Public Investment and Economic Development in Nigeria

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ABSTRACT

This paper investigated the impact of public sector investment on economic development in Nigeria over the time period 1981-2021. In order to examined how public investment on economic services, social and community services and administrative services had affected economic development measured in terms of: standard of living, literacy rate and job creation, data were collected from CBN Statistical Bulletin and World Development Indicators for the period and analysed using the ARDL. This was done after carrying out descriptive analyses and testing for unit roots properties of the variables under investigation. The result shows that public investment in economic and administrative services improved living standard while public investment in social and community services retarded living standard in Nigeria both in the short and long run. Public investments in economic and administrative services were also friendly with literacy level in the long run while public investment in economic and social services spurred employment in the long run. Public investment in administrative services was found to be friendly with literacy rate in the short run. A long-run relationship existed amongst variables under investigation in Nigeria over the period of this study. The mix effects of public investment on economic development in Nigeria could be attributed to misapplication and misappropriation of public funds. From the findings of this study, the study concluded that: public investment in economic and administrative spurred economic development than public investment in social and community services over the period of this study. Based on these findings and conclusion, the study recommended: an improvement in investment/public spending on economic and administrative services in order to create more jobs, improve income level (standard of living) and improve human capital development in Nigeria.

Key words: Public investment, Economic development, living standard, literacy rate & unemployment rate.

INTRODUCTION

Public sector investment (PSI) is one that is made for the benefit of the general populace by the federal, state, or local governments. In order to meet the current needs of the populace, the government invests in capital projects, provides infrastructure, and makes significant repairs, restructures, and overhauls to existing ones. Public Investment provides a crucial function and is essential for the sustainable growth of economies in all emerging countries (The City of Portland Oregon (TCPO), 2018).

Political stance and economic theory have both been used to defend Public sector Investment. In economics, Public Investment has typically been seen as crucial for the delivery of some essential goods and services which are either unable to be efficiently supplied by the private sector (public goods) or are designed in such a way that only one supplier could economically invest in them (natural monopolies). Police services and military defense are examples of the first type, while power, clean water, and sewage services are instances of the second. Public Investment has been defended in politics as being necessary to accomplish a number of political goals, such as ensuring national security, preserving property rights, upholding the rule of law, fostering national economic growth and full employment, preserving the environment, collectively owning the means of production, and promoting true equality in the distribution of wealth and income (Lee, 2019).

Insights from the prominent British economist John Maynard Keynes, who contended that wage, price

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and interest rates, might not automatically adjust themselves to produce full employment in the wake of significant economic setbacks, were used to justify the Public Investment. The rise of Keynesian ideas has led to governments taking on crucial roles in the management of nations, which may include diverse government direct investments in all facets of an economy. When the government spends more, as when it invests heavily in new public works initiatives like the construction of bridges, roads, or train systems, it tends to create jobs that lower unemployment and boost disposable income, which then fuels high consumption rates (Grace, 2019). Public Investment has the potential to enhance a country's infrastructure, draw more foreign direct investment (FDI), reduce unemployment and create new jobs, increase a country's productive capacity and Gross Domestic Product (GDP) through industrialization, assist in eradicating poverty, particularly in rural areas, promote agribusiness and boost the annual agricultural output of the country, and give private investment a stiff competition (Ayushp, 2021).

In order to achieve rapid economic growth and long-term economic development, investments in community and social services, such as education and health, are essential for the formation and development of human capital, whereas investments in economic services, such as agriculture, transportation, communication and construction, stimulate the growth of infrastructure (Ezigbu et al, 2018). According to Ekesiobi et al. (2016), investing in education is essential to raising labor's marginal productivity and, consequently, industrial output. They added that investments in education support the growth of innovative capacity in addition to facilitating technological innovation, which improves industrial output and boosts overall economic stability.

Nigeria's public investment has increased as a result of the country's expanding population and economic activity. Therefore, there is no question about the tendencies of transformation that public expenditure in Nigeria has seen over the years. Nigeria's capital expenditure reached its all-time high in the first quarter of 2021, at N2.522 trillion, with a larger percentage of economic administration and services accounting for N1.102.46 trillion and N635.72 billion, respectively (CBN,2022). Despite an increase in public investment, neither its quantity nor quality has resulted in a significant expansion of the economy development. Nigeria's unemployment rate has been on the increased. Statistics show that Nigeria's unemployment rate varied from 7.1% in 1981 to 10.2% in 1983 to 11.5% in 2001 to 14.6% in 2011 to 13.4% in 2016 and as at the end of 2021, it rose to 32 percent (CBN, 2021). Nigeria also ranks as one of world's poorest countries despite massive governmental expenditure. More than half of Nigerians still live in extreme poverty, and this combined with the country's crumbling infrastructure, particularly in the areas of roads and power, has caused a number of enterprises to fail (Nurudeen & Usman, 2010). In the World Bank's 2020 human capital index, Nigeria's human capital development was ranked 150th out of 157 nations (World Bank, 2021).

Additionally, in recent years, adult literacy rates, enrollment in primary and secondary schools, and other crucial consequences of educational investment in Nigeria have all decreased. According to data from the World Development Indicator (2021), the adult literacy rate dropped from a high of 70.20% in 2006 to 62.01% in 2018. Similar to how secondary school enrollment dropped from a peak of 56.21% in 2013 to 42% in 2016, elementary school enrollment in Nigeria decreased from a peak of 113.07% in 1983 to 84.73%. As of 2015, the Central Bank of Nigeria (CBN) reported that the federal government's financial contribution to education has decreased from a high of 17.59 percent in 1970 to 5.68 percent in 2021. (CBN, 2021). The situation supports the statistic that 10.5 million Nigerian children between the ages of 5 and 14 are not enrolled in school (UNICEF, 2021). The aforementioned is further supported by trend analysis data from studies such as Olanipekun & David (2020), and Kayode et al. (2020).

