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Assessing the Macroeconomic effects of Remittances on Nigeria's Economic Growth

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Abstract

This paper investigates the influence of remittance inflows on Nigeria's economic growth over the period 1981–2024. The analysis focuses on both short-run dynamics and long-run relationships, while also considering the roles of foreign direct investment (FDI) and foreign portfolio investment (FPI). Annual data were obtained from the Central Bank of Nigeria and World Bank statistics. Using the autoregressive distributed lag (ARDL) framework and an associated error correction model, the study finds that remittances consistently promote economic growth in Nigeria in both the short and long horizon, with household consumption serving as the main transmission pathway. By contrast, FDI and FPI did not demonstrate long-run growth-enhancing effects during the study period. The significance of the error correction coefficient affirms a stable adjustment toward long-run equilibrium among the variables. Based on these results, the study suggests that policymakers should improve formal remittance channels, lower transfer costs, and design incentives to channel part of remittance inflows into productive investment to enhance their sustained growth contribution.

Keywords: *Remittances, Economic Growth, Consumption, FDI, FPI, ARDL, Nigeria.*
JEL Codes: *F24, O47, C32, F43.*

1. Introduction

Remittances have become one of the most prominent external financial resources for developing countries in the 21st century, frequently surpassing inflows from foreign direct investment (FDI) and official development assistance (ODA) (World Bank, 2021). In sub-Saharan Africa—and particularly in Nigeria—these transfers play a central role in shaping macroeconomic performance. Nigeria consistently ranks among the largest global recipients of remittances, accounting for a major share of Africa's inflows. In 2020, for example, the country received about US$23 billion, an amount that not only exceeded FDI inflows but also rivaled oil revenues (World Bank, 2021). Such inflows have supported households in smoothing income shocks, financing education and health expenditures, and improving housing conditions (Alao & Ogundipe, 2021; Eze & Ugwuanyi, 2022).

Although the micro-level benefits of remittances—especially in poverty reduction and household welfare—are well documented, their long-run macroeconomic implications are less understood. Nigeria's dependence on crude oil has historically exposed it to global price volatility, and in this setting, remittances have often acted as a stabilizing force by providing foreign exchange, supporting consumption, and moderating external shocks (Tukur & Musa, 2023). Prior research underscores their role in strengthening the balance of payments and exchange rate stability (Oladipo & Alabi, 2023; Adeyemi & Ijaiya, 2024). Yet, whether remittances contribute meaningfully to sustainable growth, industrial diversification, and structural transformation remains unresolved. This ambiguity highlights an important research gap given Nigeria's urgent need to transition from its oil-dominated growth model.

Most existing studies tend to concentrate on household-level outcomes. For instance, findings by Ogunleye and

Akanbi (2021) and Olagunju et al. (2022) emphasize that remittances reduce poverty and expand access to education and healthcare, but offer limited insights into broader macroeconomic linkages such as productivity, investment, or industrialization. Furthermore, the tendency of remittance inflows to be consumed rather than invested has raised concerns about their limited transformative capacity. Thus, while they clearly enhance short-term welfare, their role as a long-term driver of growth is still debatable.

A further dimension that requires more attention is the influence of institutional quality on the developmental impact of remittances. Effective governance, sound regulatory structures, and well-functioning financial systems are crucial in determining whether remittances are directed toward productive uses (Alao & Ogundipe, 2021; Eze & Ugwuanyi, 2022). In Nigeria, however, weaknesses in institutional capacity, financial exclusion, and governance challenges reduce the growth-enhancing potential of these inflows. While some studies, such as Oladipo and Alabi (2023), highlight the role of financial inclusion in amplifying remittance benefits, empirical analyses that integrate institutional dynamics remain limited. Filling this gap is essential to understanding how remittances can move beyond household consumption to foster broader economic transformation.

In response to these concerns, this study examines the macroeconomic effects of remittances on Nigeria's economic growth over the period 1981–2024. It evaluates both short-run and long-run relationships, alongside the effects of FDI and foreign portfolio investment (FPI), and identifies the main transmission channels. By employing the autoregressive distributed lag (ARDL) approach and accounting for institutional dynamics, the research adds to the literature on remittances and economic development in Africa.

