

## Public Investment and Economic Growth in Nigeria

**OBRIKI Precious Endurance<sup>1</sup> & Ven. Prof. J.K.J. ONUORA<sup>2</sup>**

<sup>1</sup>Audit Department, Dennis Osadebay University, Delta State.

<sup>2</sup>Department of Accountancy,  
Chukwuemeka Odumegwu Ojukwu University, Igbariam Campus,  
Anambra State

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### **Abstract**

*This study empirically investigated public sector investment and economic growth in Nigeria. However, in order to achieve the objectives of this study, the study utilized four explanatory variables as proxies for public sector investment indicators (education, transportation and communication, health and social and community services) while real gross domestic product was used as a proxy for economic growth in Nigeria. The study covered a time period of 1981 to 2022. The Error Correction Model (ECM) was adopted for the analysis based on the fact that the variables were stationery at levels and first difference. The Augmented Dickey Fuller (ADF) unit root tests showed that economic growth and public investment in health as well as ECM were stationery at levels while and public investment in education, transport and communication and social and community services were stationery at first difference at ADF statistics  $>$  ADF at 5%. The ECM regression results revealed public investment in education and social and community services has a positive and a significant effect on economic growth while public in transportation and communication and health has an insignificant effect on economic growth. Based on these findings, it was recommended that government through their fiscal and monetary policy tools should ensure there is huge continuous public investment in the educational sector for improving the development of the economy. It was also suggested that government should ensure there is a massive public investment in the social and community services for raising the standard living of the citizen and thereby leading to economic growth.*

**Keywords:** *Economic growth, Public Investment in Education, Public Investment in Health, Public Investment in Social and Community Services, Public Investment in Transportation*

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### **1.0 Introduction**

The well-being and standard of living of the general public can be significantly enhanced through Public Sector Investment (PSI). Collaboration among federal, state, and local governments represents a strong commitment to this initiative. By prioritizing PSI, we can effectively promote social justice and bolster economic stability, addressing both the immediate and long-term needs of diverse communities. To make a meaningful impact, it is crucial for governments to allocate funds for a variety of capital projects that will create positive change and strengthen the fabric of our society. This includes the development of essential infrastructure such as roads, bridges, public transportation systems, hospitals, schools, and utilities. In addition, governments must undertake substantial repairs, renovations, and upgrades to existing facilities.

These efforts are crucial not only for maintaining public assets but also for enhancing the functionality and safety of the services provided to citizens.

Political perspectives and economic theories have both served to justify public sector investment. Economically, public investment is regarded as vital for delivering certain goods and services that the private sector struggles to supply efficiently (public goods) or those that can only be economically managed by a single provider (natural monopolies). Examples of public goods include police services and military defense, while natural monopolies are seen in critical services such as electricity, clean water, and sewage systems. From a political standpoint, public investment is defended as essential for achieving a range of objectives. These include ensuring national security, safeguarding property rights, upholding the rule of law, promoting national economic growth and full employment, protecting the environment, collectively managing the means of production, and advancing genuine equality in the distribution of wealth and income (Lee, 2019).

John Maynard Keynes, a prominent British economist, argued that following significant economic downturns, wages, prices, and interest rates do not always adjust to achieve full employment. This perspective has justified government intervention and funding. Since the introduction of Keynesian concepts, governments have increasingly played a vital role in managing the economy, often involving direct investments across various sectors. When the government increases its spending, particularly through large public works projects such as building bridges, roads, and rail systems, it tends to create jobs. As unemployment decreases, disposable income rises, which in turn drives higher consumption rates (Grace, 2019). Public investment has the potential to improve a country's infrastructure, attract Foreign Direct Investment (FDI), reduce unemployment, and create new job opportunities. Furthermore, it can enhance a nation's productive capacity and Gross Domestic Product (GDP) through industrialization. Ayushp (2021) posited that public investment can also help alleviate poverty, especially in rural areas, promote agribusiness, and increase the annual agricultural output of the country, while providing strong competition to private investment.