Many studies have looked at the effect of public investment on economic growth and development in Nigeria, but only a small number of studies (Uket and Christopher (2018); Ndugbu et al (2018); Olufemi (2020); and Olanipekun & David (2020)) have broken down the component of public investment into economic services, social community services, and administration. Empirical evidence shows that the studies consulted were do not laid much emphasis on all three development indicators relating to: standard

of living, literacy rate and the level of unemployment in Nigeria. Therefore, this study seeks to examine the effect of public sector investment on economic development in Nigeria from the period of 1981 to 2021. We continue our discussion by reviewing works that are related to study, provide the methodology for the study, present the results of data analysed, findings, and concluding remarks.

REVIEW OF LITERATURE

Conceptual Literature

Public Sector

An economy's public sector is that portion of the economy that, among other things, offers infrastructure, public transportation, public education, health care, and police and military services. The public sector is made up of governments, other publicly run or supported organizations, businesses, and other organizations that provide goods or services to the general public (Ayushp, 2021). The public sector is a part of the economy that consists of all tiers of government as well as firms that are under government control. Private companies, charitable organizations, and households are not included. The term "public sector" is additionally used to contrast the private sector with the third, or voluntary, sector. This makes it possible to map the scope of government activity inside the larger economy. The public sector supports a nation's economic growth in numerous ways, including through the provision of health and educational services, which have a considerable impact on the Human Development Index. The government also provides low-cost power, water, and postal services in addition to buying food grains from farmers at a "fair price" to ensure that people enjoy a good living. Grants and taxes are used to assist it accomplish this. As a result, it is essential that a country's economic progress be based on its state of human development (Yashishtm, 2021).

Public Expenditure

Public expenditure can be classified into narrow, budgetary and broad definitions. The budgetary definition restricts public expenditure to items of budgetary transactions covering expenses to maintain the government, society and economy; the costs of providing goods and services spanning appropriations to public enterprises and regulatory agencies; and of grants-in-aid to other countries. This is the amount that appears at the expenditure side of the public budget which can be designated the direct expenditure of the government. This less transfer payments provides the most restricted (narrow) definition of the size of the public sector by the level of expenditure. The broad definition seeks to add to the budgetary expenditure the incidence of government intervention in the economy on private sector spending to arrive at the size of public sector (Agiobenebo, 1998).

Composition of Public Expenditure in Nigeria

The components of public expenditure are referred to as the composition of public expenditure, according to Central Bank of Nigeria (2011). Administration, social community, economic services, transfers of public spending and social community services, are the primary functional subheads of public expenditure in Nigeria.

- **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:**

Both capital and ongoing economic services are included in economic services expenditure. Investments in manufacturing, mining and quarrying, transport and communication, housing, and building are all capital expenditures for economic services. While ongoing costs for economic services are those ongoing costs to keep the current levels of economic services.

- **Social community services of Government Expenditure:**

This includes both one-time and ongoing spending on social and community services. Government spending on things like housing, health, and education are capital expenditures on social and community services. Whereas recurring government expenses for health, education, and other social services are equal to recurring government expenses, recurring government expenses for social and community services are essential to keep current levels.

- **Transfers of Government Expenditure:**

Capital and ongoing transfer service costs are also included in transfer service expenditure. External obligation, capital recovery, and replacement are all included in capital expenditure on transfer. While recurring expenditures on transfers are those costs necessary to keep up with current levels of repayments and external financial commitments (CBN, 2011).

Economic Development

Economic development in the words of Mathew (2019), is a measure of the total wellbeing of the people in consonant with the existential norms of human capital development. In the contemporary times, economic development has been likened to the aggregate measure of life expectancy in a country. The caveat here is the fact that when an economy is termed a developed economy it has the tendency for improved social welfare, health care, and the machinery the manage conflicts, which in turns accounts for the life expectancy of the people. Federal, state, and local governments typically place a strong priority on economic development in order to raise living standards through the creation of jobs, encouragement of new ideas and innovations, growth in wealth, and improvement of general quality of life. Building or repairing infrastructure, such as roads and bridges, strengthening public safety by providing fire and police protection, or encouraging new enterprises to locate in a town are all examples of economic development (Okoye, Amahalu, Obi & Iliemna, 2019). However, a nation's economic development in this study is defined as the improvement in the overall welfare of the entire society as evidenced by long-term growth in per capita income, a decline in the degree of illiteracy, and unemployment rate.

Empirical Literature

Olanipekun and David (2020) look into how government spending affects poverty and unemployment in Nigeria. Using the ARDL methodology, government spending was broken down into its capital and recurring functional components (economic service, administration, social service, and transfer). This allowed for the individual effects of these components on unemployment and poverty levels from 1980 to 2017. The result shows that component of administrative and transfer expenditure impact on poverty reduction in short- and long-term periods, expenditure on capital economic services has weak effect on poverty but contribute significantly to minimize unemployment rate.