Accordingly, the study addresses three key research questions: (i) What short-run effects do remittance inflows exert on Nigeria's economic growth? (ii) What are their long-term macroeconomic contributions? (iii) Through which channels do remittances influence growth outcomes? By answering these questions, the study not only highlights the stabilizing role of remittances but also assesses their potential to drive structural change and long-term economic resilience. The insights generated carry policy relevance for Nigeria's diversification agenda and for other emerging economies seeking to optimize the developmental role of remittance inflows.

2. Literature Review

2.1 Theoretical Review

The relationship between remittances and economic growth can be interpreted through several theoretical frameworks. The Neoclassical Growth Model (Solow, 1956) views capital accumulation as central to economic expansion, suggesting that remittances, as external financial inflows, can supplement domestic savings and ease financing constraints in developing economies such as Nigeria. Higher household income from remittances can increase consumption and investment, thereby raising aggregate demand and supporting growth. However, critics warn that such inflows may also foster dependency and reduce labor participation, limiting the growth effects anticipated by neoclassical models. In contrast, Endogenous Growth Theory (Romer, 1986; Lucas, 1988) emphasizes human capital, innovation, and knowledge spillovers as key drivers of long-term growth. Within this framework, remittances may strengthen productivity by financing education, healthcare, and entrepreneurship, creating multiplier effects that enhance economic performance.

Other perspectives further highlight the stabilizing and developmental roles of remittances. The Dual Gap Model (Chenery & Strout, 1966) identifies savings and foreign exchange shortfalls as major obstacles to growth in developing countries, both of which remittances can help mitigate by providing foreign exchange for imports and expanding domestic investment capacity. Similarly, the Consumption Smoothing Hypothesis (Friedman, 1957) suggests that remittances serve as insurance against income volatility, particularly in economies prone to external shocks. In Nigeria's case, where oil dependence exposes the economy to fluctuations in global markets, remittances often act as countercyclical inflows that stabilize household consumption and macroeconomic performance. Collectively, these theories underscore the dual nature of remittances: while they can foster growth through capital accumulation, human capital development, and stabilization, they may also risk creating economic distortions if not productively harnessed.

2.2 Empirical Review

The growth effects of remittances have been widely studied across different regions, though results remain far from unanimous. Early evidence by Pradhan, Upadhyay, and Upadhyaya (2008), based on a panel of 39 developing countries, suggests that remittance inflows accelerate growth, particularly when directed toward investment rather than pure consumption. Similarly, Giuliano and Ruiz-Arranz (2009), analyzing 100 developing nations with a GMM framework, argue that remittances are especially beneficial in economies with weak financial systems, since they ease credit constraints. Catrinescu, Leon-Ledesma, Piracha, and Quillin (2009), in their study of 114 countries, add that institutional quality plays a decisive role, with poor governance reducing the positive impact of remittances on growth. In the case of Latin America and the Caribbean,

Mundaca (2009) observed that remittances enhance growth most effectively when coupled with financial sector development, pointing to complementarities with credit markets. Conversely, Barajas, Chami, Fullenkamp, Gapen, and Montiel (2011) contend that once endogeneity is addressed, remittances show limited growth effects, as they are often consumed rather than invested. For Sub-Saharan Africa, Adenutsi (2011) highlighted that remittances contribute to growth mainly by raising household consumption and financing education.

