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EFFECT OF REMITTANCES ON THE VALUE OF LOCAL CURRENCY IN NIGERIA

ABSTRACT

This research investigates the effect of remittances on exchange rate in Nigeria. Secondary data were used to achieve the objective. Using vector error correction model result from the long run estimates revealed that remittances positively affect exchange rate whereas FDI show negative effect. At the same time the granger exogeneity causality test based on VECM shows that the short run causality positively runs from remittances to FDI. The result generally indicates that improvement in personal remittances would be favorable to the value of local currency in Nigeria. It is therefore essential to encourage remittances from abroad and at the same time re-visit FDI inflow policies in the country.

Keywords: *FDI, Remittances, Currency, Local*

Introduction

Remittances, the funds transferred by migrants to their home countries, have become a significant source of external financing for many developing nations, including Nigeria. As one of the largest recipients of remittances in sub-Saharan Africa, Nigeria's economy is deeply intertwined with the flow of these funds, which have consistently contributed to the nation's foreign exchange reserves and provided a vital lifeline for millions of households. The significance of remittances extends beyond their direct impact on poverty alleviation and household welfare; they also play a crucial role in the broader macroeconomic environment, particularly in influencing the value of the local currency, the Nigerian Naira.

In recent years, the value of the Naira has been subject to considerable volatility, influenced by various factors such as fluctuations in global oil prices, inflationary pressures, and changes in foreign investment flows. Among these factors, remittances have emerged as a critical determinant of exchange rate stability. The relationship between remittances and the value of the local currency is complex, involving multiple channels through which remittance inflows can either bolster or weaken the Naira. Understanding this relationship is crucial for policymakers, especially in a country like Nigeria, where the exchange rate has significant implications for economic stability and growth.

Remittances can affect the value of the local currency in several ways. Firstly, remittances contribute to the supply of foreign currency in the domestic market,

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which can alleviate pressure on the exchange rate by increasing the availability of foreign exchange. This influx of foreign currency can help stabilize the Naira, particularly in times of declining oil revenues, which have traditionally been Nigeria's primary source of foreign exchange. For a country that heavily relies on oil exports, remittances provide an alternative and relatively stable source of foreign exchange, thereby reducing the economy's vulnerability to external shocks.

Secondly, remittances can influence the demand for local currency. When recipients convert remittances into Naira for local spending, the demand for the local currency increases, which can lead to an appreciation of the Naira. This increase in demand can be particularly significant in a country like Nigeria, where remittance inflows are substantial and often directed towards consumption, real estate investments, and other expenditures that require the use of local currency.

However, the impact of remittances on the value of the Naira is not unidirectional. While remittances can support the local currency by increasing foreign exchange reserves and demand for the Naira, they can also have destabilizing effects. For instance, if remittance recipients prefer to hold or invest their funds in foreign currencies rather than converting them into Naira, this can lead to capital flight and increased pressure on the exchange rate. Additionally, large and sudden inflows of remittances can lead to an appreciation of the Naira, which may adversely affect the competitiveness of Nigerian exports by making them more expensive in the global market. This phenomenon, known as "Dutch Disease," has been observed in other remittance-receiving countries and poses a potential risk to Nigeria's trade balance.

The dual nature of remittances—both as a stabilizing force and a potential source of volatility—necessitates a nuanced understanding of their impact on the value of the local currency. In the Nigerian context, where remittances are a critical component of the economy, it is essential to analyze how these inflows interact with other macroeconomic variables to influence the exchange rate. This analysis is particularly relevant given the ongoing challenges faced by the Nigerian economy, including persistent inflation, a high unemployment rate, and a reliance on oil exports in a volatile global market.

Moreover, the relationship between remittances and the value of the Naira is influenced by various structural and policy factors, including the regulatory environment, the level of financial development, and the exchange rate regime. For example, policies that encourage the formalization of remittance channels can enhance the positive impact of remittances on the exchange rate by ensuring that more funds flow through the official banking system, thereby increasing foreign exchange reserves. Conversely, restrictive policies or a lack of financial infrastructure can lead to the diversion of remittances into informal channels, reducing their effectiveness in supporting the local currency.

