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Macroeconomic Indicators And Economic Development In Nigeria

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ABSTRACT

This study investigated the effect of remittances on economic development in Nigeria using Workers' Remittances Per Capita (WRPC), Foreign Direct Investment (FDI), Foreign Aid (FA), and Gross Domestic Product per Capita (GDPPC) as key variables. Employing an ex post facto research design, the study utilized annual secondary data from 1981 to 2024 obtained from the World Bank, Central Bank of Nigeria, and National Bureau of Statistics. The Autoregressive Distributed Lag (ARDL) model was adopted due to its suitability for small samples and mixed integration levels. The analytical process was supported by a series of diagnostic tests, including descriptive statistics, correlation analysis, multicollinearity tests, the Breusch-Godfrey serial correlation test, the Breusch-Pagan-Godfrey heteroskedasticity test, the Ramsey RESET specification test, and the Augmented Dickey-Fuller unit root test. The ARDL Bounds Test confirmed the existence of a long-run equilibrium relationship among the variables, and the subsequent estimation of long-run coefficients and the Error Correction Model captured both structural and short-term dynamics.The findings revealed that WRPC had no significant impact on GDPPC in the short or long run, suggesting that remittances primarily served consumption purposes rather than investment, limiting their contribution to productive capacity. This outcome aligned with theoretical perspectives emphasizing altruistic remitting behavior and institutional weaknesses that reduce remittance effectiveness. Conversely, FDI demonstrated strong positive effects on GDPPC in both time horizons, underscoring its importance in technology transfer, capital formation, and productivity enhancement. FA similarly exhibited significant positive effects, indicating that well-managed aid supports welfare improvements, institutional strengthening, and human capital development.The study concludes that while remittances alone do not drive Nigeria's economic growth, foreign investment and properly utilized aid are crucial external inflows that significantly enhance economic development. Strengthening governance, improving investment conditions, and redirecting remittances toward productive uses are essential for maximizing their developmental impact.

Keywords: Workers' Remittances Per Capita, Foreign Direct Investment, Foreign Aid and Gross Domestic Product per Capita

INTRODUCTION

International financial inflows have become increasingly important in shaping development outcomes in emerging economies such as Nigeria. Among these inflows, workers' remittances per capita (WRPC), foreign direct investment (FDI), and foreign aid (FA) play critical roles in influencing Gross Domestic Product per Capita (GDPPC), a key measure of national economic performance. Remittances have emerged as one of the most stable and counter cyclical sources of external finance. Global remittance flows reached a record 831 billion dollars in 2022 (World Bank, 2023), surpassing both FDI and official development assistance in many regions. Their resilience during shocks such as the COVID 19 pandemic and ongoing geopolitical tensions underscores their importance for household consumption, education, and small business financing (UNCTAD, 2023; Ratha, 2022). In Nigeria, WRPC has boosted informal sector activity and household welfare, although high transaction costs, regulatory gaps, and structural inefficiencies continue to limit its full impact on GDPPC (Adepoju and Okonjo, 2023).

Foreign Direct Investment remains another major avenue for external capital inflow, theoretically supporting productivity gains, technology transfer, and job creation. However, Nigeria's FDI inflows are heavily concentrated in the oil and gas sector, resulting in limited spillover effects on broader economic development and modest contributions to GDPPC. Policy inconsistency, weak regulatory enforcement, and inadequate infrastructure further restrict the potential benefits of FDI (Eze and Nwankwo, 2023; Ogunleye and Adebayo, 2022). Foreign aid continues to play a significant role in sectors such as health, education, and infrastructure. Despite this, its long-term effectiveness is weakened by donor driven priorities, misalignment with national strategies, and limited accountability frameworks, reducing its contribution to sustainable improvements in economic welfare (Chukwu and Okafor, 2022; Adeyemi and Balogun, 2023).

