

Effect of Inflation on Returns of Commercial Real Estate in South-South Nigeria

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Abstract

Commercial real estate investment returns have now taken on a greater significance in the development of the economy of any nation. The aim of this study was to evaluate the effects of inflation on the rate of returns in the south-south geopolitical zone of Nigeria. In order to attain the stated aim, the following objectives were set; to examine the inflationary trend in the study area; to determine the rate of returns of commercial properties in the study area and to establish a relationship between the inflation rate and rate of returns of commercial properties in the study area. The research employed the survey design. The independent variable was the inflation rate while the dependent variable was the rate of returns. Both descriptive and inferential statistics were employed in the analysis of the data, with the help of the SPSS and Microsoft Excel software. Primary data for this research was obtained from Estate Surveyors and Valuers in the study area through questionnaire survey. The data comprising rental and capital values of commercial real estate was subsequently translated to returns using the Holding Period Returns formula. Similarly, secondary data about inflation rates for the period between 2016 and 2024 were collected from the Central Bank of Nigeria. The Consumer Price Index and the 364-day Treasury Bills were used as proxies for the actual and expected inflations, while their differences were used as the unexpected inflation. The research adopted the stratified random sampling technique to divide the South-South geopolitical zone of Nigeria into six (6) strata: each stratum representing each state and the data used for the research were analysed using simple linear regression model. The study revealed that the highest average capital value of commercial real estate in the south-south geopolitical zone was ₦43,538,515; while the highest average rental value of ₦1,500,000. It was also found out that the highest average rate of return of commercial real estate investment in the study area was 15.59% and the least average rate of return was 11.08%. The study revealed that there was a significant relationship between actual inflation rates and rate of returns of commercial real estate in the study area with R-squared value of 64% and F-ratio of 12.51334 but there were no significant relationships between returns and expected inflation as well as unexpected returns.

Keywords: Inflation Rate, Returns, Commercial Real Estate, Property Investment Performance, Nigeria.

Introduction

Inflation has been defined as a persistent rise in the general price level of goods and services in a country over a long period of time. It can be described as a decline in the value of money;

or an increase in the quantity of money in circulation, leading to a decline in the purchasing power of existing money. Inflation in Nigeria has a significant negative impact on the economy, affecting consumers, businesses, and the overall economic growth. In the developing economies, inflation is mostly in 2-digit figure (Nwude, 2012). For instance, in the south-south geopolitical zone which is the concern of the present study, inflation rate averaged 12.34% from 1996 until 2014, reaching an all-time high of 47.56% in the beginning year of 1996 and a record low of 2.49% in the beginning year of 2000 (Trading Economics, 2014). According to Ekpo *et al.*, (2025), there is risk that the inflation rate in Nigeria is outstripping the rate of return on property. Ekpo and Udoh, (2021) observed this decline in the returns of real estate and attributed it to inflation. Investors like to carry out investments in assets which brings about high returns and low risk. Therefore, it is important for investors to evaluate the hedging abilities of any class of investment against inflation before embarking on such an investment.

Inflation is the gradual loss of purchasing power that is reflected in broad rise in prices of goods and services over time. Inflation is observed in terms of its components of consumer price index. The consumer price index measures the overall change in consumer prices based on a representative basket of goods and services over time. Ekpo and Jeremiah (2022) probed that inflation is seen to be one of the factors that has an adverse effect on commercial property investment. On the other hand, real estate investment returns measure the profit that an investor makes. Rate of returns are investment returns expressed as a ratio relating to how much was gained. Ekpo and Udoh, (2021), referred to return as the primary motivating force that drives investment. Returns represents the reward for undertaking commercial real estate investment over a period of time expressed as a percentage (Diala and Ekpo, 2018; Ekpo and Udoh, 2021). Returns are measured as a ratio of the rental value to the capital value using the holding period return formula. Inflation and returns of commercial real estate investment are interdependent. That is to say that inflation has implications on returns of commercial real estate investment. Dabara, 2015; Ekpo, *et al.*, 2022 and several authors have attested to the existence of undeniable link between inflation and commercial real estate investment. Therefore, there is a recent advocacy for real estate investors to recognize the role of inflation on real estate investment. (Dabara, 2014) recommended that sound investment strategy demands that investment performance measurement should be made on a regular basis and that includes assessing the effect of inflation of commercial real estate investment. It is therefore important for commercial property investors and developers to be equipped with reliable and current pieces of information regarding inflation as it relates to commercial property investment. This would guide prospective investors in taking informed investment decision. It is against this that the researchers are examining the effects of inflation on the rate of returns of commercial real estate in the south-south geopolitical region of Nigeria.