Given the multifaceted nature of remittances and their impact on the value of the Naira, this research seeks to provide a comprehensive analysis of the subject. By examining the various channels through which remittances influence the exchange rate and exploring the broader macroeconomic implications, this study aims to contribute to the ongoing discourse on the role of remittances in economic development. The findings of this research will have important implications for policymakers in Nigeria, particularly in terms of designing strategies to maximize the benefits of remittance inflows while mitigating potential risks to the stability of the Naira.

Problem Statement

Remittances have become a critical component of Nigeria's economy, serving as one of the largest sources of foreign exchange inflows in the country. Despite their importance, the impact of remittances on the value of the local currency, the Nigerian Naira, remains ambiguous and subject to various interpretations. While remittances can provide a stabilizing effect by increasing the supply of foreign currency and boosting demand for the Naira, they can also introduce volatility into the exchange rate. For instance, large inflows of remittances can lead to the appreciation of the Naira, potentially harming export competitiveness, a situation known as "Dutch Disease." Conversely, if remittances are held or spent in foreign currencies, they may exacerbate capital flight, further destabilizing the exchange rate.

In recent years, the Naira has experienced significant fluctuations, driven by multiple factors, including oil price volatility, inflationary pressures, and changes in foreign investment flows. Among these, remittances have emerged as a vital, yet complex, determinant of exchange rate stability. The dual nature of remittances—as both a source of economic stability and a potential cause of volatility—creates a policy dilemma for Nigerian authorities. While remittances are critical for supporting households and alleviating poverty, their impact on the broader macroeconomic environment, particularly the exchange rate, is not fully understood.

The existing literature has not comprehensively addressed the multifaceted ways through which remittances interact with other macroeconomic variables to influence the value of the Naira. Additionally, there is a lack of empirical evidence on the dynamic effects of remittances on exchange rates in Nigeria, particularly in the context of controlling for other influencing factors like foreign direct investment (FDI). Without a clear understanding of these dynamics, policymakers may struggle to formulate effective strategies to maximize the benefits of remittance inflows while mitigating potential risks to currency stability.

This research, therefore, aims to fill this gap by providing a comprehensive analysis of the impact of remittances on the value of the Naira. The study seeks to explore the various channels through which remittances influence the exchange rate and to understand the broader macroeconomic implications of these flows. By examining both the direct and dynamic effects of remittances on the exchange rate, this study will contribute to the ongoing discourse on the role of remittances in economic development and offer valuable insights for policymakers in Nigeria.

Objectives of the Study

The broad objective of this study is to investigate on the effect of Remittances on the value of Local Currency (Naira) in Nigeria. The specific objectives are to:

- i. Examine the effect of Remittances on exchange rate in Nigeria
- ii. Examine the dynamic effect of remittances on exchange rate in Nigeria
- iii. Examine the relationship between remittances and exchange rate in Nigeria

Research Questions

- i. What are the effects of Remittances on exchange rate in Nigeria?
- ii. What is the dynamic effect of remittances on exchange rate in Nigeria?
- iii. What is the relationship between remittances and exchange rate in Nigeria?

2.0 Literature Review

Remittances, the money sent by migrants to their home countries, play a significant role in the economies of developing countries. In Nigeria, remittances are a critical source of foreign exchange, often surpassing other sources like foreign direct investment (FDI) and official development assistance. The influx of remittances can have a substantial impact on the economy, including the value of the local currency, the Nigerian Naira (NGN). This literature review explores the existing research on the effect of remittances on the value of the Naira, highlighting various theoretical perspectives, empirical findings, and policy implications.

