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PERFORMANCE VALUATION OF PUBLIC PRIVATE PARTNERSHIP IN REAL ESTATE INVESTMENT IN THE NIGERIAN POSTAL SERVICE

ABSTRACT

The study sought to appraise the performance of Public Private Partnership in the Nigeria Postal Service Real Estate Investment with a view to bringing to bare the effectiveness or otherwise of the partnership. The research adopted purposive sampling with sample size of fifty (50) NIPOST Real Estate under Public Private Partnership spread across the six(6) geographical zones. Adopting correlational research design and structured questionnaire as tool for data collection, the research employed

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Introduction

Real estate investments play vital role in the economic system of any nation and the measurement of its performance provides a basis for the analysis of the state of the market and investment decision making any point in time across levels and sector (Emele 2022). Real estate investment is also crucial indicator in the determination of cost-of-living index (Udoudoh and Bassey, 2022). Also the National Association of Real estate Trust (NAREIT) (2021), and the United States Securities and Exchange Commission (USSEC) (2021) defined real estate investment as the process of investing in properties such as lands, buildings and other structure with anticipation of earning returns. Reilly and Brown (2011) defined investment as the commitment of money or capital for a certain period of time by an investor in anticipation of future returns or streams of income that will reward such investor for the time, risk, and uncertainty of these expected income is generally term investment. Real estate investment therefore is the commitment of funds or capital to purchase, lease, develop, redevelop, re-furbish, maintain or modify real estate of any nature or form in anticipation of expected returns while taking into consideration

both quantitative and qualitative statistical tools to determine the Financial Performance Indicators in NIPOST real estate investment, determined NIPOST real estate investment returns trend Pre-PPP (2003-2012), determined NIPOST real estate investment trend Post-PPP (2014-2023), while T-test was used to compare the return trend between the Pre and Post-PPP return trend. The results revealed a moderate positive trend in NIPOST Pre-PPP real estate investment returns with regression (R=0.523, R-squared = 0.273), while Post-PPP returns showed a strong positive trend with regression (R=0.866, R-squared = 0.751), 75% of variance is explained by time, indicating effective Post-PPP strategies and robust performance. The paired t-test result of extremely small p-values (3.58822E-13) for the two-tailed test indicates a substantial difference between the mean of pre and post PPP (10347872.34 – Pre PPP Vs. 63289893.62 – Post-PPP). The result further revealed a large negative t-test (-10.03966379) and a moderate positive correlation (0.559) indicating a statistically robust performance of Post PPP and a degree of consistency between the Pre and Post –PPP return trend. The overwhelming statistical evidence from the t-test underscores the significant impact of PPP on NIPOST real estate investment. The study concluded that PPP has impacted positively on real estate investment returns of NIPOST and therefore recommends the adoption of PPP by Ministries, Departments and Agencies with underutilized real estate as alternative investment model in order to achieve it investments potential.

Keywords: Performance, Evaluation, Returns, Trend, Investment.

inherent risk and consideration made to mitigate the risk effect. Narrowing to a specific property. Agava *et al.* (2021) state that investing in real estate or property is concerned with the acquisition or disposal of real asset as land and the improvements thereon (buildings).

The exclusive purview of discussion delimited to investment in property based on its peculiarity and unique characteristics (Nwachukwu and Emoh, 2011). Some of is particularly includes its ability to provide hedge against inflation in an ever increasing inflation rates world over, the need for capital outlay, which may not be easily accessed through equity capital, amidst the increasing demand for real estate provision and it nexus with the Gross Domestic Product (GDP) (Udoudoh and Bassey, 2022). In Nigeria, the real estate sector contributed averagely 7.29% between 2010 and 2020 to the country's Gross domestic product (National Bureau of Statistics, 2020). Furthermore, the National Bureau of Statistics (NBS) in its first quarter (Q1) report of 2022 indicated that the GDP of real estate sector (nominal terms) increased by 10.84 percent. This represents a 2.79% increase from that of the first quarter of 2021 while contributing 4.92 percent to the nominal GDP. In nominal terms, real estate services in the third quarter of 2023 grew by 2.83 percent, lower by 6.30% points than the growth rate reported for the same period in 2022 and higher by 0.24% points compared to the preceding quarters (NBC, 2023), on a quarter-on-quarter, the real estate sector growth rate was 16.65%. Real estate investments contributes to a nation macroeconomic stability through savings, employment and investments. It is therefore the seeming catalyst that not only serves as engine that energies every other sector of the economy but gives impetus to the development rating of any environment. Because of the importance of real estate vis-à-vis the bedrock of any economic growth as well as being able to satisfy one of the major human needs (shelter), the demand for real estate product is always on the increase (Ayodele, 2014).