To drive rapid economic growth and sustainable long-term development, it is important to focus on investments in community and social services, particularly in education and health. These areas play a crucial role in cultivating human capital, which is essential for economic advancement. Simultaneously, investing in economic services such as agriculture, transportation, communication, and construction can significantly enhance our infrastructure, laying a strong foundation for future progress (Ezigbu et al., 2018). Furthermore, as highlighted by Ekesiobi et al. (2016), prioritizing education is fundamental in boosting the productivity of labour, leading to higher industrial output. Investments in education not only elevate the skills of the workforce but also nurture innovative capacities and promote technological advancements. These improvements contribute to a more robust industrial sector and enhanced overall economic stability, creating a cycle of growth and opportunity for all.

Nigeria has seen an increase in public investment due to its growing population and expanding economic activities. Consequently, there have been significant changes in public expenditure over the years. In the first quarter of 2021, Nigeria's capital expenditure reached an all-time high

of ₦2.522 trillion. A considerable portion of this expenditure was allocated to economic administration and services, amounting to ₦1.102 trillion and ₦635.72 billion, respectively (CBN, 2022). Despite this rise in public investment, neither the quantity nor the quality of these investments has resulted in significant economic growth. Nigeria's unemployment rate continues to climb, with historical figures showing fluctuations: 7.1% in 1981, 10.2% in 1983, 11.5% in 2001, 14.6% in 2011, and 13.4% in 2016. By the end of 2021, the unemployment rate surged to 32% (CBN, 2021). Furthermore, Nigeria ranks among the poorest countries in the world, despite substantial government spending. More than half of the population lives in extreme poverty, and this, coupled with deteriorating infrastructure—especially in roads and electricity—has led to numerous business failures (Nurudeen & Usman, 2010). According to the World Bank's 2020 Human Capital Index, Nigeria was ranked 150th out of 157 countries in terms of human capital development (World Bank, 2021).

In recent years, Nigeria has faced a significant decline in both adult literacy rates and enrollment in primary and secondary schools, which are crucial indicators of educational investment. Data from the World Development Indicator in 2023 shows that the adult literacy rate increased sharply from 70.20% in 2006 to 87.01% in 2022. Similarly, the enrollment rate for secondary schools decreased markedly, dropping from a high of 56.18% in 2013 to just 47.24% in 2021.

Furthermore, the Central Bank of Nigeria (CBN) reported in 2015 that the federal government's financial contribution to education has dwindled significantly, decreasing from 17.59% in 1970 to a mere 5.68% in 2021. This alarming trend is closely linked to the statistic that 10.5 million Nigerian children aged 5 to 14 are currently not enrolled in school, as noted by UNICEF in 2021. These concerns are further corroborated by trend analysis studies conducted by Olanipekun & David (2020) and Kayode et al. (2020). Measures must be taken to address these critical declines in educational outcomes.

Several studies have investigated the impact of public investment on economic growth and development in Nigeria. However, a limited number of these studies—specifically, those conducted by Uket and Christopher (2018), Ndugbu et al. (2018), Olufemi (2020), and Olanipekun & David (2020)—have segmented public investment into its components: economic services, social community services, and administration. The empirical evidence suggests that these studies have not given adequate attention to the three critical development indicators: standard of living, literacy rate, and unemployment level in Nigeria. Consequently, this study seeks to analyze public sector investment and economic growth in Nigeria during the period from 1981 to 2022.