Uket and Christopher (2018) looked at how public spending affected Nigeria's economic growth between 2000 and 2015. The ordinal least square (OLS) multiple regression model was used to examine the

perceived causal link between economic growth and public spending. According to the study, public spending on social and community service had a negative and insignificant effect on the unemployment rate in Nigeria, while capital expenditure on economic services and recurring expenditure on administration had a positive and insignificant effect. Additionally, the study found that recurrent expenditure on administration had a negative and significant impact on private investment in Nigeria, whereas capital expenditure on Economic Services and Social and Community Services had a positive and significant impact. The study found that public spending had a significant impact on Nigeria's GDP, unemployment rate, and private investment from 2000 to 2015.

From 1981 to 2016, Ndubueze et al. (2020) looked at how government social spending affected unemployment in Nigeria. The Ordinary Least Square (OLS) regression method was utilized in the study, which made use of secondary data. Economically, the results showed that recurrent health expenditure (REXPH), recurrent education expenditure (REXPE), and capital health expenditure (CEXPEH) did not meet expectations. In contrast to capital expenditure, government recurrent expenditure has a statistically significant impact on unemployment in Nigeria at the individual level. In addition, the overall statistic demonstrates that Nigeria's unemployment rate has been significantly impacted by recurring and capital expenditures on education and health care.

Between 1980 and 2017, Olawunmi et al. (2019) looked into how education enrollment in Nigeria was affected by disaggregated government spending. For the estimation of the parameters, the Autoregressive Distributed Lag (ARDL) was utilized. The findings indicate that, with the exception of capital expenditure on social services, which had a marginally positive impact, capital expenditure components had a negligible short-term impact on education enrollment. In the short term, every component of the recurrent expenditure model had a negative impact on enrollment in education, but only recurrent expenditure on economic services was significant. Recurrent expenditure had a negative impact on enrollment in education over time, but other factors were positive but insignificant. The components of the capital expenditure model error correction test demonstrate that they do not, in the long run, bring education enrollment back to equilibrium. The result shows that the components bring 0.006% of education enrollment back to equilibrium over time for recurrent expenses.

Kayode et al. (2020) looked into the connection between the rising four components of capital and recurrent expenditure and the standard of living, measured by per capita income (PCI). Social and Community Services (SCS), Economic Services (ECS), Administration (ADM), and Transfer Payments (TRP). The Autoregressive Distributed Lagged (ARDL) Bound Test Approach was used in the study to analyze data from the World Development Indicator and the Central Bank of Nigeria Statistical Bulletin for the years 1981–2018. According to the study, increase government spending on these four capital and recurring components is negative and insignificant.

Using time series data from 1970 to 2015, Egbulonu et al. (2018) examined the connection between public spending and Nigeria's economic expansion. GDP, total expenditure on administration, total expenditure on economic services, total expenditure on social and community services, and total expenditure on transfers are the variables that the study takes into account. The Error Correction Model (ECM) method was used to conduct unit root, cointegration, and granger causality tests on the model. With the exception of total expenditure on economic services (TEES), which had a negative and insignificant relationship with GDP, the analysis revealed that all public expenditure variables had a positive and significant relationship with GDP. However, the joint test revealed that all variables had a positive and significant impact on GDP.

According to Echekoba and Amakor's (2017) investigation of the relationship between government spending on general administration, defense, education, and health and Nigeria's GDP from 1983 to 2016, the country's economic backwardness persists despite the country's ongoing increase in government spending. The purpose of the study was to ascertain how the identified variables related to and affected

Nigeria's economic expansion. The Central Bank of Nigeria (CBN) statistical bulletins from 1983 to 2016 were used to generate the time series data. The multiple regression analysis used the Ordinary Least Square (OLS) estimation method. The outcome demonstrated that spending on general administration has a significant and positive relationship with economic expansion; There is a significant relationship between defense spending and GDP; There is a strong and positive correlation between education spending and economic expansion; Additionally, expenditures on health have a modest but positive effect on GDP.

John (2017) analyzed the of National Government Capital Use on the Nigerian development for the period 1985-2014. The study's primary objective is to investigate the impact of federal government capital expenditures on Nigeria's economic expansion in the areas of administration, economic services, social community services, and transfer. The data for the time series came from the Central Bank of Nigerian Statistical Bulletin. The multiple regression method was used to conduct the analysis. During the study period, the analysis revealed that capital expenditures by the Nigerian federal government in administration, economic services, social community services, and transfers had a significant positive impact on Nigerian economic growth. There was a positive correlation between the Nigerian federal government's capital expenditures in administration and social community services and GDP, whereas there was a negative correlation between the federal government's capital expenditures in economic services and transfers.

Between 1970 and 2013, the relationship between Nigeria's unemployment rate and fiscal policy was examined by Egbulonu and Amadi (2016). The result demonstrated a long-term relationship between the unemployment rate and fiscal policy instruments (Government Expenditure, Government Debt Stock, and Government Tax Revenue) by utilizing a co-integration test and a parsimonious Error Correction Model (ECM). Likewise, there existed a negative connection among consumption and government obligation and joblessness rate in Nigeria while government charge income showed a positive relationship with joblessness rate. In any case, the granger causality test showed that there was no causality running from both of government consumption or joblessness.

In Nigeria, Obi et al. (2016) looked at how much money the government spent on education and how good it was. The study found that public education spending has a positive and significant impact on educational outcomes in Nigeria, employing the Augmented Dickey Fuller (ADF) unit root test and the Ordinary Least Square (OLS) method. It was also discovered that urban population growth and expenditures on public health have a positive effect on educational outcomes but are not significant. The study suggested that the government increase spending on education, which must be targeted in order to achieve the desired results.