2.2 Theoretical Literature

2.2.1 Demand and Supply of Foreign Exchange

The most direct way remittances affect the value of a local currency is through the demand and supply of foreign exchange. Remittances increase the supply of foreign currency (e.g., US dollars) in the domestic economy. According to the basic principles of supply and demand, an increase in the supply of foreign currency, *ceteris paribus*, should lead to an appreciation of the local currency. This is because more foreign currency is available in the market, which reduces the price of foreign currency relative to the local currency, thereby strengthening the local currency.

2.2.2 Dutch Disease

An alternative perspective is provided by the Dutch Disease theory. This theory suggests that large inflows of foreign currency, such as remittances, can lead to an appreciation of the local currency, making exports more expensive and imports cheaper. While this might initially seem beneficial, it can harm the country's export competitiveness and lead to a decline in the manufacturing and agricultural sectors, which are crucial for long-term economic development.

2.2.3 Inflation and Monetary Policy

Remittances can also influence the value of the local currency through their impact on inflation and monetary policy. If the increase in remittances leads to higher consumer spending, this can drive up demand for goods and services, potentially leading to inflation. In response, the central bank might adjust interest rates to control inflation, which can affect the currency's value. For instance, higher interest rates could attract foreign investment, leading to currency appreciation.

2.2.3: Balance of Payments

Remittances can improve a country's balance of payments by providing a steady source of foreign exchange. A stronger balance of payments position can bolster investor confidence, leading to an appreciation of the local currency. Conversely, if remittances are used predominantly for consumption of imported goods, this could offset the positive effects on the balance of payments, potentially leading to currency depreciation.

2.3 Empirical Evidence on Remittances and Currency Value in Nigeria

2.3.1 Positive Effects of Remittances on Currency Value

Several studies have found a positive relationship between remittances and the value of the Naira. For instance, Adelokun (2011) argues that remittances have been a key factor in supporting the Naira, particularly during periods of economic instability. By increasing the supply of foreign currency, remittances help stabilize the exchange rate and prevent excessive depreciation of the Naira. Similarly, Ogundipe et al. (2014) provides empirical evidence that remittances have a stabilizing effect on the Nigerian economy, contributing to a more favorable balance of payments and, consequently, a stronger Naira. They argue that remittances play a crucial role in smoothing consumption, reducing the need for the government to rely on foreign debt, which could otherwise exert downward pressure on the currency.

2.3.2 Adverse Effects and Dutch Disease

On the other hand, some studies highlight the potential adverse effects of remittances on the Nigerian economy. Olayungbo and Quadri (2019) suggest that while remittances can lead to an appreciation of the Naira, this can also make Nigerian exports less competitive on the international market. Their findings align with the Dutch Disease hypothesis, where the inflow of foreign currency leads to a decline in the tradable goods sector, particularly agriculture and manufacturing. Ogbuabor et al. (2020) extend this argument by showing that the appreciation of the Naira due to remittances can lead to a structural shift in the economy, away from productive sectors toward non-tradable sectors like services and real estate. This shift can have long-term negative effects on economic growth and job creation.

2.3.3 Remittances and Inflationary Pressures

The relationship between remittances and inflation in Nigeria has also been explored in the literature. Balogun et al. (2016) find that remittances can lead to inflationary pressures, particularly in urban areas where the majority of remittance recipients are located. The increased demand for goods and services driven by remittances can push up prices, especially in sectors like housing and consumer goods. This, in turn, can erode the purchasing power of the Naira, leading to a depreciation of the currency in real terms. Olubiya (2020) also highlights the potential for remittances to create inflationary pressures in Nigeria. The study argues that while remittances contribute to economic stability by providing foreign exchange, they also increase money supply without a corresponding increase in the production of goods and services. This imbalance can lead to demand-pull inflation, which could counteract the positive effects of remittances on the exchange rate.