The increasing relevance and contribution of real estate to the country GDP and macroeconomics stability has led to coordinated actions towards effective utilisation of mouribound asset in order to realise its full potential, including government partnership with private sector in areas of finance, expertise, efficient resource management among others, while the dwindling government allocations to MDA's due to dwindling financial resource and increasing Governmental responsibility has made realisation of optimum returns (both financial and non-financial indicates) in public estate elusive. Consequently, the inadequate funding from government has led MDA's to sourcing for alternative funding for their real estate and Nigeria postal service being one of the MDA's.

The Nigerian postal services came into being with the establishment of Nigeria Telecommunications limited (NITEL) on January 1, 1985. However, through the promulgation Nigerian postal Service Act No. 18, 1987 the Nigerian postal services (NIPOST) became an extra-ministerial department under the ministry of communication and digital economy.

The Act provided amongst other functions of NIPOST, the following:

i. To provide and operate facilities for collection, dispatch, and distribution of inland and foreign mail at reasonable cost.
ii. To provide and operate facilities for remittance of money through the money or postal order system.
iii. To provide and operate philatelic services in Nigeria.
iv. To print and provide postage stamps for payment of postal tariff and payment of stamp duties.
v. To represent Nigeria in its relation with other postal administration and other bodies concerned with postal services.

Further, in 1992, the Nigeria postal service Act No. 41, 1992 came to be classifying NIPOST as a government parastatal and added more functions to include;

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i. To explore additional services to boost its revenue
ii. To provide and establish non-postal or similar services.

The Nigeria postal service has seven (7) commercial business units via.

i. Counter
ii. EMS/Parcels
iii. Mails
iv. E-Commerce and Logistics
v. Financial Services
vi. Engineering and technical service
vii. Nigerian Postal Institute

Engineering and technical service unit being the focus of this research
However, with the advent of internet services and social media activities, NIPOST lost more than 60% patronage of her core function resulting in dwindling revenue. In 2016 and in line with amended function – to explore additional services to boost her revenue, the management decided to boost its revenue by exploring the option of harnessing its properties potentials to investment ventures. NIPOST has about 1,589 real estate in choice locations across the all states capital including the Federal Capital Territory and major towns nationwide. This real estate has been undeveloped and the decision to convert these properties to investment assets was however hindered by lack of finances. This therefore led to the introduction of public private partnership (PPP) in other to realize the full potential of her investment asset. It is on this background that the trust of this research is to evaluate the performance of the public private partnership in real estate investment in Nigerian postal service, using both the financial and non-financial indicators.
Key financial performance indicators in real estate investment are annual revenue, capital acquisition and return on investment, while non-financial indicators to performance in real estate investment includes workplace satisfaction, clients' satisfaction, referrals, improved standard and revenue increase Ogunbuyi and Oladokun (2022).
Key performance indicators (KpI) reflect the performance and the progress of your business (Failte, 2013). It may ensure clients' satisfaction and loyalty while adhering to regulatory requirements of ethics, which are essential for a professional business long term existence and success and Oladokun and Ogunbiyi, (2018); Bai and Sarki, continuity of business organization. They are the quantitative and qualitative measures used by corporate executives to examine and review an organization progress against its pre-stated goals (Ogunbiyi and Oladokun, 2022). KPIs is also a management tool for keeping performance records of organization, evaluation included and resource performance (Rirayanaphong and Voorde 2015). KPI'^s such as

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annual revenue and return on investment are financial performance indicator that can be measured quantitatively (Wadongo *et.al,* 2010), while workspace satisfaction, client satisfaction improve standard and revenue increase Ogunbiyi and Oladokun (2022) are non-financial (qualitative) performance indicators that cannot be measured numerically (Kukoteca, 1986). The key financial performance indicators in real estate investment are annual revenue, capital appreciation and return on investment while non-financial indicator to performance in real estate investment includes work place satisfaction, clients' satisfaction, referrals, improve standards and revenue increase (Ogunbuyi and Oladokun, 2022). It appears measuring non-financial indicators might be daunting like workplace and client satisfaction in an organisation such as NIPOST. Moreso, where workplace and client satisfaction in NIPOST are not prioritised, to stay afloat in postal business in this contemporary age of ICT, might become a mirage. This study which carried out a wholistic evaluation of performance of real estate of NIPOST through PPP used annual revenue and return on investment and workplace satisfaction, client satisfaction, referrals and revenue increase as non-financial indicators (Ogunbiyi and Oladokun, 2022).