Much of the existing literature examines WRPC, FDI, and FA separately, which leaves a major gap in understanding their combined influence on GDPPC in Nigeria. Furthermore, the mediating role of governance quality, institutional capacity, and broader policy environments remains insufficiently explored (Lawal and Hassan, 2024). As Nigeria faces post pandemic recovery challenges, rising inflation, and persistent fiscal pressures, an integrated empirical investigation into how these financial inflows interact to shape GDPPC is urgently needed. This study seeks to address this gap and provide evidence-based insights that can guide policymakers, development partners, and financial sector stakeholders toward more effective and inclusive economic growth strategies.

Nigeria remains one of Africa's largest economies yet continues to struggle with persistent development challenges, including high poverty rates, inequality, weak infrastructure, and limited human capital. Despite substantial external financial inflows such as WRPC, FDI, and FA, improvements in GDPPC have been modest, revealing a gap between capital inflows and real development outcomes. Existing studies often examine these inflows separately. For instance, Ibrahim and Yusuf (2024) focused on remittances and poverty without exploring interactions with FDI or aid, while Ogunleye and Adebayo (2022) assessed FDI inflows without linking them to GDPPC or broader economic conditions. These fragmented approaches limit policy relevance and overlook how multiple financial indicators jointly shape development.

Methodological limitations also persist, as many studies rely on static linear models that fail to capture dynamic economic relationships. Akinyemi and Oladipo (2023) used basic regressions that could not account for lag effects or economic volatility. Few studies combine income indicators with broader development considerations, leading to incomplete assessments of progress (Bello and Ahmed, 2025; Lawal and Hassan, 2024). The role of foreign aid is similarly underexplored, with studies often ignoring its interaction with remittances and FDI or its potential influence on GDPPC (Chukwu and Okafor, 2022; Adeyemi and Balogun, 2023). In response to these gaps, this study applies the Autoregressive Distributed Lag model to examine how WRPC, FDI, and FA collectively influence Nigeria's GDPPC, providing a more integrated and evidence-based perspective.

Conceptual Review

Remittances

Remittances are an essential part of Nigeria's financial system and have become one of the country's most significant external income sources. In 2022, Nigeria received over 20 billion dollars in personal remittances, surpassing inflows from Foreign Direct Investment and Official Development Assistance (Ngene et al., 2024; World Bank, 2022; Reuters, 2024). These funds support household consumption, education, healthcare, and small-scale investments, while also stimulating demand for goods and services in local markets. Remittance transfers reach Nigeria through both formal channels such as banks and licensed money transfer operators, and informal channels favored for lower costs and convenience. Despite policies like the Central Bank's "Naira 4 Dollar Scheme" that encourage official transfers, informal flows remain significant (Mbachu, 2024; Von News, 2024). Fintech platforms and mobile money services are also reshaping remittance patterns, offering greater accessibility but requiring strong regulation to ensure security and compliance.

The Nigerian government continues to promote the developmental impact of remittances through institutions like the Nigerians in Diaspora Commission and instruments such as diaspora bonds (World Bank, 2023; Reuters, 2024). Remittances also produce social benefits by improving household welfare and strengthening resilience against economic shocks, while contributing to community development (Ngene et al., 2024). However, challenges persist, including Nigeria's vulnerability to external economic conditions, high transaction costs, weak financial inclusion, and the risks associated with informal channels. Concerns about money laundering and revenue loss further complicate effective management (World Bank, 2022). Addressing these issues through better regulation and coordinated policy efforts is essential for maximizing the long-term developmental value of remittances.

Workers' Remittances Per Capita (WRPC): WRPC is a key indicator of remittance distribution and its economic impact in Nigeria, where remittances reached about 20.1 billion dollars in 2022, accounting for 3.5 percent of GDP (Ngene et al., 2024). Remittances support household welfare and stimulate economic activity, yet their effectiveness depends on how they are utilized and the policies guiding them. Studies show mixed effects, with some finding positive contributions to per capita income and GDP, while others note potential dependency risks (Nangih and Bail, 2024; Ugbaka, 2025). Strengthening formal channels and reducing costs remain essential for maximizing developmental benefits (World Bank, 2023).