## **2.0 Review of Related Literature**

### **Conceptual Review**

The public sector is a crucial part of the economy, encompassing a wide range of services and activities aimed at supporting societal well-being. This sector includes essential services such as infrastructure development, public transportation, educational institutions, healthcare services, law enforcement, and military protection. It consists of various levels of government—local, regional, and national—along with publicly operated organizations and enterprises that serve the needs of the general population. Importantly, the public sector does not include private companies, nonprofit organizations, or individual households. When discussing economic activity, the term "public sector" is used to distinguish it from the private sector and the third, or

voluntary, sector. This distinction helps clarify the extent of government involvement within the larger economic framework. The public sector plays a vital role in a nation's economic growth by providing essential health and educational services, which significantly enhance the Human Development Index.

Additionally, public sector initiatives improve citizens' quality of life by offering affordable utilities, such as electricity and water, and by implementing agricultural policies that allow governments to purchase food grains from farmers at fair prices. This approach not only ensures food security but also supports farmers' livelihoods. Funding for these essential services and programs primarily comes from government grants and taxation, reflecting the collective investment made by society in its public resources. Recognizing the efforts of the public sector is essential, as the trajectory of a country's economic growth is closely linked to its level of human development. Through its diverse contributions, the public sector lays the groundwork for a more equitable and prosperous society.

### **Economic Growth**

Economic growth, as articulated by Mathew (2019), represents a comprehensive measure of the overall well-being of individuals, aligned with the fundamental principles of human capital development. In contemporary discourse, economic growth is frequently associated with the aggregate measure of life expectancy within a nation. It is imperative to acknowledge that a country designated as a developed economy typically exhibits enhanced social welfare, improved healthcare systems, and effective mechanisms for conflict resolution, all of which contribute to the longevity of its citizens. Government entities at the federal, state, and local levels prioritize economic growth as a means of elevating living standards through job creation, the promotion of innovation, the increase of wealth, and the enhancement of overall quality of life. Initiatives that exemplify economic growth include the construction or rehabilitation of infrastructure such as roads and bridges, the fortification of public safety through adequate fire and police services, and the encouragement of new enterprises to establish operations within communities (Okoye, Amahalu, Obi & Iliemna, 2019). In the context of this study, economic growth is defined as the improvement of the collective welfare of society, as evidenced by sustained growth in per capita income, a reduction in illiteracy rates, and a decline in unemployment rates.

### **Public Expenditure**

Public expenditure can be understood through three key definitions: narrow, budgetary, and broad. Each definition clarifies the role of the public sector in the economy.

The budgetary definition focuses on public expenditure about budget transactions. It includes essential expenses necessary for the government's, society's, and the economy's functioning. This encompasses costs associated with providing goods and services, appropriations for public enterprises and regulatory agencies, as well as grants-in-aid to other countries. This figure, found on the expenditure side of the public budget, highlights the direct expenditures of the government. By excluding transfer payments, this definition offers a precise (narrow) view of the public sector's size based on expenditure levels.

In contrast, the broad definition expands our understanding by considering how government intervention in the economy impacts private sector spending. This perspective allows us to recognize the wider implications of public expenditure, giving a more comprehensive view of the influence and size of the public sector (Agiobenebo, 1998). Overall, these definitions collectively

enhance our understanding of public expenditure and its significance in shaping economic dynamics.

### **Composition of Public Expenditure in Nigeria**

The composition of public expenditure is defined by its various components, as outlined by the Central Bank of Nigeria (2011). In the context of Nigeria, the primary categories of public expenditure include administration, social community services, economic services, and transfers. These functional subheads represent the principal areas of public spending within the country.

### **Administration of Government Expenditure**

Administrative services expenditure comprises of both recurrent and capital administrative expenditure. Capital expenditure on administration services include expenditure as purchase of long-term assets such as furniture, motor vehicles, national assembly, defense, internal security, capital projects, education, telecommunication, electricity, roads, railways, hospital, houses, lands. While Recurrent expenditure on administration services include expenses on administration such as salaries, interest on loans, recurrent government's purchase of current goods and services, wages, maintenance cost etc.