Research Problem

Investment assets characteristically provide hedge against inflation, secures investors capital, provides income at regular interval and serve as store of wealth. Its security of capital characteristics makes it first line investment option as a rational investor is risk averse. Real estate investments required huge capital outlay while access to equity finance to cater for such investments are increasingly unattainable (Udoudoh and Bassey, 2022). In Nigeria there are ministries, departments and parastatals with huge property portfolios with latent potential unable to develop due to lean finances (both internal generation and Government allocation). Moreso, with the withdrawal of subvention by the government, introduction of self-sustaining policy, and paucity of fund to government, it becomes imperative that MDAs' looks inwardly to harnessing every investment potential in order to meet her financial obligation and generates revenue to the Federation account.

In a bid to put her real estate to optimally generate revenue and contribute to the growth of the Nation's Gross Domestic Product, NIPOST adopted the Public Private Partnership to finance its real estate investment. PPP has been adopted by many countries including Nigeria with the infrastructure regulatory commission as the regulatory agency. Infrastructure Concession and Regulatory Commission (ICRC) was created as a regulatory authority in 2012 with a mandate to develop and issue agency guidelines on PPP policies, processes and procedures (including those for concessions) and to act as a national centre of expertise in PPP (National Policies on Public Private Partnership, 2013). The scope of the federal government of Nigeria on

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PPP are the creation of new infrastructure, and the expansion and refurbishment of existing assets such as:
Power generation plants and transmission/distribution networks, Roads and bridges, Ports, Airports, Railways, Inland container depots and logistic hubs, Gas and Petroleum infrastructure, such as storage depots and distribution pipelines, Water supply, treatment and distribution system, Solid Waste Management, Educational facilities (for example schools, University); Urban transports systems, Housing, Health care facilities, etc (National policies on PPP 2012).
The scope and application therefore suggest investment in support service and social welfare and most research has been on PPP and delivery of support services. However, NIPOST real estate investment is not support service, there is therefore the need to study the operations of PPP on investments asset with profit making baseline. From the foregoing, this research therefore seeks to evaluate the performance of PPP in real estate investment in NIPOST investigating the return trend Pre-PPP comparing with Post PPP return trend thereby determining the efficacy or otherwise of Public Private Partnership in real estate investment in NIPOST. It is intended that this study shall contribute to bringing solution to the problems of real estate investment financing in ministries, department and agencies and also contribute to increasing Gross domestic product (GDP) in the country.

Research Questions

The study was carried out to address the following research questions:

i. What was the Nigerian postal service real estate investment returns trend (pre PPP) 2003-2012?
ii. What is the Nigerian postal service real estate investment returns trend (post PPP) 2014-2023?
iii. What is the effectiveness of public private partnership in real estate investment performance in Nigerian postal services?

Aim and Objectives of the Study

The aim of this research is to appraise the effectiveness of Public Private Partnership in real estate investment in Nigerian postal service with a view to bringing to with a view to developing alternative real estate investment financing options for the real estate investment in the sector.

To achieve this aim, the study objectives are as follows:

i. To determine the Nigerian postal service real estate investment returns trend (Pre-PPP) 2003-2012.
ii. To determine the Nigerian postal service real estate investment returns trend (Post – PPP) 2014-2023.

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iii. To evaluate the effectiveness of public private partnership in Nigeria postal services real estate investment.

Empirical Review

The first documented evaluation of investment portfolio performance was conducted by the Bank Administration Institute (BAI) in the United State of America in 1968 (Finlay and Tyler, 1991). The use of time-weighted rate of return (TWFR) was recommended as the investment performance measurement base by the BAI report. In Nigeria several researched has been conducted on performance evaluation in real estate. Mfam and Kalu (2012) researched on performance evaluation on the return and risk attributes of residential and commercial real estate investments in Calabar, South East Nigeria (SIC). The study considered risk and return of the investments for 17 years period. The findings revealed that commercial properties performing better than residential properties for the period under consideration using the time weighted mean method of analysis. Udoekanem, Ighaho and Sanisu (2014), carried out research on the investment performances of office spaces in the commercial property market in Abuja metropolis. Data were obtained from 2001 to 2012 of rental value from Estate Surveyors and valuation firm in Abuja. It was found that the annual office building rental growth rate in Abuja during the period under study ranged between 8.3 and 11.97% this indicated positive growth in commercial property market in Abuja metropolis. Diala, *et.al* (2019) conducted research on the performance of residential and commercial property investments in Enugu Urban. Capital and rental value data were obtained from firms of Estate Surveyors and Valuers in the study area, the study analysed the data using mean return, standard deviation and coefficient of variation to obtain the risk and returns. The findings concluded that commercial property investment performed better than residential property investment in the area and in the period under study the study findings was in line with that of Udoekanem, *et.al* (2014).