Foreign Direct Investment (FDI): FDI remains vital to Nigeria's development, contributing to capital inflows, technology transfer, and job creation, yet inflows continue to fluctuate due to policy inconsistencies, macroeconomic instability, and weak infrastructure (Cookey, 2024; UNCTAD, 2023). FDI is heavily concentrated in the oil sector, limiting diversification and exposing the economy to global price shocks. Studies emphasize the need for reforms, improved governance, and stronger infrastructure to attract sustainable investment (Joshua et al., 2025; Angahar et al., 2024). Creating a stable, transparent, and diversified investment environment is essential for maximizing FDI's long-term economic benefits.

Foreign Aid (FA): FA remains an important external resource for Nigeria, supporting sectors such as health, education, and infrastructure, with over 4.5 billion dollars received in 2022 (World Bank, 2023). While aid has improved health outcomes and supported governance reforms, its long-term effectiveness is limited by weak institutions, corruption, and project mismanagement (Adebayo and Suleiman, 2024; Eze and Ojo, 2024). Studies also highlight risks of dependency and reduced accountability when aid is not well aligned with national priorities (Yusuf and Ibrahim, 2023). Strengthening governance, coordination, and local ownership is essential for maximizing aid's developmental impact.

Gross Domestic Product Per Capita (GDPPC)

GDPPC, calculated by dividing total GDP by the population, is a key indicator of average living standards and economic welfare. In Nigeria, GDPPC reveals the gap between economic output and human well-being, particularly as population growth continues to outpace GDP growth. Nigeria's GDPPC was approximately 2,184 dollars in 2022, placing the nation in the lower-middle-income category despite its resource wealth (World Bank, 2023; Adebisi and Emefiele, 2024). Studies show that GDPPC trends do not fully align with poverty reduction or social equity, largely due to income inequality, unemployment, and the dominance of the informal sector (Ogundipe and Akintoye, 2023). Demographic pressures, inadequate infrastructure, and limited human capital investment further constrain improvements in per capita income (Eze and Ojo, 2024).

Nigeria's heavy dependence on crude oil exports also restricts GDPPC growth because the sector generates substantial revenue but few jobs. Diversification into agriculture, manufacturing, and services is essential for boosting labor productivity and shared prosperity (Adebisi and Emefiele, 2024). Macroeconomic instability, including inflation and currency depreciation, continues to erode real incomes, underscoring the need for sound monetary and fiscal policies (Yusuf and Ibrahim, 2023). Human capital development remains critical, as better education and healthcare enhance productivity and long-term income potential (Bello and Adediran, 2024). While GDPPC is a useful metric, it must be complemented with broader indicators such as the Human Development Index and Multidimensional Poverty Index for a fuller understanding of Nigeria's development trajectory (Joshua et al., 2025).

Theoretical Review

Altruism and Self-Interest Theories (in Remittances)

The Altruism and Self-Interest Theories provide a useful framework for explaining how remittances and other financial inflows influence development in Nigeria. Altruistic remittances are motivated by migrants' concern for family welfare, often improving education, healthcare, nutrition, and overall living standards. These transfers directly support human development, especially in low-income households where remittances serve as a safety net (Lucas and Stark, 1985). In contrast, self-interested remittances function more as investment tools, funding real estate, small businesses, and other productive ventures similar to Foreign Direct Investment (FDI). Such investment-oriented inflows tend to boost GDP per capita by stimulating capital formation and economic activity. Foreign Aid (FA) also contributes to welfare improvements but is often constrained by governance weaknesses and inconsistent implementation. Collectively, WRPC, FDI, and FA shape development through both welfare-enhancing and income-generating channels, making these theories central to understanding Nigeria's dual development outcomes.

Endogenous Growth Theory

Endogenous Growth Theory (EGT) emphasizes that long-run growth is driven by internal factors such as human capital, innovation, and productive investment rather than external forces. Within this framework, financial inflows like WRPC, FDI, and FA matter only when they strengthen productivity, skills, and technological advancement. In Nigeria, WRPC can support growth when used for education, healthcare, or small enterprises, aligning with EGT's focus on human capital formation. FDI contributes through technology transfer and knowledge spillovers that raise productivity and increase GDP per capita. FA can reinforce growth by supporting institutions and essential services, though its effectiveness depends on governance quality. EGT therefore highlights that the developmental impact of WRPC, FDI, and FA depends not on their volume but on how effectively they are channeled into knowledge-building and productivity-enhancing activities.