### **Economic Services of Government Expenditure:**

Economic services expenditure encompasses both capital and ongoing expenses. Capital expenditures are investments made in sectors like manufacturing, mining and quarrying, transportation and communication, housing, and construction. In contrast, ongoing costs for economic services refer to the expenses required to maintain the current levels of these services.

### **Social Community Services of Government Expenditure:**

The following description outlines both one-time and ongoing expenditures related to social and community services. Government spending on areas such as housing, healthcare, and education is classified as capital expenditures for these services. In contrast, recurring government expenses related to health, education, and other social services are categorized as essential ongoing expenses. These recurring expenditures are vital for maintaining current levels of social and community services.

### **Transfers of Government Expenditure:**

Transfer service expenditures encompass both capital costs and ongoing service expenses. Capital expenditures related to transfers include obligations to external parties, capital recovery, and replacement costs. In contrast, recurring expenses for transfers consist of the funds required to maintain existing repayment levels and fulfill external financial commitments (CBN, 2011).

Stakeholder theory, as defined by Freeman in 1984, is grounded in moral and ethical considerations. This theory acknowledges the involvement of various parties in management, including employees, customers, contractors, financiers, communities, public agencies, political groups, trade associations, competitors, and trade unions. These stakeholders often scrutinize government spending. In this study, stakeholder theory is employed as a critical diagnostic tool to identify potential vulnerabilities among stakeholders in the government spending process. For instance, stakeholders such as voters, taxpayers, and citizens are interested in how the government allocates taxpayer money. They expect a business-like approach to governance that emphasizes good faith, transparency, and accountability—principles championed by new public management theory.

## **Theoretical Review**

The study was underpinned by the following theories;

### **Stakeholder Theory**

Stakeholder theory, as defined by Freeman in 1984, is grounded in moral and ethical considerations. This theory acknowledges the involvement of various parties in management, including employees, customers, contractors, financiers, communities, public agencies, political groups, trade associations, competitors, and trade unions. These stakeholders often scrutinize government spending. In this study, stakeholder theory is employed as a critical diagnostic tool to identify potential vulnerabilities among stakeholders in the government spending process. For instance, stakeholders such as voters, taxpayers, and citizens are interested in how the government allocates taxpayer money. They expect a business-like approach to governance that emphasizes good faith, transparency, and accountability—principles championed by new public management theory.

### **Public Expenditure Theory**

The public sector is integral to ensuring the efficient operation of economic activities within society. Moreover, the objectives of government are often multifaceted and involve numerous stakeholders. To mitigate potential disorder, public expenditure should be guided by the principles of efficiency and equity (Hindrizia & Myles, 2005). Efficiency pertains to the effective management of public activities, emphasizing the coordination, collection, and oversight of government revenue and expenditures aimed at delivering services to stakeholders. Conversely, equity concerns the equitable distribution of public benefits among these stakeholders. The theoretical framework pertinent to public expenditure in this context is embodied in Wagner's Law, commonly referred to as the law of increasing state funding. Wagner's Law asserts that, as a nation's income grows, public expenditure consistently increases. This principle indicates that the proportion of the public sector's contribution to GDP has risen over time in the context of economic growth.

### **Empirical Review**

Egbetunde and Fadeyibi (2015) investigate the investment – growth nexus in Nigeria, for the period 1981-2012. Using the Vector Error Correction Model (VECM), the study finds that investment is cointegrated with economic growth in the country; that is, there is a long-run relationship between investment and economic growth in Nigeria. The results further show that investment Granger causes economic growth in Nigeria. The paper argues that there is a need for the government to invest heavily through appropriate mechanisms, strong institutions and macroeconomic policies to result in economic progress and sustainable development in the country.

Echekoba and Amakor (2017) examined the relationship between government spending on general administration, defense, education, and health and Nigeria's GDP from 1983 to 2016. The multiple regression analysis used the Ordinary Least Square (OLS) estimation method. Despite increasing spending, Nigeria's economic backwardness persisted. The study found a significant positive correlation between general administration, defense, education, and health spending, while health expenditures had a modest positive effect.