Comparing direct and indirect real estate investments in Lagos, Nigeria, Ekemode and Olaleye (2016) conducted a research and determined the average annual total returns on those investment assets from the rental, capital and equity values collected for the period 1999 to 2014. The study found that property stocks outperformed in smooth direct real estate on a risk-return basis. Considering performance evaluation between private property investment in Abuja and Investing in property shares to find out if the two real investment options are better substitutes or not, Adeogun *et.al* (2017) carried out comparative performance studies. The study analyzed the data collected and concluded that investing in property shares was riskier than investing in private real estate. Moreso, the study revealed a strong positive correlation between property shares and private real estate investment. The findings revealed that the two real estate investment were good substitutes.

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Ekemode and Oyewole (2016) researched on the comparative assessment of the performance and diversification benefits of real property and other selected stocks using monthly capital returns of real estate stocks. The share value of UACN property development company 7up, Berger paints, Evans Pharmaceutical, Flour Mill, Guarantee Trust Bank Nigeria Breweries, Total petroleum, Okomu Oil, Nestle and Dulius Berger representing different sub-sector in the Nigerian stock exchange. Prices of each of the asset were gotten from price list published daily from 2004 to 2014 (10years). The price where converted into capital returns using holding period return analysis. The study reveals that real estate stock returns are stable and favourable and compete favourably with other investments option in Nigeria stock market base on risk-return analysis. These studies are justifiable as it present various possibilities and probabilities in investment decision and options available for decision making.

However, despite the plethora of studies on performance measurement/evaluation not much has been carried out on public private partnerships in real estate investment. The study by Umeh and Okonu (2018) was the closest where he examined the contribution of real estate to the performance of the Nigerian pension fund mixed asset portfolio to provide decision-making guidance for institutional investors and portfolio managers. Data were collected from both quarterly and annual reports of Nigerian pension commission from 2007 to 2017 the performance of different classes of asset as well as returns were gotten using Markowitz performance measurement. The finding revealed a week negative returns correlation from real estate with that from cash, private equity, other assets, ordinary shares as well as foreign investment. It further revealed a low position return correlation with returns on government securities. Real estate investment performance evaluation is a key parameter and indices for appraising real estate investments with regards to their maturity, returns, risk and potentials investors. The amount of funds invested in real estate is an indication of the level of maturity of that real estate and therefore, real estate investment performance analysis and measurement should be based on the right and appropriate methodology Diewert and Shinizu (2013).

Olayiwola *et al.* (2020) researched on Public Private Partnership in Nigerian Teaching Hospitals: Potential and Challenges with the aim of determining the current operation status as well as explore potential benefits and challenges on the use of PPP model in radiology department of selected teaching hospitals within three(3) South Western states of Nigeria-Lagos, Ogun and Oyo. The study adopted qualitative method and found that almost all radiological equipment can be acquired through PPP and that PPP brought about improved service delivery and residence training. Izuwaah (2019) worked on unlocking the potentials in the Housing market through Public Private Partnership Investment the study did not specified the methodology but however, concluded by postulating the imperative of a combination of hybrid approach in housing delivery. Madu and Kenigua (2021), focused on the role of Public Private

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Partnership in infrastructure development in Nigeria using the analytical/description method. It findings revealed huge infrastructural deficit and the imperative of adopting PPP for infrastructural delivering. Most available literature on Public Private Partnership is centered on infrastructural and housing delivery without recourse to PPP on Real Estate Investment returns, providing a gap in literature which this study is poised to full. Closest literature on Public Private Partnership in real estate investment returns is that of Ibem and Adowo (2012), which centered on Prospects and Challenges of Public Private Partnership (PPPs) in housing provision in Ogun State South West Nigeria. The study found that much attention of PPP has been on the provision of housing for high income earners, while the challenges of insufficient number of housing unit and housing affordability has not been addressed Ahmed and Sipan (2020), studied critical success factors of Public Private Partnership for affordable housing provision in Nigeria. The study adopted qualitative method and its findings, revealed good governance, availability of financial markets, sound economic policies, consistency in monetary and commitment of Public and Private sectors as critical factors to successful Public Private Partnership in provision of affordable housing. Furthermore, Owotemu, *et.al.* (2022), appraised the effect of Public Private Partnership on delivery of affordable housing in Nigeria. The survey research design was adopted, the study revealed that for Public Private Partnership to prosper and achieve stated objective, there must be established metrics for success, ability to quantity and tract accomplishments, spot and address emerging problems, while also finding out that there is significant impact of management contract on delivery of affordable housing in Nigeria.