Statement of the Problem

In the South-South geopolitical zone of Nigeria, commercial property investors consider good rate of returns and other factors such as demand of the commercial property, average income of the investor, population and crime rate before deciding to carry out commercial real estate investments. Consequently, commercial real estate investment decisions are rarely made based on the inflation rate of the economy. It is worthy of note that the study of the inflation and its effects on commercial real estate investment is very vital to the economic development of Nigeria. The present position concerning commercial real estate investment in the South-South geopolitical zone of Nigeria is that real estate returns have adversely been affected by inflation and have remained key issues that practicing Estate Surveyors and Valuers are yet to fully exploit. Several authors have noted that the investigations of the relationship between inflation and commercial real estate returns are scarce. Several authors have all discussed on the issue and their literature discussions have thrown up conflicting viewpoints and a few previous studies undertaken have come up with mixed results, which may be attributed to the different economic conditions prevalent in their respective study area. As a result of this, the researchers were challenged to carry out this research work to further determine the impact of inflation on commercial real estate investment decision-making in the South-South geopolitical region of Nigeria. In assessment of the above, this research is aimed at ascertaining the inflation hedging abilities of commercial real estate investment in the south-south geopolitical zone of Nigeria. To achieve the stated aim, the following objectives were developed:

Objectives of the study

- i. To examine the average capital and average rental values in the study area.
- ii. To assess the return pattern of commercial real estate investment in the study area.
- iii. To determine the inflation-hedging potentials of commercial real estate investment in the study area.

Hypotheses

The following hypotheses were stated:

H₀₁: There is no significant relationship between actual inflation rate and average rate of returns of commercial real estate investment in south-south geopolitical zone of Nigeria.

H₀₂: There is no significant relationship between expected inflation rate and average rate of returns of commercial real estate investment in south-south geopolitical zone of Nigeria.

H₀₃: There is no significant relationship between unexpected inflation rate and average rate of returns of commercial real estate investment in south-south geopolitical zone of Nigeria.

Review of Related Literature

Conceptual Review

Inflation or the actual inflation is the rate of increase in prices over a given period (Umeh and Oluwasore, 2015); while expected inflation refers to changes in price levels that are expected as at the starting time of an asset, or when the asset is appraised (Appraisal Institute, 2008). The difference between the actual inflation and expected inflation is referred to as unexpected inflation. The most commonly used measure of actual inflation is the Consumer Price Index. In situations where inflation rates of some individual assets are higher than the Consumer Price Index, it suggests that those assets are hedges against inflation. The Fama and Schwert (1977) while studying the inflation hedging abilities of some assets such as common stocks, government bonds, treasury bills, labour income and private residential real estate during the period between 1953 and 1971 in the United States of America exemplified how the Fisher's (1930) proposal could be used to test the inflation-hedging characteristics of investment assets. The authors split actual inflation rate into its expected and unexpected components. The Fisher (1930) equation was adjusted such that the nominal return of an asset is a function of real return, expected and unexpected inflation. The authors used Consumer Price Index (CPI) as a proxy for actual inflation; while nominal rate of United States 90-day Treasury bills was employed as a proxy for expected inflation. Ordinary Least Square regression model was used to test the inflation hedging capacities of the assets. Returns on private residential real estate were the only asset that completely hedged against both expected and unexpected inflation; while labour income hedged partially against expected and unexpected inflation. In addition, returns on government debt instruments exhibited a complete hedge against expected inflation; while for common stocks they were perverse hedges against expected and unexpected inflation. Ekpo and Bassey (2023) examined the relationship between residential real estate investment returns and the expected inflation of the Nigerian economy, with a view to determining the inflation-hedging characteristics in Phase 2 and Phase 3, Abuja, Nigeria. In order to achieve the stated aim, the following objectives were set: to determine the returns of residential real estate in districts of Phase 2 and Phase 3, Abuja, to examine the expected inflationary trend in the study area and to investigate the inflation-hedging characteristics of residential real estate investment in the study area. This research work adopted the cross-sectional survey type of design to obtain data from Estate Surveyors and Valuers in the study area through questionnaire survey. This was subsequently translated to returns using the Holding Period Returns. Similarly, secondary data with respect to the 91-day Treasury bill rates (used as proxy for expected inflation) for the period between 2012 and 2021 were also collected from the Central Bank of Nigeria. The two groups of data obtained for the study were subjected to unit root test using the rule of thumb method and the Ordinary Least Square Regression analysis was conducted between the variables. The study revealed that throughout the study period, the actual inflation had been in the double-digit range with the exception of 2016, 2020 and 2021 and it indicated a downward sloping characteristic in the inflationary trend analysis with a low R^2 value of 0.4524. The study also

found out that the returns in the districts of Phase 2 in Abuja indicated a complete hedge against inflation with a beta value of 1.00223, while that of Phase 3 districts returned a beta value of -0.14439. The study concluded that the residential property investments in Phase 2 of the Federal Capital Territory, Abuja, has the ability to hedge against inflation, while that of Phase 3 district has perverse inflation-hedging potentials.

