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Public-Private Partnership Investment Models, Blue Economy and Economic Growth in Nigeria

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ABSTRACT: Public-private partnership investment remains a strategic financing instrument for closing infrastructure gaps, improving service delivery, and mobilizing private-sector capacity for development in Nigeria. At the same time, renewed attention to the blue economy has strengthened policy interest in fisheries, maritime transport, ports, marine logistics, coastal resources, and trade-linked economic activities. This study examined the effect of public-private partnership investment models and blue economy indicators on economic growth in Nigeria. Economic growth was proxied by real gross domestic product, while public-private partnership investment was proxied by private participation in infrastructure investment commitments. The blue economy was represented by agriculture, forestry and fishing value added and merchandise trade, while gross capital formation and inflation were included as control variables. Anchored on the Endogenous Growth Theory, the study adopted an ex post facto research design and relied on annual secondary time-series data covering 2000 to 2024. Data were sourced from the World Bank World Development Indicators, World Bank Private Participation in Infrastructure Database, and related official statistical sources. Data were analyzed using descriptive statistics, the Augmented Dickey-Fuller unit root test, the Autoregressive Distributed Lag bounds testing technique, the Error Correction Model, diagnostic tests, and stability tests. The findings revealed the existence of a long-run equilibrium relationship among the variables. Public-private partnership investment and agriculture, forestry and fishing value added exhibited negative and statistically significant effects on economic growth, merchandise trade had a negative but insignificant effect, gross capital formation had a positive and significant effect, while inflation had a negative and significant effect. The study concludes that PPP investment and selected blue economy indicators have not yet transmitted into the expected positive growth outcomes in Nigeria. The study recommends stronger project selection, transparent PPP contract governance, improved blue economy data systems, and better alignment of PPP projects with ports, fisheries, water transport, logistics, and export-oriented production.

KEYWORDS: PPP Investment, Blue Economy, Economic Growth, Gross Capital Formation, Merchandise Trade, Inflation, Real Gross Domestic Product.

INTRODUCTION

Economic growth is a major policy priority in Nigeria, since it affects the economy's ability to create jobs, increase income, boost public revenue, invest in infrastructure, and plan development. The economy is vulnerable to oil-price fluctuations, poor infrastructure, inflationary pressure, exchange rate volatility and underdeveloped productive diversification; hence Nigeria has continued to search for more reliable sources of growth. Although official output reports indicate that real GDP growth has strengthened in 2024, the composition of real GDP growth reflects continued reliance on services, oil-

related revenue, and sectors whose productive linkages are not yet able to cushion the impact of unemployment and poverty pressures (NBS, 2024; World Bank, 2024). Thus, efforts to find better avenues for investment and non-oil growth are huge development challenges.

One of the methods of financing infrastructure constraint in Nigeria is public private partnership investment. Public-private partnership (P3) is a contractual arrangement between the public sector and a private entity to design, finance, build, operate, manage, maintain or deliver infrastructure and related public services. Many infrastructure projects are capital intensive and public budgets are often not enough to pay for infrastructure such as roads, ports, power systems, rail, water, sanitation and logistics facilities alone, hence the need for PPPs (Infrastructure Concession Regulatory Commission [ICRC], 2018). The World Bank Private Participation in Infrastructure Database also considers PPP investment commitments as institutional commitments considered as a measure of private-sector involvement in infrastructure projects that have been financially closed (World Bank, 2024).

The significance of PPP investment is more pronounced in Nigeria where the limitations of infrastructure have consistently affected production, trade, logistics and competitiveness. According to Ndubisi (2018), the PPP option could be used to close the gaps in Nigeria's infrastructure provision where public funds are not available. Similarly, Okhade (2021) noted that PPP has emerged as a key tool for infrastructural development in Nigeria, while more recent infrastructure-growth evidence calls for the increased rate of PPPs in transport projects and power as a means of bringing about technical expertise and lessening fiscal burden for government (Anagun & Sokunbi, 2024; Eze, Olayemi, & Garba, 2025). The growth effect of PPPs is not just generated by the volume of private investment, but also by the quality of the projects, the design of the contract, the sharing of the risks involved, the discipline in implementation, and the direction of the investment, by sector.

Nigeria now has another area of development concern, the blue economy. It is the responsible use of ocean, coastal and aquatic resources for economic, social and environmental development, including their conservation and sustainable growth. Nigeria has long coastlines, waterways, seaports, fisheries resources, coastal communities, and maritime trade pathways that can enable the diversification of its economy from oil. Yusuff & Ibidapo-Obe (2024) identified fisheries, aquaculture, maritime transportation, tourism, renewable energy and related marine resources as potential opportunities for the blue economy in Nigeria. Similarly, Obemeata (2025) demonstrated the potential of the blue economy sectors of fisheries, maritime transport, coastal tourism, marine renewables and marine biotechnology to drive long run economic growth if developed appropriately.

In spite of the potential, Nigeria is yet to take full advantage of the resources of PPP investment and the blue economy for wide spread economic growth. Fisheries and aquaculture are poorly funded, ports and logistics are congested, water transport infrastructure is weak, and many marine assets are limited due to low technological investment, insecurity, and environmental deterioration and weak regulation (Dosunmu, 2025; Shamwil & Malkina, 2025). Likewise, investment pledges in PPP projects may not yield significant output effects if they lack the quality of being targeted, timely, appropriately monitored, and linked to productive value chains. This is not only because PPPs exist or blue economy opportunities exist, but because these instruments are strong enough to affect real economic performance over time in Nigeria.

Previous research has explored PPPs, infrastructure finance, trade openness, capital formation, inflation and the blue economy to varying extents. Some studies focus on the route PPPs provide for infrastructure delivery (Ndubisi, 2018; Okhade, 2021; Amos & David, 2025), others focus on blue economy sectors and their contribution to Nigeria's economic development (Yusuff & Ibidapo-Obe, 2024; Obemeata, 2025; Shamwil & Malkina, 2025). But, the discourse is not conclusive with regards to the ability of PPP investment commitment and blue economy indicators to bring about tangible economic growth outcomes in Nigeria. This uncertainty creates the need for a time-series investigation that links PPP investment, blue economy proxies, capital formation, inflation, and real gross domestic product within one empirical framework.

Based on the foregoing discussion, the following hypotheses are proposed:

H_{O1}: Public-private partnership investment has no significant effect on economic growth in Nigeria.

H_{O2}: Agriculture, forestry and fishing value added has no significant effect on economic growth in Nigeria.

H_{O3}: Merchandise trade has no significant effect on economic growth in Nigeria.

H_{O4}: Gross capital formation has no significant effect on economic growth in Nigeria.

H_{O5}: Inflation has no significant effect on economic growth in Nigeria.

2.0 REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

Public-Private Partnership Investment

Public-private partnership investment is private-sector investment pledges that are contracted to the public sector to be used for infrastructure or public service delivery, financing, or management. The significance of PPP investment in the Nigerian policy environment is that many development projects need finance, technology and managerial skills which government alone may not be able to provide efficiently. According to ICRC (2018), PPP and the engagement of the private sector by the government to improve efficiency, access and service quality, in the design, build, finance and operation of public services or infrastructure. That is, PPP investment is not just a financing mechanism, it also is a governance arrangement. PPP investment is not a typical public expenditure practice, as it requires the allocation of risk, performance requirements, long-term contracts, and participation of the private sector in project delivery. The impact of PPP investment is estimated in macroeconomic analysis as the potential for infrastructure construction, better logistics, better service provision, better productivity and increased investor confidence. In the context of Nigeria, the researchers of Arazu & Lusty (2023) were able to parks.

treat PPP investment as a measurable means of financing infrastructure, whereas Amos & David (2025) contended that PPP can be a catalyst for the development of maritime sector in Nigeria where capacity of public investment is low.