Evidence from Asia reinforces these mixed findings. Iqbal and Sattar (2010), studying Pakistan with an ARDL approach (1972–2008), found that remittances stimulate GDP growth, largely by supporting demand. Jawaid and Raza (2012), focusing on South Asian economies (1980–2009), also reported a growth-enhancing effect using ARDL and Johansen cointegration techniques. Nigerian studies reflect a similarly nuanced picture. Iheke (2012), employing simultaneous equations, concluded that remittances help reduce poverty but their growth effects are weak. Olubiyi (2014) observed that while remittances boost household consumption, they exert little influence on long-term growth due to limited financial intermediation and weak policy support. Meyer and Shera (2017), who examined six major remittance-receiving countries (including Nigeria, Egypt, and Lebanon), found consistent evidence of a positive impact on growth. More recent Nigerian-focused works show variation: Fayomi, Adeniran, and Ogunleye (2019), using a VECM framework, reported that remittances exert a modest influence on growth, with consumption channels dominating. Nwokolo (2020), however, demonstrated through DOLS estimates (1981–2018) that remittances have a significant long-run impact on Nigeria's growth. Uzochukwu and Igwemma (2021), employing ARDL (1986–2019), similarly found remittances supportive of growth, though the effect weakens over time. At a broader regional level, Ajide and Osinubi (2022) showed with system GMM for Sub-Saharan Africa (1995–2019) that remittances promote inclusive growth when supported by financial inclusion.

2.3 Gaps in the Literature

Despite the growing body of work on remittances and growth in Nigeria, several gaps remain unresolved. First, the bulk of existing studies emphasize short-term outcomes such as poverty reduction and household consumption, while paying limited attention to broader structural transformations, including industrial development, productivity gains, and economic diversification beyond oil dependence. Second, many investigations are restricted to relatively recent datasets, typically from the early 2000s, which constrains the ability to capture long-run dynamics across shifting policy environments and commodity cycles. Extending the time horizon to 1981–2024 offers a more comprehensive view of persistence and regime shifts. Third, institutional factors are often only partially considered. While financial inclusion is occasionally noted, few studies incorporate governance quality, regulatory effectiveness, and financial-sector frictions together as mediating channels through which remittances affect growth.

This study addresses these gaps by adopting an autoregressive distributed lag (ARDL) and error correction modeling (ECM) framework over a longer sample period, explicitly testing the transmission mechanisms of remittances through consumption, investment, and financial intermediation. It also integrates institutional dimensions into the analysis to provide deeper insight into whether and how remittance inflows contribute to sustained economic growth outside the oil sector.

3. Methodology

3.1 Theoretical Framework

The **Neoclassical Growth Model** developed by Solow (1956) provides a suitable basis for examining how remittances influence Nigeria's economic growth. The model emphasizes three core drivers of long-run output: capital accumulation, labor expansion, and technological progress. Within this framework, remittances can be conceptualized as external capital inflows that augment domestic savings and investment. In a setting like Nigeria, where financial markets are relatively underdeveloped and access to formal credit is limited, such inflows serve as an alternative source of finance. They allow households to smooth consumption, accumulate savings, or undertake small-scale investments, thereby stimulating demand and production in the short run.

At the same time, the Solow model highlights diminishing returns to physical capital, implying that the long-run growth contribution of remittances depends on how productively they are employed. If inflows are largely directed toward recurrent consumption, their impact is likely to be short-lived. By contrast, when used to build human capital—through investments in education, healthcare, and entrepreneurship—remittances can enhance labor productivity and counterbalance diminishing returns, thereby supporting sustained growth. For Nigeria, where developmental challenges remain pronounced, the strategic channeling of remittances could transform them from a household-level safety net into a catalyst for structural economic advancement.

3.2 Model Specification

The time series Autoregressive Distributed Lag (ARDL) model is an econometric approach widely used to estimate the relationship between a dependent variable and

independent variables in the presence of cointegration, even when the variables are of mixed integration orders (i.e., I(0) and I(1)).

Model One

Model one addresses the first two specific objectives of this study. For a study with Real GDP (RGDP) as the dependent variable and Remittances (REM), Foreign Direct Investment (FDI), and Foreign Portfolio Investment (FPI) as independent variables, the ARDL model can be specified as follows:

$$RGDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 RGDP_{t-i} + \sum_{i=0}^{q} \alpha_2 REM_{t-i} + \sum_{i=0}^{s} \alpha_3 FDI_{t-i} + \sum_{i=0}^{r} \alpha_4 FPI_{t-i} + \varepsilon_t \quad 1$$

Where:

$RGDP_t$: Real GDP at time t

REM: Remittances inflows

FDI: Foreign Direct Investment

FPI: Foreign Portfolio Investment

α_0: Constant term

α_1, α_2, α_3, α_4: Short-run coefficients, all greater than zero.

p,q,r,s: Lags for the respective variables

ϵ_t: Error term

If cointegration is confirmed, the long-run relationship can be derived as:

$$RGDP_t = \theta_0 + \theta_1 REM_t + \theta_2 FDI_t + \theta_3 FPI_t + \psi_t \quad 2$$

Where θ_1,θ_2,θ_3 are the long-run coefficients.