The relationship between public spending and Nigeria's economic growth was investigated by Egbulonu et al. (2018) using time series data spanning 1977 to 2015. Study variables include GDP, total expenditure on administration, total expenditure on economic services, total expenditure on social and community services, and total expenditure on transfers. The model was subjected to Granger causality, cointegration, and unit root tests using the Error Correction Model (ECM) approach. According to the analysis, every indicator related to public spending had a positive and substantial association with GDP, with the exception of total expenditure on economic services (TEES), which had a negative and insignificant relationship with GDP. But according to the joint test, every variable significantly and positively affected GDP.

Olanipekun and David (2020) investigate the relationship between government spending and unemployment and poverty in Nigeria. Government spending was divided into its capital and recurring functional components (economic service, administration, social service, and transfer) using the ARDL technique. This made it possible to examine how each of these factors affected unemployment and poverty rates between 1980 and 2017. The findings indicate that whereas capital economic services spending has a small influence on poverty but makes a substantial contribution to lowering the unemployment rate, administrative and transfer expenditures have an impact on poverty reduction both in the short and long run.

Ndubueze et al. (2020) examined the relationship between government social spending and unemployment in Nigeria between 1981 and 2016. The study used secondary data and applied the Ordinary Least Square (OLS) regression approach. Economically speaking, the findings demonstrated that capital health expenditure (CEXPEH), recurrent health expenditure (REXPH), and recurring education expenditure (REXPE) fell short of projections. Government recurrent spending, as opposed to capital investment, has a statistically significant effect on individual unemployment in Nigeria. Furthermore, the aggregate figure shows that both capital and ongoing investments in health and education have had a major influence on Nigeria's unemployment rate.

The relationship between the rising four components of capital and recurring spending and the level of life as indicated by per capita income (PCI) was examined by Kayode et al. (2020). Transfer Payments (TRP), Administration (ADM), Economic Services (ECS), and Social and Community Services (SCS). The study employed the Autoregressive Distributed Lagged (ARDL) Bound Test Approach to examine data from the Central Bank of Nigeria Statistical Bulletin and the World Development Indicator for the years 1981–2018. The analysis finds that increasing government spending on these four capital and ongoing components has insignificant and negative effects.

Enya and Ezeali (2021) examined the impact of public investment in infrastructure on Nigeria's economic growth. The study utilized econometric analysis with E-Views software. The stationarity test conducted revealed that all variables were stationary at the first difference, denoted as  $I(1)$ . Consequently, the researchers proceeded to determine the presence of co-integration among the variables. The results of the co-integration test indicated the presence of two co-integration equations, demonstrating a long-run relationship among the variables. The Error Correction Model (ECM) test yielded a well-signed coefficient of -0.019307, along with a high adjusted coefficient of determination of 92.78% and a joint statistical probability of 0.00000. The study found that public investment in technology, educational infrastructure, and power positively correlates with economic growth, while investment in transport has a negative

relationship with the economy.

Akinlo (2022) explores the relationship between investment and Nigerian economic growth from 1970-2016. The study employs annual time-series sourced from Central Bank of Nigeria, Statistical Bulletin and World Bank, World Development Indicator. Using a Markov regime-switching approach, the study finds a non-linear relationship, with both public and private investments positively impacting economic growth. Private investment contributes more during expansion and contraction, supporting the neoclassical framework for long-term growth performance.

Nteegah and Okwu (2023) studied the impact of public sector investment on Nigeria's economic growth from 1981 to 2021. The study utilized data sourced from the Central Bank of Nigeria's Statistical Bulletin and the World Development Indicators, employing the Autoregressive Distributed Lag (ARDL) model for analysis. The findings revealed that public investment in economic and administrative services significantly and positively influenced living standards, whereas investment in social and community services had a negative effect. Additionally, the research demonstrated that such investments contributed to improved literacy rates and fostered employment opportunities.