PPP Investment Models

There are several different structures for implementing PPP investment models, which involve a shared responsibility of the public and private sectors in the financing, construction, operation, maintenance, ownership, and risk of projects. Common models are: service contract, management contract, lease, concession, build-operate-transfer, build-own-operate, design-build-finance-operate, joint venture, and greenfield. If the public asset is already constructed, it may be operated and maintained under a concession, or under a BOT or a DBFO, the private party may finance, construct and operate the asset before transferring it back to the government. The distribution of responsibility has a bearing on incentives, efficiency, bankability of a project, and the long run service outcome (ICRC 2018), and these are important. In the context of the blue economy, PPP investment models can be utilized across various sectors, such as seaports, fish landing centres, inland waterways, cold chain infrastructure, coastal tourism infrastructure, marine surveillance system, port community system, ship repair yard, logistics corridors. A port concession can help optimize the cargo-handling process and shorten the turnaround time; a BOT contract can provide financing for new terminals or inland dry ports; a management contract can enhance the service delivery in the water-transport facilities; and a joint venture can be established to serve marine industrial

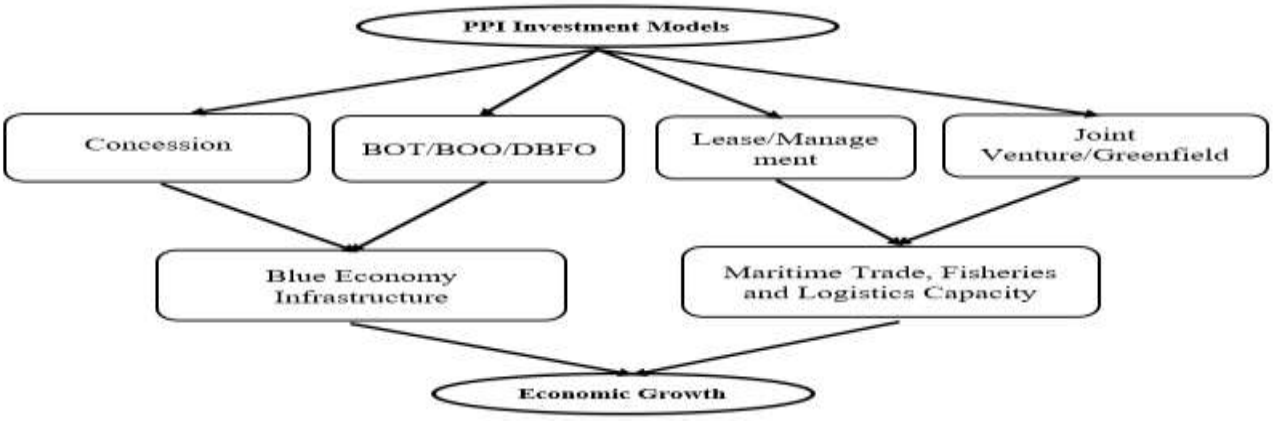

Figure 1: PPP Investment Models and Blue Economy Growth Transmission Model (2026)

Blue Economy

The blue economy is the sustainable use of the ocean, coastal, and aquatic resources to grow, create jobs, sustain livelihoods and provide for environmental health. It encompasses fisheries, inland waterway activities, aquaculture, maritime transport, ports, coastal tourism, shipbuilding, marine services and marine biotechnology. According to Yusuff & Ibidapo-Obe (2024), the blue economy potential of Nigeria is in its marine and coastal resources which can contribute towards sustainable growth, food security, and employment. Obemeata (2025) further noted that the areas of the blue economy can help diversify Nigeria's economy if well developed with proper investment and governance. Conceptually, the blue economy is crucial as it brings together the use of natural resources and sustainable development. The blue economy prioritizes and promotes productive use, conservation, value addition, and inclusive livelihoods, in contrast to an extractive model which only concerns itself with exploiting marine resources. This is crucial in Nigeria since coastal and marine resources are linked to food supply, international trade, ports and logistics, oil and gas, tourism, jobs, etc. The contribution of these resources is however dependent on infrastructure, technology, security, regulation, environmental management and investment capacity.

Agriculture, Forestry and Fishing Value Added

Agriculture, forestry and fishing value added represents the contribution of agriculture, livestock, forestry, hunting and fishing activities to gross domestic product. For this study, it is utilised as a generic indicator of the blue economy due to the fishing sector being linked directly with aquatic resources, fisheries, aquaculture, food security, marine livelihoods and coastal economic activity. The indicator is broader than fisheries but offers a consistent time series of annual macroeconomic data that reflects a sectoral pathway by which natural resource-based production contributes to output. Because of the data challenges associated with the study of the blue economy in Nigeria, the use of agriculture, forestry and fishing value added is warranted. Some annual data are not always available to estimate fishing GDP, aquaculture, coastal tourism and marine services separately. Shamwil & Malkina (2025) highlighted the significance of the fisheries sector in the growth economy of Nigeria, and Obemeata (2025) included fisheries in the core sectors of the blue economy. In line with this conceptual frame, AFF is recognized as a wide proxy for the productive role of resource-based activity in economic growth, although it is not conceptual.

Merchandise Trade

Value of merchandise exports as a percentage of GDP is considered a measure of merchandise trade. It is relevant to the blue economy because ports, shipping, maritime logistics, customs, cargo handling, storage and transportation networks are key to Nigeria's international merchandise trade. In a coastal economy, a significant proportion of trade in goods occurs via maritime gateways, which means that goods trade is an indirect indicator of maritime trade intensity and port related economic activity. Merchandise trade is the total of exports and imports of goods divided by GDP, according to the World Bank (2024). Merchandise trade is also significant due to the fact that the degree of openness in the trade markets and the efficiency of logistics have impact on the size of the market, production incentives, foreign exchange earnings, and competitiveness of the industry. However, using ARDL approach, Adekunle (2025) observed that trade openness is significant in influencing economic growth in Nigeria, while Abinabo & Abubakar (2023) and Tyokosu and Abakpa (2023) also reported that trade openness has growth relevance in Nigeria. For the purposes of the present study, merchandise trade is selected as a proxy for trade as part of the blue economy due to the fact that efficient maritime systems should generally bolster the trade-growth channel.

Gross Capital Formation

Gross capital formation is the overall increase in the economy's fixed assets and the change in stock inventories. This is added as a control variable because capital expenditures on machinery/productive assets, buildings, infrastructure and equipment are key to growth. In an endogenous growth model, an increase in capital formation enhances the productive capacity of the economy, and can boost output by improving the economy's pool of physical capital. Based on this, Anagun & Sokunbi (2024) concluded that capital formation components have significant impact on economic growth in Nigeria while Onwiodiokit & Otolorin (2021) revealed that the link between capital formation and economic growth is influenced by the

quality and composition of capital. Gross capital formation is especially important for the analysis of PPP and blue economy, as the sectors of infrastructure need high capital expenditures. Long-term investment is needed for ports, cold chain, fish processing facilities, coastal tourism infrastructure, water transport terminals and marine logistics platforms. An increase in capital formation in productive sectors should translate to employment creation, output and competitiveness. But in the absence of an efficient allocation of capital or if the growth is focused on marginalizing nonproductive uses, the growth effect can be reduced. Therefore, it is important to adjust for the process of capital formation in the empirical model.