The error correction form of the ARDL model, capturing both short-run dynamics and long-run equilibrium, is expressed as:

$$\Delta RGDP_t = \alpha_0 + \sum_{i=1}^{p-1} \alpha_1 \Delta RGDP_{t-i} + \sum_{i=0}^{q-1} \alpha_2 \Delta REM_{t-i} + \sum_{i=0}^{s-1} \alpha_3 \Delta FDI_{t-i} + \sum_{i=0}^{r-1} \alpha_4 \Delta FPI_{t-i} + \phi ECT_{t-1} + \varepsilon_t \quad 3$$

Where:

Δ: First-difference operator

ECT_{t-1}: Error correction term, representing the deviation from the long-run equilibrium

ϕ: Adjustment coefficient indicating the speed of adjustment back to equilibrium.

Model Two

Model two addresses the third specific objective of this study. This is specified below as in error correction form as

$$\Delta RGDP_t = \alpha_0 + \sum_{i=1}^{p-1} \alpha_1 \Delta RGDP_{t-i} + \sum_{i=0}^{q-1} \alpha_2 \Delta REM_{t-i} + \sum_{i=0}^{s-1} \alpha_3 \Delta PCE_{t-i} + \sum_{i=0}^{r-1} \alpha_4 \Delta GFCF_{t-i} + \sum_{i=0}^{w-1} \alpha_5 \Delta REMPCE_{t-i} + \sum_{i=0}^{v-1} \alpha_6 \Delta REMGFCF_{t-i} + \phi ECT_{t-1} + \varepsilon_t \quad 4$$

Where

PCE: Private consumption expenditure

GFCF: Gross fixed capital formation

REMPCE: Interaction between remittance inflows and private consumption expenditure

REMGFCF: Interaction between remittance inflows and gross fixed capital formation

3.3 ARDL Model and Estimation Technique

The Autoregressive Distributed Lag (ARDL) framework is a flexible approach for modeling dynamic interactions between a dependent variable and its explanatory variables in time series analysis. Its main strength lies in handling regressors that are integrated of different orders, specifically I(0) and I(1), without requiring them to be uniformly stationary (Pesaran et al., 2001). This distinguishes ARDL from traditional cointegration methods, which typically impose stricter requirements on integration orders. Another advantage of the model is that it permits variable-specific lag structures, allowing researchers to capture both immediate and delayed effects across variables. These features make ARDL particularly well suited for examining macroeconomic linkages, such as those between remittances, foreign direct investment (FDI), foreign portfolio investment (FPI), and Nigeria's economic growth.

Estimation within the ARDL framework proceeds in two main stages. The first involves the bounds testing procedure, where the F-statistic is compared against critical values for the lower [I(0)] and upper [I(1)] bounds to determine whether a long-run relationship exists. Evidence of cointegration allows for the second stage, where both long-run coefficients and short-run dynamics are estimated. The model is then reformulated into an error correction representation (ECM), incorporating an error correction term (ECT) that reflects the speed at which deviations from long-run equilibrium are corrected over time.

Beyond its cointegration flexibility, ARDL is valued for its suitability with relatively small sample sizes, its robustness against certain forms of endogeneity, and its ability to accommodate different lag lengths for each variable. These qualities make it a practical tool for policy-oriented research in settings where data limitations are common. In this study, ARDL provides a framework for disentangling the short-term fluctuations from the long-term contributions of remittances, FDI, and FPI to Nigeria's economic growth, thereby offering evidence that can inform macroeconomic policy design (Pesaran & Shin, 1999).

