INFLATION-HEDGING CAPABILITIES OF COMMERCIAL REAL ESTATE INVESTMENTS IN METROPOLITAN LAGOS

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ABSTRACT

There is a growing concern by investors seeking to understand how inflation interferes with their returns on real estate investments. However, there have been contrasting findings from studies carried out in various study areas of Nigeria about the inflation hedging capabilities of real estate investments. An attempt was made in this study to assess the hedging abilities of commercial real estate investments (shops and offices) in the commercial nerve centres of Lagos, and five prime commercial locations in Lagos metropolis were considered. The study made use of data on the total returns on commercial real estate investments derived from the average annual capital and rental values of the investments. The consumer price index was adopted as a proxy to actual inflation; while Treasury bill rates were adopted as a proxy to expected inflation. The period of data coverage was from 2007 to 2018. Regression analysis by Fama and Schwert (1977) was used to ascertain the inflation hedging abilities of the investments. The statistical software used was SPSS, version 22. The study discovered that the total returns from the commercial real estate investments in the study area did not provide a hedge against actual, expected and unexpected inflation. Thus, the study recommends that investors and real estate practitioners exercise caution when considering the real estate investments in the study areas.

Keywords: Commercial properties, hedging capabilities of inflation, inflation, Lagos metropolis, returns.

INTRODUCTION

The ability of an investment to yield a return that outstrips the rate of inflation is significant to any investor (Hargitay and Yu 1993, Isaac, 1998, Manganelli, 2015). Hargitay and Yu (1993) noted among other things the need to always take into account the effect of inflation both in terms of security of capital and in the security and stability of income. This consideration for inflation is important since it can erode the real returns on investments if not handled with care. In Nigeria, save for 2013-2015, the average annual inflation rate has been recorded to be above 10%, a very huge rate of inflation capable of eroding the real returns on investments. Thus, it is necessary to assess if investments have been able to withstand this eroding effect of inflation on their real returns. Various studies have been carried out in Nigeria to analyse and, or assess the inflation hedging characteristics of property investments. Odu (2011), Dabara (2014), Dabara (2015), Umeh and Oluwasore (2015) and Wahab et al (2018) have probed into the inflation hedging capabilities of real estate investment returns in selected locations in the various study areas ofLagos, Akure, Gombe, Ibadan, and Abuja. The investments' hedging abilities were measured against the actual, expected and unexpected inflation. Inference to be drawn from the studies is that there is no common consensus as to the inflation hedging abilities of real estate investment, due to the localised nature of property investment markets. The present study has observed that past studies on inflation hedging capability of real estate investment in Lagos focused on only the annual income returns (Odu, 2011, Osagie, Gambo, Anyakora and Idowu, 2012), leaving out the equally important concept of total return which captures income and

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capital return (Keiler, 2013). This concept of analysing the inflation hedging ability of total returns as well as the other forms of returns (income and capital) was adopted by studies such as Dabara (2014) and Umeh and Oluwasore (2015). Furthermore, there is a dearth of literature in the area of assessing the inflation hedging capabilities of commercial real estate investments in the identified nerve centres of Lagos State. It was on this basis that the need to analyse the inflation hedging capabilities of total returns of commercial real estate investments (shops and offices) in commercial nerve centres (Ikeja, Ikoyi, Lagos Island, Victoria Island, and Yaba) of Lagos Metropolis arose. The focus on two kinds of commercial investments (shops and offices) in five commercial nerve centres (Yaba, Ikeja, Lagos Island, Ikoyi and Victoria Island) in Lagos metropolis is because the areas represent a good spread in terms of commercial nerve centres in Lagos Metropolis. The present study captured a wider coverage than the three centres covered in Odu (2011). The period of data coverage adopted in carrying out this study is 12 years (2007 to 2018). This is to accommodate every business cycle that would have occurred. The method adopted in this study in determining the inflation hedging capabilities is the ordinary least square regression method by Fama and Schwert (1977), a method that was also used in the study of Odu (2011), Dabara (2014), Umeh and Oluwasore (2015). The results from the study will provide investors with essential information on the inflation hedging capabilities of the commercial real estate investments which are important in making investment decisions in the considered study areas.

