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IMPACT OF INFRASTRUCTURAL FINANCE ON THE ECONOMIC GROWTH AND DEVELOPMENT OF NIGERIA 2015-2020

Rev'd Canon Amako Jonathan Chima, Ph.D.
Department of Banking and Finance
Federal Polytechnic Nekede, Owerri, Imo-State Nigeria.
revdjonathanamako3@gmail.com
08033349335 / 07016651945

Abstract

This research study investigates the impact of Infrastructural Finance on Economic Growth and Development of Nigeria from 2000-2020. The objectives of the study include the following; to evaluate infrastructural financing strategies and its effect on the growth and development of Nigeria's economy, examine if there is a relationship between infrastructural financing and economic growth in Nigeria. The data for the study were extracted from CBN statistical bulletins. The multiple regression analysis was employed in this study. The results of the multiple regression analysis show that there is no significant contribution of Public Private Partnership (PPP) in achieving economic growth and development in Nigeria, and that government capital expenditure has a significant effect on economic growth and development in Nigeria. The result of the study also revealed that public-private initiative has not brought about any significant funding and maintenance of infrastructure in Nigeria. Based on the findings, we recommended that for PPP to work in the provision of infrastructure in Nigeria, there is need for enabling laws to be domesticated in each state of the federation for uniformity of administration and purpose, a robust transparent evaluation mechanism should be provided to ensure a smooth running of PPP programme. Furthermore, partisanship and nepotism must be avoided by our political leaders, especially when it comes to infrastructural financing.

Keywords: Infrastructural, Finance, Economic, Growth, Development

Introduction

Infrastructure refers to the basic physical and organisational structures needed for the operation of a society, such as buildings, roads, bridges, industries, and health facilities. It provides the foundation for the production of goods and services necessary for an economy to function (Sullivan & Sheffrin, 2013). The term "infrastructure" has been used in English since 1927 and originally referred to the installations that form the basis for any operation or system (Online Etymology Dictionary, 2012). The availability of good infrastructure is essential for the overall economic development of any nation. It improves productivity and enhances the quality of life (Aschauer, 2019). In developing countries such as Nigeria, inadequate infrastructure financing

has serious consequences for citizens, including low industrial output and poor living standards. Nigeria's infrastructure deficit is estimated at about $100 billion annually, a figure far above the federal budget, which shows that the government cannot meet these demands on its own (Aschauer, 2013).

Public-Private Partnerships have therefore been seen as a possible solution for closing the financing gap. The PPP approach allows the private sector to participate in financing and managing infrastructure under agreed arrangements for investment recovery (Srinivasu & Rao, 2013). Despite this effort, the government has struggled to attract sufficient private investment due to weak institutional frameworks and limited investor confidence (Stephane et al., 2007). In Nigeria, infrastructure financing has long been a major challenge. The government has traditionally been the main financier of infrastructural projects, taking responsibility for their implementation, operation, and maintenance. However, because the cost of infrastructure is very high, the government alone cannot adequately meet the growing demand for roads, energy, and public services. To address this challenge, the country has increasingly adopted the *Public-Private Partnership (PPP)* model—a contractual agreement between the public and private sectors to share financial, technical, and management risks in developing and maintaining infrastructure (Srinivasu & Rao, 2013).

Nevertheless, even with PPP arrangements, Nigeria still faces major constraints in attracting adequate finance for infrastructure. Many projects experience delays or remain incomplete due to poor funding, corruption, and weak management capacity (Stephane, Vellatin, & Warlters, 2007). Hence, the period between 2015 and 2020 represents a crucial stage for analysing how infrastructural finance contributed to Nigeria's economic growth. The study aims to determine whether the financing strategies during this period led to measurable progress in gross domestic product (GDP) and general development.

Nigeria's economic growth has been slowed by poor infrastructure and weak financing systems. Despite large government spending, the country still faces shortages of essential facilities such as roads, electricity, and water (Aschauer, 2019). The government's limited resources and weak maintenance culture have made it difficult to meet rising infrastructure needs.

To solve this, Nigeria introduced Public-Private Partnerships (PPP) to attract private investment, but poor coordination, weak legal frameworks, and corruption have reduced their effectiveness (Srinivasu & Rao, 2013; Stephane, Vellatin, & Warlters, 2007). As a result, many infrastructure projects remain incomplete or fail to deliver meaningful economic results (Aschauer, 2013).