In a study carried out in the Northern part of Nigeria, Dabara (2015) investigated the inflation-hedging performance of commercial real estate in Gombe metropolis. In line with earlier studies such as Ogunba, (2013), the author used the Nigerian CPI as a proxy for actual inflation, the Nigerian 90-day Treasury bill rates as a proxy for expected inflation and the difference between the two was computed to derive the unexpected inflation rates for the study period. The methodology adopted involved the determination of the stationarity status of the data sets used as well as the Ordinary Least Square regression models. Findings from this study showed that investments in commercial real estate in the study area provide a partial hedge vis-à-vis actual inflation component; a complete hedge vis-à-vis the expected inflation component and a perverse hedge vis-à-vis the unexpected inflation component.

Previous research works in the field of inflation-hedging in both developed and developing economies included the examination of the inflation-hedging performance of: direct investments in commercial real estate, indirect investments in commercial real estate, investments in stocks, bonds, equities, commodities, gold, and shares (Fama and Schwert 1977; Bello, 2005; Oluwasegun and Dabara, 2013 and Ekpo *et al*, 2024]. The results of these studies have shown a varying pattern, indicating that there is no consensus on the hedging ability of various asset classes. Specifically, the inflation-hedging performance of real estate was particularly observed to have divergent results across different inflation components (actual, expected and unexpected). Odu, 2011; Oluwasegun and Dabara, 2013; Ogunba *et al*, 2013 and Ekpo *et al*, 2024 asserted that lack of consensus on the findings of various researchers with respect to inflation hedging performance of real estate could be attributed to varying timeframes, fluctuating economic conditions and differences in microeconomic and macroeconomic indicators among other issues. However, despite the divergent results, opinions and findings of researchers on real estate performance as a hedge against inflation: there are compelling reasons to invest in real estate, especially in the South-South geopolitical zone of Nigeria. One of such reasons is tied to its performance characteristics. The risk-return characteristics of real estate, specifically commercial property investments, provides a buffer through annuitized cash flow, this will equip shrewd and well-informed investors in the real estate cycle to be able to deliver attractive returns from such investments by taking advantage of appropriate performance strategy to be adopted for a particular portfolio at a particular time.

Commercial properties cover a wide range of shops (including those that offer retail and wholesale services like shopping centres) and office properties including those that provide

banking as well as those that provide executive office space and structures (Babawale, 2021). The following are examples of commercial properties:

- (a) **Shops:** In Nigeria and in the south-south geopolitical zone of Nigeria in particular, shop covers a wide range of property from one room shop to strips of shops along major routes and to the large departmental stores which are usually purpose-built and owner-occupied. Rental values of properties are primarily demand determined; a demand derived from the demand from the goods or services provided by the property. Therefore, in their purchase decision, investors in shop property are primarily concerned with future rental growth.
- (b) **Office properties:** Office premises range from the converted space within a predominantly residential area to purpose-designed office block within a Central Business District (CBD) with its elaborate services and management. Office market analysis involves both the macro and micro location analyses. Macro location analysis encompasses the overall metropolitan matrix while the micro location analysis focuses on the traffic condition around the subject property and accessibility. An office building's overall productivity depends on the successful integration of diverse components (physical and nonphysical) into the office product Babawale (2021). He went further to explain the office buildings are classified into three categories: Class A, B or C, according to their construction quality, facilities condition and quality of occupying tenants. Class A buildings are relatively new structures that are well located in a major commercial nucleus showcasing the state of art construction materials, workmanship and design. Class B office buildings are also of high quality construction similarly located within prime commercial nucleus while class C office buildings are older (up to 30 years old), and have, therefore, suffer a higher degree of both physical depreciation and functional obsolescence than class B. Generally, class C office accommodation commands lower rents for class B accommodation.