Inflation

Inflation is the persistent rise in the overall level of prices of goods and services. It is part of the macroeconomic controls as it influences consumption, investment, production costs, project financing and real output. The relevance of inflation in Nigeria was heightened by exchange-rate depreciation, a surge in the price of crude oil, food supply shocks, insecurity, and monetary tightening, which impacted households and firms. Inflation has been found to have a negative short run effect on economic growth in Nigeria by Awuna & Malkina (2026), and other studies conducted in Nigeria have confirmed that high inflation rate negatively affects macroeconomic performance. There are multiple ways in which inflation impacts on PPP investment and the blue economy. Infrastructure projects are typically long-term and sensitive to cost, and the impact of high inflation is on the construction costs, the real returns, and the implementation of contracts. Inflation adds to the cost of fuel, vessels, storage, processing, equipment, transport, and imported inputs in the activities of the blue economy. An increase in inflation can lead to higher returns demanded by private investors or postponement in investments, or decrease in demand by households for goods and services. Hence, it can be predicted that inflation will have a negative impact on the growth of the economy in the model.

Economic Growth

Economic growth is the steady rise of the real value of the economy's output over time. It is often estimated using real gross domestic product (GDP), which eliminates the effect of inflation. Real GDP is a proper measure to use in Nigeria because the interest of the study is not just the increase in nominal output but the increase in the capacity to produce. Investment, infrastructure, productivity, trade, macroeconomic stability and sectoral development are among the factors that affect economic growth (NBS, 2024; World Bank, 2024). Economic growth is used as the dependent variable in this study as it is believed that the development of the PPP and blue economy will have an impact on national output, namely through infrastructure, trade, fisheries, logistics, employment and capital formation. If there is an efficient use of productive infrastructure and resources of blue economy, real GDP should react positively to PPP projects. The growth effect can be limited or negative, however, if investment is not well targeted, trade continues to be import dependent, inflation rates are high, or if the blue economy is not linked to productive value chains.

PPP Investment Models, Blue Economy and Economic Growth

The link between PPP investment models and the blue economy and economic growth is grounded in the premise that private sector involvement in infrastructure projects can open up sectors that have potential for productive activity, but that the government may not be able to finance efficiently. The blue economy needs ports, ships, terminals, cold chains, marine security, digital logistics, touristic infrastructure, and marine management. PPP can be used to help deliver these assets when constrained by public budgets. Amos & David (2025) suggested that PPP contracts could be used to drive the development of the maritime industry in Nigeria, while ICRC (2018) noted that PPPs aim to increase efficiency, access, and quality of services. But it is not a given. Projects may not be economically viable, contracts may be poorly designed, the allocation of risks may be inadequate, projects may be delayed, or the infrastructure constructed may not be linked to productive sectors, all of which can make PPP investment fall short of raising growth. Likewise, if fisheries, maritime transport and trade logistics are rendered insecure, poorly regulated, less technology driven, and less data intensive, the blue economy will not be performing. The conceptual motivation is thus that changes in economic growth are jointly determined by PPP investment, blue economy indicators, capital formation, and inflation, with the direction and significance of the effects of the three being determined empirically.

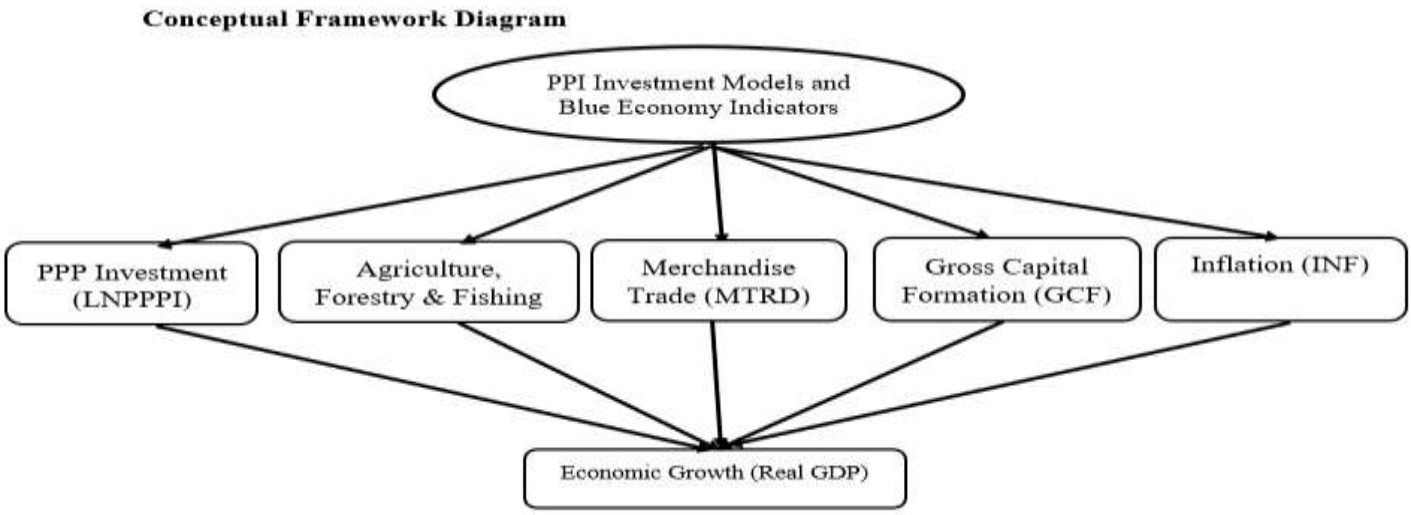

Figure 2: Conceptual framework (2026)

The conceptual framework of the study is shown in figure 2. The framework places PPP investment models and blue economy indicators as explanatory channels that are connected with economic growth. The proxy variables for PPP investment are the private sector share of infrastructure investment commitments; the blue economy is proxied by agriculture, forestry and fishing value added and merchandise trade; gross capital formation, and the inflation index serve as control variables. The anticipated correlation is between productive PPP investment, increase in blue economy activity and increase in capital formation which should positively contribute to the growth of real output, while inflation is expected to negatively impact growth.

Theoretical Framework

Endogenous Growth Theory

This study was proposed by Romer in 1986, elaborated by Lucas in 1988 and extended by Barro in 1990. Long-run growth is attributed to the internal dynamics of the economy, including investment, knowledge, innovation, human capital, technology, infrastructure and policy-enhancing productivity. While growth theories of the past assumed that technological change was exogenous to the economy, endogenous growth theory has shown that deliberate investments and institutional arrangements can increase productivity and kick-start output growth over time. For this research, the concept of PPP investment and blue economy development are defined as internal channels of growth sector that can enhance the capacity of infrastructure, trade logistics, production and creation of value based on resources. Theory is appropriate as PPP investment can contribute to growth by financing infrastructure that enhances productivity and transactions costs. Innovation in ports, roads, water transport systems, power generation, storage and logistics infrastructure can enhance the productivity of companies and boost economic activity. Likewise, when drawing the linkages between activities and the blue economy technologies, capital, markets and sustainable governance, fisheries, maritime trade, aquaculture, coastal tourism and marine services can be growth enhancing activities. The theory is therefore useful to explain the expected relationship between the PPP investment model and the blue economy indicators and the real gross domestic product of Nigeria.