2.3.4 Role of Monetary Policy

The Central Bank of Nigeria (CBN) plays a crucial role in mediating the effects of remittances on the Naira. Ibrahim and Akinbode (2018) examine how the CBN's monetary policy responses to remittance inflows can influence the exchange rate. They argue that the effectiveness of remittances in stabilizing the Naira depends on the CBN's ability to manage the money supply and control inflation. If the CBN tightens monetary policy in response to large remittance inflows, it can mitigate inflationary pressures and support the Naira. Conversely, if

the CBN fails to manage the money supply effectively, the positive impact of remittances on the Naira could be diminished.

3.0 Methodology

To investigate the effect of remittances on the value of the local currency in Nigeria, this study employs a time-series econometric approach, focusing on the use of Unit Root tests, Cointegration analysis, and the Vector Error Correction Model (VECM). These techniques are well-suited for examining the long-term relationship between remittances and the exchange rate while also capturing short-term dynamics.

3.1 Data Description

The study utilizes annual time-series data for Nigeria from 1986 to 2022. The key variables included in the analysis are:

- i. Exchange Rate (EXR): The nominal exchange rate of the Nigerian Naira (NGN) against the US Dollar (USD), used as a proxy for the value of the local currency.
- ii. Remittances (REM): Annual inflows of remittances to Nigeria, measured in US dollars. Remittance data is sourced from the World Bank's Migration and Development Brief.
- iii. Foreign Direct Investment (FDI): Net inflows of foreign direct investment as a percentage of GDP, which can also affect the demand and supply of foreign exchange.

All data are sourced from the World Bank databank. The data are transformed into natural logarithms to stabilize variance and reduce potential Heteroscedasticity.

3.2 Econometric Framework

The study employs a multivariate time-series framework to explore the relationship between remittances and the exchange rate. The following steps outline the econometric approach:

3.2.1 Unit Root Test

The first step involves testing the stationarity of the time series data using Unit Root tests. Time-series data must be stationary to avoid spurious regression results, where non-stationary data can produce misleading inferences.

- i. Augmented Dickey-Fuller (ADF) Test: The ADF test is used to check for the presence of a unit root in the individual time series of the variables (EXR, REM, FDI). The null hypothesis of the ADF test states that the series has a unit root (i.e., it is non-stationary), while the alternative hypothesis states that the series is stationary.
- ii. Phillips-Perron (PP) Test: As a robustness check, the Phillips-Perron test is also employed to confirm the stationarity of the variables. Unlike the ADF test, the PP test adjusts for serial correlation and heteroscedasticity in the error terms.

The unit root tests are conducted at levels and first differences to determine the order of integration of the variables. If the variables are non-stationary at levels but become stationary after first differencing, they are

considered integrated of order one, I(1). This qualifier for the test of cointegration to rule out the possibility of spurious regression in the OLS estimates.

3.2.2 Cointegration Analysis

Once the stationarity properties of the variables are established, the next step is to test for Cointegration to determine whether a long-term equilibrium relationship exists between remittances and the exchange rate, along with other control variables.

Johansen Cointegration Test: The Johansen cointegration test is applied to examine the existence of one or more cointegrating relationships among the variables. The Johansen method provides two statistics for testing the presence of cointegration: the Trace statistic and the Maximum Eigenvalue statistic. Both tests have their null hypotheses set up as no cointegration against the alternative of one or more cointegrating vectors.

- i. The Trace Test tests the null hypothesis that the number of cointegrating vectors is less than or equal to r against the alternative hypothesis of more than r cointegrating vectors.
- ii. The Maximum Eigenvalue Test tests the null hypothesis that the number of cointegrating vectors is r against the alternative hypothesis of $r + 1$ cointegrating vectors.

If the Johansen test indicates the presence of at least one cointegrating vector, it implies that there is a stable, long-term relationship among the variables in the model.

3.2.3 Vector Error Correction Model (VECM)

Given that the variables are found to be cointegrated, a Vector Error Correction Model (VECM) is employed to capture both the long-term equilibrium relationship and the short-term dynamics between remittances and the exchange rate.

