

# Public - Private Partnerships in Infrastructure and Communication Development A Pathway to Sustainable Growth in Nigeria

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## ABSTRACT

This study investigated the role of public–private partnership (PPP)-driven infrastructure and communication development in fostering inclusive and sustainable economic growth in Nigeria, using annual data from 1986 to 2024 and applying the autoregressive distributed lag (ARDL) framework. Data were sourced from the National Bureau of Statistics (NBS), the Central Bank of Nigeria (CBN), and the World Bank’s Private Participation in Infrastructure (PPI) database. The short-run estimates revealed strong growth persistence, with past GDP values significantly influencing current output. However, PPP investments showed mixed and often adverse effects, reflecting implementation challenges, financing constraints, and governance inefficiencies. Government expenditure and inflation exerted positive but insignificant impacts, while employment displayed contractionary and lagged expansionary effects, underscoring structural dualities in Nigeria’s labour market. Institutional quality contributed positively but only with delay, suggesting that governance reforms required time to produce measurable outcomes. In the long run, PPP investments exerted a statistically significant negative effect on growth, contrary to theoretical expectations. This reflected inflated project costs, weak institutional capacity, and poorly structured contractual frameworks. Government expenditure remained positive but insignificant, while employment failed to stimulate growth, reflecting concentration in low-productivity sectors. Inflation had no significant long-run impact, whereas institutional quality exerted a significant negative effect, highlighting extractive governance structures that constrained economic performance. These findings underscored the paradox of growth strategies that did not translate into inclusive outcomes due to fiscal inefficiencies, corruption, and institutional weaknesses. The study recommends reforming PPP frameworks, improving expenditure efficiency, enhancing labour productivity, maintaining price stability, and strengthening institutions to unlock Nigeria’s potential for sustainable and inclusive growth.

**Keywords:** Public–Private Partnership (PPP), Economic Growth, Institutional Quality, Fiscal Efficiency, Inclusive Development.

## INTRODUCTION

Across Sub-Saharan Africa, the persistent challenge of inadequate infrastructure and weak communication networks continues to undermine economic transformation and long-term growth. Poorly developed transport systems, unreliable power supply, and limited digital connectivity constrain productivity, impede regional integration, and reduce the global competitiveness of African economies (Azolibe & Okonkwo, 2020; Mbedzi & Kapingura, 2023). In recognition of these barriers, many governments in the region have increasingly turned to Public–Private Partnerships (PPPs) as strategic mechanisms for mobilising private capital, mitigating risks, and harnessing efficiency in the delivery of critical infrastructure (Ahmed Musonda & Pretorius, 2023). By bridging financing gaps and introducing innovation, PPPs are now viewed as essential drivers of sustainable development.

Nigeria, Africa’s most populous country and its largest economy, reflects these regional challenges in acute terms. Despite its vast natural and human resources, the nation continues to grapple with severe infrastructure deficits and insufficient communication systems, which have long constrained industrial growth, restricted investment flows, and limited social inclusion (Oyesiku *et al.*, 2013). Estimates suggest that Nigeria’s infrastructure deficit could reach US\$2.3 trillion by 2043 if urgent interventions are not made, while broadband

penetration, at about 48.8% in 2025, still falls short of national targets. These statistics underscore the urgency of reform (Shamwil *et al.*, 2023). Recognising this reality, the Nigerian government has elevated PPPs as a central strategy for delivering development outcomes that public resources alone cannot finance. President Bola Ahmed Tinubu's Renewed Hope Agenda explicitly places infrastructure renewal and digital transformation at the heart of the country's recovery plan, with initiatives such as the Renewed Hope Infrastructure Development Fund and the nationwide broadband expansion programme designed to leverage PPPs to promote inclusive and sustainable growth.

Theoretically, this study is anchored in the Transaction Cost Economics (TCE) framework, which offers a rigorous lens for analysing PPPs in the Nigerian context. TCE posits that when governments act unilaterally, the provision of public goods is often undermined by high transaction costs, inefficiencies, and risks. In response, partnerships with the private sector emerge as rational mechanisms that align incentives, pool resources, and introduce innovation, thereby reducing costs and improving outcomes. Within this perspective, PPPs are not merely financing arrangements but institutional responses designed to overcome the limitations of state-led provision (Wendling *et al.*, 2019). This framework is particularly valuable for assessing whether PPP-driven infrastructure and communication development contributes to measurable improvements in inclusive and sustainable economic growth.

Against this backdrop, the study is guided by one central research question: To what extent does PPP-driven infrastructure and communication development contribute to inclusive and sustainable growth in Nigeria? This question is both theoretically grounded and policy-relevant, ensuring that the study contributes meaningfully to scholarship while speaking directly to Nigeria's developmental priorities.

This study is therefore not only academically significant but also timely and policy-oriented. It aligns closely with Nigeria's aspirations under the Renewed Hope Agenda and resonates with wider continental debates on overcoming structural barriers to growth. By situating PPPs at the intersection of institutional efficiency and sustainable development, the study provides fresh insights into how African states—using Nigeria as a focal case—can craft credible, innovative pathways to long-term prosperity.

## Statement of the Research Problem

Despite the growing policy preference for Public–Private Partnerships (PPPs) in Nigeria, considerable uncertainty persists regarding their actual developmental impact (Ojelabi *et al.*, 2020). PPPs are often promoted as mechanisms to bridge financing gaps and transfer technical expertise; however, implementation outcomes have been uneven. Many projects are marked by weak procurement processes, ambiguous risk-sharing arrangements, prolonged delays, cost overruns, and inconsistent service quality (Onah, 2024). These shortcomings raise fundamental concerns about whether PPPs, in their current design and execution, contribute meaningfully to inclusive and sustainable economic growth.

Equally concerning is the significant empirical gap in scholarship on PPPs in Nigeria. Most existing studies are descriptive or case-based, with narrow focus on specific projects or institutional arrangements. Few provide systematic, economy-wide evidence linking PPP-driven infrastructure and communication initiatives to development outcomes such as employment generation, productivity growth, digital inclusion, and equitable distribution of benefits. Moreover, limited engagement with robust theoretical frameworks—particularly Transaction Cost Economics (TCE)—has constrained the ability to assess whether reductions in transaction costs and improved contractual governance under PPPs translate into long-term, sustainable growth. The absence of rigorous, evidence-based evaluation not only limits academic understanding but also undermines policy learning and institutional reform.

From a policy perspective, this gap is both pressing and consequential. The Federal Government's Renewed Hope Agenda places strong emphasis on infrastructure renewal and digital transformation, signalling significant commitments and heightened public exposure to contingent liabilities. Without reliable empirical evidence and credible performance metrics, policymakers risk perpetuating poorly structured, non-transparent, and weakly monitored contracts—arrangements that could exacerbate fiscal risks, erode public trust, and reinforce rather than address structural barriers to inclusive development.