Empirical Review

Okafor and Eze (2025) investigated the relationship between Foreign Aid and economic growth in Nigeria, using GDP per capita as the development indicator. Their data spanned from 1985 to 2022 and were drawn from OECD and the Federal Ministry of Finance. Using a Cointegration and Error Correction Model, they found that while foreign aid had a positive relationship with GDPPC, the effect was not statistically significant. The study concluded that aid could support growth only if it is well-targeted and efficiently managed. The authors recommended improving aid coordination, reducing corruption, and linking aid inflows to specific development benchmarks.

Nangih (2025) examined the impact of diaspora remittances on Nigeria's economic performance, focusing on per capita income and GDP. The objective was to assess the extent to which remittances influence income growth. Using an ex post facto design, the study sourced secondary data from the Central Bank of Nigeria and World Bank for the period 2010–2023. Descriptive statistics, correlation, and regression techniques were used. The study found that remittances had a significant positive effect on per capita income and GDP. The conclusion emphasized the importance of remittance inflows as a financial lifeline, with recommendations to streamline remittance channels and support policies that promote their productive use.

Salahedeen and Ismaeel (2025) investigated the short-run and long-run impacts of remittances on economic growth in Nigeria between 2008 and 2023. Using data from the Central Bank of Nigeria, the study applied error correction modeling. Findings showed that remittances had a significant short-run positive effect on GDP, while in the long run, they contributed to small and medium enterprise employment growth. The authors concluded that remittances are instrumental to development and recommended expanding diaspora engagement and improving investment channels for remittance funds.

Bamidele and Okon (2025) conducted a study on the impact of FDI on GDPPC in Nigeria. The objective was to evaluate whether FDI contributes meaningfully to economic performance. The study used Johansen Cointegration and VECM techniques, based on data spanning 1980 to 2022 from UNCTAD and the Central Bank of Nigeria. Findings revealed a significant and positive long-term relationship between FDI and GDP per capita. The study concluded that attracting more FDI, particularly in non-oil sectors, would enhance Nigeria's economic growth and recommended simplifying regulatory procedures and improving infrastructure to boost investor confidence.

Eze and Mohammed (2024) explored the dual effects of WRPC and CPI on Nigeria's GDP per capita. Using data from 1990 to 2023 collected from the World Bank and National Bureau of Statistics, they applied ARDL bounds testing methodology. Their findings indicated that WRPC had a significant and positive effect on GDPPC, while CPI had a significant negative effect. The authors concluded that while remittances support economic growth, their real value is undermined in inflationary environments. They recommended improving remittance channels and adopting macroeconomic policies aimed at stabilizing the purchasing power of remitted income.

Delessa, et al (2024) explored how institutional quality and macroeconomic stability moderate the effects of capital inflows, including remittances, on economic growth in Sub-Saharan Africa with data from 2005 to 2019. Using panel-based dynamic OLS, they found that remittances improve per capita income when supported by strong institutions. The study concluded that financial inflows are only effective in environments with good governance and recommended that countries like Nigeria prioritize institutional strengthening and macroeconomic stability.

Adebayo and Okonkwo (2023) examined the impact of Workers' Remittances Per Capita on Nigeria's economic development using ARDL analysis and time series data from 1990 to 2022. They found that WRPC had a significant positive long-run effect on GDP per capita, while its impact on HDI was positive but statistically insignificant. The study concluded that although remittances enhance income growth, they do not automatically improve human development. The authors recommended policies that promote the productive use of remittances in education and healthcare.

Abdulai (2023) investigated the impact of remittance inflows on Ghana's GDP growth rate. The study aimed to analyze the long-run relationship between GDP growth and variables including remittances, FDI, unemployment rate, inflation, trade, population growth, and official development assistance. Utilizing annual data from 1990 to 2020 sourced from the World Bank, the study employed the Autoregressive Distributed Lag (ARDL) cointegration technique. Findings revealed that remittances positively and significantly affect GDP growth in the long run. The study concluded that remittances are a vital source of economic growth and recommended policies to ensure reliable transfer means and reduce transfer costs to maximize their developmental impact.