The VECM is specified as follows:

$$\begin{aligned} \Delta LOER_t &= \alpha_1 + \beta_1 ECT_{t-1} + \sum_{i=1}^{p-1} \gamma_{11,i} \Delta LOER_{t-i} + \sum_{i=1}^{p-1} \gamma_{12,i} \Delta LPRR_{t-i} + \sum_{i=1}^{p-1} \gamma_{13,i} \Delta L \\ \Delta LPRR_t &= \alpha_2 + \beta_2 ECT_{t-1} + \sum_{i=1}^{p-1} \gamma_{21,i} \Delta LOER_{t-i} + \sum_{i=1}^{p-1} \gamma_{22,i} \Delta LPRR_{t-i} + \sum_{i=1}^{p-1} \gamma_{23,i} \Delta L \\ \Delta LFDI_t &= \alpha_3 + \beta_3 ECT_{t-1} + \sum_{i=1}^{p-1} \gamma_{31,i} \Delta LOER_{t-i} + \sum_{i=1}^{p-1} \gamma_{32,i} \Delta LPRR_{t-i} + \sum_{i=1}^{p-1} \gamma_{33,i} \Delta L \end{aligned}$$

Where:

- Δ represents the first difference operator.
- $LOER_t$, $LPRR_t$, and $LFDI_t$ represent the natural logarithm of the exchange rate, remittances, and foreign direct investment, respectively, at time t .
- $\alpha_1, \alpha_2, \alpha_3$ are the intercept terms.
- ECT_{t-1} is the error correction term representing the long-run equilibrium relationship between the variables, derived from the cointegrating equation.
- $\beta_1, \beta_2, \beta_3$ are the coefficients of the error correction term, indicating the speed of adjustment to the long-run equilibrium.
- $\gamma_{ij,i}$ are the coefficients of the lagged differences of the variables, capturing the short-run dynamics.
- $\epsilon_{1t}, \epsilon_{2t}, \epsilon_{3t}$ are the error terms.

The coefficient of the error correction term (ECT) in the VECM provides the speed of adjustment to the long-run equilibrium. A negative and significant coefficient indicates that any short-term deviation from the long-run equilibrium will be corrected over time, confirming the existence of a long-term relationship.

3.2.4 Granger Causality Test

To further understand the direction of causality between remittances and the exchange rate, the Granger Causality Test is employed within the VECM framework. The Granger causality test determines whether past values of one variable help predict the future values of another variable.

The null hypothesis for the Granger causality test is that the lags of one variable do not Granger-cause the other variable. If the null hypothesis is rejected, it suggests that past values of one variable can be used to predict the future values of another.

3.3 Diagnostic Tests

Several diagnostic tests are conducted to ensure the robustness and reliability of the VECM results:

- i. Serial Correlation Test (Breusch-Godfrey LM Test): To check for the presence of autocorrelation in the residuals.
- ii. Heteroscedasticity Test (White Test): To test for the presence of heteroscedasticity in the residuals.
- iii. Normality Test (Jarque-Bera Test): To verify whether the residuals are normally distributed.
- iv. Stability Test (CUSUM and CUSUMSQ Tests): To ensure the stability of the VECM parameters over time.

3.4 Model Selection Criteria

The optimal lag length for the VECM is determined using model selection criteria such as the Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC), and Hannan-Quinn Criterion (HQC). The lag length with the lowest values of these criteria is selected to ensure the best model fit without overfitting.

4.0 Result Presentation and Analysis

This chapter deal with data analysis presentation and discussion of findings. Preliminary descriptive statistics is carried out on the variables alongside the preliminary stationarity test.

4.1 Unit-root test

The Table 4.1 below shows the result unit root test result using the augmented-Dickey Fuller test. The test revealed that all the variables are non-stationary but integrated of order one (I(1)). This is an indication that first condition of absence of spurious regression on OLS estimation is violated. However, we can proceed to second condition that is testing for the long run convergence or cointegration relations. Moreover, the fact that all the variable are integrated of the same order guaranteed the use of Johansen-Jesilius cointegration approach.

