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INFLATION HEDGING CHARACTERISTICS OF REAL ESTATE HOSTEL INVESTMENT IN NIGERIA

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ABSTRACT

Purpose: This study examines the inflation hedging capability of hostel investments around the Federal University of Technology Akure (FUTA), south gate, Akure. The study sought to undertake the economic analysis of inflation hedging of the return generated from hostel investment in Federal University of Technology Akure, South gate.
Design/methodology/approach: The study area is characterised with purely private hostel developments. The target population for the study comprises of the registered Estate Surveying and valuation firms in Akure. The survey questionnaire was administered on the twenty-five practicing registered Estate Surveying and Valuation firms in the study areas; out of this, fifteen were retrieved and used for analysis. The secondary data on inflation required for the study were obtained from the records of the Nigerian Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN). The data were analyzed descriptively through sample mean, and standard deviation, and inferentially through Ordinary Least Square Regression analysis. Phillip Perron unit root test used to test the stationarity of the data shows the data sets were a combination of a different order of integrations.
Findings: The result of the inflation hedging capability indicates that hostel investment is not an all-time hedge against inflation as it is traditionally perceived to be, there are instances where they provided a perverse hedge or partial hedge against inflation. It is expected that the findings in this study will guide investors that desire to invest in hostel. The study recommends that the Nigerian government should put relevant policies in place that will bring down the inflation rate to a single digit and also maintain a single-digit inflation rate to check volatility.
Originality/value: The study is the first to examine the inflation hedging capability of hostel real estate investment in an African emerging real estate market. This makes the study unique in nature.

Keywords: Inflation; hedging; real estate; investment; hostel.

1. INTRODUCTION

Inflation is an economic term that nation uses to guide various economic policies and programs (Osagie, Gambo, Anyakora & Idowu 2012). An inflation hedge is provided when the return on investment increases at a commensurate or higher rate more than the

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general price levels (Glascock, Feng, Fan & Bao 2005); this is the desire of investors. Every investor motive is to invest in an investment that hedge against inflation (through the rate of return of the investment) and protect the real value of the investment (Martin 2010). One quality of holding an investment is to provide an investment with a positive real rate of return during the period's inflation (Ruben, Bond & Webb 1989). However, there are investment options that are available to investors, the investment may be real or financial, and the real estate investment is the main focus of this study. Real estate investment is associated with positive return ratio, known with low-risk characteristics Chandra (2008), also hedging of unexpected inflation and delivery of streams of cash flow to the investors (Fabozzi 2001). Chen & Mills (2006) maintained that real estate is an attractive investment with the benefits accrued from total returns derived from rental and capital components. These benefit accrued from real estate returns over other investment options have enhanced its attractiveness to investors across the globe.

Real estate has an age-long standing reputation being perceived as a hedge against inflation. This connotes that it has the power to protect the investors' fund against the eroding power of inflation (Odu 2011). However, Kloosterman (2009) opined that assets which do not perform well as inflation hedges will exhibit negative return patterns that are not correlated with inflation. Therefore, the capability of an asset class in providing inflation hedge is measured by its capability to reduce the loss of purchasing power resulting from inflation (Wurtzebach, et al., 1991).

Different studies have been done in the past to ascertain the inflation hedging potentials of real estate investment. Voigtlander and Demary (2009) observed that real estate investment did not provide a hedge against inflation, Quingping (2008) shows that Taiwan real estate provided a hedge against inflation, Bello (2005) found out that real estate is not an all-time hedge against inflation, Amidu and Aluko (2006) and Odu (2011) reveals that real estate is a hedge against inflation. However, these studies show varying conclusion as regards the inflation hedging capability. In view, of the above, no known study investigated inflation hedging capability of a hostel as an example of real estate investment.

The increase in students' enrolment in tertiary institutions is growing per annum; however, the provision of new purpose-built students' hostel is limited. The provision of student hostels for all student on campus was no longer feasible. This, in turn, creates opportunities for the development of students' hostel in many cities in Nigeria by private sector/ individual investors. Hostel investment as a subsidiary of real estate investment has been perceived as a hedge against inflation. There is a need to investigate whether it really provides a hedge or not against the background of economic volatility and recession that has characterized the economy. Inflation is an integral part of the economy which affects the real estate of which hostel investment is not left out. Fraundorf (2012) is of the view that prospective investors wisely invest in assets that possess a certain degree of inflation-hedging potentials against eroding the purchasing power of the investors' funds, in certain prevailing inflationary trends. It is against this background that this study seeks to undertake the economic analysis of inflation hedging of the return generated from hostel investment in Federal University of Technology Akure, South gate. The study area is characterised with purely private hostel developments.

