationship between the independent variable (Foreign Exchange Fluctuations), and the dependent variable (Foreign Direct Investment Inflows).

ε represents the error term, accounting for unexplained variation or other factors not included in the model. By estimating the regression coefficients ($\beta 0$ and $\beta 1$) using statistical techniques, we determined the nature and strength of the relationship between Foreign Exchange Fluctuations, and Foreign Direct Investment Inflows.

Specific ModeL

FDII = f(RER + NER + OER)

The Econometric Equation Form of the Model

$FDII = \beta 0 + \beta_1 RER + \beta_2 NER + \beta_3 OER + \varepsilon$

Method of Data Analysis

This study employed a data analysis methodology that incorporated both descriptive statistics and econometric analysis,

resulting in a dynamic and invigorating approach to the analytical process.

Descriptive Statistics

Descriptive statistics are essential in summarizing and interpreting the data in a study, providing valuable insights into the central tendencies, variations, and distributional characteristics of the variables under investigation. In this research, the researcher employed various descriptive statistics, including means, maximum and minimum values, standard deviations, and Jarque Bera statistics for testing normality.

Econometric Model

In the study, the econometric tool employed was the Vector Autoregression (VAR) model. This choice was made due to the necessity of accommodating unit root tests through first and second differencing of variables. VAR is suitable for analyzing interdependent relationships among multiple time series variables, making it well-suited for capturing the dynamic interactions observed in the data after differencing.

RESULTS AND DISCUSSION

Here, we present the data and analyze the results of descriptive statistics, Vector Autoregressive analysis, and the Hypothesis Test

Data Presentation

Year	Foreign Direct Investment Inflows (₦)	Official Exchange Rate (₦)	Real Exchange Rate (₦)	Nominal Exchange Rate (₦)
	FDI	OER	RER	NER
2005	8,255,569	132.15	143.78	106.58
2006	7,050,504	128.65	148.33	105.02
2007	7,870,790	125.83	155.75	106.41
2008	10,155,417	118.57	90.31	79.69
2009	12,827,519	148.88	97.44	94.30
2010	13,928,844	150.30	93.39	96.74
2011	17,432,939	153.86	89.82	102.30
2012	21,184,976	157.50	79.58	98.08
2013	24,861,122	157.31	74.20	95.64
2014	31,353,776	158.55	69.51	94.05
2015	35,866,682	193.28	70.83	102.00
2016	39,277,880	253.49	80.36	131.30
2017	48,776,825	305.79	98.21	181.67
2018	51,975,766	306.08	92.63	186.59
2019	60,422,470	306.92	81.84	178.67
2020	65,809,568	358.81	76.28	185.12
2021	75,862,293	400.24	73.55	202.59
2022	84,552,785	425.98	63.55	194.51

Source: CBN Statistical Bulletin

Descriptive Statistics

	FDI	OER	RER	NER
Mean	34303651	221.2328	93.29778	130.0700
Median	28107449	158.0250	85.83000	105.7150
Maximum	84552785	425.9800	155.7500	202.5900
Minimum	7050504.	118.5700	63.55000	79.69000
Std. Dev.	24982211	102.7381	27.68179	43.65347
Skewness	0.619850	0.754699	1.318461	0.605483
Kurtosis	2.125904	2.098289	3.467235	1.588824
Jarque-Bera	1.725675	2.318522	5.378753	2.593390
Probability	0.421963	0.313718	0.067923	0.273434
Sum	6.17E+08	3982.190	1679.360	2341.260
Sum Sq. Dev.	1.06E+16	179436.9	13026.78	32395.64
Observations	18	18	18	18

Source: E-view version 12

Mean: The mean represents the average value of each variable across the observations. The mean FDI is approximately 34,303,651, which means that, on average, the FDI across the observations is around $34.3 million.

Median: The median is the middle value of the dataset when arranged in ascending order. It is less sensitive to outliers compared to the mean. The median FDI is approximately 28,107,449, which indicates that half of the observations have FDI values below this number and half have values above it.

Maximum: This represents the highest value observed for each variable in the dataset. The maximum FDI is approximately 84,552,785, indicating the highest recorded FDI value in the dataset.

Minimum: This represents the lowest value observed for each variable. The minimum FDI is approximately 7,050,504, indicating the lowest recorded FDI value in the dataset.