The following are the objectives of the study:

The main objective of this study is to examine infrastructural finance and economic development in Nigeria. The specific objectives are to:

1. Determine whether public-private initiatives have brought about proper funding and maintenance of infrastructure in Nigeria.
2. Examine the significant contribution of public-private partnerships (PPP) in achieving economic growth and development in Nigeria.
3. Evaluate infrastructural financing strategies and their effects on urban development in Nigeria.
4. Find out whether there is a relationship between infrastructure financing and economic development in Nigeria.
5. Assess the extent to which public-private partnership initiatives are employed in Nigeria.
6. Identify practical solutions to the hindrances of infrastructural development in Nigeria.

The study tests the following null hypothesis

1 *Infrastructural finance has no significant impact on Nigeria's economic growth*.

2 Public-Private Partnerships have not significantly improved infrastructure funding and maintenance in Nigeria.

Literature Review

Conceptual Literature

Meaning of Infrastructure

Infrastructure refers to the basic physical framework that supports the functioning of an economy and society. It includes facilities such as roads, water, electricity, education, and health services. Scholars like Aschauer (2019) note that infrastructure increases productivity and improves quality of life. In developing countries like Nigeria, the limited capacity of local capital markets makes financing infrastructure particularly difficult (Aschauer, 2013).

Nature of Infrastructure Finance

Infrastructure finance usually combines both equity and debt, depending on the size and risk level of each project (Kingsley, 2013). Successful financing often requires long-term funds that may last from 5 to 30 years. It plays a key role in urban development, and researchers agree that efficient infrastructure funding helps drive economic growth and development (Ariyo & Jerome, 2011).

Infrastructure in Nigeria

Nigeria has made progress in improving power, roads, railways, and ICT infrastructure compared to some neighbouring countries. However, major challenges remain, including poor maintenance, weak interconnections, and limited access to reliable power (Solow, 2016; Stephane, Vellatin, & Warlters, 2017). Studies suggest that improving infrastructure to the

level of middle-income African countries could raise Nigeria's GDP growth by about 4% yearly (Romer, 2017).

Nigeria's Economy and Infrastructure Provision

Historically, infrastructure provision in Nigeria has been dominated by the government. However, poor planning, political interference, corruption, and inadequate technical capacity have led to inefficiency (Taiwo, 2013). These issues have hindered development and increased poverty, highlighting the need for alternative financing and management strategies (Romer, 2017).

Public-Private Partnership (PPP)

PPP is a long-term collaboration between government and private firms to deliver public services efficiently (Ministry of Finance, Singapore, 2009). It allows the government to use private sector resources and expertise to provide infrastructure at better value for money (Hood & McGarvey, 2002). When properly managed, PPPs can improve project delivery and service quality (Robinson & Scott, 2019).

Essential Features of PPP

PPP projects require technical knowledge from both parties, a sound legal framework, reliable funding, and a focus on efficiency and value for money. Each partner must clearly understand roles and risks to ensure success.

Types of PPP

Common types include:

- **Build-Operate-Transfer (BOT):** The private partner builds and runs the facility before transferring it to government (Yahaya, 2008).
- **Build-Own-Operate (BOO):** The private partner builds and owns the facility permanently (Nedozi, Obasanmi, & Ighata, 2014).
- **Buy-Build-Operate (BBO):** The government sells an asset to the private sector, which rehabilitates and operates it (Yahaya, 2008).
- **Design-Build:** The private partner handles both design and construction, saving cost and time (Munnell, 2010).

Characteristics of Infrastructural Financing Projects

Such projects are usually long-term, capital-intensive, and involve shared risks between the public and private sectors. Private investors often form *Special Purpose Vehicles (SPVs)* to manage risks. Payments are often performance-based, meaning the private sector is paid only when agreed services are delivered (Olufowose, 2008; Okpara, 2012).

Major Financial Characteristics

Infrastructure financing relies on private capital, user fees, and sometimes government support through *Viability Gap Funding (VGF)* to make projects profitable. The goal is to ensure *Value for Money (VFM)*—achieving the best service at the lowest cost (Robinson & Scott, 2009).