LITERATURE REVIEW

One of the early foreign-based studies on inflation hedging abilities of real estate investments, Stevenson and Murray (1999), examined the commercial real estate market of the Republic of Ireland to determine if the commercial property investments provided a hedge against inflation. The study found that real estate investments did not provide a good hedge against inflation. They noted that the findings go against the earlier commonly held norm that real estate investments provide a good hedge against inflation.

Another foreign-based study on inflation hedging ability of real estate investments, by Amonhaemanon, Annaert and De Ceuster (2014) examined whether real estate in Thailand can hedge against ex-post and ex-ante inflation using relevant data obtained from 1987-2011 period. The ordinary least square regression method was adopted in the study, and the findings were that over the period, real estate returns have a positive (albeit not strongly significant) relation with expected and unexpected inflation. They also found that the relationship between inflation and real estate returns depends on the state of the economy; and that real estate provides a tremendous hedge against inflation, especially during the financial crisis.

Dabara (2014) investigated the relationship between inflation and commercial real estate investment returns to determine the inflation-hedging characteristics of commercial property investments in Akure, Nigeria. The study revealed that the inflation-hedging characteristics of commercial property investments in Akure vis-à-vis the actual inflation provide a perverse hedge for income, capital, and total returns. Similarly, the expected inflation also provides a perverse hedge for income, capital, and total returns; while the unexpected inflation component provides a partial hedge for income, capital, and total returns.

Another study by Umeh and Oluwasore (2015) examined the inflation hedging capabilities of returns on residential property investments starting from the year 2002 to 2014 in selected areas in metropolitan Ibadan, Nigeria. Their study employed the ordinary least squares regression method by Fama and Schwert (1977) to regress the rates of returns (capital, income, and total return) of the considered residential property investments against actual, expected and

unexpected inflation. The inflation hedging capabilities of real estate investments were found to vary across geographical sub-markets. 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 properties in Akobo sub-market completely hedged against inflation; while for Bodija estate, it was the income and total returns that hedged completely and partially respectively.

Also, Osagie, Gambo, Anyakora and Idowu (2012) have examined the inflation hedging capabilities of returns from office and shop properties in Lagos Metropolis from 1998-2008. They focused on properties in five locations – Lagos Island, Ikeja, Surulere, Ikoyi, and Lekki. Their study used descriptive statistics to show the trend of returns on commercial real estate investments against the change of inflation during the period under review and rental values were used as proxies for actual prices. Their study discovered that office and shop properties do not provide a hedge against inflation in the short run, but do soin the long run, only office properties provide a hedge against inflation. The study did not make use of any statistical (analytical) method in determining the inflation hedging abilities of the property investments. Thus, the methodology of the study was not robust enough.

Odu (2011) examined the relative inflation hedging capabilities of commercial properties (offices) in three prime locations (Victoria Island, Ikoyi and Ikeja) in Lagos state. The study made use of the ordinary least square model as proposed by Fama and Schwert (1977). This was used in regressing the real estate rates of returns against actual, expected and unexpected inflation rates. The results from the study showed that for prime locations around Victoria Island and Ikoyi, commercial properties provide a perverse hedge against actual inflation; while commercial properties within Ikeja and environs have been seen to provide a complete hedge against actual inflation. The findings of Odu (2011) were theoretically validated by Dabara (2014) who posited that there is no common ground as to the inflation hedging characteristics of commercial real estate investment due to the localised nature of the property market. Also, there is a need to expand the coverage in terms of the location of investments in Lagos. Odu (2011) focused on only investments located in three commercial nerve centres in Lagos, leaving out the equally important areas of Yaba and Lagos Island captured in the present study.