2. REVIEW OF RELATED LITERATURE

Inflation is considered as a purely monetary phenomenon that leads to a general increase in the price level of goods. Inflation can reduce people`s purchasing power and erode their wealth in the long run (Zhe, 2010). The inflation components used for studies are generally divided into three different components: the actual, expected and unexpected inflation. The most commonly used measure of actual inflation is the Consumer Price Index - CPI (Fama & Schwert, 1977; Zhe, 2010). 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 90days Treasury bill rates are used as a proxy to measure the expected inflation (Zhou & Clements 2010; Zhe, 2010; Park & Bang 2012, Dabara, 2015). Unexpected Inflation is a period when the inflation rate is higher than economists' anticipation. The unexpected inflation is the difference between actual inflation and expected inflation (Kloosterman, 2009; Odu, 2011; Arnason & Persson 2012). These three (3) components of inflation are observed to react differently to asset returns in an inflationary environment.

Fama and Schwert (1977) studied inflation hedging abilities of some assets in the United States of America such as common stocks, government bonds, treasury bills, labour income and private residential real estate during the period between 1953 and 1971. The study adopted Fisher's (1930) proposal to test the inflation hedging characteristics of investment assets. The Consumer Price Index (CPI) was used as a proxy for actual inflation; while the nominal rate of United States 90-day Treasury bills was used as a proxy for expected inflation. Ordinary Least Square regression model was used to test the inflation hedging capability of the assets returns. The study revealed that private residential real estate returns exhibited complete hedge against expected and unexpected inflation; while labour income exhibited partial hedge against expected and unexpected inflation. Hence, returns on government debt instruments exhibited a complete hedge against expected inflation; common stocks exhibited perverse hedge against expected and unexpected inflation.

Sing and Low (2000) empirically tested the inflation hedging characteristics of both property and non-property assets in Singapore. The returns data employed in this study comprised the Urban Redevelopment Authority's (URA) all-property price index. The authors used CPI as a benchmark to measure actual inflation, for the expected inflation, the lagged period 3-month Treasury bill was used as a direct proxy. The unexpected inflation was determined as the difference between the actual inflation and expected inflation. The Pearson rank correlation coefficients between the asset returns and the inflation rate were determined. Findings from the study showed that property provides a better hedge against inflation than non-property assets. The industrial property was found to be the most effective hedge against both expected and unexpected inflation, whereas shop property type offered only significant hedge against the expected inflation. In the sub-period analyses involving four different 5- yearly periods, it was found that more assets established significant hedges against both expected and unexpected inflation in the sub-period from 1993 to 1998. When the tests were extended to examine the inflation hedging characteristics of assets in the high and low inflation environments, residential property was found to be a good hedge against unexpected inflation in the low inflation period, whereas industrial property showed a better hedge against inflations during the high inflation period. In summary, property type provides a better inflation hedge against inflation than non-property assets. This finding is in agreement with the finding of (Li, 2001), that the abilities of real estate to hedge against inflation are often higher in the case of high inflation, but they diminish and lose the significance or even disappear in the case of low inflation.

Wang, Lee and Nguyen (2008) investigated the inflation hedging ability of Taiwan housing investment. Consumer Price Index was used as a proxy for actual inflation while the return data was obtained from Taiwanese monthly housing returns. The study was done within the period between 1991 and 2006. The study used inflation as the threshold variable to create the nonlinear vector correction model that divides the inflation rates into a high and low regime. The Augmented Dickey Fuller (ADF) unit root test and Johensen cointegration analysis were used in the analysis of the returns and inflation data. The study revealed that when inflation rates are higher than 0.83% threshold value, housing returns were able to hedge against inflation, and, otherwise, they were unable.

Voigtländer and Demary (2009) studied the inflation hedging of real estate properties comparison between direct and equity investment. The study employed Panel Data Augmented Fama and Schwert Regression. The dataset includes the total return indices for homes, offices and retail property and covers the following countries Canada, USA, Finland, France, Germany, Ireland, the Netherlands, Sweden and the United Kingdom were used. The result reveals that investment in equities and real estate equities do not protect the investor against inflation. Also, the study found out that direct investment performs better in protecting against inflation. However, different degrees of inflation protection for homes, offices and retail real estate exists. The correlation between returns and inflation is negative and statistically significant.

Zhou and Clements (2010) investigated the inflation hedging ability of real estate between 2000 and 2008. The variable used to estimate the return on direct real estate investment was the real estate price index from Chinese economic database. For inflation rates the Chinese CPI was used as a proxy, ARIMA was used as a proxy for the expected inflation and the unexpected inflation was the difference between actual and expected inflation. Before analysing the relationship of Chinese real estate prices and inflation, the stationarity of the variables was first examined using the unit root test, Engle and Granger's cointegration was used to test the hedging ability of the Chinese real estate. The study found that Chinese real estate was not an effective hedge against actual and unexpected inflation.