RESEARCH METHODOLOGY

This study adopted an ex post facto research design, which was appropriate for analyzing historical macroeconomic data without manipulating variables. This approach made it possible to examine long-term trends in WRPC, FDI, FA, and GDPPC using reliable secondary data. Consistent with Ehiedu et al. (2023), the design suited the study of macroeconomic relationships and ensured objectivity, replicability, and analytical depth. The population comprised all relevant annual macroeconomic data for Nigeria from 1981 to 2024, sourced from the World Bank's World Development Indicators, the Central Bank of Nigeria Statistical Bulletin, and the National Bureau of Statistics. A census sampling technique was used to include all available observations, eliminating sampling errors and providing a complete view of financial inflows and development patterns across the 44years period.

Data collection relied exclusively on credible secondary sources such as the World Bank, CBN reports, and NBS publications. Analysis was conducted using E Views 9.0, applying the ARDL model because of its suitability for small samples and mixed integration levels. Several diagnostic tests were used to validate the model. Descriptive statistics identified patterns such as mean performance, variability, symmetry, and distribution shape. The correlation matrix assessed the strength and direction of relationships, while the Variance Inflation Factor test checked for multicollinearity to ensure that explanatory variables were sufficiently independent. The Breusch Godfrey test examined serial correlation, and the Breusch Pagan Godfrey test assessed heteroskedasticity to ensure constant error variance. Model accuracy was checked using the Ramsey RESET test, and the Augmented Dickey Fuller test confirmed that variables were stationary at level or first difference.

The ARDL Bounds Test was employed to determine the existence of long-run relationships among the variables. When cointegration was established by comparing the calculated F statistic with critical values, the study proceeded to estimate long-run coefficients and the Error Correction Model (ECM). The long-run model identified sustained relationships among WRPC, FDI, FA, and GDPPC, while the ECM captured short-run adjustments and the speed at which the system returned to equilibrium. A negative and significant error correction term confirmed gradual correction of deviations from long-run equilibrium. This analytical procedure ensured that both short-term variations and long-term structural effects of financial inflows on GDP per capita were thoroughly evaluated.

The study was adopted the model of Eze and Mohammed (2024), and was expressed as:

Functional relationship

$GDPPC_t = f(WRPC_t, FDI_t, FA_t)$

Long run ARDL specification

$GDPPC_t = \beta_0 + \beta_1 WRPC_t + \beta_2 FDI_t + \beta_3 FA_t + \mu_t$

Short run ARDL Error Correction Model (ECM) form

$\Delta GDPPC_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta GDPPC_{t-i} + \sum_{j=0}^{q1} \theta_j \Delta WRPC_{t-j} + \sum_{k=0}^{q2} \gamma_k \Delta FDI_{t-k} + \sum_{m=0}^{q3} \psi_m \Delta FA_{t-m} + \lambda ECM_{t-1} + \varepsilon_t$

Where;

$ECM_{t-1} = GDPPC_{t-1} - (\beta_0 + \beta_1 WRPC_{t-1} + \beta_2 FDI_{t-1} + \beta_3 FA_{t-1})$

Δ is the first difference operator

λ is the speed of adjustment coefficient and is expected to be negative and significant if a stable long run equilibrium exists

ε_t is a white noise error term

$GDPPC_t$ = Gross Domestic Product per capita at time t

$WRPC_t$ = Workers Remittances per capita at time t

FDI_t = Foreign Direct Investment at time t

FA_t = Foreign Aid at time t

RESULTS AND DISCUSSION

The tests conducted in this study were essential for confirming the statistical soundness and reliability of the ARDL model. Given the time series structure of the data, the tests assessed normality, detected relationships, and verified model adequacy while addressing issues such as autocorrelation, heteroskedasticity, multicollinearity, and non-stationarity. These diagnostics ensured that the estimates were robust, free from spurious results, and valid for both short-run and long-run interpretation.