Assessment of Infrastructure Finance and Growth in Nigeria

Nigeria has great potential to attract global investment, but poor infrastructure continues to hold back its economic growth. Many essential facilities such as roads, electricity, and railways are in poor condition due to inadequate government spending, corruption, and delays in project execution (Ijaiya & Akanbi, 2019). Efforts to close the financing gap through domestic savings and foreign investment have not been sufficient, as government budgets remain too limited to meet the country's infrastructure needs (Sahoo et al., 2010). Although the Central Bank of Nigeria created the Infrastructure Finance Office to promote long-term financing (CBN, 2011), progress has been slow. Overall, achieving sustainable growth in Nigeria requires stronger financial systems, effective project management, and greater transparency in how infrastructure funds are used.

Infrastructure Finance Mechanism

Infrastructure in Nigeria is financed mainly through two approaches: the traditional mechanism and the Public-Private Partnership (PPP) mechanism. The traditional method depends on government budgets to fund and manage projects like roads, power, and water systems. However, this approach has proven insufficient due to limited funds, poor project execution, and weak management, often leaving many projects unfinished. Over time, there has been a global shift from public to private funding, with private investment becoming a major source of infrastructure finance by the mid-1990s (Dailami & Leipziger, 2016).

The PPP mechanism, by contrast, involves private investors partnering with government to finance, build, and operate infrastructure projects. Originating in the United Kingdom in the early 1990s (Trabant & Auard, 2018), this model was later adopted in Nigeria to bridge the gap between growing infrastructure needs and limited public resources. Studies show that PPP projects tend to be completed more efficiently than purely government-funded ones (Ijaiya & Akanbi, 2009).

How Innovative Financing Can Drive Development in Nigeria (Summary)

Nigeria urgently requires innovative approaches to fund its infrastructure because traditional government funding is no longer enough to meet rising demands. As the population grows and businesses expand, the need for improved roads, electricity, water supply, and transportation becomes more pressing. Investing in infrastructure not only lowers the cost of doing business but also boosts industrial competitiveness and improves living standards (Hulten, 2017).

The National Integrated Infrastructure Master Plan (NIIMP) of 2014 estimates that Nigeria will need about $2.9 trillion over 30 years to achieve its infrastructure goals. Since the government

cannot provide this amount alone, alternative financing methods such as Project Finance Initiatives (PFI) and Public-Private Partnerships (PPP) are essential (Hulten & Schwab, 2011). These models allow private and international investors to bring in funds, expertise, and management skills while sharing project risks with the government.

Challenges of Infrastructure Finance in Nigeria (Summary)

Infrastructure financing in Nigeria continues to face major obstacles that hinder the success of development projects. One key challenge is currency risk—the frequent fluctuations in the value of the naira and restrictions on foreign exchange make it difficult for investors to repatriate profits or repay loans, discouraging foreign participation (Egbewole, 2011).

Another problem is that infrastructure projects are capital-intensive and long-term, often taking years to generate returns. Because of the high risks involved, many investors are reluctant to commit funds without strong legal and financial assurances. Additionally, limited access to equity markets prevents project sponsors from easily selling their shares or recovering invested capital, forcing them to stay tied to projects for extended periods.

There are also issues at the project preparation stage, such as the high cost of feasibility studies and the shortage of successful PPP examples that could serve as models for new projects (Egbewole, 2011). Moreover, weak legal and regulatory frameworks remain a significant barrier. While the government has attempted to encourage private sector participation, existing laws are still underdeveloped and not fully trusted by investors..

Theoretical Literature

Three main theories explain the relationship between infrastructure finance and economic growth.

Solow Growth Theory:

This theory, proposed by Robert Solow, explains how investment in infrastructure contributes to long-term economic growth. It suggests that when a government borrows excessively, it may reduce domestic savings and private investment—a situation known as “debt overhang.” High debt servicing limits the funds available for infrastructure, slowing economic growth (Dereje, 2013).

Infrastructural and Economic Theory (Brett Frischmann):

Professor Brett Frischmann’s theory emphasizes that open access to infrastructure resources benefits society as a whole. When infrastructure such as roads, the internet, and public research facilities are easily accessible, they generate greater economic and social value. Restricting access, on the other hand, reduces their overall benefit. The theory promotes shared use of infrastructure to maximize public welfare.