Although existing scholarship on PPPs in Nigeria has yielded valuable insights, critical limitations remain. Most studies (e.g., Makinde, 2019; Stella & Osezele, 2020; Eze *et al.*, 2024) are project- or state-specific, rely on descriptive surveys, and therefore lack national generalisability. They focus predominantly on physical infrastructure, while communication and digital infrastructure—central to Nigeria’s economic transformation—are often neglected. In addition, Nigerian studies typically cover short time horizons of three to five years and rely heavily on qualitative methods, limiting their ability to capture long-term dynamics or establish causal relationships. By contrast, international research (e.g., Fabre & Straub, 2021; Casady & Suárez-Alemán, 2025) employs broader timeframes, cross-country panel data, and econometric methods, producing more rigorous evidence on sustainability and governance. Furthermore, few Nigerian works are anchored in strong theoretical frameworks such as TCE, restricting their capacity to link PPP design to developmental outcomes.

Together, these gaps underscore the need for a comprehensive, theory-driven, and methodologically rigorous national-level study that integrates both infrastructure and communication sectors, examines long-term impacts, and evaluates how PPPs contribute to inclusive and sustainable growth in Nigeria.

This study directly addresses these gaps by moving beyond anecdotal narratives and policy rhetoric to rigorously examine the role of PPP-driven infrastructure and communication development in promoting inclusive and sustainable economic growth. Anchored in the Transaction Cost Economics framework, the research will provide empirical evidence to inform better project selection, contract design, and regulatory oversight. Ultimately, it seeks to offer practical recommendations to strengthen institutional capacity, minimise implementation failures, and maximise the developmental returns of PPPs in Nigeria.

## Objectives

1. To analyse the role of PPP-driven infrastructure and communication development in promoting inclusive and sustainable economic growth in Nigeria.

## LITERATURE REVIEW

### Theoretical Review

Transaction Cost Economics (TCE), developed by Oliver Williamson, explains that economic activities are structured to minimise costs of negotiation, monitoring, enforcement, and information asymmetry. When markets alone are inefficient due to high transaction costs, hybrid governance models such as public–private partnerships (PPPs) emerge as alternatives. In Nigeria, PPPs in infrastructure and communication aim to share risks, reduce inefficiencies, and leverage private expertise and finance, (Yakubu & Anigbogu, 2016). By lowering transaction costs, PPPs can improve access, service quality, and sustainability, making TCE a useful lens for assessing their efficiency and contribution to inclusive, sustainable growth.

### Empirical Literature

Babatunde, Ekundayo, Udejaja, and Abubakar (2022) investigated PPP infrastructure projects between 2018 and 2021 to assess sustainability practices. Drawing on surveys and case evidence from existing projects, they found that education, stakeholder equity, and health and safety were the leading social sustainability factors, although environmental and institutional practices remained weak. This implies that PPP frameworks in Nigeria must move beyond financial concerns to embed stronger social and environmental safeguards for long-term success.

In a related study, Makinde (2019) examined the Lagos Metropolitan Area Transport Authority (LAMATA) between 2015 and 2019 to evaluate the effectiveness of PPP initiatives in transportation management. Using a descriptive survey of 77 respondents supported by interviews, the study revealed that PPPs facilitated vehicle procurement, reduced traffic congestion, and enhanced government revenue, suggesting that well-structured transport PPPs can deliver efficiency gains and service improvements in urban contexts. Similarly, Eze, Okwueze, and Ishiwu (2024) appraised the role of PPPs in managing public infrastructure in Enugu State. Employing both primary questionnaires and secondary data, and testing hypotheses with t-tests, they found that PPPs improved infrastructure management and that concession agreements enhanced service delivery, although

financial constraints posed challenges. This underscores the need for subnational governments to leverage PPPs for infrastructure provision while strengthening financial mobilisation strategies.

At the state level, Stella and Osezele (2020) examined PPP operations in Edo State to evaluate their effects on infrastructure provision. Using secondary data and qualitative analysis, they reported that PPPs significantly improved infrastructure quality and citizen welfare, but political instability and regulatory weaknesses undermined implementation. Accordingly, strong legal frameworks and stable political environments are essential for effective state-level PPPs. Similarly, Bardi and Delunzu (2023) investigated PPP modalities as a solution to Nigeria's infrastructure gap. Based on purposive surveys of 84 respondents from ministries and agencies and analysed with semantic weighted averages, they found that PPP modalities are feasible but vulnerable to macroeconomic volatility and policy inconsistencies. The implication is that Nigeria must stabilise its regulatory and political climate to unlock the potential of PPPs for infrastructure development.

Itu and Kenigua (2021) assessed the contribution of PPPs to infrastructural development and socio-economic well-being in Nigeria. Using qualitative analysis of secondary data within a stakeholder theory framework, they observed that while PPPs helped to address infrastructure deficits, they were often undermined by weak legal frameworks and risks of abandonment during political transitions. This highlights the importance of stronger legislation, policy continuity, and institutional safeguards to ensure sustainability. Complementing this, Gognaje *et al.* (2023) studied six PPP infrastructure projects in North-Central Nigeria to identify success and failure factors. Using questionnaires administered to PPP experts and analysed with Failure Mode and Effects Analysis (FMEA), they found that cost overruns, political risk, and regulatory uncertainty were the most severe threats, suggesting that comprehensive risk assessment and regulatory stability are essential to minimise PPP failures in Nigeria.

Extending the scope beyond Nigeria, Tanveer *et al.* (2025) assessed PPPs as catalysts for digital transformation in developing countries, focusing on Africa and South Asia between 2010 and 2023. Using mixed-method country case studies and quantitative indicators of digital adoption, they found that PPPs accelerated digital infrastructure rollout when supported by blended finance and regulatory incentives, but could entrench incumbents and reduce competition in the absence of safeguards. This indicates that communications PPPs must balance rollout incentives with open-access requirements to avoid incumbent capture. Likewise, Rakesh, Kumar, and Tripathi (2017) performed a case study of the Hyderabad Metro PPP in India during 2014–2017. Drawing on stakeholder interviews, document analysis, and performance data, they found that strong political backing, a robust private consortium, and revenue-sharing or land-value capture mechanisms were crucial for project success despite land acquisition and financing challenges. This implies that urban transport PPPs require aligned land-use, fiscal, and political arrangements for long-term viability, and similar mechanisms could be adapted for urban communications rollout.

Similarly, Fabre and Straub (2021) reviewed empirical evaluations of PPPs in infrastructure, health, and education between 2000 and 2020 across OECD and developing countries. Using structured evidence synthesis, they found heterogeneous results: some PPPs in transport and telecoms improved delivery and innovation, while others raised fiscal and equity concerns depending on contract and regulatory settings. This suggests that PPP contract design must address affordability and fiscal risk while evaluations compare outcomes against credible public-provision counterfactuals. In the same vein, Chauhan and Patel (2019) analysed firm-level returns from PPP participation in emerging economies such as India, Brazil, and South Africa between 2000 and 2016. Using panel regressions and matched comparison techniques, they found that private partners earned higher returns in competitive, well-regulated markets, whereas weak institutional environments limited private gains and increased contractual disputes. The implication is that private-sector incentives depend on credible enforcement, competition, and regulatory commitment. Similarly, Andrés, Biller, and Vincent-Larousse (2016) conducted a meta-synthesis of PPP impacts across infrastructure sectors globally between 1990 and 2015, finding that successful PPPs operated in competitive markets with strong regulation, while weak governance often led to affordability and fiscal challenges. This underscores the importance of including fiscal risk and affordability measures in PPP evaluations.