Although helpful, the theory has also been attacked for occasionally failing to address institutional weaknesses, corruption, policy conflict, environmental constraints or inequality, among other things, in its quest to achieve growth through investment and innovation. However, investment in a developing economy cannot lead to growth in the absence of an appropriately selected project, poor contracts, underutilized infrastructure, or poorly connected productive sectors. The criticism is relevant in Nigeria because PPP investments can be made without delivering robust real-sector results, and the blue economy assets and resources can be poorly utilised because of governance challenges, insecurity, lack of data and technology. Since the relationship expected between investments, productive capacity, and economic growth is

explained by the Endogenous Growth Theory, the study is based on this theory. PPP investment is expected to improve infrastructure and efficiency; blue economy indicators are expected to boost production and trade; and gross capital formation is expected to grow productive assets, while inflation is expected to negatively affect growth by impacting stability and investment confidence. On this basis, the theory provides the study with a good framework for assessing whether the use of PPP investment models and blue economy indicators have significantly influenced the economic development of Nigeria or not.

Empirical Review

David (2026) investigated the Growth Effects of Public social expenditure in Nigeria focusing on institutional quality. To investigate the relationship between social spending and economic performance, this study used the annual data between 2000 and 2023 and employed time-series analysis. The findings highlighted how outcomes of expenditure are related to institutional factors and the ability of public expenditure to lead to meaningful outcomes in terms of real development. The study is relevant because it further strengthens the argument that unless the governance quality and efficiency of implementation is good, public-purpose investment does not necessarily lead to growth.

In Nigeria, Awuna & Malkina (2026) examined the relationship between inflation and economic growth between 1980 and 2023 and applied the ARDL bounds-testing technique. The study did not observe long run relationship between the variables while on the contrary, a significant negative relationship between the variables, inflation and economic growth was observed in the short run ARDL estimates. Their conclusion has implications for the current study since they have included inflation as a control variable, and it is hypothesized that the growth impact of PPP and blue economy activity will be reduced in regions with volatile prices.

Afolabi (2026) conducted a study of population growth, non-renewable energy and economic growth in Nigeria from 1993 to 2023. The study followed the ARDL approach after determining the mixed orders of integration of the variables. The results supported the fact that in Nigeria the structural and resource-related factors play a role in the nation's macroeconomic growth. The study has not directly addressed PPP investment or the blue economy, but it justifies the application of ARDL to the recent analysis of Nigerian macroeconomic time-series.

Shamwil & Malkina (2025) examined how the blue economy, financial development and technological innovation influenced economic growth in Nigeria between 1981 and 2022. The study used dynamic ARDL simulation to conclude that in the long run, aquaculture and total fisheries production had positive influence in the economy, as well as financial development and technological innovation. The study finally found that growth in Nigeria's blue economy needs technological governance and coordinated policy implementation.

Obemeata (2025) assessed the effect of the sectors of the blue economy on the Nigerian economic growth with time series data for the period 1981–2024. The fisheries, maritime transport, coastal tourism, marine renewable energy and marine biotechnology industries were studied using FMOLS and Johansen cointegration techniques. The findings revealed that there were significant positive long run relationships between the blue economy sectors and GDP. The finding here supports the argument for using blue economy indicators as potential drivers of the economic growth in Nigeria empirically.

Dosunmu (2025) conducted the economic impact assessment of blue economy sectors in Nigeria focusing on fisheries, maritime trade, tourism and diversification. The study employed descriptive and regression-based approach to prove the strong relationship between maritime trade and tourism with contribution to non-oil GDP. The study found that Nigeria's blue economy has growth potential, but that it is hampered by infrastructural challenges, low funding, security challenges and poor sectoral coordination.

The effect of PPP agreement on the growth of the blue economy in Nigeria was explored by Amos & David (2025). The analysis they conducted in their study suggested that PPPs could help fill financing and infrastructure gaps in the maritime sector, by tapping into private capital and expertise for marine-resource-development. The study is relevant because it directly connects PPP agreements with Nigeria's blue economy and justifies the conclusion that PPP approach can be adopted as a way to develop ports, marine services, logistics and other maritime assets.

Ebehung and Ogar (2025) analyzed the relationship between infrastructure and economic growth in Nigeria using ARDL model. Based on their findings,

the researchers noted that the longterm effects of some infrastructure sectors are weak, and they made a recommendation to expand PPPs in the power and transport sectors to mobilize resources and enhance the delivery of infrastructure. The study is relevant as it serves as a basis for the treatment of PPPs as an investment vehicle that growth effect relies on sectoral targeting and implementation quality.

Adekunle (2025) studied the relationship between trade openness and economic growth in Nigeria applying ARDL method. The study revealed that trade openness had significant influence on economic growth as did foreign direct investment, which meant external-sector integration continued to play an important role in Nigeria's growth process. This finding agrees with the application of trade through merchandise trade as a proxy of trade related to blue economy in the current study, since port related trade is one of the trade channels through which the marine infrastructure will impact output.

Yusuff & Ibidapo-Obe (2024) looked at the blue economy in Nigeria, its potentials and challenges. The study was able to highlight the potential role of fisheries, aquaculture, tourism, renewable energy, and maritime transportation as key sectors of the blue economy that can contribute to the creation of jobs, food security and GDP. Other factors identified in the study as significant constraints are overexploitation, inadequate governance, maritime insecurity, climate change and environmental mismanagement. This offers conceptual and policy support for the variables of the blue economy applied in the current research.

This study by Anagun & Sokunbi (2024) employed ARDL technique to examine the disaggregated effect of capital formation on economic growth in Nigeria from 1990 to 2021. The study revealed that physical and human capital formation had a positive and significant long run effects on economic growth. Their finding is of interest because the current model includes gross capital formation as a control variable which is anticipated to aid the expansion of real output.

Ojo et al (2024) explored the moderating effect of public debt on productive expenditure and economic growth in Nigeria over the period 1991 – 2021. The study had an ex post facto design and concluded that the economic and social service expenditures have an impact on the economic growth, while reducing the effect of debt moderation changed some of these effects. The study is relevant because it focuses on the importance of expenditure and investment pathways to growth, depending on the nature of funding and implementation.

Andohol (2024) studied the effect of trade liberalization, non-oil exports, and economic growth in Nigeria. The study highlighted the role of trade policy and export diversification for growth performance. Relevance is in its contribution of demonstrating the significance of merchandise trade and non-oil export routes in the growth discussion in Nigeria particularly in relation to port and maritime systems.

Akinola (2024) examined the external debt, foreign direct investment and economic growth of Nigeria and found that the gross capital formation can have differential effects under different macroeconomic conditions, and under different financing conditions. The study is relevant although the study is not related to the blue economy it does reflect the need for "capital formation" to be controlled for when evaluating the relationship between capital formation and investment growth.

Arazu & Lusty (2023) investigated on public-private partnership and its impact on economic growth in Nigeria between 1971 and 2020. Their research demonstrated, on a practical basis, the relationship between private sector participation in infrastructure provision and growth and emphasized the importance of using descriptive policy claims as a basis for assessing PPP investment. The study is directly relevant because it considers PPP as a variable of infrastructure financing which is related to growth in Nigeria.

Abinabo and Abubakar (2023) studied the effect of trade openness on economic growth in Nigeria. They concluded that there was a relevance of trade openness to long-run economic performance. The study contributes to the discussion about incorporating trade variables in growth models and helps in the interpretation of the merchandise-trade effect in the current study.

Tyokosu & Abakpa (2023) investigated the relationship between trade openness and economic growth in Nigeria over the period 2000 – 2020. The finding of the study was that, in the context of the study trade openness holds significant importance for growth, but the direction and significance of this relationship could vary based on exchange-rate conditions, import dependence and export

diversification. The study is relevant to this work owing to the use of merchandise trade as a proxy indicator for maritime trade.