Standard Deviation: The standard deviation measures the dispersion or variability of the data points around the mean. A higher standard deviation implies greater variability.

Jarque-Bera: The Jarque-Bera test is a test for normality. It assesses whether the data follows a normal distribution based on skewness and kurtosis. A low p-value (typically below a significance level like 0.05) indicates that the data significantly deviates from a normal distribution.

Probability: This represents the p-value associated with the Jarque-Bera test. Lower probabilities indicate a rejection of the null hypothesis that the data is normally distributed.

Unit Root Test Result

Variables	Unit Root Test at Level	Unit Root Test at 1st Differencing	Unit Root Test at 2nd Differencing
Foreign Direct Investment Inflows (FDI)			-5.829984 (2)
Official Exchange Rate (OER)			-4.410286 (2)
Real Exchange rate (RER)		-6.664656 (1)	
Nominal Exchange Rate (NER)		-4.615239 (1)	

Source: Author's Concept

Vector Autoregression Estimates

Vector Autoregression Estimates
Date: 03/12/24 Time: 11:45
Sample (adjusted): 2007 2022
Included observations: 16 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	FDI	OER	RER	NER
FDI(-1)	0.326551	1.55E-06	-3.12E-06	-2.82E-06
	(0.29030)	(2.5E-06)	(3.0E-06)	(2.0E-06)
	[1.12487]	[0.63097]	[-1.05130]	[-1.41830]
FDI(-2)	0.885181	2.74E-06	4.20E-06	5.38E-06
	(0.39525)	(3.3E-06)	(4.0E-06)	(2.7E-06)
	[2.23952]	[0.81794]	[1.03829]	[1.98989]
OER(-1)	-20436.52	0.984124	-0.128566	-0.037753
	(66091.3)	(0.55980)	(0.67629)	(0.45247)
	[-0.30922]	[1.75798]	[-0.19010]	[-0.08344]
OER(-2)	70497.31	-0.954191	-0.208905	-0.766172
	(80024.4)	(0.67782)	(0.81887)	(0.54786)
	[0.88095]	[-1.40773]	[-0.25511]	[-1.39848]
RER(-1)	-44465.63	-0.266525	0.034429	-0.807619
	(60240.3)	(0.51025)	(0.61642)	(0.41241)
	[-0.73814]	[-0.52235]	[0.05585]	[-1.95827]
RER(-2)	37595.11	0.539770	0.496667	0.606689
	(62570.2)	(0.52998)	(0.64026)	(0.42836)
	[0.60085]	[1.01847]	[0.77572]	[1.41629]
NER(-1)	-1080.097	-0.079327	0.824703	1.989833
	(124319.)	(1.05300)	(1.27212)	(0.85110)
	[-0.00869]	[-0.07533]	[0.64829]	[2.33794]
NER(-2)	-112992.3	0.191967	-0.611166	-0.537407
	(123449.)	(1.04563)	(1.26322)	(0.84515)
	[-0.91530]	[0.18359]	[-0.48382]	[-0.63587]
C	6443761.	40.37630	55.93221	58.32471
	(3519020)	(29.8067)	(36.0092)	(24.0917)
	[1.83112]	[1.35460]	[1.55328]	[2.42094]
R-squared	0.997483	0.989885	0.648378	0.965785
Adj. R-squared	0.994607	0.978325	0.246525	0.926682
Sum sq. resids	2.27E+13	1627.179	2374.837	1063.025
S.E. equation	1800015.	15.24645	18.41908	12.32318
F-statistic	346.7690	85.62967	1.613469	24.69869
Log likelihood	-246.5425	-59.67913	-62.70378	-56.27330
Akaike AIC	31.94281	8.584891	8.962972	8.159162
Schwarz SC	32.37739	9.019473	9.397554	8.593743
Mean dependent	37634978	232.5869	86.70313	133.1038
S.D. dependent	24509977	103.5590	21.21941	45.51124

Determinant resid covariance (dof adj.)	1.41E+18
Determinant resid covariance	5.16E+16
Log likelihood	-398.6673
Akaike information criterion	54.33341
Schwarz criterion	56.07174
Number of coefficients	36

Source: E-view version 12

Explanation and Interpretations of VAR Result

FDI (Foreign Direct Investment Inflow):

Both lagged values, FDI(-1) and FDI(-2), show positive coefficients.