Amonhaemanon, Ceuster, Annaeert and Long (2013) examine whether real estate in Thailand can hedge against ex post and ex ante inflation during the 1987-2011. The Fama and Schwert (1977)'s framework was used to analyse the data. The consumer price index (CPI) in Thailand was used as a proxy for actual inflation. The actual inflation rate was decomposed into expected and unexpected inflation components in order to give a better way to defining the hedge against inflation. The study finds that real estate returns have positive relation with both ex post and unexpected inflation over the period, even though the statistical evidence does not strongly support this. Furthermore, after separating the time series into sub-periods to control for the possible structural changes in the economy, the study found that the relationship between inflation and real estate returns change under various economic environments.

Fleischmann, Fritz and Sebastian (2019) studied Real Estate, Stocks, and Bonds as a Deflation Hedge using Japan and Hong Kong as a case study. Asset returns for these product between 1986 and 2009 was examine using Fama and Schwert (1977) Regression model and Auto Regressive Integrated Moving Average (ARIMA) model to explore whether they offer a deflation hedge. The data for Japan was derived from the real estate institute in Japan while the Hong Kong data was derived from the Rating and Valuation Department in Hong Kong. The study found out that rents and real estate prices are closely linked to consumer prices. The study reveals that Hong Kong, estimated coefficients of expected changes βi are positive for all investments and range from 0.08 to 1.597. While the unexpected changes γi the estimated coefficients range from -0.199 to 1.756. The

lowest coefficients are on stocks (βi = 0.008 and γi = -0.199), but they are not statistically significant at any level. Residential real estate offers the most strongly significant hedge against expected inflation while industrial properties offers a complete hedge against unexpected inflation. Japanese real estate also exhibits very good hedging behaviour (βi from 2.288 to 3.551; γi from 1,585 to 2.529); it a complete hedge against expected as well as unexpected price changes.

In the Nigeria context, Bello (2004) empirically investigated the inflation hedging characteristics of residential properties in Lagos Nigeria between 1996 and 2000. For actual inflation rate data, the author used the Nigerian CPI as a proxy, while for the expected component of inflation; the Nigerian three months Treasury bill rate was used as a proxy. The unexpected inflation rate was derived by subtracting expected inflation from actual inflation. The data on returns on residential properties was obtained from valuation based indices of residential property returns. Data for the study was analysed by regressing the inflation rates and rate of returns using the Fama and Schwert (1977) model. The result from the findings indicated that residential properties have a strong inflation hedging characteristics against expected inflation but not against actual and unexpected inflation. The result is controversial to the finding of Fama and Schwert (1977) that residential property was not a complete hedge against unexpected inflation. It conforms to the finding of Zhuo and Clement (2010) that real estate was not an effective hedge against actual and unexpected inflation.

Odu (2011) studied inflation hedging attributes of commercial properties in prime areas of Lagos State, Nigeria. Ordinary Least Square model proposed by Fama and Schwert (1977) was used to regress real estate rates of returns against actual, expected and unexpected inflation rates. Consumers Price Index was used as a proxy to measure the actual inflation and the 90days Treasury bill rates were used as a proxy for expected inflation. The results show that, for prime locations around Victoria Island and Ikoyi, returns on commercial properties provided perverse hedged against actual inflation; while commercial properties within Ikeja axis provided a completely hedged against actual inflation.

Ogunba, Obiyomi and Dugeri (2013) tested the inflation hedging characteristics of office and shop property investments in Ibadan metropolis in Nigeria between 2000 and 2010. The authors used the Consumer Price Index as a proxy for actual inflation; while the Nigerian 90days Treasury bill rates were used as a proxy for expected inflation. Property return data on rental values and capital values of commercial properties were obtained Estate Surveying and Valuation Firms in the study area. The Ordinary Least Square (OLS) regression by Fama and Schwert (1977) was adopted for the analysis. Findings from the results indicated that commercial property returns were a poor hedge against actual inflation, a partial hedge against unexpected inflation, and a complete hedge against expected inflation. This result complies with the finding of Odu (2011) that real estate presented a complete hedge against actual inflation. The conformity of the result may be because of the methodology that was employed by the authors for the study.

Dabara (2014) investigated the inflation hedging characteristics of residential property investments in Gombe metropolis from 2003 to 2012. The author employed the Consumer Price Index and the 90days Treasury bill rates as a proxy for actual and expected inflation respectively. Fama and Schwert (1977) Ordinary Least Square was adopted. An initial stationarity test was carried out to remove spuriousness from the data set. Findings show that residential property returns completely hedged against expected inflation, partially hedged against actual inflation, but a perversely hedged against unexpected inflation. This study used the methodology that was employed by Odu (2012) and Ogunba et al (2013).

However, the conformity of their findings may be as a result of the Fama and Schwert (1977) regression that was employed for the various study. However, the findings of Bello (2004) that residential is not and hedge against inflation is not in conformity with the findings of Dabara (2014) that residential property is a complete hedge against inflation.