Table 4.1: Augmented-Dickey Fuller Unit Root test

Variables	Levels		First Difference	
	Intercept	Intercept & Trend	Intercept	Intercept & Trend
<i>LOER</i>	-2.86337	-2.90797	-6.19989*	-6.37797*
<i>LPRR</i>	-2.02756	-1.52107	-6.72988*	-3.38195*
<i>LFDI</i>	-2.42424	-1.73526	-7.28891*	-7.60388*

Notes: * indicate that the series is stationary at at least 5% significance level since the given Critical values are greater than their respective Statistics.

Source: Authors' Estimation Using Eviews 9.

4.2 Johansen-Jesilus Cointegration Test

The conduct of jj cointegration test depends on apriori lag-length selection. The Table 4.2 below is a result from the VAR lag Order selection criteria where selection criteria were used to arrive at the appropriate lag length for cointegration test as well as the subsequent Vector Error Correction. The result from the test indicates that Lag One is the most appropriate. Out of the five selection criteria four are in favor of Lag 1 and none for the remaining lag. Having identified the appropriate lag, test for cointegration is done

Table 4.2 VAR Lag Order Selection Criteria

Endogenous variables: LOER LPRR LFDI

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-132.3029	NA	0.730960	8.200179	8.336225	8.245954
1	-60.47640	126.2406*	0.016285*	4.392509*	4.936693*	4.575610*
2	-56.23270	6.687040	0.022077	4.680770	5.633092	5.001197
3	-54.04350	3.051607	0.034695	5.093545	6.454007	5.551299
4	-41.56455	15.12600	0.030323	4.882700	6.651300	5.477780

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 4.3 presents the result for the Johansen-Juselius cointegration test. The test involves two statistics; the Maximum-Eigenvalue and Trace Statistics. The result shows the presence of cointegration in one equation, meaning that there is a long run convergence among the variables. OLS estimates could be free from spurious regression but going by the granger representation theorem the result from the Vector Error Correction could be relied upon instead. This is because of the superior advantage VEC model has over OLS. VECM provide three important advantages over OLS. The estimates from VECM are free from spurious regression because the variables involve are all stationary, both the short run and long run estimate can be presented and lastly the presence of speed of adjustment in VECM is important for policy analysis.

Table 4.3: Johansen-Juselius Cointegration Tests

Hypothesized No. of CE(s)	Trace	Max-Eigen	Critical Values (5%)	
	Statistic	Statistic	Trace	Max-Eigen
r = 0	31.41672*	22.03883*	29.79707*	21.13162
r ≤ 1	9.377889	8.895153	15.49471	14.26460
r ≤ 2	0.482736	0.482736	3.841466	3.841466

Note: * denotes significant at 5% significance levels.

4.3 Vector Error Correction Model

According to Granger Representation Theorem if the model contains cointegration relationship among the variables, then one can proceed to VECM. The Equation 4.1 below is the long run representation normalized on the dependent variable; official exchange rate. The result shows that all the explanatory variables are statistically significant. This means that remittances positively affect exchange rate status in Nigeria in the long run.

Improvement in the international remittances in to the country will lead to appreciation of the value of local currency and hence favorable balance of payment status in the country. Similarly, the negative and significant value of FDI variables means that increase in FDI does not bring about increase in value of local currency. Above all, the error correction term (-0.22327) is negative, less than one and statistically significant, attesting to the reliability of the estimated VECM model. The value of the speed of adjustment 0.22327 means that approximately 22% proportion of the disequilibrium from the previous period is corrected in the current period.