Okhade, (2021) carried out a study on public-private partnership and infrastructural development in Nigeria. The study analyzed the history and emergence of PPP as a tool for the development of infrastructure and revealed that PPP is now an important policy instrument addressing the infrastructure deficit in Nigeria. It is relevant as it gives background evidence on institutionalization of PPPs in Nigeria.

Onwiodiokit & Otolorin (2021) re-examined the effect of capital formation on the economic growth of Nigeria with data for annual observations between 1981–2018 and used DOLS. They found that the negative and significant effect of gross fixed capital formation and the positive effect of human capital formation. The mixed result is important because it reminds us that the growth impact of capital accumulation is contingent upon the investment's quality, composition and productivity.

The focus of Omoke & Opuala-Charles (2020) was the trade openness-economic growth relationship in Nigeria, taking into account institutional quality. According to their research, the results on trade openness effects depend on the institutional framework. This has implications in the current study for merchandise trade stimulating growth in import dependent economies, inefficient ports, and inefficient institutions.

Duru et al. 2020 conducted an evaluation of the effect of trade liberalization on Nigeria's economic growth. Their research offers insights into the importance of the trade growth relationship being sensitive to the nature of trade and Nigeria's ability to translate openness into domestic production. This is important to note when discussing merchandising trade as a proxy for a blue economy.

To study the PPP investment and economic growth in developing countries, Mofokeng (2019) employed the growth model and system GMM estimation. The study broke down the amount of PPP investment by sector and revealed that the share of PPPs is related to sectoral distribution and institutional factors. The study is cross-country, but is still useful as it lends support to the notion that growth effects of PPP investment are not entirely uniform across sectors.

Ndubisi (2018) discussed the Infrastructure Gap and PPP option in Nigeria. The study pointed out that PPP has a potential to fill infrastructure financing gap due to scarcity of public funding. It also noted policy, institutional and regulatory issues that could detract from the performance of PPP. The study has relevance because it gives Nigerian evidence for the rationale for the use of PPPs as a development financing mechanism.

Voyer et al. (2018) analysed competing views of the blue economy and demonstrated the use of the concept in different policy settings. The study is relevant in that it warns that the development of a blue economy policy must be compatible with growth, social inclusion, and environmental sustainability. This reinforces the importance of the growth of blue economy as a structured development process and not exploitation of marine resources.

3.0 METHODOLOGY

This study adopts an *ex post facto* research design. The design is appropriate because the study relies on already existing macroeconomic data and does not involve the manipulation of variables. The study is based on secondary annual time-series data covering the period 2000 to 2024. The data are sourced from the World Bank World Development Indicators, the World Bank Private Participation in Infrastructure Database, the Federal Reserve Economic Data mirror of official macroeconomic series, and related official statistical sources. Data on real gross domestic product, agriculture, forestry and fishing value added, merchandise trade, gross capital formation, and inflation are obtained from World Bank WDI and associated official macroeconomic databases. Data on public-private partnership investment are obtained from the World Bank PPI Database.

The functional relationship for the study is expressed as:

$$RGDP = f(PPPI, AFF, MTRD, GCF, INF)$$

Model 3.1

Where: RGDP represents real gross domestic product, PPPI represents public-private partnership investment, AFF represents agriculture, forestry and fishing value added, MTRD represents merchandise trade, GCF represents gross capital formation, and INF represents inflation rate.

The econometric form of the model is specified as:

$RGDP_t = \beta_0 + \beta_1 PPPI_t + \beta_2 AFF_t + \beta_3 MTRD_t + \beta_4 GCF_t + \beta_5 INF_t + \mu_t$ Equation 3.1

To improve scale comparability and reduce possible heteroskedasticity, the estimable log-linear form is stated as:

$\ln RGDP_t = \beta_0 + \beta_1 \ln PPPI_t + \beta_2 AFF_t + \beta_3 MTRD_t + \beta_4 GCF_t + \beta_5 INF_t + \mu_t$ Equation 3.2

Where: β_0 is the intercept, β_1 to β_5 are slope coefficients, μ_t is the stochastic error term, and t represents the time period.

Real gross domestic product (real GDP) is used as an indicator of the economy's growth. This is an indicator of the value of the economy's output adjusted for the rising prices of goods and services and is a common measure of the long run performance of the Nigerian economy. Private participation in infrastructure investment commitments in millions of United States dollars (USD) is used as a proxy for public-private partnership investment. If necessary, the following transformation is applied: ln(1 + PPPI) with the natural logarithm of PPPI. Agriculture, forestry and fishing value added and merchandise trade are proxies of the blue economy. The value added in agriculture, forestry and fishing reflects the contribution of the resources-based production, including the contribution of the fishing activity. Merchandise trade is calculated as a percentage of GDP and it is used as a proxy for maritime trade, as Nigeria's goods trade is highly dependent on the ports and maritime logistics. The following variables are controlled for: gross capital formation and inflation. Gross capital formation is measured as a percentage of GDP and inflation is measured as an annual rate of consumer price inflation.

The study is expected to have a positive relationship between economic growth and public-private partnership investment, agriculture, forestry and fishing value added, merchandise trade, gross capital formation. There will be enhanced infrastructure and productive capacity due to higher PPP investments. The value added of agriculture, forestry, and fisheries is projected to stimulate production via food supply and fisheries-related activity. Exports and port activity, as well as increased access to the market, should drive higher merchandise trade growth. Gross capital formation is expected to increase the productive capacity through capital accumulation. Economic growth should have a negative relationship with inflation as increases in inflation raise costs, diminish the purchasing power and limit investment confidence.

Thus, the expected signs are: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 < 0$ Equation 3.3

The study uses descriptive and inferential methods. The behaviour of the variables is summarized with descriptive statistics including mean, standard deviation, minimum, maximum, skewness, kurtosis and Jarque-Bera statistics. The bounds testing approach of ARDL is used for inferential analysis. The ARDL technique is suitable for the study as the order of the variables are 0,1 and not 2. It also allows the ability to estimate the short run and long run relationship within the same framework for annual macroeconomic data. The stationarity properties of the variables are first checked using Augmented Dickey-Fuller unit root test before estimating the ARDL model. This is required to make sure none of the variables is second differenced. The ARDL bounds test for cointegration is then performed to assess the possibility of a long run relationship between public-private partnership investment, blue economy indicators, control variables and economic growth after the ARDL unit root test. The long run coefficients are estimated if cointegration is found, and an Error Correction Model is estimated within the ARDL framework to explain short-run dynamics and speed of adjustment from short run disequilibrium to long run equilibrium.

The general ARDL representation is expressed as:

$\Delta \ln RGDP_t = \alpha_0 + \Sigma\alpha_{1i}\Delta \ln RGDP_{t-i} + \Sigma\alpha_{2i}\Delta \ln PPPI_{t-i} + \Sigma\alpha_{3i}\Delta AFF_{t-i} + \Sigma\alpha_{4i}\Delta MTRD_{t-i} + \Sigma\alpha_{5i}\Delta GCF_{t-i} + \Sigma\alpha_{6i}\Delta INF_{t-i} + \lambda_1 \ln RGDP_{t-1} + \lambda_2 \ln PPPI_{t-1} + \lambda_3 AFF_{t-1} + \lambda_4 MTRD_{t-1} + \lambda_5 GCF_{t-1} + \lambda_6 INF_{t-1} + \varepsilon_t$

Equation 3.4

Where: Δ is the first-difference operator, Σ is the summation operator, α_0 is the constant term, α_{1i} to α_{6i} are short-run coefficients, λ_1 to λ_6 are long-run coefficients, and ε_t is the white-noise error term.