Umeh and Omisore (2015) investigated inflation hedging capacities of returns on residential property investments in Ibadan. The time frame of the study is between 2002 and 2014, Ordinary Least Square regression model was employed. The inflation component was decomposed into actual, expected and unexpected inflation. The study found out that the inflation hedging capacities of real estate investments were found to vary across geographical sub-markets and return components. Residential properties did not hedge against actual inflation in all the considered areas. However, with regards to expected inflation, the capital and total returns of residential for properties in Akobo are complete hedge against inflation; while for Bodija estate, income and total return are complete and partial hedge against inflation. However, the findings of Bello (2004) that residential real estate is not a hedge against inflation contradict these findings that residential income and total return for Bodija at least is a partial hedge.

Wahab, Ola, sule, Adepoju and Dodo (2018) examine the inflationary hedging capacity of house price returns in emerging economy. Abuja was used as the study area, of which five residential housing zones were selected for the study. The study utilized Ordinary least squares (to show short run inflationary characteristics), Augmented Dicker Fuller (ADF) to test for the stationarity in the data, Engle Granger co-integration to establish long run relationships and co-integrating regression analysis to establish long run inflationary characteristics in Abuja Housing Market. The result of the Fully Modified Ordinary Least Square revealed that housing markets failed to provide a complete hedge against inflation across all the markets within a possible short run. The result of co-integrating regression revealed that housing market in Nigeria could not effectively offer a complete hedge against unexpected inflation for both short run and the long run, due to the fact the Nigeria property market is still operating a direct property market system which does adjust immediately to sudden change in economy indicators such as inflation. However, the findings of Bello (2004) that residential real estate is not a hedge against inflation conforms the findings of Wahab et al (2018) that housing market failed to provide a hedge against inflation. It contradicts the findings of Dabara (2014) that residential property is a complete hedge against inflation.

The disparity in the above findings calls for a constant investigation of inflation hedging capability of real estate investment to ascertain the hedging capability of real estate investment across the region. No known study has been done to ascertain the inflation hedging of hostel real estate investment in Nigeria. Hence the study will fill the existing gap by examining the inflation hedging capability of hostel investment in Akure.

3. RESEARCH METHODOLOGY

The target populations for the study are Registered Practicing Estate Surveying Firms that are duly registered with the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON). The sample frame for the study is 25 as obtained from the 2019 directory of the Nigerian Institution of Estate Surveyors and Valuers (NIESV), Akure. Census survey of the whole 25 was considered because the size is within a manageable frame. The questionnaire was designed and administered on the registered practising Estate Surveyors and Valuers in Akure. They provided information on rental and capital values of hostels

from 2009 to 2018 in the study area. The secondary data on inflation was obtained from the records of the Nigerian National Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN). In line with previous studies such as Bello (2005) and Ogunba et al. (2013), the actual inflation rates were derived from the Nigerian Consumer Price Index (CPI) which was computed by the NBS. The 90-day Treasury bill rate was used as a proxy for expected inflation, this was obtained from the records of the CBN, while the unexpected inflation was calculated as the difference between the actual and expected inflation. The statistical approaches that were applied in the study are descriptive and inferential statistics. The descriptive statistics include mean and time series trend analysis while the inferential statistics include ordinary least square.

The rental and capital values of hostel are converted to returns using the formula below: The Total Return is expressed as;

$$TR=IR+CR \quad (1)$$

This can be expressed as;

$$TR = (IRt/CVt) + [(CVt+1 - CVt)/CVt)] \quad (2)$$

Where Rt is the income received during period,
CVt is the capital value at the start of period t,
CVt-1 is the capital value at the start of period t – 1, Rt/
CVt is the income return for period t and
(CVt+1- CVt)/CVt) is the capital return for period t.

In time series, it is important to carry out an initial test for the stationarity data sets to avoid spurious results in subsequent analysis and efficiently capture the long-run relationship of the dataset, thus, Philip Perron unit root equation used is expressed as:

$$CYt = \alpha + \mathrm{bYt} - 1 + \varepsilon t \quad (3)$$

Where:

εt is a zero-mean,

k is variate stationary time series process,

α is a k-vector of drift parameters and

ΔY is (trend) stationary.

The hypothesis is:

Ho:δ=0 (Unit Root) (4)

H1:δ=0

The decision rule for the analysis is that: If t*>PP critical value, = not reject the null hypothesis, i.e., unit root exists. If t*<PP critical value, = reject the null hypothesis, i.e., unit root does not exist.