Inflation is a gradual loss of purchasing power that is reflected in a broad rise in prices for goods and services over time. The inflation rate is calculated as the average price increase of a basket of selected goods and services over one year. High inflation means that prices are increasing quickly, while low inflation means that prices are growing more slowly. Inflation can be contrasted with deflation, which occurs when prices decline and purchasing power increases. An increase in the money supply is the root of inflation, though this can play out through different mechanisms in the economy. The causes of inflation may include supply bottlenecks and shortages of key goods, which can push prices to rise. When inflation occurs, money loses its purchasing power. This can occur across any sector or throughout an entire economy. The expectation of inflation itself can further sustain the devaluation of money. Inflation measures how quickly the prices of goods and services are rising. Inflation is classified into three types: demand-pull inflation, cost-push inflation, and built-in inflation. The most commonly used inflation indexes are the Consumer Price Index and the Wholesale Price Index. Inflation can be viewed positively or negatively

depending on the individual viewpoint and rate of change. Inflation can affect the economy in several ways. For example, if inflation causes a nation's currency to decline, this can benefit exporters by making their goods more affordable when priced in the currency of foreign nations.

Concept of Investment Returns

Investment has been viewed by many scholars including Emoh (2004) and Bello (2007) as the commitment of a given sum of money at the present time in expectation of recovering a large sum in the future. Bello (2007) adds that investment involves risk, speculation, prediction, uncertainties and forecast. And the fact that it is an opportunity cost since the alternative present consumption is foregone. Diala and Ekpo (2018) posited that investment is the giving up of a capital sum now in exchange for benefits to be derived in the future. The authors further defined investment as an act of laying out money now in return for future financial rewards. All of them look at returns on investment to accrue in financial form. Investment involves opportunity cost as the present consumption is forgone for the expected benefits. In total agreement with older scholars, an investment is the art of committing a given sum of money at the present time in expectation of returns in the future. It is the foregoing of a fixed sum as an alternative for some future benefits. Such benefits may be in the form of economic attainment such as income flow and/or capital gain. One of the ways of calculating the Return on investment on a real estate investment is using the holding period return formula.

Study Area

The study area for this research is the South-South geopolitical zone of Nigeria. According to Afa (2011), the South-South geopolitical zone is one of the six geopolitical zones of Nigeria. It comprises six (6) states namely: Akwa Ibom, Bayelsa, Cross River, Delta, Edo and River States. The South-South zone of Nigeria is strategically located at the point where Y tail of the River Niger joins the Atlantic Ocean through the Gulf of Guinea between Ndoni and Aboh, descending eastwards to the Qua Iboe River at Eket and westwards to the Benin River with its base at Atlantic Coast (NBS, 2010; 2013). It is geographically located within Latitude $4^{\circ}57.5358'N$ and Longitude $8^{\circ}19.617'E$ at Calabar (Eastern Delta) and Latitude $6^{\circ}20.289'N$ and Longitude $5^{\circ}37.545'E$ at Benin (Western Delta). The property market in the South-South geopolitical zone of Nigeria may be divided into local, national and international. As there is no formal organization bringing buyers and sellers together, the South-South geopolitical zone has enough Estate Surveyors and Valuers engaged professionally in the transactions between a willing buyer and a willing seller as well as give professional advice on the marketing of real estate. There is also the presence of private real estate investors in the study area, who participate fully in the activities of the property market by purchasing the commercial properties as pure investments and those who purchase for occupation and use. However, the South-South zone property market

comprises mostly the commercial as well as residential and industrial real estate markets. (Udoudoh, 2016).

Research Methods

In this study, the cross-sectional survey type of design was used. The dependent variable of the study was the average rate of return of commercial real estate investment while actual, expected and unexpected inflation rates served as the independent variables. Although there are different commercial properties types in the selected areas of the south-south geopolitical zone, this study is however, limited commercial properties to bungalows used as (offices and shop properties) developed within a 500m² land area comprising not more than 5 standard rooms. This research employed the random sampling technique to identify firms of Estate Surveyors and Valuers as well as commercial properties properly appraised and managed by the Estate Surveyors and Valuers under study, in the South-South geopolitical zone of Nigeria. Stratified sampling technique was used to select the towns for the quantitative data collection. In determining the sample size that is adequate for this study, the Bartlett *et al*'s (2001) model was used. The research sought to define sample of commercial property investment to ensure at least 95% level of confidence. The sample size of 55 was obtained based on the total population of 111 Estate Surveyors and Valuers practicing in the study area. The South-South geopolitical zone of Nigeria was divided into six (6) strata: each stratum representing each state. The primary source of data collection was through a structured questionnaire and copies of the questionnaire was administered to the Principal Partners of each Valuation Firm sampled. The secondary sources were obtained from documents which included journal articles, conference papers, textbooks and websites which include that of Central Bank of Nigeria. The methodology involves the analysis of data collected from the respondents. Descriptive method such as the use of tables, graph, and percentages were employed to analyze the data obtained through the use of questionnaire. In addition, the study made use of inferential statistics such as Analysis of Variance and Simple Linear Regression Analysis to investigate the study. The Microsoft Excel Package was used to aid in the statistical analysis. The field survey for the collection of data for this research was undertaken between the Months of February, 2024 and December 2024. The analysis was based on actual, expected and unexpected inflation rates as well as average rate of returns computed from the capital and rental values obtained between 2016 and 2024. The rental and capital values of investment in commercial properties were all computed accordingly to obtain their respective holding period returns using Equation 1.