In Southeast Asia and Europe, Teo, *et al.* (2024) empirically tested PPP “bundles” in road and health projects between 2010 and 2020. Using small-N case analysis and performance metrics, they found that competition, contract clarity, and sector-specific bundling improved outcomes, while poor competition and unclear scope caused underperformance. This suggests that procurement design should prioritise competitive bidding and sector-appropriate bundling. Likewise, Casady and Suárez-Alemán (2025) examined PPP enabling conditions in Latin America and the Caribbean between 2000 and 2022. Using panel econometric analysis linking enabling indices (legal frameworks, procurement capacity, and fiscal transparency) to infrastructure delivery, they found that stronger enabling conditions significantly improved project performance, while weaker institutions led to frequent renegotiations and project failures. The implication is that institutional and fiscal reforms must precede large-scale PPP programmes, particularly in communications sectors.

Finally, Liu *et al.* (2024) examined whether PPPs promote innovation and value-for-money across transport, telecom, and energy projects between 2000 and 2020. Using regression analysis with governance and regulatory controls, they found that PPPs were associated with higher technology adoption and innovation inputs—especially in transport and telecommunications—although value-for-money gains depended on regulatory oversight and contract design. This suggests that PPPs can catalyse innovation but only when governance and safeguards ensure public value. In conclusion, despite these contributions, most Nigerian studies remain project- or state-specific, relying on descriptive surveys with limited national applicability. They focus primarily on physical infrastructure, while communication and digital infrastructure—critical to Nigeria’s economic transformation—receive little attention. Moreover, short time horizons and predominantly qualitative approaches restrict the ability to capture long-term dynamics, unlike international research that uses broader timeframes, cross-country data, and econometric methods. Few Nigerian studies are grounded in strong theoretical frameworks such as Transaction Cost Economics, highlighting the need for a comprehensive, theory-driven, and methodologically rigorous national-level study that integrates both infrastructure and communication sectors to evaluate their long-term contributions to inclusive and sustainable growth.

## METHODOLOGY

### Model specification

Based on the theoretical review and empirical considerations, the study employed the following model. The relationship among the variables of interest is specified as follows: To analyse the role of PPP-driven infrastructure and communication development in promoting inclusive and sustainable economic growth in Nigeria, the model is specified as:

This is mathematically written as:

$$GDP = f(PPP, GEXP, EMR, INF, INST) \text{-----} (1)$$

The explicit estimable econometric, equation (i) is written as:

$$GDP = \beta_0 + \beta_1 PPP_t + \beta_2 GEXP_t + \beta_3 EMR_t + \beta_4 INF_t + \beta_5 INST_t + \eta_t \text{-----} (2)$$

Where:

GDP = Real GDP growth rate (sustainable growth indicator)

PPP = Value of PPP investments/projects

GEXP = Government capital expenditure on infrastructure and communication

EMR = Employment rate/unemployment reduction (inclusive growth dimension)

INFL = Inflation rate (control for macroeconomic stability)

INST = Institutional quality/governance index

$\epsilon$  = error term

**Justification for Variable Selection:** The variables were chosen for their direct relevance to infrastructure and sustainable growth in Nigeria. Real GDP (GDP) captures economic performance and productive capacity, while Public–Private Partnerships (PPP) and government capital expenditure (GEXP) represent private and public contributions to infrastructure provision. Employment rate (EMR) measures inclusiveness through job creation, and inflation (INFL) reflects macroeconomic stability affecting project costs and viability. Institutional quality (INST) underpins governance, contractual efficiency, and the developmental impact of PPPs. Together, they offer a robust framework for analysing the link between infrastructure and sustainable growth.

The **a-priori** expectations for each variable based on theoretical understanding are as follows:  $\beta_1 > 0$ ;  $\beta_2 > 0$ ;  $\beta_3 > 0$ ;  $\beta_4 < 0$ ;  $\beta_5 > 0$ .

| Variable                              | Proxy/Measurement                                                                                                                                                                                                              | Expected Sign      | Source                                                                                                                    | A-priori Expectation |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------|
| Real GDP Growth (GDP)                 | Annual percentage growth rate of real Gross Domestic Product. This serves as the proxy for sustainable economic growth because it measures the rate of expansion in economic output adjusted for inflation.                    | Dependent Variable | World Development Indicators (WDI); Central Bank of Nigeria (CBN)                                                         | -                    |
| Public–Private Partnership (PPP)      | Annual value of Public–Private Partnership (PPP) investments or infrastructure projects (₦ billion or constant US\$), representing private sector participation in infrastructure development.                                 | (+)                | Infrastructure Concession Regulatory Commission (ICRC); World Bank Private Participation in Infrastructure (PPI) Database | $\beta_1 > 0$        |
| Government Capital Expenditure (GEXP) | Government capital expenditure on infrastructure and communication (₦ billion). This measures public investment in physical infrastructure, including roads, railways, power, communication, education, and health facilities. | (+)                | Central Bank of Nigeria (CBN) Statistical Bulletin; National Bureau of Statistics (NBS)                                   | $\beta_2 > 0$        |
| Employment Rate (EMR)                 | Employment rate (%) or unemployment reduction, used as a proxy for inclusive economic growth by reflecting the economy's capacity to generate productive employment opportunities.                                             | (+)                | National Bureau of Statistics (NBS); World Development Indicators (WDI)                                                   | $\beta_3 > 0$        |
| Inflation Rate (INFL)                 | Annual percentage change in the Consumer Price Index (CPI). Inflation is included as a control variable for macroeconomic stability since persistent inflation increases production costs and discourages investment.          | (–)                | Central Bank of Nigeria (CBN); World Development Indicators (WDI)                                                         | $\beta_4 < 0$        |
| Institutional Quality (INST)          | Composite governance indicator obtained from the Worldwide Governance Indicators (WGI), measured using the                                                                                                                     | (+)                | Worldwide Governance Indicators (WGI)                                                                                     | $\beta_5 > 0$        |

|  |                                                                                                                                                                                       |  |  |  |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
|  | average of governance dimensions such as government effectiveness, regulatory quality, rule of law, and control of corruption. Higher values indicate stronger institutional quality. |  |  |  |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|

Source: Authors' Computation (2026)

## Data and Sources

This study employs annual time-series data spanning 1986 to 2024. Core data on government capital expenditure, employment, and macroeconomic indicators are sourced from the National Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN). Public–Private Partnership (PPP) investments are obtained from the Infrastructure Concession Regulatory Commission (ICRC) and the World Bank's Private Participation in Infrastructure (PPI) database, while Foreign Direct Investment (FDI), real GDP per capita, and real GDP growth come from the World Development Indicators (WDI). Institutional quality indicators are drawn from the Worldwide Governance Indicators (WGI), and although differences in estimation methods may introduce minor biases, these are acknowledged and considered in the analysis.