Prior research on performance evaluation in real estate investment has been centered on returns risk evaluation between different types of real estate (residential, commercial, industrial, educational etc).

Also, study on Public Private Partnership has been focused on PPP and housing delivering and infrastructural provision at the forefront. No studies have been carried out highlighting the Nexus between Public Private Partnership and Real Estate Investment Return which the researcher is aware. This study therefore is to fill the gap and provide literature for further studies on the performance of Public Private Partnership in Real Estate Investment Returns.

Research Design

In research, particularly academic study, the major determinant of research design is the problem the researcher is aiming to solve. Research design refers to different components of the study in a coherent and logical way, thereby ensuring proper and efficient address of the research problem (William, 2006). Dabarel *et.al* (2014), carried out research on performance evaluation of investments in Real Estate and selected Financial Assets in Nigeria using survey design.

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The study showed investment in direct property provided the highest return as well as the highest risk in the investment portfolio. Similar study on performance measurement by Olagbenga and Oluwafemi (2020) on Portfolio management and Bank performance in Nigeria where Ex-post facto and survey research design were employed. The study found that Ivan risk analysis, Ivan risk diversification and loan risk monitoring positively and significantly affect bank performance in Nigeria. The choice of the research design may have as a result of representative study. However, correlational research design investigates relationships between variables without the researcher controlling or manipulating any of them (Bhandari, 2021). A correlation reflects the strength and or direction of relationship between two or more variables which can be either positive or negative. Correlation research is ideal for gathering data quickly from natural settings that helps one generalize study findings to real-life situation in an extremely valid way. This research shall adopt correlational design. The choice of this research design is informed by the fact that it involves gathering data to investigate the relationship between two variables – public private partnership in NIPOST and real estate investment returns.

Sample Frame

The sample design includes the following:

A sample frame of fifty(50) completed and operational Public Private Partnership real estate in NIPOST were selected by purposive sampling from among the sixty four(64) PPP in NIPOST for the research. The study covered a period of 10 years pre-PPP between 2003 to 2012 and 10 years Post PPP starting from 2014 to 2023. The reason for the adoption of purposive sampling is not to randomly select unit from a population to create a sample with the intention of making generalization but to focus on the particular characteristic of a population that are of interest (which is real estate investment returns in NIPOST), which will facilitate answers to the research questions.

Sample size: Taro Yamane (1967) technique was used to determine the sample size for a finite population. The research carried out pilot survey and obtained the number of staff in E&TS directorate including those in state offices to determine the staff population. There are forty (40) staff of Engineering and Technical Service (E&TS) the Directorate incharge of PPP in the corporate headquarters, while one hundred and eight (108) staff comprising three(3) each of E & TS Directorate in each state of the Federation. The formula for Taro Yamane (1967).

is n = $\frac{N}{1+N^{C^1}}$

Where:

N = Population size

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n = Sample size

e = Significance coefficient at 95% (0.05)

Using the formula, inputted data will be

$$n = \frac{148}{1+148(0.05)^2}$$

$$n = \frac{148}{1+148(0.0025)}$$

$$n = \frac{148}{1.37}$$

n = 107

From the calculation, 107 respondents were analyzed.

-

Considering the size of the target population, the entire population is to be considered. The study is based on 95 percent confidence level. Therefore, the level of significance for the study shall be determined as follows:

-

$$\text{Level of significance} = \frac{100-\ confidence\ level}{100}$$

$$= \frac{100-95}{100} = \frac{5}{100} = 0.005$$

Result and Discussion of findings

The study obtained real estate investment return trend of NIPOST Pre and Post PPP era by geopolitical zones for ease of assessment as shown in table 1.

Pre-PPP and Post-PPP Real estate Investment Returns Trend Exponential Functions

Zone	Pre	Post
North West	$512,861.38(1.12)^x + e$	$24,547,089.16(1.12)^x + e$
North Central	$851,138.04(1.02)^x + e$	$11,748,975.55(1.2.88)^x + e$
North East	$2,089,296.13(1.04)^x + e$	$301,995,172.00(1.01)^x + e$
South West	$9,549,925.86(1.02)^x + e$	$3,235,936,569.00(1.14)^x + e$
South South	$3,548,133.89(1.07)^x + e$	$15,488,166.19(1.26)^x + e$
South East	$12,882,495.52(1.02)^x + e$	$11,220,184.54(1.12)^x + e$