The Holding Period Return is expressed as;

$$H_{PR} = \frac{H_1 - H_0 + a_1}{H_0} \quad \dots \text{Equation 1}$$

Where:

H_{PR} = Holding Period Return

H_0 = Capital value of commercial property at the beginning

H_1 = Capital value of commercial property at the end

a_i = Net Income of direct property received during the holding period

From the foregoing, the holding period returns of the commercial property investment were obtained. The secondary data on expected inflation required for the study was obtained from the records of the Central Bank of Nigeria (CBN) in line with previous studies such as Sing and Low, (2000), Ogunba *et al* (2013), Dabara *et al.*, (2014), Dabara (2014), Dabara (2015) Ekpo and Udoh, (2021) and Ekpo *et al.*, (2022). Furthermore, trend lines were used to graphically display trends in the inflation and returns data series used for this study to help analyze problem of future predictions. The R^2 value was used to determine the reliability of the trend and the accuracy of the forecast or predictions made. A trend line is said to be most accurate when its R-Squared value is at or near 1. Similarly, linear regression equations were generated for prediction of future returns. These are the equations of a straight line that best fits the points on the chart. The method used to determine these equations involves finding the line that produces the least value for the sum of the squares of the vertical differences between data points and the line. The equation is in the form:

$$y = mx + b \quad \dots \text{Equation 2}$$

where: y is the dependent variable (returns), m is the slope of the line, which equals the change in the y value divided by the change in the x value; x is the independent variable (year in this case); and b is the y -axis intercept of the line.

Data Presentation and Analysis

In this section, analysis of the data collected were made in order to accomplish the set objectives of the research. In doing so, the linear regression model was used in the analysis. The dependent variable of the study is the average rate of return of commercial real estate investment while actual inflation rates served as the independent variable. The profile of the respondents was presented in Table 1.

Table 1: Respondents Profile

Profile	Item	Frequency	Percentage (%)
Educational Qualification	Doctor of Philosophy (PhD)	6	10.91
	Master of Science (MSc)	10	18.18
	Bachelor of Science (BSc)	26	47.27
	Higher National Diploma (HND)	13	23.64
	Total	55	100
Professional Qualification	FNIVS	9	16.36
	ANIVS/RSV	15	27.27
	ANIVS	31	56.36
	Total	55	100
	Above 20 years	2	3.64
	15 – 19 years	3	5.45

Years of Professional Experience	10 – 14 years	7	12.73
	5 – 9 years	13	23.64
	1 – 4 years	30	54.55
	Total	55	100

Source: Researchers' field survey, 2024.

Table 1 presents the profile of respondents who supplied primary data on average rate of returns of commercial real estate in terms of their professional qualifications, Educational qualifications and years of professional practice as Estate Surveyors and Valuers. This was carried out in order to ascertain the validity and consistency of the data collected for the study. The respondents in terms of their professional qualification were FNIVS which constituted 16.36%. ANIVS/RSV and ANIVS constituted 27.27 and 56.36% respectively. All the respondents were either polytechnic or university graduates with different categories of degree. The PhD holders, HND (Higher National Diploma) holders and MSc holders constituted 10.91%, 23.64% and 18.18% respectively while the BSc holders constituted 47.27% and formed the highest rate. This shows that all the respondents had good academic qualifications in the respective firms, which give more credence to the reliability of the data provided. In the same vein, all the respondents are in different membership cadre of the Nigerian Institution of Estate Surveyors and Valuers (NIESV), and they have professional experience between 1 and 20 years. This showed that all the respondents are academically and professionally qualified to supply reliable data for this study.

Analysis of the Average Capital and Average Rental Values in the Study Area

In order to answer objective 1, the average capital and average rental values of commercial real estate in the study area was obtained from the records of Estate Surveyors and presented in Table 2.

Table 2: Average capital value, rental value and returns of commercial properties in the study area.