Ordinary Least Square Regression was used to examine the inflation hedging ability of hostel investments in the study area between 2009 and 2018. The ordinary least square regression equation is expressed as:

$$Rjt = \alpha j+\beta jE(\Delta t/\phi t-1) + yj\ [\Delta t-E(\Delta t/\ \phi t-1] +\varepsilon jt \quad (5)$$

Where Rjt is the nominal return on hostel investment from period t-1 to t,

αj is the intercept term in the regression model, it reflects the return on hostel investment type j from period t-1 to t,

Bj is the slope coefficients for expected inflation hostel investment type j with respect to income or capital return,

$E(\Delta t/\phi t-1)$ is the best estimation of the expected value of inflation in time t

θt is based on the information set available up to time t-1, as denoted as $\phi t-1$,

Yj is the true value of observed inflation rate from period t-1 to t is the slope coefficient for unexpected inflation for hostel investment type j with respect to income return or capital return,

$\Delta t - E(\Delta t/\phi t-1)$ is used to measure shocks after acknowledgement of true inflation rate θt, or rather the unexpected or unanticipated inflation rate which is known in time t and εjt is the error term for the return of hostel investment type j from period t-1 to t.

The regression equation will further be broken down into actual inflation, expected inflation and unexpected inflation components as income and capital returns to know how they react differently to the different inflationary phenomenon. Thus:

The regression equation for actual inflation is given as:

$$Rt = \alpha +\beta\ (\ AIt\ ) \quad (6)$$

The regression equation for expected inflation is given as:

$$Rt = \alpha +\Upsilon\ (EIt) \quad (7)$$

The regression equation for unexpected inflation is given as:

$$Rt = \alpha +\Upsilon\ (EI) + \delta\ (AI - EI)t \quad (8)$$

Where:

Rt is the mean nominal return of hostel investment at time t;

α is the intercept term in the regression model, which also reflects the real rate of return on the property asset;

β is the coefficient for actual inflation for the property asset, with respect to income return, capital return or total return;

AIt is the observed inflation rate from period t -1 to t;

ϒ is the coefficient for expected inflation,

EIt is the expected inflation estimate for period t;

δ is the coefficient of unexpected inflation for the property asset with respect to income, capital or total return and

(AI - EI) t is the unexpected inflation estimate for period t.

4. RESULTS AND DISCUSSION

This section presents the results from the analysis of data obtained for the study. The rental, capital and total returns obtained from the two most dominant types of hostel developments in the study area are presented in Table 1.

Table 1: Total, Income and Capital Returns for the hostel developments between 2009 and 2018

Years	INCOME RETURN		CAPITAL RETURN		TOTAL RETURN	
	Tenement	Self-Contain	Tenement	Self-Contain	Tenement	Self-Contain
2009	0.35	0.44	5.26	5.26	5.61	5.70
2010	0.33	0.42	5.00	5.00	5.33	5.42
2011	0.34	0.43	8.89	11.41	9.23	11.84
2012	0.32	0.40	2.04	3.06	2.36	3.46
2013	0.34	0.39	16.66	7.86	17.01	8.25
2014	0.31	0.38	8.27	4.45	8.58	4.84
2015	0.31	0.37	3.91	1.73	4.23	2.10
2016	0.30	0.40	0.00	5.44	0.30	5.84
2017	0.30	0.40	5.00	6.37	5.30	6.77
2018	0.30	0.39	5.95	2.74	6.26	3.13
SUM	**3.2**	**4.02**	**60.98**	**53.32**	**64.21**	**57.35**
AVG	**0.32**	**0.40**	**6.1**	**5.33**	**6.42**	**5.74**
MAX	**0.35**	**0.44**	**16.66**	**11.41**	**17.01**	**11.84**
MIN	**0.30**	**0.38**	**0.00**	**1.73**	**0.30**	**2.10**

Table 1, shows the returns of hostel investment types in the study area. It is noticeable that tenement building has its highest total return in 2013 with a return of 17.01% and the lowest total return was seen in 2016 with a return of 0.30.%. The high return could be connected to high demand in the property type in the location during the period. The total return of tenement declined between 2014 and 2016 and picked up in 2017 with a return of 5.30%. It is noticeable that self- contain building has its highest total return in 2011 with a return of 11.84% and the lowest total return was seen in 2015 with a return of 2.10%. The high return could be connected to a high demand in the property type in the location during the period. The total return of self-contain declined between 2013 and 2015 and picked up in 2016 with a return of 5.84%. It is noticeable that there is no significant increase in the income return of both tenement and self-contain buildings during the period under review. None of their returns hits the 0.5% mark. This shows that the returns are not significant enough to be considered as an increase during the period under review.

Table 2: Inflation components during the period

YEAR	ACTUAL	EXPECTED	UNEXPECTED
2009	12.59	3.67	8.92
2010	13.76	3.85	9.91
2011	10.85	10.07	0.78
2012	12.24	14.11	-1.87
2013	8.52	11.6	-3.08
2014	8.06	10.93	-2.87
2015	9.01	9.65	-0.64
2016	15.63	10.44	5.19
2017	16.55	14.36	2.19
2018	12.15	11.02	1.13

Source: Nigeria Bureau of Statistics/ CBN Statistical Bulletin and Official Report

It is noticeable that tenement building has its highest capital return in 2013 with a return of 16.66% and the lowest capital return was seen in 2016 with a return of 0.00%. The high return could be connected to a high demand in the property type in the location during the period. The capital return of tenement declined between 2014 and 2016 and picked up in 2017 with a return of 5.00%. It is noticeable that self-contain building has its highest capital return in 2011 with a return of 11.41% and the lowest capital return was seen in 2015 with a return of 1.73%. The high return could be connected to a high demand in the property type in the location during the period. This finding conforms to the findings of Hwa (2003) and Dabara (2015) that real estate properties provide higher returns. The returns of the study show that the average rental, capital and total return exhibited positive returns this is confirmed by the finding of Idowu (2006) that the return in the capital and rental value should show a positive return to classify that the investment is viable.