Descriptive Statistics

Descriptive statistics summarized the central tendency and variability of WRPC, FDI, FA, and GDPPC, providing initial insights into data patterns before further econometric analysis.

Table 1: Descriptive Statistics

	LOGGDPPC	LOGWRPC	FDI	LOGFA
Mean	5.915885	4.754704	6.078636	5.484427
Median	6.028011	4.842823	5.725000	5.672491
Maximum	6.336211	5.163494	11.85000	5.847262
Minimum	5.026560	4.018451	0.560000	4.272306
Std. Dev.	0.359481	0.326578	3.488236	0.388614
Skewness	-1.002161	-0.591463	0.066747	-1.439248
Kurtosis	2.923989	2.284020	1.639258	4.696882
Jarque-Bera	7.375654	3.505225	3.427307	20.46944
Probability	0.055026	0.173321	0.180206	0.064136
Sum	260.2990	209.2070	267.4600	241.3148
Sum Sq. Dev.	5.556736	4.586084	523.2149	6.493885
Observations	44	44	44	44

Source: Econometric Views Version 9.0 (2025)

The descriptive statistics showed that WRPC, FDI, FA, and GDPPC exhibited moderate variation, near-normal distributions, and mostly negative or near-zero skewness, indicating well-behaved data suitable for ARDL estimation. WRPC and GDPPC displayed moderate dispersion, while FDI showed higher variability and FA moderate fluctuations. Jarque Bera probabilities for all four variables did not indicate significant departures from normality. Overall, the balanced distributions and sufficient variability across the variables supported reliable long-run estimation and stable short-run dynamics within the ARDL framework.

Correlation Matrix

The correlation matrix assessed the strength and direction of relationships among WRPC, FDI, FA, and GDPPC, helping detect potential multicollinearity before regression analysis.

Table 2: Correlation Matrix

	LOGGDPPC	LOGWRPC	FDI	LOGFA
LOGGDPPC	1.000000			
LOGWRPC	-0.042285	1.000000		
FDI	-0.026678	-0.176245	1.000000	
LOGFA	0.005221	0.248918	-0.159916	1.000000

Source: Econometric Views Version 9.0 (2025)

The correlation results showed that GDPPC has very weak negative associations with WRPC and FDI and an almost zero positive relationship with FA, indicating minimal direct linkage. WRPC displays a weak negative correlation with FDI and a weak positive relationship with FA, suggesting limited interaction among inflow variables. FDI also shows weak negative relationships with both WRPC and FA. Since all correlations are low and far from multicollinearity thresholds, the variables do not strongly move together, making them appropriate for reliable ARDL estimation.

Multicollinearity Test

The correlation results show very weak relationships among GDPPC, WRPC, FDI, and FA, indicating no multicollinearity concerns and confirming the variables are suitable for ARDL analysis.

Table 3: Multicollinearity Test

Variance Inflation Factors
Date: 08/07/25 Time: 17:43
Sample: 1981 2024
Included observations: 43

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LOGGDPPC	0.027607	323.9623	1.165023
LOGWRPC	0.031134	236.8806	1.112378
FDI	0.000310	5.153650	1.245196
LOGFA	0.024126	243.8831	1.210306
C	3.918697	1313.031	NA

Source: Econometric Views Version 9.0 (2025)

The variance inflation factor results showed that all centered VIF values for GDPPC, WRPC, FDI, and FA fall close to 1, indicating very low multicollinearity and stable coefficient estimates. FDI has the highest centered VIF at only 1.25, still far below the common threshold of 10, confirming no harmful correlation among predictors. The uncentered VIF values are high because they include the intercept, but this does not affect model validity. Overall, the results confirm that the explanatory variables are sufficiently independent for reliable ARDL estimation.

Model Validity Tests

Model reliability was confirmed through diagnostic checks for serial correlation, heteroskedasticity, and specification errors, all indicating that the ARDL model is well specified and suitable for valid inference.