The parsimonious ECM form is specified as:

$\Delta \ln RGDP_t = \gamma_0 + \Sigma\gamma_i \Delta X_{t-i} + \varphi ECT_{t-1} + \varepsilon_t$

Equation 3.5

Where: ECT_{t-1} is the lagged error correction term, φ measures the speed of adjustment, X represents the

vector of explanatory variables, and ε_t is the error term.

Post-estimation diagnostic tests are carried out to make sure the estimated model is valid and reliable. These tests involve Breusch-Godfrey serial correlation LM test, Breusch-Pagan-Godfrey test for heteroskedasticity, Jarque-Bera test for normality of residuals and Ramsey RESET test for functional form specification. In addition, the stability of the model is evaluated with the help of the CUSUM and CUSUM of squares tests. These tests are required to determine if the estimated coefficients are constant within the sample time. The level of significance used in the study is $\alpha = 0.05$. So, if the probability value is less than 0.05, the null hypothesis is rejected; and if the probability value is greater than 0.05, the null hypothesis is accepted. To check for cointegration for the bounds test, the computed F-statistic should be greater than the upper-bound critical value at the specified significance level.

4.0 RESULTS AND FINDINGS

Secondary data has been merged on an annual basis and used for the analysis of the study variables. The period of the estimation window was 2000-2024, as the series of data used were only available for the period following the application of the disclosed PPPI treatment rule. This section provides descriptive statistics, selection of ARDL model, bounds test, long run estimates, error correction model, diagnostic tests, stability tests and decision on hypotheses. This section details descriptive statistics, selection of ARDL model, bounds test, long run estimates, error correction model, diagnostic test, stability test and decision about hypothesis.

Table 4.1: Descriptive Statistics of Variables

Statistic	LNRGDP	LNPPPI	AFF	MTRD	GCF	INF
Obs	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Mean	5.9191	6.2014	23.9975	29.9504	13.5448	13.9316
Median	6.0486	6.1377	23.3570	30.7300	12.0671	12.8766
Maximum	6.2932	8.1042	36.9700	42.7600	21.0590	33.2421
Minimum	5.1912	3.0445	19.9900	16.2000	10.6896	5.3880
Std. Dev.	0.3425	1.3472	4.0281	8.9855	3.2217	5.9386
Skewness	-0.8312	-0.7538	2.0024	-0.1650	1.3221	1.5303
Kurtosis	2.4050	3.2903	7.4878	1.4571	3.3397	6.7067
Jarque-Bera	3.0682	2.0876	26.8303	2.3876	6.4238	16.6238
Prob.	0.2156	0.3521	0.0000	0.3031	0.0403	0.0002

Source: Researcher's Computations (2026)

As seen in the descriptive statistics of Table 4.1, there is a significant difference in the study variables. The average of logged real GDP was 5.9191, and the average of logged PPP investment was 6.2014. Agriculture, forestry and fishing value added averaged 23.9975 per cent and merchandise trade averaged 29.9504 per cent of GDP. The average gross capital formation rate for GDP was 13.7636 per cent and the average inflation rate was 14.0328 per cent. The Jarque-Bera statistics suggested that some of the variables are not normally distributed, which is not uncommon with macroeconomic time-series data, in particular AFF and INF. The independence and the dispersion in the variables make it appropriate to use an econometric method which allows the identification of the short and long run movements.

Table 4.2: Augmented Dickey-Fuller Unit Root Test Results

Variable	Level ADF	Level Prob.	Level Lag	1st Diff. ADF	1st Diff. Prob.	Diff. Lag	Order
LNRGDP	-3.7287	0.0037	1	-2.4988	0.1158	0	I(0)
LNPPPI	-2.8253	0.0548	1	-5.4960	0.0000	0	I(1)
AFF	-2.0354	0.2713	0	-4.0163	0.0013	0	I(1)
MTRD	-2.0726	0.2557	0	-4.2848	0.0005	0	I(1)

GCF	-0.9288	0.7784	2	-3.9514	0.0017	1	I(1)
INF	-0.8965	0.7891	0	-5.1940	0.0000	0	I(1)

Source: Researcher's Computations (2026)

Table 4.2 presents the results of the ADF test which indicated that logged real GDP is stationary at level, while "logged PPP investment" and "logged agriculture, forestry and fishing", "logged merchandise trade", "logged gross capital formation" and "logged inflation" were stationary after differencing. This means that the variables were integrated of mixed orders, I(0) and I(1). The ARDL bounds-testing approach is suitable for the study because none of the variables was integrated at second difference.

Table 4.3: Top Five ARDL Specifications by Akaike Information Criterion

Model	AIC	BIC	HQIC
ARDL (2,2,1,2,2,2)	-116.0204	-95.5815	-110.8801
ARDL (2,2,2,2,2,2)	-115.2645	-93.6901	-109.8386
ARDL (2,2,2,1,2,2)	-114.5061	-94.0672	-109.3658
ARDL (1,2,1,2,2,2)	-114.2019	-94.1750	-108.8888
ARDL (1,2,2,2,2,2)	-113.8031	-92.5981	-108.1774

Source: Researcher's Computations (2026)

Table 4.3 shows the top competing lag structures selected. In this case, the smallest AIC was obtained for ARDL (2,2,1,2,2,2) which was used for the final estimation. It is noted that there are 25 observations per year in the period, but the lag structure used was chosen since it yielded the minimum I.C. among the other candidates. The suggestion is that the model selection was made on a statistical comparison basis and not on the basis of picking a lag at random.

Table 4.4: ARDL Bounds Test for Cointegration

Item	Value
F-Bounds Statistic	4.9502
5% Lower Bound I (0)	2.4620
5% Upper Bound I(1)	3.6272
Lower-tail p-value	0.0001
Upper-tail p-value	0.0034

Source: Researcher's Computations (2026)

In the bounds test of the relationship in Table 4.4, we see that the relationship is indeed long-run. The computed value of the F-statistic was 4.9502 which is greater than the upper bound critical value for the F-statistic at the 5 percent level, 3.6272, and the upper bound p-value was less than 0.05. Hence, the null hypothesis of non-cointegration is rejected. This result suggests a co-integration in the long run between economic growth, PPP investment, blue economy proxies, capital formation, and inflation.

Table 4.5: Long-Run ARDL Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.7409	0.5521	15.8328	0.0000
LNPPPI	-0.2121	0.0618	-3.4306	0.0006
AFF	-0.0653	0.0089	-7.3733	0.0000
MTRD	-0.0086	0.0066	-1.2930	0.1960
GCF	0.0662	0.0167	3.9676	0.0001
INF	-0.0315	0.0129	-2.4435	0.0145

Source: Researcher's Computations (2026)

The long-run estimates in the table 4.5 reveal that the coefficient of PPP investment was negative and statistically significant. This means that, holding other factors constant, the greater the amount of investment in PPP, the less real GDP in the long run. The broad resource-based proxy also had a negative

and statistically significant coefficient for agriculture, forestry and fishing value added, indicating that this sector did not have a positive impact on growth during this period. There is a slight negative coefficient but not statistically significant for merchandise trade. The gross capital formation has a positive and statistically significant influence on economic growth, while the inflation has a negative and statistically significant influence. The findings indicate that capital formation was a growth enabler, while the other factors (PPP investment, AFF and inflation) did not have the anticipated positive growth pattern.