Table 2 shows the analysis of the inflation components from 2009 to 2018 of hostel investment in the study area. The inflation measure used for the study was divided into three components; actual, expected and unexpected. The decomposition of inflation into various components was done because real estate investment reacts separately to the inflation components.

Table 2 shows the inflation rates for actual, expected and unexpected from 2009 to 2018. The table reviews the rate of inflation volatility in the Nigerian economy. It can be deduced from the table that the actual inflation rates show volatility which shows the Nigerian economy instability. The annual actual inflation within the period of 2009 to 2012 maintained a double-digit, from 2013 to 2015, it was on a single-digit and in 2016 to 2018 it moved to a double-digit. The expected inflation was seen to be progressing from 2009 to 2012 and decreases from 2013 to 2015 before it keeps rising again. The unexpected inflation dropped to 0.78 in 2011 and increased to 5.19 in 2016. The implication of the result shows that the Nigerian government is facing a serious challenge of maintaining a single-digit rate. The finding is in agreement with the findings of Dabara (2015) that the Nigeria government is finding it difficult to bring down and maintain inflation figures within a single-digit range. However, it contradicts with the finding of Zhou and Clement (2010) that actual inflation rates were found to be mostly in a single-digit range. The trend graph is shown in Figure 1.

Figure 1 shows the trend of actual, expected and unexpected inflations in Nigeria during the period under review, the coefficient for actual inflation (0.772) is positive, implying that unit changes in time will result to a rise of 0.772 in actual inflation. The R2 shows the level of reliability of prediction, 41.5% for actual inflation. The R2 for actual inflation is low implying that there may be other factors that contribute to the variation in the actual inflation. Also, the figure revealed that with time the actual inflation tends to increase with

an increase in time. The coefficient for expected inflation (0.177) is positive, implying that unit changes in time will result in a rise of 0.177 in expected inflation. The R2 shows the level of reliability of prediction, 3.4% for expected inflation. The R2 for expected inflation is very low implying that there are other factors that contribute to the variation in the expected inflation. Also, the figure revealed that with time the expected inflation tends to increase with an increase in time. The coefficient for unexpected inflation (0.151) is positive, implying that unit changes in time will result in a rise of 0.151 in unexpected inflation. The R2 shows the level of reliability of prediction, 2.5% for unexpected inflation. The R2 for unexpected inflation is very low implying that there are other factors that contribute to the variation in the actual inflation. Also, with time the actual inflation tends to increase with the increase in time