It could be observed from the literature review that much empirical attention has not been paid to the relationships between public sector investment and economic development. It is clear that majority of studies (Uket and Christopher, 2018; Ndugbu and others (2018); 2020 Olufemi; and Olanipekun & David (2020)) in this literature reviewed did not address the major issues that this study proposed. As previously stated, economic development indicators that accurately reflect the true nature of development, as suggested by David Seers (1969), were lacking in previous empirical studies. Seers asserted that the inquiries regarding a nation's development pertain to: What is going on with poverty? What is befalling Joblessness? Additionally, what is the state of income inequality? This study addressed the question of what is happening to the literacy rate in addition to capturing the three indicators of development that Seers (1969) identified. Using a disaggregate component for both the dependent and independent variables, this study examined the extent to which public sector investment influence economic development from 1981 to 2021 to fill the gap in the existing body of research.

METHODOLOGY

The Keynesian Theory of Employment Determination, Human Capital Theory, and Endogenous Growth Theory, respectively, served as the theoretical foundation for this study on the effect of Psi on economic

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development (quality of living, literacy rate, and unemployment rate).

The Endogenous growth model serves as the theoretical foundation for the Per Capita Income (a proxy for standard of living) model. The endogenous growth model, contends that innovation and public-private investments in human capital drive economic growth. Barro, 1990; Rebelo, 1991; Romer, 1996; Lucas, 1988. The majority of models confirm that PI has an impact on economic growth, affecting both aggregate supply and demand. Therefore, more economic growth via PI will lead to higher per capita income.

The literacy rate model is base the foundation of human capital theory (HCT). HTC is the idea that education has a significant impact and is essential for increasing a population's potential for production. Human capital theorists contend that a population with access to education is one that is productive. According to this view, education raises the cognitive capacity of workers, improving their production and efficiency. According to the study's goals, the education production function might be analogously stated as follows:

L = f (G) .....(1)

Where L is a social indicator reflecting Literacy outcome measured by primary school enrolment, G is the vector for explanatory variables. The explanatory variables are Psi.

The Keynesian model of employment determination serves as the foundation for the unemployment rate model. According to the Keynesian model, the volume of national aggregate demand affects overall employment. Employers frequently create a lot when overall spending is low because they do not want to have excess inventory. In the event of poor production, fewer staff will be required. The aggregate income will be low if few people are hired, which might lead to a vicious cycle. From the perspective of Keynes, in an effort to understand the depression, GDP is reasonably thought of as being determined by aggregate demand. The components of aggregate demand are consumption, investment, government purchases, and net exports. Let's denote aggregate demand by AD. Thus

$AD = C + I + G + X\text{-}M$..... (2)

Where X stands for exports and M import. In the Keynesian model, aggregate supply, denoted AS, is just equal to the actual value of GDP that we observe. Thus:

$AS = GDP$..... (2)

Setting aggregate supply equal to aggregate demand, we get,

$GDP = C + I + G + X\text{-}M$..... (3)

Generally speaking, government spending can support economic growth. Therefore, through multiplier effects on aggregate demand, a rise in government consumption is likely to result in an increase in employment, profitability, and investment. Government spending thereby boosts overall demand, which in turn causes an increase in output depending on the expenditure multiplier (Chinonye, 2020).

Model Specification

Economic theories are typically the foundation of economic models. Therefore, the specification of economic models requires knowledge of both the facts of the phenomenon being studied and of economic theory (Koutsoyannis, 1977). Three regression models would be used in the estimation. The first regression

model shall seek to examine the impact of PI on standard of living proxy by per capita income. The second model seeks to determine the impact of PI on literacy rate. The third will seek to ascertain the impact of PI on unemployment rate in Nigeria.

Model I: Per Capita Income Model

Following the Endogenous Growth theory and taking a cue of the work of Kayode et al (2020) empirical study, then the functional modification is specified as follows:

$$PCI = f\left(\alpha_0 PIES_t^{\alpha_1},\ PISS_t^{\alpha_2}, PIAD_t^{\alpha_3}\right) \quad 4$$

The econometric form of the model can be expressed as:

$$\ln PCI = \alpha_0 + \alpha_1 \ln PIES + \alpha_2 \ln PISS + \alpha_3 \ln PIAD + \mu_1 \quad 5$$

Model II: Literacy Rate Model

Following the Human Capital theory and adopting model of Olawunmi et al (2019) with some modifications. The functional form is therefore specified as follows:

$$LTR = f\left(\beta_0 PIES_t^{\beta_1},\ PISS_t^{\beta_2}, PIAD_t^{\beta_3}\right) \quad 6$$

Econometrically, the above equation 6 becomes:

$$\ln LTR = \beta_0 + \beta_1 \ln PIES + \beta_2 \ln PISS + \beta_3 \ln PIAD + \mu_2 \quad 7$$

Model III: Unemployment Rate Model

In line with the Keynesian Model of Employment Determination and adopting the empirical model developed by Uket and Christopher (2018) with modifications, the functional form is specified as:

$$UNR = f\left(\kappa_0 PIES_t^{\kappa_1},\ PISS_t^{\kappa_2}, PIAD_t^{\kappa_3}\right) \quad 8$$

The econometric form of the model can be expressed as:

$$\ln UNR = \kappa_0 + \kappa_1 \ln PIES + \kappa_2 \ln PISS + \kappa_3 \ln PIAD + \mu_3 \quad 9$$

Where; Ln = natural logarithm, PCI =Per capita income, LTR = Literacy rate, UNR = Unemployment Rate, PIES = public investment in Economic Services, PISS = public investment in Social Community Services, PIAD = public investment in Administration, and α_0, β_0, & κ_0 represent the constant parameters while α_i, β_i, & κ_i with i= 1, 2, 3 are the slope parameters.