## DATA ANALYSES AND DISCUSSION OF FINDINGS

### Descriptive Statistics

Table 4.2: Descriptive Statistics Result

|             | RGDP   | PPP    | GEXP   | EMR    | INFL    | INST   |
|-------------|--------|--------|--------|--------|---------|--------|
| Mean        | 1.462  | 3.927  | 2.512  | 71.158 | 109.312 | -0.727 |
| Median      | 1.183  | 3.924  | 2.716  | 78.636 | 61.387  | -0.900 |
| Maxim       | 12.276 | 4.059  | 3.496  | 97.173 | 421.071 | 0.000  |
| Minim       | -4.507 | 3.753  | 0.804  | 0.000  | 0.869   | -1.510 |
| Std. Dev.   | 3.599  | 0.079  | 0.759  | 24.583 | 124.827 | 0.547  |
| Skew        | 0.562  | -0.209 | -0.836 | -2.525 | 1.255   | 0.408  |
| Kurt        | 3.743  | 2.241  | 2.691  | 7.627  | 3.412   | 1.569  |
| Jarque-Bera | 2.948  | 1.222  | 4.699  | 76.238 | 10.513  | 4.409  |
| Prob        | 0.229  | 0.543  | 0.095  | 0.000  | 0.0052  | 0.110  |
| Obs         | 39     | 39     | 39     | 39     | 39      | 39     |

Source: Authors' Computation (2026)

Table 4.2 presents the descriptive statistics. Real GDP (RGDP) averaged 1.462 with considerable variation (–4.507 to 12.276), reflecting episodes of both contraction and growth; it is moderately right-skewed but not significantly non-normal. Public–Private Partnerships (PPP) remained remarkably stable, averaging 3.927 with minimal variation and approximate normality. Government expenditure (GEXP) averaged 2.512 with moderate variability and slight left skewness, showing borderline normality. Employment rate (EMR) averaged 71.158 but ranged widely (0 to 97.173), with strong negative skewness and excess kurtosis, confirming non-normality.

Inflation (INFL) averaged 109.312, was highly volatile (0.869 to 421.071), positively skewed, and significantly non-normal. Institutional quality (INST) averaged  $-0.727$ , reflecting weak governance, and although moderately skewed, it is approximately normal.

Overall, the statistics highlight the volatility of growth, employment, and inflation in contrast to the stability of PPPs, while the non-normality in employment and inflation underscores the importance of applying robust econometric techniques in subsequent analysis.

### Correlation Analysis

Table 4.3: Correlation Analysis

|      | RGDP   | PPP    | GEXP   | EMR    | INFL   | INST |
|------|--------|--------|--------|--------|--------|------|
| RGDP | 1      |        |        |        |        |      |
| PPP  | -0.086 | 1      |        |        |        |      |
| GEXP | 0.061  | 0.859  | 1      |        |        |      |
| EMR  | -0.156 | 0.529  | 0.631  | 1      |        |      |
| INFL | -0.160 | 0.783  | 0.752  | 0.253  | 1      |      |
| INST | -0.427 | -0.545 | -0.661 | -0.454 | -0.339 | 1    |

Source: Authors' Computation (2026)

Table 4.3 shows that real GDP (RGDP) is weakly and negatively correlated with most variables—PPP, employment rate (EMR), inflation (INFL), and institutional quality (INST)—while it has only a slight positive link with government expenditure (GEXP), suggesting growth has not been strongly influenced by these factors. PPP is strongly correlated with GEXP (0.859), moderately with EMR (0.529), and highly with inflation (0.783), indicating that PPP expansion tends to move with higher public spending, rising employment, and inflationary pressures. GEXP also shows strong positive links with PPP and inflation, and a moderate one with EMR, reflecting their interdependence. EMR's weak positive association with PPP and GEXP but negative link with RGDP implies job creation does not always translate into growth. Institutional quality (INST) is negatively correlated with all variables, most strongly with GEXP ( $-0.661$ ) and PPP ( $-0.545$ ), showing that weak governance often coincides with increased spending and investment.

Overall, the analysis highlights the strong interaction between PPPs, government spending, and inflation, contrasted with weak growth–employment dynamics and persistently poor institutional quality, underscoring the role of governance in ensuring infrastructure-led investments yield sustainable outcomes.

Table 4.4: Results of Unit Root Test

| Test at Level |                |                   |        |      | Test at first level difference |                   |        |      |
|---------------|----------------|-------------------|--------|------|--------------------------------|-------------------|--------|------|
| Variable      | Test Statistic | 5% critical value | Remark | S/NS | Test Statistic                 | 5% critical value | Remark | S/NS |
| GEXP          | -1.879         | -2.941            | I(0)   | NS   | -6.972                         | -2.943            | I(1)   | S    |
| RGDP          | -4.244         | -2.941            | I(0)   | S    | -11.023                        | -2.943            | I(1)   | S    |

|      |        |        |       |    |         |        |      |   |
|------|--------|--------|-------|----|---------|--------|------|---|
| PPP  | -1.687 | -2.946 | I (0) | NS | -10.279 | -2.946 | I(1) | S |
| INST | -1.681 | -2.943 | I (0) | NS | -18.111 | -2.943 | I(1) | S |
| GEXP | -1.879 | -2.941 | 1(0)  | NS | -6.972  | -2.943 | I(1) | S |
| EMR  | -2.396 | -2.941 | 1(0)  | NS | -8.243  | -2.943 | I(1) | S |

Where; S indicates Stationary; NS non-Stationary

Source: Researcher's Compilation, (2026)

The unit root test results in Table 4.4 show that most variables—GEXP, PPP, INST, and EMR—are non-stationary at level I(0), as their test statistics are less negative than the 5% critical values. This confirms the presence of unit roots and the absence of mean reversion in their original form. After first differencing, however, these variables become stationary at I(1), indicating they are integrated of order one. By contrast, RGDP is stationary at both level and first difference, showing inherent stability without differencing while still retaining stationarity after transformation. Overall, the results reveal that the series are predominantly I(1), making them appropriate for advanced econometric analysis such as cointegration and error correction modelling. Given the mixed order of integration—with variables at both I(0) and I(1)—the Autoregressive Distributed Lag (ARDL) model is the most suitable approach. It accommodates such combinations while allowing both short-run and long-run dynamics to be captured effectively.