### **3.0 Methodology**

#### **Research Design**

Research design plays a vital role in effectively addressing and resolving research challenges. This study employed the Ex post facto research design, which serves as a robust methodological tool that allows researchers to analyze outcomes following the occurrence of specific events.

#### **Model Specification**

This study aims to analyze the relationship between public investment in infrastructure and economic growth in Nigeria from 1981 to 2022. The model specification draws upon the works of Fan et al. (2004) and Enya and Ezeali (2023). In this analysis, RGDP (Real Gross Domestic Product) serves as the dependent variable. At the same time, PIED (Public Investment in Education), PITR (Public Investment in Transport and Communication), PIH (Public Investment in Health), and PISCS (Public Investment in Social and Community Services) are the independent variables. The Ordinary Least Squares (OLS) linear regression equation will be used to establish the functional relationship between these variables.

$$Y = a_0 + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + \mu \text{ ----- (1)}$$

$$\text{Hence RGDP} = a_0 + a_1\text{PIED} + a_2\text{PITR} + a_3\text{PIH} + a_4\text{PISCS} + \mu \text{ ----- (2)}$$

Where:

RGDP = Real Gross Domestic Product

PIED = Public Investment in Education

PITR = Public Investment in Transportation and Communication

PIH = Public Investment in Health

PISCS = Public Investment in Social and Community Services

$\mu$  = error term

a = intercept

Putting them in the same base elements logging them

$$\log \text{RGDP} = a_0 + a_1 \log \text{PIED} + a_2 \log \text{PITR} + a_3 \log \text{PIH} + a_4 \log \text{PISCS}$$

#### **Method of Data Analysis**



In order to determine the casual relationship among the variables, E-view econometrics techniques will be used to estimate the parameters.

### **Test of Significance**

#### **T-Test**

The T-test is employed to assess the statistical significance of parameter estimates. A two-tailed test is conducted at a 5% significance level. The decision rule is as follows: if the calculated t-value (t-cal) exceeds the critical t-value (t-table), the parameter is deemed statistically significant; otherwise, it is not.

#### **F-Test**

The F-test is utilized to evaluate the overall significance of the model. If the calculated F value (F-cal) exceeds the critical F value (F-tab) at a significance level of 5%, it may be concluded that the model is significant. Conversely, if F-cal is less than F-tab, the model is deemed nonsignificant, and the alternative hypothesis is rejected.

#### **Test of Goodness of Fit**

This test is conducted to evaluate the effectiveness of independent variables in explaining the variations observed in the dependent variables. The  $R^2$  value is presented as the adjusted multiple coefficient of determination, which considers the degrees of freedom associated with the sum of squares.

#### **Test for Stationarity**

A unit root test will be conducted using the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test.

#### **Test for Co-integration**

Cengiz and Dilip (2005) assert that the relationships among variables are fundamental in the realm of economic analysis. While these variables may exhibit divergence in the short run, they are expected to converge toward equilibrium in the long run. Co-integration analysis presents a valuable methodology for examining this phenomenon. As outlined by Engle and Granger (1987), the stationarity of a variable is indicative of its degree of integration. Furthermore, they demonstrated that if the linear combination of variables is integrated at any order less than  $d$ , the variables in question can be classified as integrated.

#### **Sources of data Collection**

The study used secondary data sourced from the CBN statistical bulletins from 1981 and 2022.

### **4.0 Data Analysis and Discussion of Results**

Descriptive statistics are used in this study to assess the individual characteristics of the variables and shown in the table below.