The analysis made used of annual time series data covering the years 1981- 2021 for the variables chosen. The figures were gathered from secondary sources, such as the World Development Indicators Word Bank, the National Bureau of Statistics (NBS), and publications like the statistical bulletin, annual report, and statement of account of the central bank of Nigeria.

Estimation techniques

- **Unit Root Test:** This involves testing for stationarity properties of times series informational indexes utilized for this examination. Checking the request for mix of every variable in the model is utilized.

Thus, to test for the unit root character of the information series, the scientist applied the Expanded

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Dickey Fuller (ADF) test. The ADF test is in this way assessed based on the accompanying conditions:

$$\Delta Y_t = \alpha_0 + \alpha Y_{t-1} + \sum_{i-1}^{n} \alpha_1 \Delta Y_{t-1} + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. \; 10$$

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \alpha Y_{t-1} + \sum_{i-1}^{n} \alpha_1 \Delta Y_{t-1} + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. \; 11$$

Where:

Y_t = A time series, t = Linear time trend, Δ = first difference operator, α_0 = constant term, n = optimum number of lags on the dependent variables and e_t = the error term. However, the difference between (10) and (11) is that the first equation includes just drift and the second equation includes both drift and linear time trend.

- **Model Estimation Technique: Autoregressive Distributed Lag (ARDL) Bounds Testing Approach.**

The ARDL bound testing is an alternate method for doing econometric analysis for determining whether there is a cointegrating (long-run) link between the dependent and independent variables [Pesaram Shin and Smith, 2001]. The main benefits of this strategy over others are its ability to be applied to small data sets, ease of application using OLS, lack of endogeneity issues, simultaneous estimation of long-run and short-run coefficients, and applicability with a combination of both I(1) and I(0) variables (Pesaran, Shin & Smith, 2001 and Sulaiman & Mohammad, 2010). Therefore, it seems sense to use the ARDL for the empirical analysis. Below is a representation of the ARDL's general specification: Where:

$$Y_t = \lambda_{0i} + \sum_{i=1}^{p} \varphi_i Y_{t-1} + \sum_{i=0}^{q} \theta_i X_{t-1} + \sigma ECM_{t-1} + \varepsilon_{it} \qquad 12$$

Y_t = The dependent variable which is a function of its lagged values, current and lagged values of the other exogenous variables. Y_{t-1} = The lagged value of the dependent variable, X_t = Current value of exogenous variables, X_{t-1} = Lagged values of exogenous Variable, p = Optimum lag values of the dependent variable, q = Optimum lag of the independent variables, i = Number of variables in the model, φ_i & θ_i = Coefficient of the variables, λ_{0i} =Constant term in the model and ε_{it} = Error term

RESULTS

The study investigates empirically how Psi affects Nigeria's economic growth. As dependent variables, per capita income, literacy rate, and unemployment rate are used to portray the development indicators in a sequential manner. The data used for the study, the outcomes of several econometric analyses, and the study's findings—on which the conclusions and suggestions will be based—are all specifically presented in this section.

Table 1: Descriptive Statistics Result

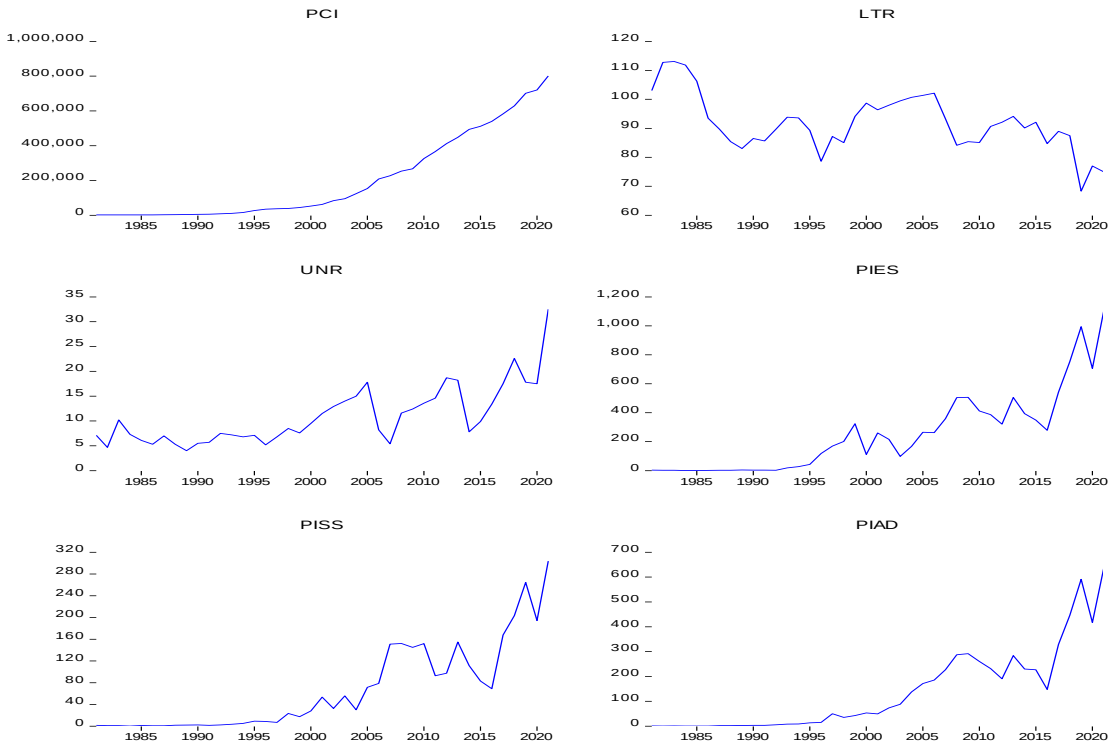
Statistic	PCI	LTR (%)	UNR (%)	PIES	PISS	PIAD
Mean	202784.6	91.88938	10.90976	254.1838	67.81503	140.1836
Median	62036.26	90.67124	8.5	200.8619	30.03252	53.2795
Maximum	800872	113.0788	32.5	1102.465	303.66	635.73