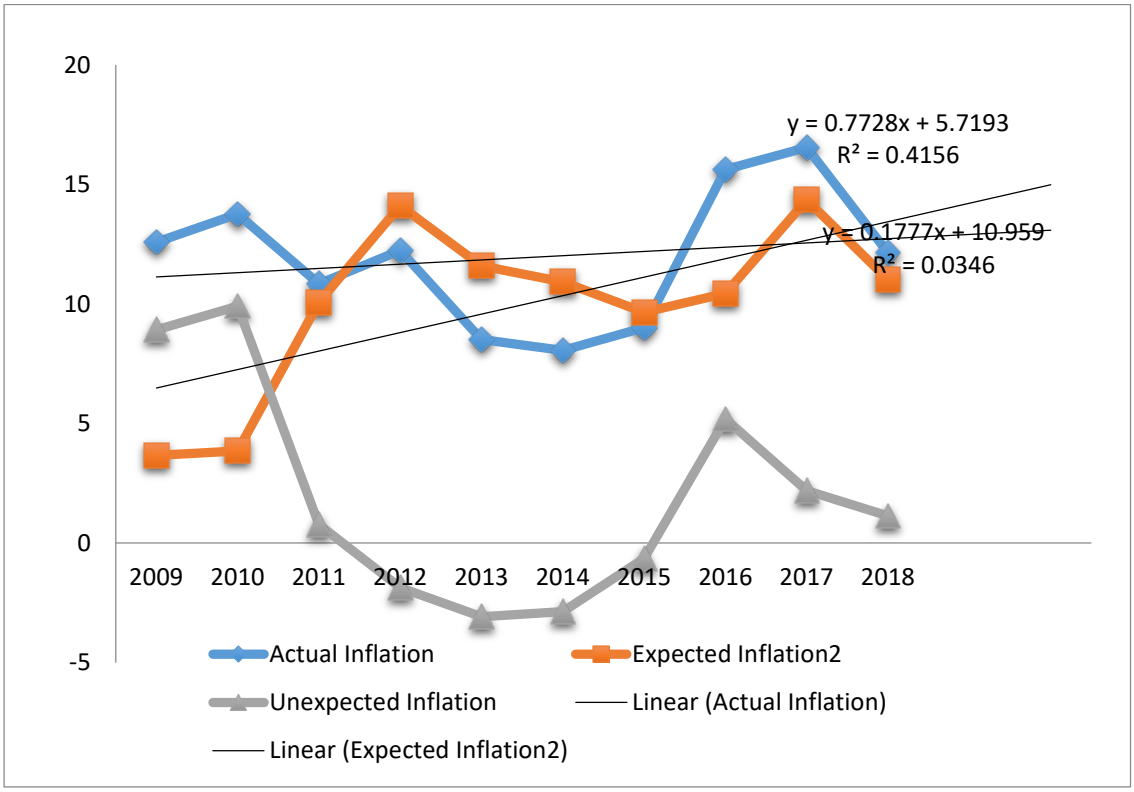


Figure 1: Inflation Components in the Last Ten Year

Actual inflation = 0.772x + 5.719; R^2 = 0.415
Expected Inflation = 0.177x + 10.95; R^2 = 0.034
Unexpected Inflation = 0.151x + 12.63; R^2 = 0.025

Table 2 presents the Philip Perron unit root test of the rate of returns and the rate of inflation components. The computed Philip Perron test analysis was done at "tau" 5% significant levels. The null hypothesis (H0) of a unit is rejected if the p-value is greater than 0.05 and accepted if the p-value is less than 0.05. The unit root test results show that the times series variables are integrated at different order integration. Based on the unit test result, Ordinary Least Square was used to assess inflation hedging capability of real estate returns.

Table 3 examines the inflation hedging capability of hostel investment in the study area. The inflation hedging capability is considered based on the inflation components, these components are actual inflation, expected inflation and unexpected inflation. The decision rule for the inflation hedging capability is as follows if the Coefficient beta is between 1 and 0.5, the asset is a complete hedge against inflation if the coefficient beta lies between

0.4 and 0.1 the asset is said to be a partial hedge against inflation. If the coefficient beta is less than 0 that is a value of beta is negative it is a perverse hedge against inflation (Odu (2011); Dabara (2015).

Table 2: Philip-Perron unit root test for returns/inflations data sets (2009- 2018)

Level			**First Difference**			
	t-Statistic 5%	**Prob.**		**t-Statistic 5%**	**Prob.**	**Order of Integration**
Actual Inflation	-1.9882	0.504	d(Actual Inflation)	-1.9959	0.021	I(1)
Expected Inflation	-3.2598	0.027	d(Expected Inflation)	-3.3210	0.250	I(0)
Unexpected Inflation	-1.9959	0.001	d(Unexpected Inflation)	-1.9959	0.026	I(0)
T--Return self-contain	-3.6651	0.028	d(T-Return self-contain)	-10.2429	0.000	I(0)
T-Return Tenement	-2.9197	0.081	d(T-Return Tenement)	-7.5928	0.000	I(1)
C-Return self-contain	-3.6830	0.028	d(C-Return self-contain)	-10.2214	0.000	I(0)
C-Return Tenement	-2.9217	0.081	d(C-Return Tenement)	-7.5824	0.000	I(1)
R-Return self-contain	-3.2005	0.054	d(R-Return self-contain)	-3.3660	0.047	I(1)
R-Return Tenement	-1.6984	0.399	d(R-Return Tenement)	-15.54321	0.000	I(1)

Table 3 shows the reaction of the inflation components to total return, capital return, and income return of hostel investment from 2009 to 2018 in the study area. It is observable in Table 3 that for total return, tenement property showed a complete hedge against actual inflation, a perverse hedge against expected inflation and a partial hedge against unexpected inflation. The hostel real estate investment can be classified under residential real estate investment. This is contrary to the findings of Zhou et al (2005) that residential property is a hedge against both expected and unexpected inflation also Rubens, Bond and Webb (1989) concluded that residential, commercial and farmland real estate provide at least partial hedges against inflation. Tenement R square for actual inflation is 30.4% and expected inflation R square is 40.9% while unexpected inflation R square is 84.7%. The implication of the R square indicates that 84.7% of the variation in the return of the tenement property is explained by unexpected inflation, the R square was seen to be lowest in actual inflation and highest in unexpected inflation. The self-contain total return showed a perverse hedge against actual and unexpected inflation, a complete hedge against expected inflation. The inflation hedge of the total return of self -contain contradicts earlier findings of Chen and Sing (2006) that residential real estate is at least a partial hedge against inflation. The Self-contain R square for actual inflation is 35.4% and for expected inflation R square is at 44.9% while unexpected inflation R square is 39.1%. The implication of the R square indicates that 44.9% of the variation in the return of the self-contain property is explained by the expected inflation, the R square was seen to be lowest in actual inflation and highest in expected inflation.