Table 4.5: Johansen Co-Integration Test

| Trace Max-Eingen & Max-Eingen Statistics                                                     |                  |                            |       |                       |                            |          |
|----------------------------------------------------------------------------------------------|------------------|----------------------------|-------|-----------------------|----------------------------|----------|
| H <sub>0</sub>                                                                               | Trace Statistics | Critical value at 5% level | Prob. | Max-Eingen Statistics | Critical value at 5% level | Prob.    |
| None *                                                                                       | 118.491          | 95.754                     | 0.000 | 39.540                | 40.078                     | 0.057**  |
| At most 1 *                                                                                  | 78.950           | 69.819                     | 0.008 | 36.082                | 33.877                     | 0.0268** |
| At most 2                                                                                    | 42.868           | 47.856                     | 0.136 | 19.363                | 27.584                     | 0.387    |
| At most 3                                                                                    | 23.505           | 29.797                     | 0.222 | 14.657                | 21.132                     | 0.314    |
| At most 4                                                                                    | 8.848            | 15.495                     | 0.379 | 8.109                 | 14.265                     | 0.368    |
| At most 5                                                                                    | 0.738            | 3.841                      | 0.390 | 0.738                 | 3.841                      | 0.390    |
| Trace test indicates 5 co-integrating eqn.(s) at the 0.05 level,                             |                  |                            |       |                       |                            |          |
| Denotes rejection of the hypothesis at the 0.05 level** indicates statistically significant. |                  |                            |       |                       |                            |          |

Source: Researcher's Compilation, (2026)

The Johansen cointegration results in Table 4.5 confirm the presence of long-run relationships among the variables. The trace statistic rejects the null hypothesis of no cointegration and at most one cointegrating vector at the 5% level, with probabilities of 0.000 and 0.008, respectively. Similarly, the maximum-eigenvalue test rejects the null of no cointegration and at most one cointegrating vector, with probabilities of 0.057 and 0.0268. However, subsequent hypotheses are not rejected, indicating the existence of at least two cointegrating equations. Taken together, the results show that the variables move together over time and share a stable long-run equilibrium. This validates the use of the ARDL approach, which is particularly appropriate as it accommodates

variables of mixed order of integration, captures both short-run dynamics and long-run relationships, and provides robust estimates of the equilibrium path.

## Presentation of Results

**Objective:** To analyse the role of PPP-driven infrastructure and communication development in promoting inclusive and sustainable economic growth in Nigeria.

## Bound Test Result

Table: 4.6.2: ARDL Bound Test Result

| Test Statistic                                             | Value | K           |             |
|------------------------------------------------------------|-------|-------------|-------------|
| F-statistic                                                | 8.347 |             |             |
| Critical Value                                             |       | Lower bound | Upper bound |
| 10%                                                        |       | 2.26        | 3.35        |
| 5%                                                         |       | 2.62        | 3.79        |
| 2.5%                                                       |       | 2.96        | 4.18        |
| 1%                                                         |       | 3.41        | 4.68        |
| Notes: ** denote significant at 5% levels. Critical values |       |             |             |

Source: Research's Compilation, 2026 from E-view-9

The ARDL bounds test in Table 4.6.2 above provides strong evidence of a long-run relationship among the variables. The computed F-statistic of 8.347 is substantially higher than the upper critical bound at the 1% significance level (4.68). Consequently, the null hypothesis of no cointegration is rejected, confirming that the variables are cointegrated. This finding implies that the variables evolve together over time and share a stable long-run equilibrium. Accordingly, the ARDL framework is validated as an appropriate estimation technique, as it not only accommodates variables with mixed orders of integration but also captures both short-run dynamics and long-run relationships, thereby ensuring robust and reliable estimates of the equilibrium adjustments.

## Short-Run Estimates (Dependent Variable: RGDP)

Table 4.7: Short-Run Result of ARDL

| Variable    | Coefficient | Std. Error | t-Statistic | Prob.   |
|-------------|-------------|------------|-------------|---------|
| D(RGDP(-1)) | 0.879       | 0.304      | 2.892       | 0.018** |
| D(RGDP(-2)) | 0.489       | 0.152      | 3.206       | 0.011** |
| D(PPP)      | -27.227     | 12.214     | -2.229      | 0.053** |
| D(PPP(-1))  | 17.948      | 12.807     | 1.401       | 0.195   |
| D(PPP(-2))  | 21.855      | 15.417     | 1.418       | 0.190   |
| D(PPP(-3))  | -23.501     | 11.788     | -1.993      | 0.077   |

|             |        |       |        |         |
|-------------|--------|-------|--------|---------|
| D(GEXP)     | 3.253  | 4.384 | 0.742  | 0.477   |
| D(GEXP(-1)) | -3.363 | 4.625 | -0.727 | 0.486   |
| D(GEXP(-2)) | -0.645 | 4.904 | -0.132 | 0.898   |
| D(GEXP(-3)) | -3.681 | 4.766 | -0.772 | 0.459   |
| D(EMR)      | -0.102 | 0.037 | -2.758 | 0.022** |
| D(EMR(-1))  | 0.086  | 0.028 | 3.121  | 0.012** |
| D(INFL)     | -0.017 | 0.032 | -0.542 | 0.601   |
| D(INFL(-1)) | 0.090  | 0.140 | 0.641  | 0.537   |
| D(INFL(-2)) | -0.219 | 0.199 | -1.095 | 0.302   |
| D(INST)     | 0.071  | 1.266 | 0.056  | 0.956   |
| D(INST(-1)) | 3.133  | 1.814 | 1.727  | 0.118   |
| D(INST(-2)) | 0.996  | 1.506 | 0.661  | 0.525   |
| D(INST(-3)) | 4.057  | 1.045 | 3.884  | 0.004** |
| CointEq(-1) | -1.467 | 0.343 | -4.275 | 0.002** |

Source: Research's Compilation, 2026 from E-view-9

Table 4.7 above presents the short-run ARDL estimates, which reveal that past values of real GDP exert a significant positive influence on current GDP. Specifically, the first lag of RGDP,  $D(RGDP(-1))$ , has a coefficient of 0.879 with a probability value of 0.018, indicating that a 1% increase in GDP in the previous period raises current GDP by about 0.88%. This effect is statistically significant at the 5% level. Similarly, the second lag,  $D(RGDP(-2))$ , carries a positive coefficient of 0.489 with a probability value of 0.011, showing that GDP from two periods earlier also exerts a significant positive effect on current output, though the magnitude is smaller than that of the first lag. Taken together, these results imply strong growth persistence in Nigeria, as past economic performance continues to shape present output levels. This reflects the momentum of economic activities and the path-dependent nature of the country's growth dynamics.

The coefficient of public-private partnership (PPP) investment exerts mixed and largely unexpected effects on Nigeria's real GDP. The contemporaneous coefficient of  $D(PPP)$  is negative ( $-27.227$ ) and marginally significant at the 10% level ( $p = 0.053$ ), contradicting the a priori expectation of a positive relationship ( $\beta_1 > 0$ ). This suggests that, in the short run, increases in PPP investment may be associated with a decline in output, potentially reflecting project gestation lags, high initial financing costs, or inefficiencies in project implementation. Although the first and second lagged values of PPP (17.948 and 21.855) are positive, they are statistically insignificant, indicating that the expected productivity gains from PPP investments do not materialise immediately. Interestingly, the third lag ( $-23.501$ ) is weakly significant ( $p = 0.077$ ), reinforcing the evidence of short-run volatility and delayed adverse adjustments. The negative short-run relationship may also reflect weaknesses in project selection and prioritisation. In Nigeria, some PPP projects have historically been selected based on political considerations rather than rigorous economic cost-benefit analysis, resulting in investments that generate limited productivity gains or fail to address critical infrastructure bottlenecks. Furthermore, regulatory and institutional weaknesses often create uncertainty for investors through inconsistent policies, lengthy approval processes, and weak enforcement of contractual obligations. Such regulatory inefficiencies

increase transaction costs, delay project completion, and reduce the capacity of PPP projects to stimulate economic activity within the implementation period.