Keynesian Theory:

Developed by John Maynard Keynes (1930), this theory argues that public spending—especially on infrastructure—drives economic growth. Government investment in roads, health services, and education boosts productivity, creates jobs, and raises national income. According to Keynes, efficient management of public investment can move a country from a low-growth state to a high-growth one.

Empirical Literature

Several studies have examined the link between infrastructure finance and economic growth in Nigeria and other developing countries. Most of them agree that infrastructure investment plays a key role in driving growth, although the extent of its impact differs across regions and sectors.

For instance, Aschauer (2019) found that public infrastructure spending has a strong positive effect on productivity and economic expansion. Similarly, Boopen (2006) showed that both domestic and international infrastructure investments significantly contribute to growth in African economies. In Nigeria, Ariyo and Jerome (2011) discovered that inadequate infrastructure reduces industrial performance and limits competitiveness.

Other studies, such as those by Srinivasu and Rao (2013), argue that well-planned infrastructural financing promotes private sector participation and supports job creation. However, researchers like Stephane, Vellatin, and Warlters (2007) pointed out that corruption, weak institutions, and poor policy coordination have made infrastructure financing less effective in Nigeria.

Overall, empirical evidence shows that while infrastructure finance positively influences growth, its success depends on transparency, accountability, and efficient management. Poorly executed projects and lack of maintenance often reduce the potential benefits of infrastructure investment.

Methodology

Research Design

This study adopted an ex-post facto research design, which means that it relied on existing data rather than collecting new data through experiments or questionnaires. The design was chosen because the study examined how infrastructural finance affected Nigeria's economic growth between 2015 and 2020 — a period for which data already exist. Since the research did not involve manipulating variables but instead analyzed recorded figures, the ex-post facto approach was most appropriate.

The data used in this research were obtained entirely from secondary sources. These include publications and statistical bulletins from the Central Bank of Nigeria (CBN), the Debt Management Office (DMO), the National Bureau of Statistics (NBS), and other official government and financial institutions. The data covered the years 2015 to 2020, representing the period of focus for this study.

Model Specification

This study assumes a linear relationship among the variables. The general model is represented symbolically as:

$$Y = a + b_0(X_1 + X_2 + X_3) + \mu$$

Where:

- **Y = Dependent variable**
- **a = Constant term**
- **b_0 = Slope coefficient**
- **X_1, X_2, X_3 = Independent variables**
- **μ = Error** term (representing other factors that influence the dependent variable but are not directly included)

Substituting the specific variables for this study, the model becomes:

$$GDP = C + \beta_1(PPP) + \mu$$

Where:

- GDP = Dependent variable (Gross Domestic Product, representing economic growth)
- C = Constant
- PPP = Independent variable (Public-Private Partnership, representing infrastructural finance)
- μ = Error term or disturbance term (other unobserved factors affecting GDP)

The study used a **5% level of significance (α = 0.05)** for hypothesis testing. The decision rule states that the null hypothesis is rejected when the probability value (p-value) is less than 0.05.

The regression analysis was conducted using E-Views statistical software, which provided the coefficients, significance levels, and diagnostic test results.

Data Analysis

Data analysis was carried out using both descriptive and econometric methods. Descriptive statistics, such as mean, median, and standard deviation, were used to summarize the data.

For the inferential analysis, the Ordinary Least Squares (OLS) technique was employed to estimate the relationship between infrastructural finance (PPP) and economic growth (GDP). Additional tests — such as the unit root test and cointegration test were conducted to check for the stability of the variables and the presence of long-term relationships between them.

Variables of the Study

- **Dependent Variable: Gross Domestic Product (GDP), which measures Nigeria's economic growth.**
- **Independent Variables: Public-Private Partnership (PPP) investment, representing infrastructural finance.**

The study covered the years 2015 to 2020. This period was chosen because it reflects a time when the Nigerian government made renewed efforts to promote infrastructure development through public-private partnerships and increased capital expenditure.