**Table 1: Descriptive Statistics**

	<b>RGDP</b>	<b>PIED</b>	<b>PITR</b>	<b>PIH</b>	<b>PISCS</b>
Mean	40981.46	161.4095	17.18524	98.02024	106.0921
Median	9766.840	61.37000	8.920000	28.89500	12.25500
Maximum	199336.0	702.9800	90.03000	437.5200	488.4900
Minimum	137.9300	0.160000	0.030000	0.040000	0.030000
Std. Dev.	55220.83	209.7204	20.84456	133.6052	152.4138
Skewness	1.331917	1.218897	1.450103	1.287162	1.164756
Kurtosis	3.682571	3.257909	5.107683	3.416178	2.966251

Jarque-Bera	13.23335	10.51638	22.49367	11.90061	9.498592
Probability	0.001338	0.005205	0.000013	0.002605	0.008658
Sum	1721221.	6779.200	721.7800	4116.850	4455.870
Sum Sq. Dev.	1.25E+11	1803288.	17814.32	731864.3	952429.2
Observations	42	42	42	42	42

Source: Researcher's Computation from E-view 9.0.

It was observed from Table 1 above that Real Gross Domestic Product (RGDP) has a mean of N40981.46 billion and a standard deviation of 55220.83. Public Investment in Education (PIED) has a mean of N161.40 billion and a standard deviation of 209.72. Public Investment in Transportation and Communication (PITR) has a mean of N17.18 billion and a standard deviation of 20.84. Public Investment in Health (PIH) has a mean of N98.02 billion and a standard deviation of 133.60, and Public Investment in Social and Community Services (PISCS) has a mean of N106.09 billion and a standard deviation of 152.41. It was observed that the Jarque-Bera value of the variables with their probabilities values indicated an acceptable threshold which shown that it is normally distributed.

#### Unit Root Test

To examine the long-run relationship among the variable, the Augmented Dickey Fuller (ADF) unit root tests was used to test for stationary in the series and the result is presented in Table 2 below.

**Table 2: Augmented Dickey-Fuller Unit Root Test**

LEVEL	ADF Statistics	ADF (95%)	Remark
RGDP	14.10	-2.93	Stationery
PIED	-2.29	-2.93	Not Stationery
PITR	-2.54	-2.93	Not Stationery
PIH	3.81	-2.94	Stationery
PISCS	1.34	-2.93	Not Stationery
ECM	-4.21	-2.93	Stationery
<b>FIRST DIFFERENCE</b>			
PIED	-4.90	-2.93	Stationery
PITR	-5.21	-2.93	Stationery
PISCS	-5.83	-2.93	Stationery

Source: Researcher's Computation from E-view 9.0

It was observed from the table above that all the variables were stationary at levels and first difference while ECM was stationary at level. This implies that Error Correction Model (ECM) is more appropriate in testing our formulated hypotheses.

#### Johansen Co-Integration Test

The co-integration test for the variables using Trace-statistics is presented in Table 3 below;

**Table 3: Johansen Co-Integration Test**

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**

None *	0.768082	163.9289	69.81889	0.0000
At most 1 *	0.699592	105.4740	47.85613	0.0000
At most 2 *	0.591448	57.36945	29.79707	0.0000
At most 3 *	0.345778	21.56404	15.49471	0.0054
At most 4 *	0.108449	4.591707	3.841466	0.0321

Source: Researcher's Computation from E-view 9.0

The co-integration results were based on the Johansen test using Trace-Statistics. The findings from the Trace-Statistics revealed that the selected variables were with one co-integrating vector. The existence of co-integration among the variables justified the use of error correction model in this study.

#### Error Correction Model

The Error Correction Model (ECM) model examines the analysis of tax revenue and inequality of income. The result is presented in Table 4 below;