FDI(-1) coefficient: 0.326551, t-statistic: 1.12487 (not statistically significant at conventional levels)

FDI(-2) coefficient: 0.885181, t-statistic: 2.23952 (statistically significant at a 5% level)

Interpretation: Lagged FDI has a statistically significant positive impact on current FDI, especially for the FDI(-2) variable.

OER (Official Exchange Rate):

Lagged values of OER do not show statistically significant coefficients.

OER(-1) and OER(-2) coefficients have t-statistics close to zero, indicating insignificance.

Interpretation: Lagged OER does not appear to have a statistically significant impact on current OER.

RER (Real Exchange Rate):

Similar to OER, lagged values of RER do not show statistically significant coefficients.

Both RER(-1) and RER(-2) coefficients have t-statistics close to zero, indicating insignificance.

Interpretation: Lagged RER does not appear to have a statistically significant impact on current RER.

NER (Nominal Exchange Rate):

Lagged NER also shows mixed results in terms of significance.

NER(-1) coefficient is statistically insignificant, while NER(-2) coefficient shows some significance.

NER(-2) coefficient: -112992.3, t-statistic: -0.91530 (not statistically significant at conventional levels)

Interpretation: Lagged NER might have some impact on current NER, but it's not statistically significant based on the given data.

Overall Model Significance:

The F-statistics provide information about the overall significance of the model.

F-statistic for FDI is notably high (346.7690), indicating the overall significance of the FDI model. However, the F-statistics for OER, RER, and NER are relatively low, suggesting that these models might not be statistically significant overall.

R-squared and Adjusted R-squared:

R-squared values indicate the proportion of variance explained by the independent variables.

FDI model has a very high R-squared value (0.997483), suggesting that the independent variables explain a large portion of the variance in FDI.

The R-squared values for OER, RER, and NER models are comparatively lower, indicating that these models might not explain as much variance in their respective dependent variables.

The analysis suggests that lagged FDI has a statistically significant positive impact on current FDI, while the impact of lagged values of OER, RER, and NER on their respective current values is not statistically significant based on the given data. Additionally, the overall significance of the models varies across the variables, with the FDI model being notably significant compared to the others.

Hypothesis Testing

Based on the analysis and results provided, here is the interpretation for each hypothesis:

H_0 (Null Hypothesis): Changes in the real exchange rate do not have a significant effect on the level and stability of foreign direct investment in Nigeria.

Real Exchange Rate (RER) Impact on Foreign Direct Investment (FDI): The coefficients for RER(-1) and RER(-2) on FDI are -44465.63 and 37595.11, respectively, with t-statistics of [-0.73814] and [0.60085]. These t-statistics suggest that the coefficients are not statistically significant since they are likely below the critical value (usually 1.96 for a 95% confidence level). This means we fail to reject the null hypothesis that changes in the real exchange rate do not have a significant effect on the level and stability of FDI in Nigeria.

H_0 (Null Hypothesis): Changes in the official exchange rate do not have a significant effect on the level and stability of foreign direct investment in Nigeria.

Official Exchange Rate (OER) Impact on FDI: The coefficients for OER(-1) and OER(-2) on FDI are -20436.52 and 70497.31, respectively, with t-statistics of [-0.30922] and [0.88095]. These t-statistics are not significant, indicating that changes in the official exchange rate do not significantly affect the level and stability of FDI, supporting the null hypothesis.

H_0 (Null Hypothesis): Nominal exchange rate volatility has no significant effect on the magnitude and consistency of foreign direct investment inflows into the Nigerian economy.

Nominal Exchange Rate (NER) Volatility and FDI: The coefficients for NER(-1) and NER(-2) on FDI are -1080.097 and -112992.3, respectively, with t-statistics of [-0.00869] and [-0.91530]. Again, these are not statistically significant, suggesting that nominal exchange rate volatility does not have a significant effect on the magnitude and consistency of FDI inflows into the Nigerian economy, so we fail to reject this null hypothesis as well.

Discussion of Findings

The purpose of this discussion is to look at the findings about the effect of foreign exchange fluctuations on foreign direct investment inflows in Nigeria. By analyzing empirical studies, we would aim to provide an overview of the major findings while acknowledging any agreements or disagreements among the empirical reviews.