In addition, corruption risks and weak contract management remain significant challenges to PPP effectiveness. Cost overruns, procurement irregularities, inadequate transparency, and poor monitoring can divert resources away from productive investment and reduce project quality. Similarly, ineffective contract administration, including weak risk-sharing arrangements, delayed government counterpart funding, and limited technical capacity among implementing agencies, can prolong project execution and diminish the expected economic returns. These governance deficiencies may explain why increased PPP investment is associated with lower short-run economic performance despite its long-run developmental potential.

Empirically, this finding is consistent with Mofokeng, Alhassan, and Zeka (2018), who argue that PPPs in certain sectors may undermine growth in the short run, and with Zangouinezhad and Azar (2014), who highlight how weak governance and project misalignment limit the benefits of PPPs. It also aligns with recent Nigerian evidence reported by NI Journals (2025), which documents negative short-run growth effects of PPP projects arising from implementation and governance challenges. Conversely, the result diverges from Mofokeng, Alhassan, and Zeka (2023), who report a positive PPP–growth nexus across developing countries; Ouertani and Belaid (2022), who confirm the long-run growth-enhancing role of PPPs in Morocco; and Owusu-Manu et al. (2021), who demonstrate that strong institutional quality significantly improves the effectiveness of PPPs in promoting economic growth. Similarly, Adekunle and Gold (2020) find that PPP investments significantly increase GDP per capita in Sub-Saharan Africa, suggesting that the success of PPPs depends largely on the quality of governance and institutional capacity.

The economic implication is that, although PPP investments possess considerable potential to support Nigeria's long-run growth trajectory, their immediate effects may be contractionary when projects are poorly selected, implemented under weak regulatory frameworks, or undermined by corruption and ineffective contract management. Consequently, policymakers should not expect immediate output gains from PPP investments. Instead, emphasis should be placed on rigorous project appraisal based on economic viability, strengthening regulatory institutions, enhancing transparency and accountability throughout the procurement process, improving contract design and monitoring, and ensuring effective risk allocation between the public and private sectors. Addressing these institutional and governance constraints will improve project efficiency, accelerate infrastructure delivery, and enable PPP investments to make a more meaningful contribution to inclusive and sustainable economic growth in Nigeria.

The short-run ARDL estimates further show that the coefficient of government expenditure (GEXP) exerts mixed and statistically insignificant effects on Nigeria's real GDP. The contemporaneous coefficient of  $D(GEXP)$  is positive (3.253) but insignificant ( $p = 0.477$ ). While this aligns with the a priori expectation of  $\beta_2 > 0$ , it fails to establish a measurable short-run impact on output. In principle, higher government spending could stimulate growth; however, the result suggests that such effects are not immediately realised. Furthermore, the first, second, and third lags of GEXP are negative (−3.363, −0.645, and −3.681, respectively), though also insignificant, implying that past expenditure does not translate into short-run growth gains. These lagged results highlight the likelihood of fiscal inefficiencies, leakages, or misallocations that offset any potential multiplier effects in the short term. Analytically, this finding is consistent with studies such as Egbetunde and Akinlo (2023), who show that government expenditure in Nigeria fails to generate significant short-run growth due to weak implementation; Oladipo and Alege (2022), who report that recurrent-heavy spending tends to crowd out productive investment; Osei and Agyapong (2021), who find that fiscal expansion in West Africa often produces delayed rather than immediate effects; and Akpan and Ogar (2020), who argue that corruption and inefficiency undermine the growth impact of Nigeria's public expenditure. By contrast, the result contradicts evidence from Uwazie and Igbunugo (2024), who document a strong positive effect of fiscal expansion on Nigeria's short-run growth; Essien, Okechukwu, and Nwafor (2022), who establish that infrastructure-driven public spending significantly raises GDP in Sub-Saharan Africa; and Ijeoma and Okonkwo (2021), who demonstrate that well-structured and efficiently implemented government expenditure yields immediate growth dividends in Nigeria. The economic implication of these findings is that, although government expenditure is theoretically expected to stimulate short-run economic activity, in practice it does not significantly enhance Nigeria's output within the

period under study. This outcome may reflect structural weaknesses such as inefficient budget execution, widespread corruption, and an excessive concentration of spending on recurrent rather than capital items. For fiscal policy to deliver meaningful growth outcomes, public spending should be strategically directed towards productive, growth-enhancing sectors, supported by institutional reforms that strengthen transparency, efficiency, and accountability.

Moreover, the employment rate (EMR) presents a nuanced yet revealing picture. The contemporaneous change in EMR ( $D(EMR)$ ) has a statistically significant negative effect on real GDP, with a coefficient of  $-0.102$  ( $p = 0.022$ ). This indicates that a 1% increase in the employment rate immediately reduces real GDP by approximately 0.10%. Such a finding runs counter to the a priori expectation that  $\beta_3 > 0$ , since economic theory posits that higher employment should enhance productivity, expand output, and boost aggregate demand. The negative sign may be symptomatic of structural rigidities in Nigeria's labour market, including underemployment, low labour productivity, and the dominance of informal sector jobs that fail to translate into meaningful contributions to national output. By contrast, the first lag of the employment rate ( $D(EMR(-1))$ ) shows a positive and statistically significant effect on real GDP, with a coefficient of  $0.086$  ( $p = 0.012$ ). This result accords with the a priori expectation, suggesting that the growth benefits of employment expansion emerge with a time lag. Newly created jobs typically require a gestation period before they generate measurable increases in productivity, household incomes, investment, and consumption. Thus, while the immediate effect of rising employment appears contractionary, the subsequent lag indicates a delayed but positive contribution to growth, reflecting the complex and dual nature of Nigeria's labour market dynamics. The economic implication of these findings is clear: employment growth in itself is insufficient to guarantee immediate economic expansion if it is not accompanied by improvements in job quality and productivity. Merely increasing employment numbers, particularly within low-skilled or informal activities, may exert short-run pressure on growth. Over time, however, as workers transition into more productive roles, the economy can realise tangible gains in output. This underscores the importance of policies that not only generate jobs but also enhance labour productivity through skills development, technological adoption, and structural diversification. Also, these results are consistent with studies such as Okoye and Ezeaku (2022), Adetutu and Olayemi (2023), Yakubu and Musa (2023), and Ogunleye and Oke (2024), who all found that employment growth, particularly when concentrated in productive sectors, strengthens real output and supports macroeconomic stability in developing economies. Conversely, evidence from Olawale (2021), Chika and Danjuma (2022), and Ibrahim and Omodero (2023) contradicts this view, showing that high employment rates do not necessarily translate into economic growth in contexts dominated by low-skilled, informal, and low-productivity jobs.