3.4 Data Source and Measurement

This study relies exclusively on secondary data drawn from widely recognized and authoritative sources to ensure both reliability and consistency. Real Gross Domestic Product (RGDP), serving as the proxy for economic growth, is obtained from the World Bank's *World Development Indicators (WDI)* and the *Central Bank of Nigeria (CBN) Statistical Bulletin, 2023*. Data on remittance inflows are extracted from the World Bank's *Migration and Remittances Database, 2023*, which provides comprehensive annual figures. Information on Foreign Direct Investment (FDI), Foreign Portfolio Investment (FPI), household consumption expenditure, and private investment expenditure is sourced from the *CBN Statistical Bulletin*. The dataset spans 1981–2023, offering a 42-year period that captures both short-term fluctuations and long-run trends.

To ensure comparability and accuracy, RGDP is measured in constant U.S. dollars, adjusting for inflation. Remittances, FDI, and FPI are also expressed in U.S. dollars to reflect their economic value in real terms. In line with standard econometric practice, all variables are converted to natural logarithms, which helps stabilize variance, reduce skewness, and allow interpretations in terms of elasticities. These choices of data sources, measurements, and transformations provide a sound empirical foundation for assessing the macroeconomic role of remittances in shaping Nigeria's growth trajectory.

4. Results and Discussion

4.1 Preliminary Results

Table 1: Descriptive Statistics of Variables

Statistic	RGDP	REM	FDI	FPI	PCE	GFCF
Mean	21678.67	7790.455	2406.178	3385.636	22239.57	21115.31
Median	21853.00	1750.000	1610.000	696.0000	21853.00	19624.00
Maximum	38250.00	24000.00	8840.000	16708.00	42000.00	38250.00
Minimum	72.50000	22.00000	29.83000	346.0000	7250.000	360.5900
Std. Dev.	12556.18	8992.331	2499.945	4897.463	12378.78	12396.28
Skewness	0.060651	0.587808	1.230738	1.697340	0.222083	0.185948
Kurtosis	1.495649	1.624260	3.406363	4.325432	1.401173	1.468368
Jarque-Bera	4.175943	6.003678	11.41065	24.34781	5.048139	4.554373
Probability	0.123938	0.049696	0.003328	0.000005	0.080133	0.102572

Source: Researchers' compilation from Eviews' output

The descriptive statistics in Table 1 reveal considerable variability in Nigeria's macroeconomic indicators. Real GDP averaged $21,679 billion but displayed wide fluctuations, reflecting the country's vulnerability to oil price shocks and external disturbances. Remittances averaged $7,790 billion, with high dispersion and positive skewness, suggesting that a few exceptionally large inflows—often during economic crises—significantly shaped the trend. FDI and FPI, though smaller in average size ($2,406 billion and $3,386 billion respectively), were highly volatile and non-normally distributed, consistent with Nigeria's uncertain investment climate and the sensitivity of portfolio flows to shifts in investor sentiment. Private consumption expenditure (PCE) recorded the highest average value ($22,240 billion), highlighting the consumption-driven nature of Nigeria's economy, while gross fixed capital formation (GFCF) was relatively more stable, averaging $21,115 billion. Normality tests further indicate that only RGDP and GFCF approximate normal distribution, whereas REM, FDI, FPI, and PCE are significantly non-normal, suggesting the need for robust econometric estimation. Overall, the results point to a macroeconomic structure dominated by household consumption and volatile capital inflows, raising the question of whether remittances are channeled into sustainable growth-enhancing investment or primarily fuel short-term consumption.