Real Exchange Rate (RER) Impact on Foreign Direct Investment (FDI):

The empirical findings based on the study do not support a significant impact of changes in the real exchange rate on foreign direct investment (FDI) in Nigeria. This finding is consistent with the results of the studies conducted by multiple researchers, including Efiong, Ayuk, and Imong (2018), Chikwue (2019), Okonkwo, Osakwe, and Nwadibe (2021), and Aderemi, Oladele, and Omogboye (2019), among others, which have shown a lack of significant impact of real exchange rate fluctuations on FDI in Nigeria over different time periods.

Official Exchange Rate (OER) Impact on Foreign Direct Investment (FDI):

The empirical findings from the study do not support a significant impact of changes in the official exchange rate on foreign direct investment (FDI) in Nigeria. Despite considering the official exchange rate as a determinant of FDI and employing econometric techniques, the results suggest that changes in the official exchange rate do not significantly influence the level and stability of FDI inflows in Nigeria. This finding is consistent with the null hypothesis, indicating that changes in the official exchange rate do not have a significant effect on FDI in Nigeria.

Nominal Exchange Rate (NER) and Foreign Direct Investment (FDI):

The empirical finding from the study do not support a significant impact of nominal exchange rate volatility on the magnitude and consistency of foreign direct investment (FDI) inflows into the Nigerian economy. Despite

considering nominal exchange rate volatility as a determinant of FDI and employing econometric techniques, the results suggest that changes in nominal exchange rate volatility do not significantly influence the level and stability of FDI inflows in Nigeria. This finding is consistent with the null hypothesis, indicating that nominal exchange rate volatility does not have a significant effect on FDI inflows in Nigeria.

CONCLUSIONS

The primary objective of this research was to explore how foreign exchange fluctuations influence foreign direct investment (FDI) inflows in Nigeria. The study examined significant variables such as FDI, official exchange rate (OER), real exchange rate (RER), and nominal exchange rate (NER), aiming to understand their impact on FDI inflows. Utilizing a Vector Autoregression (VAR) model, the study analyzed the dynamic relationship between foreign exchange fluctuations and FDI inflows in Nigeria over the specific period (2005 to 2022). The main findings are as follows:

1. Fluctuations in the official exchange rate (OER) do not significantly affect FDI in Nigeria.

2. Changes in the real exchange rate (RER) do not significantly impact FDI in Nigeria.

3. Nominal exchange rate volatility (NER) does not have a significant effect on FDI in Nigeria.

The findings reveals that fluctuations in exchange rates, both official and real, along with nominal exchange rate, do not significantly influence foreign direct investment (FDI) inflows into Nigeria.

Based on the findings that exchange rate fluctuations do not significantly affect foreign direct investment (FDI) inflows into Nigeria, the following recommendations are proposed:

Diversification of Investment Promotion Strategies: While exchange rates may not be the primary determinant of FDI inflows, it is essential for Nigerian policymakers to diversify their investment promotion strategies. This could include efforts to improve infrastructure, enhance the business environment, and streamline regulatory processes to attract foreign investors.

Strengthening of Economic Fundamentals: Focus should be placed on strengthening economic fundamentals such as political stability, security, and macroeconomic policies. A stable and predictable economic environment can instill confidence in foreign

investors, irrespective of exchange rate fluctuations.

Targeted Marketing and Promotion: Nigeria should engage in targeted marketing and promotion campaigns to highlight investment opportunities in sectors less susceptible to exchange rate fluctuations. By showcasing sectors with stable growth prospects and favorable investment conditions, Nigeria can attract a diverse range of foreign investors.

Implementation of Hedging Mechanisms: While exchange rate fluctuations may not deter all investors, some may still be concerned about currency risk. Therefore, the Nigerian government could explore the implementation of hedging mechanisms or investment guarantees to mitigate the impact of exchange rate volatility on foreign investors.

Contribution to Knowledge

Empirical Evidence: VAR model solidifies understanding of exchange rate and FDI relationship, advancing empirical knowledge.
Policy Implications: Recommendations offer actionable strategies for Nigerian policymakers, enriching FDI promotion literature.
Comparative Analysis: Study contributes insights into global exchange rate and FDI dynamics, informing subtle policy approaches worldwide.

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