Table 4.6: Error Correction Model and Short-Run Dynamics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.2478	0.1130	-2.1932	0.0708
ΔLNRGDP(-1)	0.5137	0.2682	1.9152	0.1040
ΔLNPPPI	-0.0202	0.0067	-2.9932	0.0242
ΔLNPPPI(-1)	0.0159	0.0082	1.9436	0.0999
ΔAFF	-0.0120	0.0070	-1.7209	0.1361
ΔMTRD	-0.0022	0.0018	-1.2185	0.2688
ΔMTRD(-1)	-0.0020	0.0012	-1.6758	0.1448
ΔGCF	0.0084	0.0051	1.6510	0.1498
ΔGCF(-1)	-0.0221	0.0044	-5.0159	0.0024
ΔINF	-0.0043	0.0020	-2.1866	0.0714
ΔINF(-1)	0.0039	0.0018	2.1298	0.0772

Source: Researcher's Computations (2026)

From the error correction result in Table 4.6, it is seen that the error correction result of ECT(-1) is negative, indicating that the correction direction is as expected. The coefficient of -0.2478 indicates that about 24.78 percent of the short-run disequilibrium is corrected annually. But the probability value of 0.0708 suggests that the adjustment term is not statistically significant at 5 percent level but it is at 10 percent level. The short run coefficients indicate that only the change in INF and LNPPPI were statistically significant, as was most of the other differenced variables at the 5 percent level. This suggests that there was a different growth response in the short run between variables.

Table 4.7: Diagnostic Tests

Test	Statistic	Prob.	Null Hypothesis
Breusch-Godfrey Serial Correlation LM Test	0.6776	0.4104	No serial correlation
Breusch-Pagan-Godfrey Heteroskedasticity Test	12.8107	0.6865	Homoskedastic residuals
Jarque-Bera Normality Test	1.6151	0.4460	Residuals are normally distributed
Ramsey RESET Test	0.3275	0.5919	Model is correctly specified

Source: Researcher's Computations (2026)

Diagnostic Tests in Table 4.7 show that the estimated model is generally satisfactory. Breusch-Godfrey LM test demonstrated that there was no evidence of serial correlation as the probability level was greater than 0.05. An insignificant probability value was obtained from the Breusch-Pagan-Godfrey test, suggesting that there is no evidence of heteroskedasticity. Both the Jarque-Bera test and Ramsey RESET test indicate that there are no serious functional-form misspecifications and that residuals are approximately normally distributed. The results are in support of the reliability of the ARDL estimates.

Stability Test

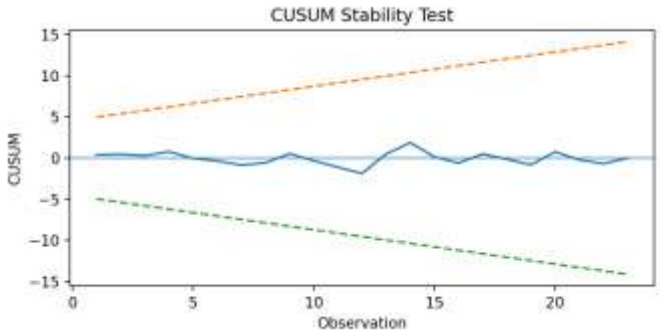

Figure 4.1: CUSUM Stability Test

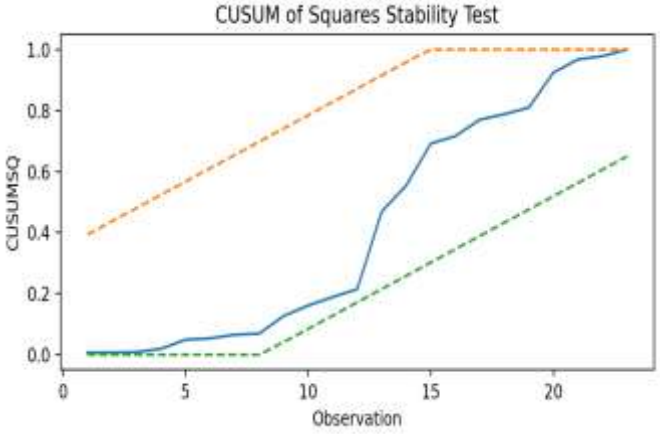

Figure 4.2: CUSUM of Squares Stability Test

The CUSUM of Squares and CUSUM plots continued to stay in the critical bands at the 5 percent level. This suggests that the model had consistent coefficients during the recursive estimation process and that there was no important structural instability that would render the estimated relationship invalid. The stability result is in line with the diagnostic tests and justifies the choice of the ARDL model for inference.

Table 4.8: Decision on the Null Hypotheses

Hypothesis	Statement	Prob.	Decision
Ho_1	PPPI has no significant effect on economic growth	0.0006	Reject Ho
Ho_2	AFF has no significant effect on economic growth	0.0000	Reject Ho
Ho_3	MTRD has no significant effect on economic growth	0.1960	Accept Ho
Ho_4	GCF has no significant effect on economic growth	0.0001	Reject Ho
Ho_5	INF has no significant effect on economic growth	0.0145	Reject Ho

Source: Researcher's Computations (2026)

Ho_1: Public-private partnership investment has no significant effect on economic growth in Nigeria.

The coefficient for LNPPPI was -0.2121 and the probability value was 0.0006, which is below 0.05. This indicated that Nigeria's public-private partnership investment had a positive and statistically significant impact on Nigeria's economic growth. But the minus sign means that the effect was in opposition to the a priori expectation. Hence, the study found that the null hypothesis was rejected and it concluded that PPP investment was significantly affecting economic growth of Nigeria during the considered period.

Ho_2: Agriculture, forestry and fishing value added has no significant effect on economic growth in Nigeria.

The value of the long run coefficient of AFF is -0.0653 and the value of the probability of AFF is 0.0000. A P value < 0.05 indicates a significant effect. The result of the negative coefficient indicates that the value added of agriculture, forestry and fishing decreased when real GDP increased in the studied period (2011–2013). Thus, the null hypothesis is rejected and it concludes that AFF influenced economic growth in Nigeria in a significant negative way.

Ho3: Merchandise trade has no significant effect on economic growth in Nigeria.

For the test MTRD, the coefficient obtained was -0.0086 and the probability value was 0.1960. If the probability value is above 0.05, then the variable is not statistically significant. This indicates that there was no consistent long-term effect from merchandise trade on real GDP over the period. Thus, the null hypothesis is accepted and it was concluded that the merchandise trade does not have significant effect on the economic growth in Nigeria.

H_{O4}: Gross capital formation has no significant effect on economic growth in Nigeria.

The long run outcome for GCF is a coefficient of 0.0662 and a probability value of 0.0001. The probability value is less than 0.05, therefore, the effect is a statistically significant one. The sign is positive because the increase in the capital stock was a positive contribution to real output. Thus, the null hypothesis is rejected and it is concluded that gross capital formation had a significant positive effect on the economic growth in Nigeria.

H_{O5}: Inflation has no significant effect on economic growth in Nigeria.

The long-run coefficient for INF is -0.0315 and its probability value is 0.0145. The probability value was less than 0.05 – this means the effect is statistically significant. The negative sign indicates that inflation had a negative impact on real output for the period. But this study fails to accept the null hypothesis which means there was a significant negative effect of inflation on economic growth in Nigeria.