Minimum	1829.048	68.3	4	0.6563	0.2376	0.2627
Std. Dev.	245499.4	9.76308	5.925234	277.4642	80.32646	167.3194
Skewness	1.010758	0.209502	1.424184	1.278093	1.182185	1.293417
Kurtosis	2.665726	3.200768	5.473936	4.32031	3.605677	4.102049
Jarque-Bera	7.172032	0.368782	24.31566	14.1404	10.17669	13.50646
Probability	0.027709	0.831611	0.000005	0.00085	0.006168	0.001167
Sum	8314170	3767.465	447.3	10421.54	2780.416	5747.526
Sum Sq. Dev.	2.41E+12	3812.71	1404.336	3079455	258093.6	1119832
Observations	41	41	41	41	41	41

Source: Author's Computation using E-view 10.

The result in table 1 shows that Per capita income (PCI) has an average, minimum and maximum value of 202784.6, 1829.048 and 800872 Naira respectively. The literacy rate (LTR) recorded an average rate of 91.80%, and a minimum and maximum value of 68.3% and 113.079% respectively. The unemployment rate (UNR) within the sample period average approximately to 10.91%, with a minimum rate of 4% and maximum rate of 32.5%. PI in economic services (PIES) recorded an average value of 254.1838 billion, with a minimum and maximum value of 0.6563 billion and 1102.465 billion Naira respectively. Public investment in social community services have a mean value reported as 67.81509 billion Naira, with a minimum and maximum value of 0.2376 billion and 303.6626 billion Naira respectively. Public investment in administration recorded a mean, minimum and maximum value of 140.1835 billion, 0.2627 billion and 635.7288 billion Naira respectively. The result further shows that all the variables are positively skewed distribution. The Jarque-Bera statistic shows that only poverty rate is normally distributed since its probability value of 0.390974 is greater than 0.05 (5%) significance level. This justified why the variables were log in the model estimation results.

Figure 1: Trend in Per capita income, literacy rate, unemployment rate, public investment in Economic services, Social and community services, and Administrative Services in Nigeria for the period 1981 – 2021



Source: Author's computation extracted from E-view 10

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The figure depicted above illustrates a positive trend in per capita income and the unemployment rate, indicating an increase over time. In contrast, the literacy rate exhibits a negative trend, suggesting a decline. These trends are accompanied by evidence of a corresponding positive increase in public investment in economic services, social and community services, as well as administration.

However, it is noteworthy that the observed increase in public investments does not align with an increase in the literacy rate or a decline in the unemployment rate. This discrepancy is attributed to the presence of institutional and systemic corruption within Nigeria's government system. This corruption has hindered the effective utilization of public investments and their intended positive impact on socio-economic indicators.

Table 2: The Result of Augmented Dickey Fuller (ADF) and Phillip-Perron (PP) Unit Root Test for Stationarity of the Variables at Levels and First Difference.

Unit Root Test	ADF	ADF	ADF	PP	PP	PP
Variables	T-Statistics @ Level	T-Statistics @ 1st Difference	Critical Values @ 5% Sign.	T-Statistics @ Level	T-Statistics @ 1st Difference	Critical Values @ 5% Sign.
LogPCI	1.3043	-3.4518	-2.9389	-1.0181	-3.4046	-2.9389
LogLTR	-1.8981	-7.0951	-2.934	-1.8613	-7.0951	-2.9389
LogUNR	-1.6149	-6.3109	-2.9411	-1.2936	-11.8546	-2.9389
LogPIES	-0.7328	-6.762	-2.939	-0.7055	-6.7636	-2.939
LogPISS	-0.6115	-9.8723	-2.939	-0.4865	-10.2518	-2.939
LogPIAD	-1.1259	-5.0897	-2.9434	-1.0468	-10.5226	-2.939

Source: Author's computation extracted from E-view 10 Result (2022).

The above result in table 2 shows the unit root test for the stationary of the variables after first difference using the conventional 5 percent level of significance for both Augmented Dickey Fuller (ADF) and Phillip-Perron (PP) unit root test. Since the results of the variables were stationary at first differences {I(1)} only, the most appropriate method to confirm long run relationship exist among the variables is the ARDL bounds testing for cointegration.

Table 3: ARDL Bound-Test for Co-integration Results for Unemployment Rate (UNR), Per Capita Income (PCI) and Poverty Rate (POVR).

Models	F-statistics	Parameters	Critical Value Bounds @ 5%	
			I (0)	I (1)
Log(PCI)	5.382309	3	3.38	4.23
Log(LTR)	10.4252	3	3.38	4.23
Log(UNR)	5.424777	3	3.23	4.35

Source: Author's computation extracted from E-view 10 Result (2022).

From the table 3 above, it can be seen that the critical value is exceeded at the 5% level of significance for the estimated F-statistics for per capita income (PCI), literacy rate (LTR), and unemployment rate (UNR). This means that, at the 5% level of significance, the null hypothesis that there is no long term relationship between per capita income (PCI), literacy rate (LTR), and unemployment rate (UNR), and indices of Psi, is rejected. The three models and their independent variables therefore have a long-term equilibrium

connection.