The coefficient of inflation (INFL) and institutional quality (INST) also provide valuable insights into Nigeria's growth dynamics. The contemporaneous coefficient of inflation ( $D(INFL)$ ) is negative ( $-0.017$ ) but statistically insignificant ( $p = 0.601$ ). This aligns with the a priori expectation that  $\beta_4 < 0$ , since inflation is generally anticipated to exert a contractionary effect on growth by eroding purchasing power and destabilising investment decisions. Similarly, the second lag of inflation ( $-0.219$ ,  $p = 0.302$ ) also carries a negative but insignificant coefficient, reinforcing the view that inflation weakens output, although the effect is not statistically evident in the short run. Interestingly, the first lag of inflation ( $0.090$ ,  $p = 0.537$ ) is positive though insignificant, suggesting that temporary price adjustments may occasionally have stabilising effects, but these remain too weak to meaningfully influence output. Taken together, the results imply that inflation does not exert a statistically significant short-run impact on Nigeria's real GDP, although the negative signs in key periods are consistent with theoretical expectations of inflation as a growth-retarding factor. In contrast, institutional quality presents a more encouraging pattern. The contemporaneous effect of  $D(INST)$  is positive ( $0.071$ ) but insignificant ( $p = 0.956$ ), while the first and second lags ( $3.133$  and  $0.996$ , respectively) are also positive yet statistically insignificant. These results suggest that improvements in governance and institutional structures do not immediately translate into measurable output growth in the short run. However, the third lag of institutional quality ( $4.057$ ) is both positive and statistically significant ( $p = 0.004$ ), strongly supporting the a priori expectation that  $\beta_5 > 0$ . This indicates that institutional reforms require time to take effect before generating tangible economic benefits, reflecting the gradual process through which stronger governance, transparency, and rule of law enhance investor confidence, improve resource allocation, and strengthen productive efficiency. The economic implication is that inflation remains a potential drag on Nigeria's growth trajectory, even if its immediate short-run effects are weakly reflected in the estimates. Sustained efforts to maintain price stability are

therefore essential for safeguarding economic performance. On the other hand, the significant positive effect of institutional quality at the third lag underscores the importance of persistent institutional reforms. While governance improvements may not yield instant growth dividends, they play a pivotal role in sustaining long-term development. Policymakers must therefore pursue a dual strategy: controlling inflation in the short run while strengthening institutional frameworks in the medium to long run, thereby ensuring a stable and sustainable growth path for Nigeria.

Lastly, the error correction term, CointEq (-1), is negative (-1.467) and highly significant ( $p = 0.002$ ), confirming the existence of a stable long-run equilibrium relationship. The magnitude indicates that more than 100% of past disequilibria are corrected within a year, pointing to an over-adjustment process. This implies that although Nigeria's economy rapidly reverts to equilibrium aftershocks, the adjustment path may be volatile, requiring policies that promote stability in growth dynamics.

### Long-run Estimates (Dependent Variable: RGDP)

Table 4.8: Long-run Estimates (Dependent Variable: RGDP)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|-------|
| PPP      | -79.372     | 22.769     | -3.486      | 0.007 |
| GEXP     | 1.024       | 3.052      | 0.335       | 0.745 |
| EMR      | -0.047      | 0.0306     | -1.548      | 0.156 |
| INFL     | 0.039       | 0.024      | 1.688       | 0.126 |
| INST     | -5.761      | 2.022      | -2.849      | 0.019 |
| C        | 310.036     | 83.638     | 3.707       | 0.005 |

Source: Research's Compilation, 2026 from E-view-9

The long-run ARDL estimates presented in Table 4.8 reveal that public-private partnership in infrastructure (PPP) exerts a statistically significant but negative effect on Nigeria's real GDP, with a coefficient of -79.37 ( $p = 0.007$ ). This outcome contradicts the a priori expectation ( $\beta_1 > 0$ ), which posits that PPP investments should enhance economic growth by addressing infrastructure deficits, improving service delivery, and attracting private capital. Instead, the result suggests that the long-run contribution of PPPs to economic growth in Nigeria has been constrained by persistent institutional and implementation challenges that undermine the expected productivity gains from infrastructure investment. A plausible explanation for this adverse relationship lies in weak project selection and prioritisation. Many PPP projects in Nigeria have been initiated without rigorous feasibility studies or comprehensive cost-benefit analyses, leading to the implementation of projects with limited economic viability or weak developmental linkages. Political considerations rather than socio-economic priorities have, in some cases, influenced project selection, resulting in investments that generate low economic returns and fail to address the country's most critical infrastructure needs. Consequently, substantial financial resources are committed to projects that contribute little to long-term productive capacity.

The negative relationship may also reflect weak regulatory and institutional frameworks governing PPP implementation. Frequent policy inconsistencies, inadequate regulatory oversight, lengthy approval procedures, and weak enforcement of contractual obligations create uncertainty for private investors and reduce the efficiency of project delivery. Such institutional deficiencies often delay project completion, increase operational costs, and diminish investor confidence, thereby limiting the growth-enhancing effects of PPP investments over time.

Furthermore, corruption risks and ineffective contract management remain significant impediments to the success of PPP projects in Nigeria. Procurement irregularities, inflated project costs, rent-seeking behaviour, limited transparency in concession awards, and inadequate accountability mechanisms can reduce value for money and weaken the quality of infrastructure delivered. Similarly, poorly designed contracts, weak monitoring and evaluation systems, inappropriate risk allocation between public and private partners, and frequent contract renegotiations may increase project costs and reduce operational efficiency. These shortcomings undermine the sustainability and economic returns of PPP investments, thereby explaining their negative long-run association with economic growth.

Empirically, this finding is consistent with Akinwale and Adekunle (2023), who demonstrate that many Nigerian PPP projects are characterised by cost overruns, governance failures, and managerial inefficiencies. It also supports Mensah and Boateng (2022), who argue that regulatory weaknesses and weak institutional capacity across West Africa substantially reduce the effectiveness of PPP arrangements in promoting economic development. Similarly, Tanveer, *et al.*, (2025) find that poorly implemented PPPs in developing economies can crowd out productive public investment, increase fiscal risks, and dampen long-run economic growth. Conversely, the result contradicts Teo, *et al.*, (2024), who show that well-coordinated PPP programmes supported by robust institutions significantly enhance infrastructure efficiency and economic growth in Asia. Likewise, Omotosho and Abiola (2023) report that PPP investments in Nigeria's energy and transport sectors can generate positive long-run growth effects when implemented under strong regulatory oversight, transparent procurement systems, and effective contract enforcement.

Overall, the negative coefficient indicates that the issue is not PPP financing itself but rather the quality of its implementation and governance. For PPPs to contribute meaningfully to Nigeria's long-run economic growth, policymakers should strengthen project appraisal and selection procedures by ensuring that investments are based on rigorous economic feasibility and national development priorities. In addition, regulatory institutions should be reinforced to improve policy consistency, contract enforcement, and investor confidence, while procurement processes should be made more transparent to minimise corruption and rent-seeking. Strengthening contract design, monitoring, performance evaluation, and risk-sharing arrangements between public and private partners will enhance project efficiency, reduce implementation delays, and enable PPP investments to realise their intended contribution to sustainable and inclusive economic growth.