Source: Researcher's Computation (2025)

The pre-PPP real estate investment returns trend in the exponential functions are - $512,861.38(1.12)^x + e$, $851,138.04(1.02)^x + e$, $2,089,296.13(1.04)^x + e$, $9,549,925.86(1.02)^x + e$, $3,548,133.89(1.07)^x + e$ and $12,882,495.52(1.02)^x + e$ and in the post-PPP real estate investment returns trend in the exponential functions are - $24,547,089.16(1.12)^x + e$, $11,748,975.55(1.2.88)^x + e$, $301,995,172.00(1.01)^x + e$, $3,235,936,569.00(1.14)^x + e$, $15,488,166.19(1.26)^x + e$ and $11,220,184.54(1.12)^x + e$.

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Table 2: Pre-PPP and Post-PPP Real estate Investment Returns Trend

Zone	Pre	Post
North West	9,295,000.00	399,050,000.00
North Central	196,625,000.00	654,800,000.00
North East	27,630,000.00	282,695,000.00
South West	110,405,000.00	753,430,000.00
South South	54,010,000.00	526,500,000.00
South East	146,380,000.00	415,150,000.00

Source: Researcher's Computation (2025)

The average value of each zone (pre and post) was 1,021,612.94, 952,567.23, 4,161,849.69, 10,687,980.15, 5,285,301.70 and 14,417,688.50; 48,807,470.30, 160,871,669,993,234.00, 319,437,085.00, 7,246,826,244.50, 70,225,708.73 and 42,657,333.69.

The study further compare the trend graphically by combining the analysis of the varying geopolitical zones to produce a single trend for pre-PPP and Post PPP as shown in figure 1 and 2 respectively.

Pre-PPP

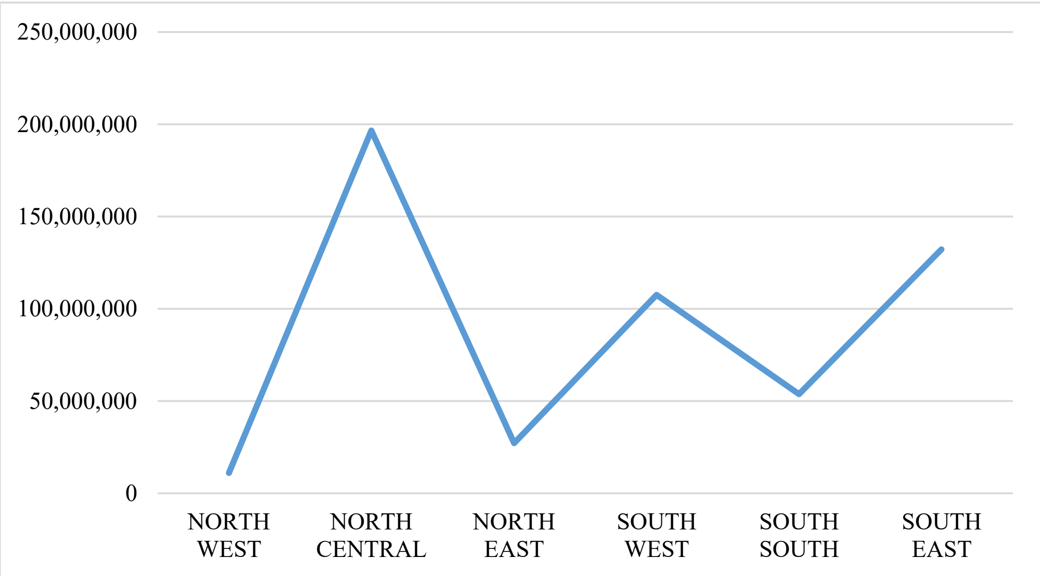

Fig. 1 Combine zones real estate investment return trend of pre-PPP, 2003-2012

Prior to the implementation of Public-Private Partnerships (PPP), NIPOST's real estate investments demonstrated a varied returns trend across Nigeria's geopolitical zones. The North Central zone exhibited the highest returns, bringing in ₦196,625,000. This was significantly higher than other regions, suggesting a concentration of valuable real estate assets or more profitable ventures in that area during the pre-PPP period. The South East followed with ₦132,200,000, indicating another strong performing region. The South West also contributed substantially with ₦107,480,000. In contrast, the North West recorded the lowest returns at ₦10,960,000, suggesting limited or less profitable real estate holdings there. The South South and North East zones generated ₦53,790,000 and ₦27,155,000 respectively, falling in the middle range. This historical data is crucial for the objective of comparing pre-PPP and post-PPP returns trends, as it established the baseline performance for each region, highlighting which areas were already yielding significant returns and which were underperforming before the introduction of PPPs.