Following the establishment of long-run to co-integrated relationship among the variables, the long run parameters of the variables were examined. The empirical results of the long-run models are presented in tables as follows:

Table 4: Per Capita Income (PCI) ARDL Long-Run Model (2,5,3,5)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PIES)	0.018768	0.080244	0.233888	0.8180
LOG(PISS)	-0.16863	0.172282	-0.978804	0.3422
LOG(PIAD)	0.702295	0.182375	3.850829	0.0014

Source: Author's computation extracted from E-view 10 Result (2022).

The outcome demonstrates the long-term effects of PI on per capita income in the areas of economic services, social services, and administration. Although the projected PI in economic services (PIES) coefficient is positively correlated and in line with theoretical expectations, it has little long-term impact on per capita income. The public investment in social community services (PISS) coefficient is inversely related to per capita income, statistically insignificant, and does not meet long-term theoretical expectations. The public investment in administration (PIAD) has a positive coefficient, is consistent with economic theory, and has a considerable long-term influence on per capita income.

Table 5: Literacy Rate (LTR) ARDL Long-Run Model (1,4,2,3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PIES)	2.87271	2.726772	1.05352	0.3035
LOG(PISS)	-19.42493	7.630698	-2.54563	0.0184
LOG(PIAD)	20.47805	6.843571	2.992304	0.0067

Source: Author's computation extracted from E-view 10 Result (2022).

The outcome demonstrates the long-term effects of public investment on the rate of literacy in economic services, social community services, and administration. The estimated public investment in economic services (PIES) coefficient is positive, appropriately signified, and does not significantly affect the rate of literacy over the long term. Although projected public investment in social community services (PISS) has a negative coefficient and does not align with theoretical expectation, it has a significant long-term impact on literacy rate. According to theoretical predictions, and statistically significantly so over the long term, the coefficient of Public Investment in administration is positively connected to the literacy rate.

Table 6: Unemployment Rate Long-Run ARDL Model (1,1,1,1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PIES)	-12.23832	8.507983	-1.438451	0.1600
LOG(PISS)	-19.22439	11.83412	-1.624489	0.1141
LOG(PIAD)	26.15581	12.40835	2.10792	0.0430

Source: Author's computation extracted from E-view 10 Result (2022).

The outcome demonstrates the long-term effects of public investment on the unemployment rate in economic services, social community services, and administration. The predicted public investment coefficients for economic services (PIES) and social community services (PISS) are inversely related to the unemployment rate, are consistent with theoretical predictions, and have little impact on it over the long term. Although not in accordance with economic theory, the calculated public investment in administration (PIAD) coefficient has a positive coefficient and statistically significantly affected the unemployment rate over the long term.

Table 7: Error Correction Result for Selected Per Capita Income (PCI) ARDL Model

Variable	Coefficient	t-Statistic	Prob.
C	4.436291	5.873975	0.0000
DLOG(PIES)	0.002066	0.056928	0.9553
DLOG(PISS)	-0.022450	-0.578739	0.5708
DLOG(PIAD)	0.117910	2.949141	0.0094
ECM(-1)	-0.556793	-5.799951	0.0000

R^2 = 0.81; R^2-adjusted = 0.67; F-statistic = 5.74(Prob = 0.000) DW- statistic = 2.52

Source: Author's computation extracted from E-view 10 Result (2022).

The outcome demonstrates the short-term effects of public investment on per capita income in economic services, social community services, and administration. The outcome also accounted for the per capita income model's short-run divergence that could happen when calculating the cointegrated equation over the long run. The cointegrating equation (ECM=-0.556793) is correctly negative, smaller than one (1), and statistically significant as needed for dynamic stability. The ECM demonstrates that the divergence from the long-term equilibrium of per capita income adjusts by 55.6793%. According to economic theory, public investment in Economic Services (PIES) has a positive coefficient in the short run and has little impact on per capita income. In contrast to administration, where public investment is aligned with economic theory and has a substantial positive effect on per capita income, the coefficient of public investment in social community services is negatively related to per capita income, is inconsistent with economic theoretical expectation, and has no significant impact on per capita income.

Table 8: Error Correction Representation for Selected Literacy Rate (LTR) ARDL Model

Variable	Coefficient	t-Statistic	Prob.
C	61.47926	7.682632	0.0000
DLOG(PIES)	-2.614851	-1.637013	0.1159
DLOG(PISS)	-2.900671	-1.736846	0.0964
DLOG(PIAD)	4.912329	2.529791	0.0191
ECM (-1)	-0.636012	-7.848787	0.0000

R^2 = 0.74; R^2-adjusted = 0.64; F-statistic = 7.29(Prob = 0.000) DW- statistic = 2.71

Source: Author's computation extracted from E-view 10 Result (2022).

The result in table 8 demonstrates how the literacy rate is affected by the short-term public investment coefficients. As a result, the ECM variable exhibits a negative coefficient that is less than one, statistically

significant, and necessary for dynamic stability. Therefore, the coefficient of -0.636012 denotes an approximate 63.6012% rate of transition from short-run dynamic to long-run equilibrium. The coefficients of public investment demonstrate that, while public investment in administration has a positive significant impact on literacy rate and is consistent with economic theoretical relationship, public investment in economic services and social community services are statistically insignificant and negatively related to literacy rate.