Year	Capital Value (N)	Rental Value (N)	Rate of Returns (%)
2016	17,000,000	800,000	14.02
2017	17,758,600	1,000,000	14.20
2018	23,117,369	1,000,000	15.12
2019	23,858,492	1,200,000	15.59
2020	24,055,777	1,200,000	14.97
2021	30,844,242	1,300,000	14.80
2022	31,319,896	1,300,000	14.13
2023	31,593,185	1,400,000	11.08
2024	43,538,515	1,400,000	13.23

Source: Field Survey and Analysis, 2025

Table 2 showed the average capital and rental values obtained from the records of Estate Surveyors and Valuers in the south-south geopolitical zone of Nigeria. From the table, it was seen that the highest average capital value of commercial real estate in the zone was ₦43,538,515 observed in 2024, while the lowest capital value was ₦17,000,000 observed in 2016. Similarly, the average lowest rental value was ₦800,000 observed in 2016, while the highest average rental value was obtained in 2024. The table also showed the rate of returns of commercial properties in the study area calculated using the holding period return formula given in equation 1, with the highest rate being 15.59% and the lowest of 13.23%.

Analysis of the Average Rate of Return of Commercial Properties in the Study Area

In order to answer objective 2, this section presents the analysis of the rate of returns of sampled commercial properties in the study area from 2016 to 2024 and results presented in Table 3.

Table 3: Average Rate of returns of commercial properties in south-south geopolitical zone of Nigeria

Years	Rate of returns (%)						Average
	Rivers	Akwa Ibom	Edo	Cross River	Bayelsa	Delta	
2016	17.11	9.57	11.32	15.24	15.64	15.24	14.02
2017	18.97	10.23	10.89	14.25	16.62	14.25	14.20
2018	19.1	14.56	13.26	15.42	14.2	14.2	15.12
2019	19.17	16.2	14.14	16.68	13.68	13.68	15.59
2020	19.91	11.24	12.59	15.45	15.32	15.32	14.97
2021	19.52	10.75	11	14.26	16.64	16.64	14.80
2022	20.39	12.3	10.2	10.65	15.61	15.61	14.13
2023	20.41	8.69	9.46	7.45	10.23	10.23	11.08
2024	21.45	9.49	11.78	9.94	12.25	14.47	13.23

Source: Field survey, 2025

Table 3 showed the average rate of returns of commercial properties in the study area from 2016 to 2024. The table showed the highest average rate of return of commercial real estate investment of 15.59% in 2019 and the least average rate of return of 11.08%, which was obtained in 2023. The table revealed an inconsistent increase in the rate of returns of commercial properties in the study area.

Analysis of the Inflation-Hedging Potentials of Commercial Real Estate Investment in the Study Area

In this section, an attempt was made in the establishment of a relationship between inflation rates and average rate of return of commercial real estate investments in the south-south geopolitical zone of Nigeria. The actual, expected and unexpected inflation rates as well as the average rates of return were presented in Table 4.

Table 4: Actual Inflation Rates in Nigeria

Year	Actual Inflation (%)	Expected Inflation (%)	Unexpected Inflation (%)	Average Return (%)
2016	15.68	21.00	-5.32	14.02
2017	16.52	15.57	0.95	14.2
2018	12.09	16.88	-4.79	15.12
2019	11.40	7.30	4.10	15.59
2020	13.25	0.048	13.202	14.97
2021	16.95	4.90	12.05	14.8
2022	18.85	8.49	10.36	14.13
2023	28.92	12.24	16.68	11.08
2024	34.80	20.65	14.15	13.23

Source: National Bureau of Statistics and Researchers' analysis, 2025.

Table 4 presented the actual, expected and the unexpected inflation rates in Nigeria between 2016 and 2024. the actual inflation rates had been in the double-digit range throughout the period between 2016 and 2024. The expected inflation rates were observed to have decreased in value consistently from 2016 until 2021, before a sharp increase between 2022 to 2024. The table also showed that the unexpected inflation rate, which was calculated as the difference between the actual inflation and the expected inflation had negative values in 2016 and 2018, but returned the highest value of 16.68 in 2023. In order to establish a relationship between the inflation rates and the average returns of commercial real estate investment in the study area, a linear regression analysis was carried out, and presented below, between the independent and the dependent variables.

Inferential Statistics (Test of Hypotheses)

Relative Contribution of Actual Inflation to Variability in Returns of Commercial Real Estate Investment in South-South Geopolitical zone of Nigeria: In determining the contribution of actual inflation (independent variable) to variability in returns of commercial real estate (dependent variable), the linear regression model was used and the output of the regression shown in Table 5.