Table 3: Inflation-Hedging characteristics of hostel investment in Akure (2009 – 2018)

	Inflation Components	Constant	Standardized Coefficients Beta	R Square	P-Value (prob)	Type of Hedge
Total Return Tenement	Actual Inflation	7.170	0.788	0.304	0.028	Complete
	Expected Inflation	6.168	-0.091	0.409	0.202	Perverse
	Unexpected Inflation	12.681	0.064	0.847	0.007	Partial
Total Return Self Contain	Actual Inflation	7.170	-0.201	0.354	0.038	Perverse
	Expected Inflation	6.168	0.788	0.449	0.212	Complete
	Unexpected Inflation	5.479	-0.081	0.391	0.242	Perverse
Capital Return Tenement	Actual Inflation	7.170	-0.196	0.604	0.025	Perverse
	Expected Inflation	6.168	-0.201	0.509	0.252	Perverse
	Unexpected Inflation	0.135	0.537	0.338	0.322	Complete
Capital Return Self Contain	Actual Inflation	7.170	0.792	0.304	0.028	Complete
	Expected Inflation	6.168	-0.196	0.409	0.202	Perverse
	Unexpected Inflation	0.135	0.310	0.338	0.322	Partial
Income Return Tenement	Actual Inflation	7.170	0.520	0.414	0.028	Complete
	Expected Inflation	6.168	0.111	0.709	0.202	Partial
	Unexpected Inflation	0.135	0.069	0.538	0.322	Partial
Income Return Self Contain	Actual Inflation	0.741	0.105	0.144	0.396	Partial
	Expected Inflation	1.465	0.836	0.373	0.268	Complete
	Unexpected Inflation	0.135	0.520	0.338	0.322	Complete

It was also seen in Table 3 that for the capital return, tenement property showed a perverse hedge against actual inflation, a perverse hedge against expected inflation and a complete hedge against unexpected inflation. Tenement R square for actual inflation is 60.4% and expected inflation R square is 50.9% while unexpected inflation R square is at 33.8%. The implication of the R square indicates that 60.4% of the variation in the return of the tenement property is explained by the actual inflation, the R square was seen to be lowest in unexpected inflation and highest in actual inflation.

The self-contain showed a complete hedge against actual inflation, a perverse hedge against expected inflation and a partial hedge against unexpected inflation. Self-contain R square for actual inflation is 30.4% and expected inflation R square is 40.9% while unexpected inflation R square is 33.8%. The implication of the R square indicates that 40.9% of the variation in the return of the self-contain property is explained by the expected inflation, R square was seen to be lowest in actual inflation and highest in expected inflation.

Further from table 3, for income return, tenement property showed a complete hedge against actual inflation, partial hedge against expected and unexpected inflation. This conforms to the earlier findings of Chen and Sing (2006) that residential real estate is at least a partial hedge against inflation. Tenement R square for actual inflation is 41.4% and the expected inflation R square is at 70.9% while unexpected inflation R square is 53.8%. The implication of the R square indicates that 70.9% of the variation in the return of the tenement property is explained by expected inflation; the R square was seen to be lowest in actual inflation and highest in expected inflation.

The self-contain showed a partial hedge against actual inflation, a complete hedge against expected inflation and a complete hedge against unexpected inflation. Self-contain R square for actual inflation is 14.4% and expected inflation R square is 37.3% while unexpected inflation R square is 33.8%. The implication of the R square indicates that 37.3% of the variation in the return of the self-contain property is explained by the expected inflation, R square was seen to be lowest in actual inflation and highest in expected inflation.

5. CONCLUSION

The study sought to undertake the economic analysis of inflation hedging of the return generated from hostel investment in Federal University of Technology Akure, South gate. The study area is characterised with purely private hostel developments. The study examined the rate of return of hostel investment, the inflation components and the inflation hedging capability of hostel investment. The result of the investigation has shown that the average return of total, capital and rental return for hostel investment shows a positive return. The decomposition of the inflation rates into various components was necessitated by the fact that real estate returns react differently to the individual inflation components. From the study, it was discovered that the hedging capability of hostel investments in FUTA South gate area varies. The rental income for tenement and self-contain shows at least a partial hedge against the three inflation component. Testing for total and capital returns against inflation showed different hedging attributes. While some are a complete hedge, others showed partial and perverse hedge. This revealed that the general belief that real estate is always a hedge against inflation is not always true at all times. It implies that the findings of this study will guide both individual and hostel investors in FUTA South gate area so as to know the hedging capability of the inflation components and not to go by the general perceived thought that real estate investment is a hedge against inflation. The study recommends that the Nigerian government should put relevant policies in place that will bring down the inflation rate to a single digit and also maintain a single-digit inflation rate to check volatility.

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