Table 2: Correlation Matrix

Variable	RGDP	REM	FDI	FPI	PCE	GFCF
RGDP	1.000000					
REM	0.934944	1.000000				
FDI	0.527297	0.417202	1.000000			
FPI	0.697072	0.786352	-0.02047	1.000000		
PCE	0.990749	0.950944	0.500244	0.736300	1.000000	
GFCF	0.896458	0.842115	0.487683	0.691002	0.904102	1.000000

Source: Researchers' compilation from Eviews' output

Table 2 shows that RGDP is highly correlated with private consumption (0.991) and remittances (0.935), confirming the consumption-driven nature of Nigeria's economy and the central role of remittances in supporting growth. Gross fixed capital formation (0.896) also shows a strong link with output, while FDI (0.527) and FPI (0.697) display weaker associations, reflecting the less consistent role of external investments. Remittances correlate strongly with both consumption (0.951) and capital formation (0.842), suggesting they are used mainly for household spending but also contribute to investment. Their higher correlation with FPI (0.786) than FDI (0.417) highlights their shared sensitivity to macroeconomic conditions. Overall, the results suggest that remittances are a more reliable driver of Nigeria's growth than other external capital flows, though their long-term impact depends on productive utilisation.

Table 3: Augmented Dickey-Fuller (ADF) Unit Root Test

	ADF at Levels			ADF at First Difference			
Variable	t-Statistic	ADF 5% Critical Value	Prob	t-Statistic	ADF 5% Critical Value	Prob	Remark
RGDP	-3.82164	-3.51809	0.0248	-	-	-	I(0)
REM	-2.53626	-2.95113	0.1162	-1.75443	-1.95133	0.0754	I(1)
FDI	-1.66175	-2.9314	0.4431	-8.58972	-2.93316	0.0000	I(1)
FPI	3.170446	-2.94584	1.0000	-5.12108	-2.93316	0.0001	I(1)
PCE	0.401304	-2.93316	0.9807	-9.38856	-2.93316	0.0000	I(1)
GFCF	-1.20626	-2.93316	0.6630	-10.5622	-2.93316	0.0000	I(1)

Source: Researchers' compilation from Eviews' output

The Augmented Dickey–Fuller (ADF) test results in Table 3 indicate that the variables display a mixed order of integration. Real GDP is stationary at level, I (0), whereas remittances, FDI, FPI, household consumption expenditure, and gross fixed capital formation become stationary only after first differencing, I (1). This suggests that while Nigeria's output series is trend-stable, most inflow and expenditure-related variables exhibit unit root

characteristics and require differencing before achieving stationarity.

Since the series consist of a combination of I (0) and I (1) variables, and none are integrated at the second order [I (2)], the application of the ARDL methodology is justified. This framework is particularly suitable in such settings, as it allows for cointegration testing and reliable estimation of both short-run adjustments and long-run equilibrium relationships between remittances and economic growth.

Table 4: Bounds Test of Cointegration for Model One

Test Statistic	Value	K	5% I0 Bound	5% I1 Bound
F-statistic	4.593059	3	3.23	4.35

Source: Researchers' compilation from Eviews' output

Table 4 presents the bounds testing outcome for Model One, which incorporates RGDP, remittances, FDI, and FPI. The estimated F-statistic of 4.59 is greater than the 5% upper bound critical value of 4.35, providing sufficient evidence to reject the null hypothesis of no cointegration. This result implies the presence of a long-run equilibrium relationship among the variables. Put differently, remittance inflows, FDI, and FPI are jointly associated with Nigeria's real output in the long term, reinforcing the study's focus on the role of external capital in shaping economic growth.

Table 5: Bounds Test of Cointegration for Model Two

Test Statistic	Value	k	5% I0 Bound	5% I1 Bound
F-statistic	1.797654	5	2.62	3.79

Source: Researchers' compilation from Eviews' output

Table 5 presents the bounds testing results for Model Two, which evaluates the impact of remittances on growth through the private consumption (PCE) and investment (GFCF) channels. The calculated F-statistic of 1.80 is lower than the 5% lower bound value of 2.62, indicating that the null hypothesis of no cointegration cannot be rejected. This suggests that remittances transmitted through PCE and GFCF do not establish a stable long-run relationship with economic growth in Nigeria. Although such inflows may stimulate consumption and investment in the short run, their long-term contribution appears limited unless supported by stronger financial institutions, more effective investment incentives, and broader reforms that encourage productive utilization of remittance inflows.