. Moreover, Table 4.5 show that government expenditure (GEXP) has a positive but statistically insignificant effect on Nigeria's real GDP, with a coefficient of 1.02 ( $p = 0.745$ ). While the sign agrees with the a priori expectation ( $\beta_2 > 0$ ), suggesting that higher spending should stimulate growth, the insignificance implies that expenditure has not translated into measurable long-run gains. This likely reflects fiscal inefficiencies, corruption, and the dominance of recurrent over capital expenditure. The employment rate (EMR) shows a negative and insignificant effect ( $-0.047$ ;  $p = 0.156$ ), contradicting the a priori expectation ( $\beta_3 > 0$ ). Rather than boosting growth, rising employment may be concentrated in low-productivity or informal sectors, limiting its contribution to long-run output. Underemployment, skill mismatches, and poor job quality may also account for this outcome. These findings are consistent with Egbetunde and Akinlo (2023), who argue that government spending in Nigeria often fails to drive long-run growth due to misallocation; Osei and Agyapong (2022), who find that fiscal expansion in West Africa yields limited effects when recurrent expenditure dominates; and Akinyemi and Adegboye (2021), who report that low-quality jobs reduce the positive impact of employment. However, they contradict Uwazie and Igbunugo (2024), who show that targeted government spending enhances long-run growth, and Essien, Okechukwu, and Nwafor (2022), who find that employment supports growth in Sub-Saharan Africa when tied to skill development and industrial policy. Overall, although government spending and employment are theoretically expected to stimulate long-run output, their weak impact in Nigeria reflects fiscal inefficiency and labour market distortions. Redirecting expenditure toward productive sectors and promoting high-quality jobs are critical for achieving sustainable growth.

In addition, the coefficient of inflation (INFL) has a positive but statistically insignificant effect on Nigeria's real GDP, with a coefficient of 0.0398 ( $p = 0.126$ ). Although the sign aligns with the expectation that moderate inflation can stimulate demand and investment, the insignificance suggests that inflation does not exert a measurable long-run impact on growth. This reflects the mixed role of inflation in developing economies, where

unstable prices and weak policy frameworks often offset potential benefits. Lastly, the Institutional quality (INST), however, records a negative and statistically significant effect on real GDP ( $-5.76$ ;  $p = 0.019$ ). This contradicts the a priori expectation that stronger institutions should enhance growth. Instead, the result implies that Nigeria's institutions may be weak, extractive, or poorly designed, such that governance reforms impose costs rather than generating efficiency. Corruption, policy inconsistency, and weak rule of law likely explain why institutional structures undermine, rather than support, long-run growth. Overall, while inflation exerts no significant long-run influence on Nigeria's output, institutional weaknesses remain a critical drag on economic performance. Sustainable growth therefore requires consistent price stabilisation alongside deep institutional reforms that promote transparency, accountability, and effective governance.

Table 4.9: Summary of Post-Estimation Diagnostic Tests

| Diagnostic Test                                    | Statistic           | Value  | p-Value | Decision/Interpretation                                                     |
|----------------------------------------------------|---------------------|--------|---------|-----------------------------------------------------------------------------|
| Serial Correlation Test<br>(Breusch-Godfrey LM)    | F-statistic         | 1.353  | 0.319   | No evidence of serial correlation (based on F-statistic).                   |
|                                                    | Obs*R-squared       | 9.756  | 0.008   | Suggests potential presence of serial correlation; further checks required. |
| Heteroskedasticity Test<br>(Breusch-Pagan-Godfrey) | F-statistic         | 1.228  | 0.323   | No evidence of heteroskedasticity. Homoscedasticity satisfied.              |
|                                                    | Obs*R-squared       | 14.060 | 0.297   | Confirms no heteroskedasticity.                                             |
|                                                    | Scaled explained SS | 6.769  | 0.873   | Supports homoscedasticity assumption.                                       |
| Model Specification Test<br>(Ramsey RESET)         | t-statistic         | 0.476  | 0.647   | No evidence of model misspecification. Functional form appears adequate.    |
|                                                    | F-statistic         | 0.227  | 0.647   | Confirms absence of omitted variable bias.                                  |

Source: Researcher's Computation, 2026

## SUMMARY, CONCLUSION AND POLICY IMPLICATION

This study examined the role of public-private partnership (PPP)-driven infrastructure and communication development in fostering inclusive and sustainable economic growth in Nigeria, using annual data covering the period 1986–2024. The short-run ARDL estimates revealed strong growth persistence, as past GDP values exerted a significant influence on current output. PPP investments, however, produced mixed and often negative short-run effects, reflecting implementation bottlenecks, financing constraints, and governance inefficiencies. Government expenditure and inflation were positive but insignificant, while employment displayed both immediate contractionary and lagged expansionary impacts, underscoring the structural duality of Nigeria's labour market. Institutional quality showed delayed yet significant contributions to growth, indicating that governance reforms require time before yielding measurable results.

In the long run, PPP investments had a statistically significant negative effect on growth, contrary to theoretical expectations. This outcome highlights challenges such as inflated project costs, weak institutional capacity, and poorly designed contractual frameworks. Although government expenditure maintained a positive effect, it remained insignificant, reflecting fiscal inefficiency and the overwhelming dominance of recurrent spending. Employment also failed to enhance long-run growth, suggesting that job creation is concentrated in low-productivity sectors. Inflation exerted no significant long-run impact, while institutional quality had a significant but negative effect, signalling extractive governance and policy weaknesses that undermine sustainable economic performance. These findings suggest that while PPPs, government spending, and employment are

theoretically expected to stimulate growth, their weak or adverse effects in Nigeria are largely attributable to structural inefficiencies, corruption, and misaligned policy frameworks. The evidence underscores the paradox of growth strategies that fail to deliver inclusive development, as weak institutions and resource misallocation limit the benefits of economic expansion.

## RECOMMENDATIONS

- i. **Reform PPP Frameworks:** Strengthen institutional capacity, ensure transparent procurement and contract management, and prioritise PPP projects in sectors with high multiplier effects such as energy, transportation, and ICT. Establish robust monitoring and accountability mechanisms to curb inefficiencies and cost overruns.
- ii. **Improve Public Expenditure Efficiency:** Reallocate government spending toward capital-intensive, growth-enhancing sectors such as infrastructure, health, and education, while reducing the disproportionate emphasis on recurrent expenditure. Fiscal transparency and strong anti-corruption reforms are necessary to improve budgetary outcomes.
- iii. **Enhance Labour Market Productivity:** Design employment policies that prioritise quality job creation in high-productivity sectors. Investments in skills development, industrial diversification, and entrepreneurship promotion are crucial for transforming employment into a driver of sustained growth.
- iv. **Maintain Price Stability:** Although inflation was not found to have a significant effect, ensuring a stable price environment remains vital for fostering investor confidence and protecting household welfare. Strengthening monetary–fiscal policy coordination is essential to maintain macroeconomic stability.
- v. **Strengthen Institutions:** Comprehensive governance reforms are needed to address corruption, policy inconsistency, and weak enforcement of the rule of law. Building transparent, accountable, and efficient institutions will reduce the negative effects of extractive governance and unlock their potential as enablers of long-term growth.

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