Post-PPP

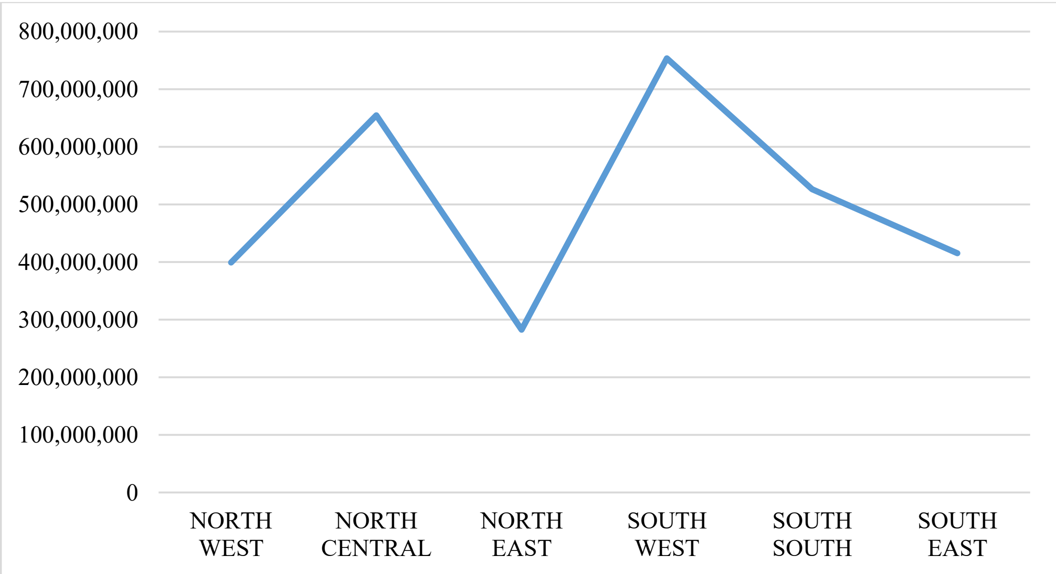

Fig. 2 Combine zones real estate investment return trend of Post-PPP, 2014-2022

In the post-PPP era, NIPOST's real estate investments exhibited varied returns across Nigeria's geopolitical zones. The South West zone recorded the highest returns at 753,430,000, indicating a strong performance in that region. Following closely was the North Central zone, which generated 654,800,000 in returns. The South South zone also showed substantial performance with 526,500,000, while the South East zone brought in 415,150,000. The North West zone achieved 399,050,000, and the North East zone recorded the lowest returns at 282,695,000. These figures, when compared to pre-PPP data, would be crucial in determining whether the Public-Private Partnership model positively or negatively impacted the returns trend of NIPOST's real estate investments, revealing if the partnerships succeeded in enhancing the financial performance of these assets.

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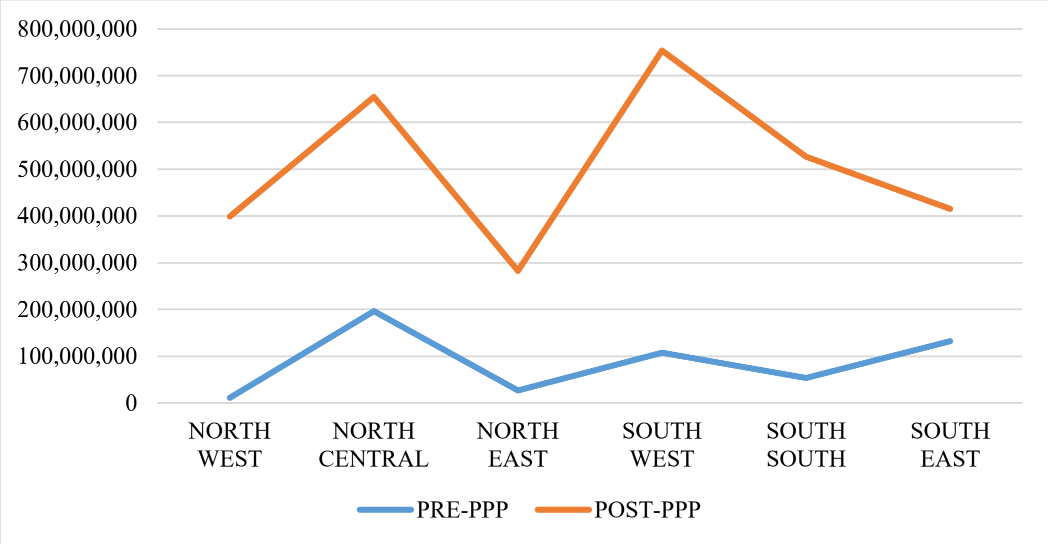