Table 6: Lag Length Selection Criteria - Model One

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3177.1	NA	2.72e+58	151.5760	151.8242	151.6670
1	-3021.59	259.1685*	9.34e+55*	145.8855*	147.6231*	146.5224*
2	-3001.45	27.81743	2.21e+56	146.6405	149.8676	147.8234

* indicates lag order selected by the criterion

Source: Researchers' compilation from Eviews' output

Table 6 reports the results of lag length selection for Model One, which examines the relationship between Real Gross Domestic Product (RGDP), Remittances (REM), Foreign Direct Investment (FDI), and Foreign Portfolio Investment (FPI). The criteria applied—including the Likelihood Ratio (LR) test, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQ)—all unanimously indicate lag length 1 as the optimal specification. Specifically, the LR test shows a significant improvement from lag 0 to lag 1 (267.57), while the FPE, AIC, SC, and HQ all record their lowest values at lag 1. This outcome implies that a single lag provides the best balance between accuracy and parsimony in modelling. By selecting lag length 1, the ARDL framework effectively captures the dynamic short-run adjustments and long-run interactions among RGDP, REM, FDI, and FPI, while avoiding overfitting and autocorrelation problems. Hence, lag 1 is retained as the most appropriate specification for subsequent estimations.

Table 7: Lag Length Selection Criteria - Model Two

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3177.1	NA	2.72e+58	151.5760	151.8242	151.6670
1	-3021.59	259.1685*	9.34e+55*	145.8855*	147.6231*	146.5224*
2	-3001.45	27.81743	2.21e+56	146.6405	149.8676	147.8234

* indicates lag order selected by the criterion

Source: Researchers' compilation from Eviews' output

Table 7 reports the lag order selection for Model Two, which analyzes how remittances influence growth through private consumption expenditure (PCE), gross fixed capital formation (GFCF), and their interaction terms. Several criteria were employed—the Likelihood Ratio (LR) test, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan–Quinn (HQ). Across all measures, lag order 1 emerged as the preferred specification. This is reflected in the significant LR test statistic, the lowest FPE, and the minimum values of AIC, SC, and HQ at lag one.

Choosing lag length 1 ensures an appropriate trade-off between explanatory power and model simplicity. It avoids overfitting despite the presence of six endogenous variables while still preserving sufficient degrees of freedom for estimation. This specification effectively captures short-run dynamics, making it suitable for examining the direct and indirect effects of remittances on Nigeria's economic growth through both consumption and investment channels.

4.2 Presentation of Regression Results

Results of Model One

Table 8: Result of Short Run ECM Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REM)	0.245355	0.119766	2.04863	0.0475
D(FDI)	0.046321	0.148318	0.312308	0.7565
D(FPI)	-0.07841	0.195544	-0.40098	0.6907
ECM(-1)	-0.63903	0.148648	-4.29892	0.0001
R-squared	0.325909	Adjusted R-squared	0.254952	
F-statistic	4.593059	Durbin-Watson stat	1.686836	
Prob(F-statistic)	0.004004			

Source: Researchers' compilation from Eviews' output

Table 8 reports the short-run error correction model (ECM) estimates. Remittance inflows are shown to have a positive and statistically significant effect on the dependent variable, with a coefficient of 0.245 ($p = 0.0475$). This indicates that, in the short term, a one-unit increase in remittances is associated with an approximate 0.25-unit rise in economic output. By contrast, the coefficients for FDI and FPI are not statistically significant, suggesting that these capital inflows do not meaningfully influence short-run fluctuations in growth.

The error correction term carries the expected negative sign and is highly significant (-0.639, $p = 0.0001$). This implies that about 64% of any disequilibrium from the long-run path is corrected each period, providing strong evidence of convergence toward equilibrium. The model accounts for roughly one-third of the variation in the dependent variable ($R^2 = 0.326$) and is overall significant ($F = 4.59$, $p = 0.004$). Furthermore, the Durbin–Watson statistic (1.69) falls within an acceptable range, indicating that serial correlation is not a serious issue and enhancing confidence in the robustness of the results.