**Table 4: Regression Result for Error Correction Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2407.898	832.6779	2.891752	0.0069
DPIED(-2)	107.2404	26.16989	4.097855	0.0003
DPITR	-78.68570	56.82989	-1.384583	0.1761
DPIH	4.354837	27.83824	0.156434	0.8767
DPIH(-1)	14.37389	30.58441	0.469974	0.6417
DPISCS	4.650182	25.26910	0.184026	0.8552
DPISCS(-2)	86.67051	28.81752	3.007563	0.0052
ECM(-1)	0.473082	0.178542	2.649702	0.0126
R-squared	0.612566	Mean dependent var		5107.150
Adjusted R-squared	0.525081	S.D. dependent var		6217.609
S.E. of regression	4284.826	Akaike info criterion		19.74423
Sum squared resid	5.69E+08	Schwarz criterion		20.08547
Log likelihood	-377.0125	Hannan-Quinn criter.		19.86666
F-statistic	7.001950	Durbin-Watson stat		1.605737
Prob(F-statistic)	0.000050			

Source: Researcher's Computation from E-view 9.0

It was observed from Table 4 above that the R-squared value of 0.612566 accounts for about 61% of the systematic variation in the dependent variable which was jointly explained by the independent variables. The F-statistics value of 7.00 with its associated probability value of 0.00 shows that the model overall is statistically significant. This means that there exists a significant linear relationship between public investment and economic growth in Nigeria in the model. The Durbin Watson D-Statistic obtained was 1.60 which can be approximated to 2. This means that there is no auto correlation in the model. Hence, the model can be used for realistic forecasts. More importantly, public investment in education (DPIED) lag (-2) has a positive and a

significant effect on economic growth measured by real gross domestic product (RGDP) at p-value  $< 0.05$  level of significance, public investment in transportation and communication (DPITR) has a negative and an insignificant effect on economic growth measured by real gross domestic product (RGDP) at p-value  $> 0.05$  level of significance, public investment in health (DPIH) has a positive and an insignificant effect on economic growth measured by real gross domestic product (RGDP) at p-value  $> 0.05$  level of significance and public investment in social and community services (PISCS) lag (-2) has a positive and a significant effect on economic growth measured by real gross domestic product (RGDP) at p-value  $< 0.05$  level of significance. The Error Correction Model (ECM (-1)) has a positive coefficient of 0.47 and was statistically significant. The positive sign of ECM was based on the fact that dependent variable (economic growth) was very volatile. This result clearly shows that long-run in public sector investment is quickly adjusted to equilibrium in the short-run.

### **Discussion of Findings**

From the empirical findings the Error Correction Model showed that public investment in education lag (-2) has a positive and a significant effect on economic growth at p-value  $< 0.05$  level of significance. The result was consistent with the findings of Echekeba and Amakor (2017) that a significant positive relationship between education, health spending and economic growth. Public investment in transportation and communication has a negative and an insignificant effect on economic growth at p-value  $> 0.05$  level of significance. The result was inconsistent with the findings of Enya and Ezeali (2021) that investment in transport has a negative relationship with the economic growth. Public investment in health has a positive and an insignificant effect on economic growth at p-value  $> 0.05$  level of significance. The result was inconsistent with the findings of Echekeba and Amakor (2017) that a significant positive relationship between health spending and economic growth. Public investment in social and community services lag (-2) has a positive and a significant effect on economic growth at p-value  $< 0.05$  level of significance. The result was consistent with the findings of Egbulonu et al. (2018) and Nteegah and Okwu (2023) that social and community services had a positive and substantial association with GDP.

### **5.0 Conclusion and Recommendations**

The study empirically investigated the effect of public sector investment on economic growth in Nigeria for a period of 42 years (1981 to 2022). The well-being and standard of living of the general public can be significantly enhanced through public sector investment. Specifically, the result shows that public sector investment such as public investment in education and social and community services has a positive and a significant effect on economic growth while public in transportation and communication and health has an insignificant effect on economic growth. It was concluded that public sector investment would contribute immensely to economic growth.

The following specific policy recommendations are raised:

- (i) The government through their fiscal and monetary policy tools should ensure there is huge continuous public investment in the educational sector for improving the development of the economy.
- (ii) The government should ensure there is a massive public investment in the social and community services for raising the standard living of the citizen and thereby leading to

economic growth.

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