Fig. 3 Pre and Post PPP real estate investment return trend combined

The trend clearly illustrated a significant positive shift in the returns trend of NIPOST real estate investments across all geopolitical zones when comparing the periods pre- and post-Public-Private Partnership (PPP) implementation. Prior to the PPP, total returns were considerably lower, with the North West generating ₦10,960,000, North Central ₦196,625,000, North East ₦27,155,000, South West ₦107,480,000, South South ₦53,790,000, and South East ₦132,200,000. In stark contrast, the post-PPP era saw a substantial increase in returns across the board. The North West's returns surged to ₦399,050,000, North Central to ₦654,800,000, North East to ₦282,695,000, South West to ₦753,430,000, South South to ₦526,500,000, and South East to ₦415,150,000. This dramatic uplift in returns across all regions post-PPP strongly implies that the partnership initiative was highly effective in enhancing the profitability and overall financial performance of NIPOST's real estate investments, directly addressing the objective of comparing the returns trend and indicating a positive impact of the PPP model.

Using Table 2, a t-test was undertaken to test if there is a significant difference between the pre-PPP returns and the post-PPP returns

Table 3: t-Test Value of Pre-PPP and Post-PPP Real estate Investment Returns Trend

t-Test: Paired Two Sample for Means

	46800000	*57000000*
Mean	10347872.34	63289893.62
Variance	1.02706E+14	1.66387E+15
Observations	47	47
Pearson Correlation	0.555917336	
Hypothesized Mean Difference	0	

Df	46
t Stat	-10.03966379
P(T<=t) one-tail	1.79411E-13
t Critical one-tail	1.678660414
P(T<=t) two-tail	3.58822E-13
t Critical two-tail	2.012895599

Source: Researcher's Computation (2025).

The paired t-test results offer compelling evidence for a statistically significant difference in the performance indicator evaluated in the context of Public-Private Partnerships (PPPs) in real estate investment within the Nigerian Postal Service. The extremely small p-values (3.58822E-13 for the two-tailed test) indicate that the substantial difference observed between the means of the two groups (10347872.34 vs. 63289893.62) is highly unlikely due to random chance. The large negative t-statistic (-10.03966379) further reinforces this conclusion, suggesting a considerable and statistically robust divergence in performance. Given that the mean of the second group is significantly higher, these findings imply that the implementation of PPPs is associated with a notable improvement in the measured performance metric. While the moderate positive correlation (0.5559) between the paired observations suggests a degree of consistency in performance trends, the overwhelming statistical evidence from the t-test underscores the significant impact of PPPs on real estate investment outcomes within the Nigerian Postal Service.

Conclusion

The following conclusions were made, namely;

The exponential growth analysis of Pre-PPP investments revealed an inverse relationship between asset size and growth rate, with smaller properties (₦512,861) achieving 12% growth compared to larger assets (₦9.5 million) at just 2% indicting that NIPOST's Pre-PPP strategy favoured higher-risk, higher-return investments in smaller properties.

Post-PPP implementation showed dramatic improvements in growth rates (up to 26% in some assets) compared to Pre-PPP performance, conclusively demonstrating that the PPP model successfully enhanced NIPOST's real estate investment returns, though with varying degrees of success across different asset classes.

The extremely statistically significant difference ($p = 2.354 \times 10^{9}$) between Pre and Post-PPP performance provides irrefutable quantitative evidence that PPP adoption generated substantially better financial outcomes for NIPOST's real estate investments, validating the partnership model's effectiveness.

While PPP implementation improved resource management (mean 1.8020) and brought private sector expertise (mean 1.3366), the chronically low fund availability

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(mean 1.1980) emerges as the critical limiting factor, indicating that the future PPP depends on solving NIPOST's underlying financing challenges.

Recommendations

The following recommendations are drawn from the findings of this study:

i. Performance is real estate investments are both quantitative and qualitative and should adopt financial and financial indicators in evaluating performance of PPP in real estate investment returns.
ii. Performance appraisal of PPP in real estate investment returns in NIPOST and similar MDA's should be evaluated for a reasonable period not less than ten years before the implementation of PPP and ten years Post PPP to be able to ascertain the actual performance of PPP.
iii. Ministries, Departments, and Agencies with underutilized real estate should adopt the public private partnership model in order to achieve maximally, the real estate investment returns.

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