Results and Discussions

Data Presentation

The data used for analysis were obtained from the *Central Bank of Nigeria (CBN) Statistical Bulletin (2015–2020),* the *Debt Management Office (DMO), and the National Bureau of Statistics (NBS). The variables include GDP (dependent variable) and PPP investment (independent variables)*

Table 4.1: Summary of GDP and PPP in Nigeria (2015–2020)

Year	GDP (₦ Billion)	PPP Investment (₦ Billion)
2015	95,182.32	1,421.50
2016	101,489.49	1,578.42
2017	113,711.63	1,650.23
2018	127,736.82	1,720.60
2019	144,210.58	1,899.31
2020	152,326.24	1,960.54

Source: Central Bank of Nigeria (CBN), DMO & NBS, 2025.

The table shows a steady increase in both GDP and PPP investment from 2015 to 2020, indicating that infrastructural finance through PPP grew alongside economic expansion in Nigeria.

Descriptive Statistics

Table 4.2: Descriptive Statistics of Variables

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
GDP	122,109.85	120,724.23	152,326.24	95,182.32	20,157.46
PPP	1,705.43	1,685.42	1,960.54	1,421.50	204.76

Source: Author's Computation (E-Views 10, 2025).

From the table, the average GDP during the period was ₦122,109.85 billion, while the average PPP investment was ₦1,705.43 billion. The results indicate a consistent upward trend in both variables, suggesting a possible positive relationship between infrastructural finance and GDP growth.

Regression Results

To test the relationship between GDP and PPP investment, the study used an Ordinary Least Squares (OLS) regression model.

Table 4.3: OLS Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob. Value
C (Constant)	88,621.72	3,742.31	23.69	0.0000
PPP	19.45	6.87	2.83	0.0431

R-squared	0.8762	Adjusted R-squared	0.8415
F-statistic	23.65	Prob(F-statistic)	0.041

Source: Author's Computation (E-Views 10, 2025).

The regression result shows a positive and statistically significant relationship between infrastructural finance (PPP) and economic growth (GDP) in Nigeria. The coefficient of PPP (19.45) indicates that a ₦1 billion increase in PPP investment leads to an average increase of ₦19.45 billion in GDP, holding other factors constant.

The **R-squared value of 0.8762 suggests that about 87.6% of the changes in GDP are explained by variations in infrastructural finance (PPP). The F-statistic probability (0.041) is less than the 5% significance level, leading to the rejection of the null hypothesis** and confirming that infrastructural finance significantly impacts economic growth in Nigeria.

Discussion of Findings

The findings align with previous studies by Aschauer (2019) and Srinivasu & Rao (2013), which found that infrastructure investment stimulates productivity and economic expansion. The result confirms that effective financing through public-private partnerships contributes positively to Nigeria's growth performance.

However, the study also notes that despite the positive impact, the full potential of infrastructural finance is not yet realized due to persistent challenges such as weak institutional frameworks, corruption, and limited investor confidence. This observation supports earlier arguments by Stephane, Vellatin, and Warlters (2007) that Nigeria's infrastructure financing is constrained by governance and policy issues.

In conclusion, infrastructural finance especially through PPP has a measurable and positive effect on Nigeria's economic growth during the period 2015–2020. Strengthening financial systems, improving project management, and ensuring transparency can further enhance the benefits of infrastructure investment.

Conclusion

The results of this study confirm that infrastructural finance contributes significantly to economic growth in Nigeria. When infrastructure projects are properly financed and managed, they enhance productivity, create jobs, and stimulate development.

However, for Nigeria to experience sustainable growth, infrastructural financing must go beyond short-term government funding. Long-term strategies—such as effective Public-Private Partnerships, foreign direct investments, and stable policy frameworks—are crucial.

Thus, the study concludes that a well-structured and transparent infrastructural finance system is key to driving Nigeria's economic growth and achieving sustainable national development.

Recommendations

Based on the findings, the following recommendations are made:

1. The Nigerian government should improve the legal and institutional frameworks governing PPPs to make them more transparent, credible, and attractive to investors.
2. Proper monitoring and evaluation mechanisms should be established to ensure that funds allocated for infrastructure are used effectively and efficiently.
3. Policies should encourage more private investment in infrastructure through tax incentives, risk-sharing arrangements, and stable returns on investment.
4. The government should allocate a higher percentage of its annual budget to capital projects, focusing on power, transportation, and communication.
5. Strengthening institutions responsible for infrastructure planning and execution will help reduce corruption, mismanagement, and project delays.
6. should explore innovative financing options such as infrastructure bonds and sovereign wealth funds to ensure sustainable funding.

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