Discussion of the Findings

Public-Private Partnership Investment and Economic Growth

The study has revealed that investment by public-private partnerships (PPP) was negatively and significantly affecting the economic growth in Nigeria. This result indicates that the positive real output benefits from PPP investments were not materialized during the period of observation. The discovery does not necessarily imply that PPP is not an effective policy tool; it shows that the success of PPP for projects is related to the type of projects, the discipline of implementation, risk allocation, project monitoring, and the linkage of projects to productive sectors. The finding is also inconsistent with Amos & David (2025) who asserted that PPP agreements can propel the growth of the maritime sector in Nigeria and Arazu & Lusty (2023) who attributed the growth in Nigeria to PPP investments. The result is in line with that of Mofokeng (2019) which noted that the growth effect of PPP investment is not uniform by sectors, but is significantly influenced by institutional and sectoral conditions. It also supports Eze, Olayemi & Garba (2025) who argued that the effects of PPPs in certain sectors of infrastructure has been low and that the expansion of the PPPs had to be strengthened. What is being suggested is that Nigeria's commitments to PPPs may not have been fruitful enough, timely enough, and associated to growth-enhancing infrastructure in Nigeria's blue economy.

Agriculture, Forestry and Fishing Value Added and Economic Growth

The agriculture, forestry and fishing value added was found to be negative and significantly affecting the economic growth of the study area. This is an unexpected finding as the fishing part of AFF is theoretically supposed to promote food security, employment, export potential and rural income. The negative sign can be interpreted as the result of the widespread nature of the proxy (fishing plus agriculture and forestry), and structural weaknesses in Nigeria's resource-based sectors. The result differs from that of Obemeata (2025), who found that the sectors of the blue economy (Aquaculture, Marine Fisheries Production, Marine Fisheries Trade, Marine Fisheries Services, and Marine Fisheries Exports) were positively associated with GDP in the long run; and Shamwil & Malkina (2025), who noted that Aquaculture and Total Fisheries Production were significant and positive for economic growth in the LR. Furthermore, it contrasts with the findings of Yusuff & Ibidapo-Obe (2024) which highlighted the potential of the blue economy sectors in ensuring sustainable growth. But the outcome confirms the notion that potential is not meant for growth. Dosunmu (2025) said that fisheries and aquaculture resources continue to be under funded and faced challenges such as insecurity, infrastructure deficit and environmental issues. Hence, the negative outcome could be due to low productivity, informality, value of addition, and lack of linkage between the resource-based activity and aggregate growth.

Merchandise Trade and Economic Growth

The research revealed that merchandise trade was not a significant factor in economic growth. This indicates that the trade of merchandise did not have an adequate long-run growth influence during the

period analyzed. This finding contrasts with the results of Adekunle (2025) who noted that trade openness significantly influenced economic growth for Nigeria, and Abinabo & Abubakar (2023) who regarded trade openness as growth relevant. It also differs from Tyokosu & Abakpa (2023) who found that growth implications of trade openness. But it makes sense in a context where merchandise trade is imported, highly susceptible to exchange-rate fluctuations and less diversified in exports in Nigeria. Omoke & Opuala-Charles (2020) found that the relationship between trade and growth is a function of institutional quality, whilst Duru et al. (2020) demonstrated that trade liberalization outcomes are a consequence of the structure of domestic production. In the context of a blue economy, merchandise trade could be a weak engine of growth in cases of inefficient ports, shipping, logistics and export value chains, and where imports outweigh exports.

Gross Capital Formation and Economic Growth

The result of the study indicated that gross capital formation positively and significantly contributed to Nigeria's economic growth. The result is in accordance with a priori expectation and also reinforces the Endogenous Growth Theory that puts the emphasis on the growth enhancing effects of investment and capital accumulation. The result is in line with Anagun and Sokunbi (2024) who established that long run effect of physical and human capital formation on Nigeria's economic growth was significant. It is also consistent with Ojo et al. (2024) who demonstrated that productive expenditure can impact economic growth when channeled towards economic and social services. The finding is however in contradiction with Onwiodiokit & Otolorin (2021), indicating that gross fixed capital formation showed a negative and significant impact on growth, which implies that the impact of capital formation is dependent on the composition and productivity of the capital formation. The positive coefficient in this present study means that capital accumulation is still a more effective and stable way of driving growth than the commitments for PPP projects.

Inflation and Economic Growth

The study revealed that inflation negatively affected the economic growth and the effect was statistically significant. This is consistent with theory, which indicate that inflation will all contribute to a decline in purchasing power, higher production costs, greater uncertainty and deter long-term investment. This result corroborates the result of Awuna and Malkina (2026) which established that in the short run, the effect of inflation on Nigeria's economic growth was found to be significant and negative. It also concurs with the Nigerian macroeconomic evidence that high inflation reduces real output due to increases in inflation costs and policy uncertainty. Inflation, in the context of PPP and the blue economy, can increase project costs, project financing risk, real returns, and long-term contract assumptions. It can also increase the price of fuel and vessels, logistics, fisheries and sea transport storage and processing. Thus, the inflation negative effect supports the fact that economic instability remains a significant bottleneck to growth effect of investment and blue economy activities in Nigeria.

5.0 CONCLUSION AND RECOMMENDATIONS

The study focused on Public Private Partnership Investment Models and Blue Economy Indicators on Nigeria's economic growth from 2000 to 2024. The study employed real gross domestic product as the indicator of economic growth and the explanatory variables included public-private partnership investment, agriculture, forestry and fishing value added, merchandise trade, gross capital formation and inflation. The ARDL bounds test showed that there was a long-run relationship between the variables, indicating that the variables selected for the investment, blue economy and macroeconomic indicators move in harmony with economic growth over time. Results indicated that there was a statistically significant negative relationship between PPP investment and economic growth with a statistically significant positive relationship between agriculture, forestry and fishing value added and economic growth with a negative non-significant relationship between merchandise trade and economic growth. The positive and statistically significant effect was due to gross capital formation and the negative and statistically significant effect was due to inflation. The study, therefore, findings showed that the investment under the PPP scheme and the selected blue economy indicators have not yet yielded the desired positive growth outcomes in Nigeria. The positive impact of gross capital formation indicates that investment is important for growth, while the negative impacts of PPP and AFF indicate that the quality, structure and transmission of investment are also crucial.

Based on the findings and the conclusion of this study, the following recommendations were made:

i. Government should strengthen the design and monitoring of PPP projects so that investment commitments are directed toward productive infrastructure with clear growth linkages, especially ports, inland waterways, fisheries infrastructure, logistics platforms, and export-support facilities.
ii. Blue economy policy should be linked directly to investment and industrial policy. Fisheries, aquaculture, maritime trade, and coastal tourism will contribute more to growth when supported by processing facilities, cold-chain infrastructure, marine security, digital logistics, and access to finance.
iii. Gross capital formation should be strengthened through policies that encourage productive investment, domestic savings mobilization, private-sector confidence, and infrastructure development. PPP investment should form part of a wider capital-formation strategy rather than operate as isolated project finance.
iv. Macroeconomic stability should be prioritized because inflation weakens investment planning, raises project costs, and reduces real economic performance. Stable prices, predictable exchange-rate policy, and lower financing uncertainty are necessary for PPP and blue economy investments to produce stronger growth outcomes.
v. Merchandise trade should be made more growth-enhancing through export diversification, port efficiency, better customs systems, and stronger domestic value addition. Trade will have stronger growth effects when maritime logistics support production and exports rather than mainly import consumption.

Future research on the blue economy should include more disaggregated blue economy indicators, as they will become available as longer and more comprehensive time series are available, including fishing GDP, aquaculture production, water transport GDP, port throughput, maritime employment, coastal tourism earnings, marine renewable energy, and maritime services. Further studies can also be conducted to extend the period beyond 2024, and to compare the ARDL results with the dynamic ARDL model, nonlinear ARDL model, or structural break model.

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