Furthermore Table 4.4 captured the result of the short run dynamic using the Granger causality test of the VECM. The result shows one significant direction of causality from remittances to FDI while the rest of the short run dynamic shows no causal relationship among the variables.

$$\begin{array}{l}
 \text{LOER}_{t-1} = 3.186992 + 0.594168 \text{LPRR}_{t-1} - 0.548116 \text{FDI}_{t-1} \dots\dots\dots 4-1 \\
 \text{s.e} \qquad \qquad \qquad (0.07282) \qquad \qquad (0.21340) \\
 \text{t-stat} \qquad \qquad \qquad [8.15907] \qquad \qquad [2.56845]
 \end{array}$$

Table 4.4: Granger Causality Results based on VECM

Dependent Variable	χ^2 -statistics of lagged 1 st differenced term [p-value]			ECT _{t-1} coefficient (t-ratio)
	LOER	Δ LPRR	Δ LFDI	
LOER	--	1.491873 [0.2219]	0.00029 [0.9862]	-0.22327** (-3.29306)
Δ LPR	0.603823 [0.4371]	--	5.74800* [0.0165]	
Δ LFDI	1.188132 [0.2757]	0.990316 [0.3197]	--	

*Note: ** denotes significant at at least 5% significance level, respectively. The figure in the parenthesis (...) denote as statistic and the figure in the squared brackets [...] represent as p-value*

4.4 Diagnostic Test

Table 4.5 below shows the result for the diagnostic test on the estimated VEC residuals. The assumption of Homoscedasticity and No serial autocorrelation are upheld in all instances. This means that inferences drawn from the estimates are valid.

Table 4.5: Diagnostic Test Results on the Residual

Diagnostic Test	Null Hypothesis	Test Used	Decision	Interpretation of result
Heteroscedasticity test	Homoscedasticity (Constant Variance of Residuals)	VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)	0.9090 P-Value is 0.9090	There is no heteroscedasticity problem. The null is not rejected
Seral Autocorrelation test	No serial autocorrelation in the residuals up to lag K	VEC Residual Portmanteau Tests for Autocorrelations	P-values up to lag 5 are all greater than 5%	The null hypothesis is not rejected there is no Serial autocorrelation in the residuals

4.5 Discussion of Findings

This section discusses the key findings from the data analysis, particularly focusing on the results of the unit root test, Johansen-Juselius cointegration test, and the Vector Error Correction Model (VECM). These findings provide valuable insights into the dynamic relationships among the variables under study, specifically in the context of the Nigerian economy.

4.4.1 Stationarity and Unit Root Test

The Augmented Dickey-Fuller (ADF) test results indicate that all variables (official exchange rate [LOER], remittances [LREM], and foreign direct investment [LFDI]) are non-stationary at their levels but become stationary after first differencing, suggesting they are integrated of order one, I(1). This finding meets the prerequisite condition for the application of the Johansen-Juselius cointegration test, which requires all variables to be integrated of the same order. The result confirms that standard Ordinary Least Squares (OLS) estimation could be prone to spurious regression if applied without considering the cointegration among the variables.

The Johansen-Juselius cointegration test results, as presented in Table 4.3, reveal the existence of one cointegrating equation at the 5% significance level, as indicated by both the Trace and Maximum Eigenvalue statistics. This finding suggests a long-run equilibrium relationship among the variables, confirming that these variables move together in the long run despite short-term deviations. The presence of cointegration implies that OLS estimates can be refined to eliminate the risk of spurious results by using the VECM, which accounts for both short-term dynamics and long-term equilibrium.

The VECM analysis provides a more understanding of the relationships between the variables:

Long-Run Dynamics

The results indicate that remittances (LREM) have a positive and statistically significant effect on the official exchange rate (LOER) in Nigeria. This suggests that an increase in remittances leads to an appreciation of the local currency in the long run. This finding is consistent with the economic theory that remittance inflows increase the demand for the local currency, thereby strengthening its value. Conversely, foreign direct investment (LFDI) has a negative and statistically significant impact on the exchange rate, implying that an increase in FDI does not necessarily lead to an appreciation of the local currency. This result could reflect the fact that FDI inflows may be associated with capital outflows such as profit repatriation or increased demand for foreign currency to fund imported capital goods.