Table 9: Error Correction Representation for Selected ARDL Unemployment Rate Model

Variable	Coefficient	t-Statistic	Prob.
C	22.82786	4.439222	0.0001
DLOG(PIES)	0.890693	0.196586	0.8454
DLOG(PISS)	-4.488632	-1.020714	0.3150
DLOG(PIAD)	3.595582	0.753882	0.4564
ECM (-1)	-0.620758	-4.871694	0.0000

R^2 = 0.41; R^2-adjusted = 0.34; F-statistic = 6.11(Prob = 0.000) DW- statistic = 1.64

Source: Author's computation extracted from E-view 10 Result (2022).

The impact of public investment short run coefficients on the unemployment rate is displayed in Table 9. The unemployment rate (UNR) model's error correction is less than one (1), in the right sign, and statistically significant. The ECM's coefficient is -0.620758. The ECM specifically describes how quickly the departure from the short-run UNR model adjusts by 62.0758% to reach long-run equilibrium. The outcome also shows that all of the public investment coefficients are relatively insignificant, with only the public investment in social community services being compatible with or in accordance with a priori economic expectations.

Post- Estimation Test

Some of the problems associated with time series data like: serial correlation, heteroskedasticity, normality and stability of the model were checked with Breusch-Godfrey Serial Correlation LM test, Heteroskedasticity Breusch-Pagan-Godfrey test, Jarque-Bera Normality test and Ramsey Reset test.

Table 10: Post Estimation Test

Per Capita Income Model			
Test Serial correlation (LM)	F-statistics 1.563481	Obs* R-square 6.572714	Prob. Value 0.2439
Heteroskedasticity Test	0.039952	0.039952	0.8472
Ramsey RESET Test	1.528324		0.23143
Normality Test	Jarque-Berra value= 0.160843		0.922727
Literacy Rate Model			
Serial correlation (LM) Test	F-statistics 2.871310	Obs* R-square 8.253897	Prob. Value 0.0801

Heteroskedasticity Test	3.085146	2.994872	0.0880
Ramsey RESET Test	1.072390		0.3122
Normality Test	Jarque-Berra value= 5.437635		0.065953
Unemployment Rate Model			
Serial correlation (LM)	2.193614	2.643417	0.1487
Heteroskedasticity Test	0.017339	0.018268	0.8960
Ramsey RESET Test	1.302556		0.2625
Normality Test	Jarque-Berra value = 4.494749		0.105878

Source: Author's computation extracted from E-view 10 Result (2022).

Table 10 above indicates that the ARDL equations passed all the second order diagnostic tests and confirmed that the short run and long-run estimated ARDL models have as follows: no autocorrelation of the random term, constant mean and variance of the random term, normally distributed and linearly specified since their respective probability values is greater than 5% level of significance.

DISCUSSION OF FINDINGS

Public investment in economic and administrative services improves per capita income (living standard) in the short run while public investment in social and community services retarded living standard. Public investment in administrative services stimulated literacy level in the short run while public investment in economic, social and community services retarded literacy level. Public investment in social and community services retarded unemployment in the short run while public investment in economic and administrative services fuelled joblessness in Nigeria in the short run.

The result further revealed that public investment in economic and administrative services stimulated per capita income (living standard) while public spending on social and community services retarded living standard in the long run. Public investment in economic and administrative services spurred literacy level while public investment in social and community services retarded literacy rate in the long run in Nigeria. The result also shows that public investment in economic and social services were friendly with job creation while public investment in administrative services stimulated unemployment in Nigeria in the long run.

The mix effects of public investment on economic development in Nigeria could be attributed to misapplication and misappropriation of public funds. Though government spending on capital projects (economic and social services) usually accounted for a large proportion of government budget at all tiers of government in Nigeria, the actual allocation of funds is usually skewed in favour of the administrative services which has less multiplier effect on economic development.

In the living standard model, the ECM revealed that approximately 55.6793% of per capita income is corrected annually towards restoring equilibrium in the long run. Public investment in economic and social services has no significant impact in the short and long term while public investment in administration influence positively on per capita income during the both period. The findings are in line with the work of Kayode et al., (2020).

In the literacy rate model, the ARDL ECM coefficient shows that about 63.6012% of literacy rate is corrected annually towards restoring equilibrium in the long run. While no significant impact of PI in economic services on literacy rate exist in both period, PI in social services impact strongly in the long run on literacy rate. Furthermore, finding from the perspective of public investment in administration

indicates a strong positive influence on literacy rate in the short term and long term of the model. On effect of public investment in social services, the study corroborates with the finding of Olawunmi et al., (2019).

From the unemployment Model, an approximately 45.9540% of unemployment rate is corrected annually towards restoring long run equilibrium relationship. In the short run dynamic, none of the exogenous variables contribute significantly to job creation, while in the long term, the impact of public investment in administration induces a reduction the level of unemployment of rate in Nigeria. However, in line with this finding is the work of Uket and Christopher (2018).

CONCLUSIONS AND RECOMMENDATIONS

The result shows that public investment in economic and administrative services improved living standard while public investment in social and community services retarded living standard in Nigeria both in the short and long run. Public investments in economic and administrative services were also friendly with literacy level in the long run while public investment in economic and social services spurred employment in the long run. From the findings of this study, the study concluded that: public investment in economic and administrative spurred economic development that public investment in social and community services. A long-run relationship existed amongst variables under investigation in Nigeria over the period of this study. The mix effects of public investment on economic development in Nigeria could be attributed to misapplication and misappropriation of public funds. Based on these results and conclusion, the study recommended: an improvement in investment in economic and administrative services in order to create more jobs, improve income level (standard of living) and improve human capital development in Nigeria.

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