Table 5: Summary Statistics of Regression of Actual Inflation and Rate of Returns

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	85.8726	19.06005	4.505371	0.00278	40.80274	130.9425
Average Return	-4.75376	1.34385	-3.53742	0.009503	-7.93146	-1.57606

Source: Researchers' analysis, 2025

The output in Table 5 shows the result of fitting a linear regression model to describe the relationship between actual inflation rate and average rate of returns of commercial real estate investment in the study area. The equation of the fitted model is:

$$\text{Rate of return} = 85.8726 - 4.75376 (\text{actual inflation rate}) \quad \text{..... Equation 3}$$

The Analysis of Variance of the relationship between actual inflation and average returns of commercial real estate investment in south-south geopolitical zone of Nigeria indicates the F-ratio, R^2 value and p-value. The p-value is 0.009503 as shown in Table 5, which is less than 0.05

Table 6: ANOVA of Relationship between Returns and Actual Inflation

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	325.3155	325.3155	12.51334	0.009503
Residual	7	181.9824	25.99749		
<i>Regression Statistics</i>					
Multiple R		0.800794			
R Square		0.641271			
Adjusted R Square		0.590024			
Standard Error		5.098774			

Source: Researchers' analysis, 2025

Since the p-value in the ANOVA table (Table 6) is less than 0.05, there is a statistically significant relationship between actual inflation and commercial real estate investment returns in the south-south geopolitical zone of Nigeria at the 95% confidence level. The R-square statistics indicated that the model as fitted explains 64.13% of the variability in returns of commercial real estate investment in south-south geopolitical zone of Nigeria. The adjusted R-squared statistic, which is more suitable for comparing models is 59%. Since the p-value is less than 0.05, the independent variable (actual inflation) is statistically significant at the 95% confidence level.

Relative Contribution of Expected Inflation to Variability in Returns of Commercial Real Estate Investment in South-South Geopolitical zone of Nigeria: In determining the contribution of expected inflation (independent variable) to variability in returns of commercial real estate (dependent variable), the linear regression model was also used and the output of the regression shown in Table 7.

Table 7: Summary statistics of regression of expected inflation and rate of returns

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	37.4978	27.278	1.37466	0.21163	-27.004	102
Average Return	-1.8122	1.92326	-0.9423	0.37744	-6.36	2.7356

Source: Researchers' analysis, 2025

The output in Table 7 shows the result of fitting a linear regression model to describe the relationship between expected inflation rate and average rate of returns of commercial real estate investment in the study area. The equation of the fitted model is:

Rate of return = $37.4978 - 1.8122$ (expected inflation rate) Equation 4

The Analysis of Variance of the relationship between the expected inflation and average returns of commercial real estate investment in south-south geopolitical zone of Nigeria indicates the F-ratio, R^2 value and p-value. The p-value is 0.37744 as shown in Table 8, which is more than 0.05

Table 8: ANOVA of relationship between returns and expected inflation

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	47.2759	47.2759	0.88784	0.37744
Residual	7	372.739	53.2485		
Total	8	420.015			
<i>Regression Statistics</i>					
Multiple R		0.3355			
R Square		0.11256			
Adjusted R Square		-0.0142			
Standard Error		7.29716			

Source: Researchers' analysis, 2025

Since the p-value in the ANOVA table (Table 8) is not less than 0.05, therefore, there is no statistically significant relationship between expected inflation and commercial real estate investment returns in the south-south geopolitical zone of Nigeria at the 95% confidence level. The R-square statistics indicated that the model as fitted explains 11.26% of the variability in returns of commercial real estate investment in south-south geopolitical zone of Nigeria. Since the p-value is more than 0.05, the independent variable (expected inflation) is not statistically significant at the 95% confidence level.

Relative Contribution of Unexpected Inflation to Variability in Returns of Commercial Real Estate Investment in South-South Geopolitical zone of Nigeria: In determining the contribution of unexpected inflation (independent variable) to variability in returns of commercial real estate (dependent variable), the linear regression model was also used and the output of the regression shown in Table 9

Table 9: Summary Statistics of regression of unexpected inflation and rate of return

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	48.37475	29.33336	1.649138	0.143108	-20.9876	117.7371
Average Return	-2.94157	2.068181	-1.4223	0.197934	-7.83204	1.948905

Source: Researchers' analysis, 2025

The output in Table 9 shows the result of fitting a linear regression model to describe the relationship between the unexpected inflation rate and average rate of returns of commercial real estate investment in the study area. The equation of the fitted model is:

Rate of return = $48.37475 - 2.94157$ (unexpected inflation rate) Equation 5

The Analysis of Variance of the relationship between unexpected inflation and average returns of commercial real estate investment in south-south geopolitical zone of Nigeria was carried out and results indicated the F-ratio, R^2 value and p-value. The p-value is 0.197934 as shown in Table 10, which is more than 0.05

Table 10: ANOVA of relationship between returns and unexpected inflation

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	124.5624	124.5624	2.022927	0.197934
Residual	7	431.0275	61.57536		
<i>Regression Statistics</i>					
Multiple R		0.473496			
R Square		0.224199			
Adjusted R Square		0.11337			
Standard Error		7.846997			

Source: Researchers' analysis, 2025

Since the p-value in the ANOVA table (Table 10) is not less than 0.05, therefore, there is no statistically significant relationship between unexpected inflation and commercial real estate investment returns in the south-south geopolitical zone of Nigeria at the 95% confidence level. The R-square statistics indicated that the model as fitted explains 22.42% of the variability in returns of commercial real estate investment in south-south geopolitical zone of Nigeria. Therefore, since the p-value is more than 0.05, the independent variable (unexpected inflation) is not statistically significant at the 95% confidence level.

Discussion of Findings

The study revealed that the highest average capital value of commercial real estate (shops/offices of not more than 5 rooms, developed within 500m² of land) in the south-south geopolitical zone was ₦43,538,515 observed in 2024, while the lowest capital value was ₦17,000,000 observed in 2016. Similarly, the average lowest rental value was ₦800,000 obtained in 2016, while the highest average rental value was obtained in 2024. It was also found out that the highest average rate of return of commercial real estate investment in the study area was 15.59% in 2019 and the least average rate of return of 11.08%, was obtained in 2023. This indicated an inconsistent rise in the rate of returns of commercial real estate in the study area. Linear regression was performed between the independent variables and the dependent variables. The study revealed that there was a significant relationship between actual inflation rates and rate of returns of commercial real estate in the study area with an R-squared value of 64% and F-ratio of 12.51334. The fitting of a linear regression model to describe the relationship between the dependent and independent variables as shown in equation 3, can be used in forecasting the rate of returns in the study

area. For instance, with an inflation rate of 15% in the future, the predicted rate of return would be $85.8726 - 4.75376 (15) = 14.57\%$. However, the study revealed that there were no significant relationships between returns and expected inflation as well as unexpected returns. The possible reasons for the lack of significant relationship for expected and unexpected inflation may be due to the astronomical rise in inflation rate in Nigeria. The implication of this is that it will erode the returns of real estate investment in Nigeria and in the south-south in particular. Generally, the commercial real estate investment returns do not have any hedge against inflation during the study period. The findings are in congruent with the past researches carried out by Ekpo *et al.*, (2025), Ekpo and Bassey, (2023) as well as Umeh and Oluwasore, (2015); that actual inflation has a significant relationship with returns of real estate investments.

Conclusion

This research was conducted to evaluate the effects of inflation on the average rate of returns of commercial real estate in the south-south geopolitical zone of Nigeria. Similarly, the lowest rental value was ₦800,000 observed in 2016. The study further showed the rate of returns of the sampled commercial properties which were offices in the six states constituting the south-south geopolitical zone of Nigeria which the average rate of return was computed from. The study further revealed the analysis of variance of the relationship between inflation rate and the rate of return of commercial property in each of the states in the study area. It was found out that there was a statistically significant relationship between inflation rate and rate of returns of commercial real estate investment with a p-value of 0.009503 which is less than 0.05 at 95% confidence interval. This implies a statistically significant relationship between inflation rate and rate of return of commercial real estate in the study area. Therefore, the null hypothesis stating that there is no significant relationship between actual inflation rate and rate of returns of commercial real estate investment in south-south geopolitical zone of Nigeria was rejected. On the contrary, the study revealed that there was no significant relationship between expected and unexpected inflation rates. The study concluded that there was a statistically significant relationship between inflation and returns of commercial real estate investment in the south-south geopolitical zone of Nigeria.

Recommendations

The following recommendations are made based on the research findings:

- Government should introduce subsidies on building materials and also bring out policies that will curb the persistent rise in the prices of building materials in the study area.
- Commercial real estate investors should intensify and upgrade commercial real estate developments in the south-south geopolitical zone of Nigeria in order to bring about consistent increase in returns

- Prospective commercial property investors in the study area should take measures to embark upon the development of commercial real estate investments with good inflation-hedging capabilities.

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