Short-Run Dynamics

The short-run dynamics, analyzed through the Granger causality test, show a unidirectional causality running from remittances (LREM) to FDI (LFDI), suggesting that remittance inflows may stimulate foreign direct investment in the short term. However, no significant short-run causality was found among other variables, indicating that in the short term, changes in one variable do not necessarily predict changes in another.

Speed of Adjustment

The error correction term (ECT) coefficient of -0.22327 is negative, less than one, and statistically significant, which is consistent with the conditions for a valid VECM model. This coefficient implies that approximately 22% of any deviation from the long-run equilibrium is corrected in the next period. This speed of adjustment suggests a moderate pace at which the exchange rate returns to equilibrium following a shock, indicating that the Nigerian economy can partially

4.6 Summary, Conclusion, and Recommendations

4.6.1 Summary

This chapter focused on the analysis, presentation, and discussion of the empirical findings regarding the relationship between official exchange rates (LOER), remittances (LPRR), and foreign direct investment (LFDI), in Nigeria. The analysis commenced with the preliminary descriptive statistics and unit root tests using the Augmented Dickey-Fuller (ADF) method, which revealed that all variables were non-stationary at their levels but became stationary after first differencing, indicating they are integrated of order one, $I(1)I(1)I(1)$.

Given that all variables were integrated of the same order, the Johansen-Juselius cointegration test was conducted to assess the existence of a long-run equilibrium relationship among the variables. The results confirmed the presence of one cointegrating equation, suggesting a long-run convergence among the variables, thus satisfying the conditions for employing the Vector Error Correction Model (VECM).

The VECM results showed that remittances positively influence the exchange rate in the long run, indicating that increased remittance inflows contribute to the appreciation of the local currency. In contrast, foreign direct investment (FDI) was found to have a negative impact, suggesting that increases in FDI do not lead to an appreciation in the value of the local currency. The error correction term was significant and negative (-0.22327),

confirming that approximately 22% of the disequilibrium from the previous period is corrected in the current period, which demonstrates a moderate speed of adjustment back to equilibrium.

Furthermore, the Granger causality tests indicated a significant unidirectional causality running from remittances to FDI, while no other short-run causal relationships were observed among the variables.

4.6.2 Conclusion

The study's findings highlight the critical role of remittances in stabilizing the Nigerian exchange rate by promoting currency appreciation in the long run. While FDI is traditionally considered beneficial, the results suggest that it does not have a favorable impact on the exchange rate in the Nigerian context, possibly due to repatriation of profits, capital flight, or other factors that offset its benefits. The significant error correction term indicates that the variables adjust moderately to restore equilibrium after a shock, emphasizing the dynamic nature of these economic relationships.

4.6.3 Recommendations

Based on the findings, the following recommendations are proposed:

1. Encourage Remittance Flows: Policymakers should create a favorable environment to attract and maintain high levels of remittances. This could involve reducing transaction costs, improving the efficiency of remittance channels, and providing incentives for diaspora engagement, which could help stabilize the exchange rate and improve the balance of payments.
2. Re-evaluate FDI Policies: The government should re-evaluate current policies related to FDI to ensure that the inflows lead to a net positive impact on the economy, including currency stabilization. Efforts should focus on enhancing the quality of FDI by targeting sectors that generate significant foreign exchange earnings or have high value-added potential.
3. Enhance Financial Market Stability: Strengthening financial market stability is crucial to reduce the adverse effects of sudden capital movements. This can be achieved by implementing sound monetary policies, developing robust foreign exchange management practices, and enhancing the regulatory framework to mitigate risks associated with volatile capital flows.
4. Promote Economic Diversification: To mitigate the negative impact of external shocks on the exchange rate, there is a need for diversification of the economy away from over-reliance on remittances and FDI. This could involve promoting sectors such as agriculture, manufacturing, and technology to build a more resilient economic structure.
5. Conduct Further Research: It is recommended that further research be undertaken to explore the channels through which FDI affects the exchange rate negatively, particularly in relation to capital repatriation and profit transfers. This could provide a deeper understanding of the dynamics at play and inform more targeted policy interventions.

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