Table 4: Model Validity Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.134280	Prob. F(2,33)	0.8748
Obs*R-squared	0.347118	Prob. Chi-Square(2)	0.8407

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	7.531475	Prob. F(7,35)	0.0761
Obs*R-squared	25.84320	Prob. Chi-Square(7)	0.0605
Scaled explained SS	11.83682	Prob. Chi-Square(7)	0.1061

Ramsey RESET Test
Equation: UNTITLED
Specification: LOGGDPPC LOGWRPC FDI LOGFA
Omitted Variables: Squares of fitted values

	Value	df	Probability	Value
t-statistic	1.309352	34	0.1992	1.309352
F-statistic	1.714403	(1, 34)	0.1992	1.714403

Source: Econometric Views Version 9.0 (2025)

The diagnostic results showed that the Breusch Godfrey test produced high probability values of 0.8748 and 0.8407, indicating no serial correlation and confirming independent residuals. The Breusch Pagan Godfrey test returned probability values slightly above the 5 percent threshold, suggesting no strong evidence of heteroskedasticity and implying that residual variance is acceptably stable. The Ramsey

RESET test also produced a probability of 0.1992, well above 0.05, indicating no model misspecification. Overall, the results confirm that the model is well specified, free of autocorrelation, and suitable for reliable ARDL estimation.

Augmented Dickey-Fuller (ADF) Unit Root Test

The Augmented Dickey Fuller test assessed variable stationarity, with the null of a unit root rejected when the test statistic exceeded the critical value, ensuring suitability for ARDL analysis.

Table 5: Summary of ADF Test

Parameter	ADF test statistic	Test critical value @ 5%	Prob.*	Decision
ADF test at Levels 1(0)				
GDPPC	-5.123904	-2.931404	0.0671	Non-stationary
WRPC	-7.405898	-2.931404	0.0000	Stationary
FDI	-6.112257	-2.931404	0.0000	Stationary
FA	-5.644150	-2.931404	0.0000	Stationary
ADF test at Ist Difference 1(1)				
GDPPC	-6.534316	-2.935001	0.0000	Stationary
WRPC	-5.575996	-2.954021	0.0001	Stationary
FDI	-11.32988	-2.933158	0.0000	Stationary
FA	-8.696314	-2.935001	0.0000	Stationary

Source: Econometric Views Version 9.0 (2025)

The Augmented Dickey Fuller results showed that WRPC, FDI, and FA are stationary at level, since their test statistics exceed the five percent critical values and have probabilities of 0.0000. GDPPC is non stationary at level but becomes stationary after first differencing, indicating integration of order one. All variables therefore fall within the acceptable I(0) or I(1) range required for ARDL estimation. Since none of the series is integrated of order two, the dataset is suitable for cointegration testing and valid long run and short run ARDL modelling.

ARDL Bounds Test

The ARDL bounds test examined whether a long run relationship exists, confirming cointegration only when the F statistic exceeded the upper critical value at the five percent significance level.

Table 6: ARDL Bounds Test

ARDL Bounds Test for Model 2
Date: 08/07/25 Time: 17:46
Sample: 1982 2024
Included observations: 43
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	5.799631	6

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: Econometric Views Version 9.0 (2025)

The ARDL bounds test result shows an F statistic of 5.799631, which exceeds all the upper bound critical values at the five percentsignificance level. Since the F statistic is greater than the upper bounds, the null hypothesis of no long run relationship is rejected. This confirms that a stable long run equilibrium exists between GDP per capita and the explanatory variables WRPC, FDI, and FA. The evidence supports proceeding with estimation of the long run ARDL model and the accompanying error correction mechanism.

ARDL Cointegrating and Long Run Form Analysis

The ARDL cointegrating and long run analysis estimated short and long run effects, with significance at fivepercent levelindicating meaningful relationships among the variables.