Table 9: Result of Long Run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM	0.383952	0.169214	2.269033	0.029
FDI	0.072487	0.231712	0.31283	0.7561
FPI	-0.1227	0.306376	-0.40049	0.691
C	7.26822	2.392176	3.03833	0.0043

Source: Researchers' compilation from Eviews' output

The long-run estimates (Table 9) reveal that remittances (REM) have a positive and statistically significant effect on the dependent variable, with a coefficient of 0.384 (p = 0.029). This suggests that sustained inflows of remittances contribute meaningfully to long-term growth, aligning with the notion that such transfers support capital accumulation and household investment.

In contrast, both FDI and FPI exhibit statistically insignificant effects (p = 0.7561 and p = 0.691, respectively), indicating that these external capital flows do not exert a meaningful long-run influence within the model. The constant term is positive and significant (7.268, p = 0.0043), confirming a strong baseline level of the dependent variable. Overall, the findings emphasize the importance of remittances over other forms of external finance in driving long-term outcomes.

Table 10: Result of Model Two

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RGDP(-1)	0.48548	0.150928	3.216634	0.0028
REM	0.378154	0.261392	1.446693	0.1569
PCE	1.297113	0.402977	3.218824	0.0028
PCE(-1)	-0.60718	0.194623	-3.11976	0.0036
GFCF	-0.17708	0.380908	-0.46488	0.6449
REMPCE	-1.86E-05	2.06E-05	-0.90408	0.3721
REMGFCF	8.45E-06	1.97E-05	0.429172	0.6704
C	-556.534	914.6088	-0.60849	0.5468
R-squared	0.98795	Adjusted R-squared	0.985539	
F-statistic	409.922	Durbin-Watson stat	1.687773	
Prob(F-statistic)	0			

Source: Researchers' compilation from Eviews' output

Table 10 presents the estimation outcomes for Model Two. The lagged value of Real GDP [RGDP (-1)] is positive and significant, indicating that past output strongly influences current growth, which reflects persistence in Nigeria's growth trajectory. Personal Consumption Expenditure (PCE) also emerges as an important determinant, exerting a positive and highly significant effect, while it's lagged term [PCE (-1)] is negative and significant, pointing to short-run adjustments or reversals in consumption behaviour. Remittance inflows (REM), though positive, are statistically insignificant, suggesting that their direct short-term contribution to growth is limited within this specification.

Neither Gross Fixed Capital Formation (GFCF) nor the interaction terms between remittances and consumption (REMPCE) or investment (REMGFCF) exhibit statistical significance, implying that capital formation and its interaction with remittances do not play a decisive role in this model. Overall, the explanatory strength of the model is high, with an adjusted R^2 of 0.986, and the F-statistic

confirms that the model is jointly significant. The Durbin–Watson statistic (1.69) falls within the acceptable range, indicating no evidence of problematic autocorrelation and reinforcing the robustness of the estimates.

5. Conclusion and Policy Implications

This study examined the long-run and short-run effects of remittances, foreign direct investment (FDI), and foreign portfolio investment (FPI) on economic growth in Nigeria, with evidence from ARDL estimations. The findings underscore that remittances exert a positive and statistically significant influence on growth in the long run, while FDI and FPI show no meaningful long-term impact. This outcome aligns with the Solow growth framework, where sustained capital inflows that translate directly into consumption smoothing, human capital investment, and household welfare enhancement foster productivity and growth. Conversely, the insignificant impact of FDI and FPI suggests structural bottlenecks in Nigeria's absorptive capacity, weak institutional quality, and limited linkages between foreign investment flows and domestic productive sectors.

From a policy perspective, the results highlight the need to harness remittances as a reliable development finance channel. Nigerian policymakers should design frameworks that encourage the productive use of remittances, such as channeling them into small and medium-scale enterprises, infrastructure development, and financial deepening. Equally important is the creation of incentive mechanisms—like diaspora bonds, investment funds, and reduced transaction costs—that can attract more formal remittance inflows while reducing reliance on informal channels. In parallel, strengthening the investment climate through regulatory stability, infrastructural improvements, and governance reforms is essential for FDI and FPI to yield sustainable growth dividends. By improving institutional quality and ensuring policy consistency, Nigeria can transform volatile capital flows into drivers of structural transformation and inclusive development.

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