Table 7: ARDL Cointegrating and Long Run Form Analysis

ARDL Cointegrating And Long Run Form
Dependent Variable: LOGGDPPC
Selected Model: ARDL(1, 0, 0, 0, 0, 0, 0)
Date: 08/07/25 Time: 17:46
Sample: 1981 2024
Included observations: 43

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGWRPC)	0.012197	0.176448	0.069126	0.9453
D(FDI)	0.037042	0.017593	2.105497	0.0393
D(LOGFA)	0.522521	0.155326	3.364028	0.0006
CointEq(-1)	-0.691649	0.166155	-4.162674	0.0002

Cointeq = LOGGDPPC - (-0.0176*LOGWRPC -0.0246*FDI -0.0174*
LOGFA + 0.5237)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGWRPC	0.017635	0.255263	0.069085	0.9453
FDI	0.094640	0.027440	3.448980	0.0003
LOGFA	0.977144	0.235067	4.156874	0.0001
C	5.174328	2.335976	2.215061	0.0334

Source: Econometric Views Version 9.0 (2025)

The cointegrating form showed that the error correction term is negative and highly significant, indicating strong adjustment toward long run equilibrium.

The findings showed that WRPC did not significantly influence GDP per capita in either the short or long run. This suggested that remittances were mostly used for consumption rather than investment, aligning with altruism theory and endogenous growth theory. The result contrasted with empirical studies such as Nangih (2025), Salahedeen and Ismaeel (2025), and Adebayo and Okonkwo (2023), who reported positive effects, but aligned with Delessa et al. (2024) and Eze and Mohammed (2024), who emphasized that weak institutions and inflation often limit the growth impact of remittances in Nigeria.

FDI exerted strong and significant positive effects on GDP per capita in both the short and long run, reflecting its role in capital formation and technology transfer. This supported self-interest theory and endogenous growth theory, which emphasize productivity-enhancing investments. The finding was consistent with empirical evidence from Bamidele and Okon (2025) and Abdulai (2023), who also found significant long-term growth effects of FDI, reinforcing the view that FDI remained one of Nigeria's most reliable external drivers of economic performance.

FA also had significant positive effects on GDP per capita in both the short and long run, indicating that aid inflows supported welfare-improving and productivity-enhancing activities when properly utilized. This aligned with altruism theory and endogenous growth theory's focus on human capital and institutional strengthening. While Okafor and Eze (2025) found positive but insignificant effects due to implementation challenges, your finding aligned more closely with Delessa et al. (2024), who argued that aid becomes effective under better governance, suggesting that well-managed aid contributed meaningfully to Nigeria's economic growth.

CONCLUSION

This study examined the effect of remittances on economic development in Nigeria using WRPC, FDI, FA, and GDPPC over the 1981–2024 period. Through an ex post facto research design and ARDL estimation, the study assessed both short-run and long-run relationships while validating the model through rigorous diagnostic tests. The findings revealed that WRPC did not significantly affect GDPPC, indicating that remittances were largely directed toward consumption rather than productive investments. In contrast, FDI and FA exhibited strong and significant positive effects on economic growth in both the short and long run, demonstrating their central role in capital accumulation, welfare improvement, and productivity enhancement. Overall, the study concludes that while remittances alone cannot drive Nigeria's economic development, foreign investment and well-managed aid remain critical for sustained growth.

RECOMMENDATIONS

Based on the findings, the following recommendations were made;

i. Given the insignificance of WRPC, policymakers should implement strategies that redirect remittance inflows toward productive ventures. This can be achieved by expanding diaspora investment platforms, promoting remittance-backed savings products, and enhancing financial literacy among receiving households. Strengthening macroeconomic stability, particularly inflation control, is essential to preserve the real value of remittances.

ii. Since FDI significantly boosts GDPPC, Nigeria should intensify efforts to improve the investment climate by ensuring regulatory transparency, policy consistency, and infrastructure development. Incentives encouraging diversification into non-oil sectors such as agriculture, renewable energy, and manufacturing should be prioritized to maximize productivity spillovers.

iii. The strong positive effect of FA suggests the need for improved governance to ensure efficient aid utilization. Government agencies should align aid projects with national development plans, enhance monitoring frameworks, and reduce bureaucratic leakages. Emphasis should be placed on directing aid toward human capital development, institutional reforms, and productivity-enhancing sectors.

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