RESEARCH METHODS

Primary data used in this study was sourced from the archives of estate firms registered with the Estate Surveyors Registration Board of Nigeria (ESVARBON) in Lagos metropolis. The number of estate firms considered was 192 out of the 382 firms. This was obtained using the online sample size calculator www.surveysystem.com/sscalc.htm to determine the sample size 95% confidence level and 5% confidence interval. In terms of the type of properties considered, data were collected on two types of commercial properties – shops and offices. Data was collected on a total of 200 properties. The data on the capital and rental values served as inputs in determining the total returns for the various commercial real estate investments(shops and officesinYaba, Ikeja, Lagos Island, Ikoyi and Victoria Island).The period of data coverage for this study ranges from 2007 to 2018. The long duration is to accommodate every business cycle that would have occurred over a long time. The total return for the real estate investment asset is expressed as:

$$TR_t = \left(\frac{(CV_t - CV_{(t-1)} - CExpt_t + \mathrm{CRpt}_{(t)} + NI_{(t)}}{CV_{(t-1)} + CExpt_t} \right) \times 100$$

Where: TR_t represents the total return for the period under review (t)

CV_t represents the capital value at the end of period under review (t)

$CExpt_t$ represents the capital expenditure (includes purchases and developments) in period (t)
$CRpt_t$represents the capital receipts (includes sales) in period (t)
NI_t represents the rent receivable during period (t), net of property management costs, ground rent and other irrecoverable expenditure

The secondary data (inflation rates and treasury bills rates) were sourced from the statistical bulletins of the Central Bank of Nigeria (CBN), and they served as inputs in determining the actual, expected and unexpected inflation, as was done in previous, related studies by Dabara (2014) and Umeh and Oluwasore (2015).The inflation rate is taken as the actual inflation; while the treasury bill rate is taken to be the excepted inflation. Unexpected inflation is obtained by subtracting the expected inflation from the actual inflation.

The study employed the ordinary least square regression method by Fama and Schwert (1977) to analyse the inflation hedging abilities of commercial real estate investments in Lagos Metropolis. This method was also adopted in the previous studies on inflation hedging abilities of property investments in Lagos by Odu (2011) and Umeh and Oluwasore (2015). The regression equation is expressed as,

$R_{pt} = \alpha_p + \beta_p(AI_t) + \varepsilon_{pt};\ R_{pt} = \alpha_p + \beta_p(EI_t) + \varepsilon_{pt};\ R_{pt} = \alpha_p + \beta_p(AI - EI)_t + \varepsilon_{pt}$

Where: R_{pt} represents the average nominal return on the property p, at period t
α_p represents the intercept term, it represents the real rate of return on the property p
β_p represents the coefficient of actual inflation of the property for total return
AI_t represents the actual inflation rate from period t-1 to t
EI_t represents the expected inflation rate from period t-1 to t
$(AI - EI)_t$ represents the unexpected inflation rate from period t-1 to t
ε_{pt} represents the error term

DATA PRESENTATION AND ANALYSIS

The data obtained for this study are presented and analysed as follows.

Table 1: Average Total returns for Shops and Offices in Selected Locations of Lagos

	Shops					Offices				
Year	**Yaba**	**Ikeja**	**L/Island**	**Ikoyi**	**V/Island**	**Yaba**	**Ikeja**	**L/Island**	**Ikoyi**	**V/Island**
2007	11.9647	4.5242	0.1284	14.7071	17.2454	17.8670	2.9625	7.1520	3.5909	17.2454
2008	8.0899	11.4293	13.6021	4.4775	1.9487	3.4063	7.2261	8.8155	9.5234	1.9487
2009	9.9550	3.9035	0.1258	3.5303	14.1065	10.6158	7.3344	1.5557	9.8506	14.1065
2010	2.4277	11.1244	18.3049	11.1665	17.3242	14.0161	4.7151	10.7795	3.0966	17.3242
2011	15.4297	6.7114	0.1288	12.3888	13.1167	5.8519	15.9481	1.3770	13.3169	13.1167
2012	3.9927	7.8534	13.9745	12.5229	14.8970	10.4116	5.5581	10.9463	8.2830	14.8970
2013	3.8592	2.4852	0.1346	5.8815	10.2282	7.7794	0.0152	0.0268	2.4527	10.2282
2014	5.1347	25.7573	5.2905	2.6828	22.3048	1.0739	14.4044	1.3405	0.7649	22.3048
2015	4.9059	1.9460	2.7294	2.8615	0.4510	1.0660	0.2680	1.0518	2.3356	5.1825
2016	6.6150	1.1790	7.2270	7.7645	-0.2851	11.2790	-0.9994	2.0366	2.0957	-0.2723
2017	5.0202	1.8190	4.6476	5.2180	2.4407	5.3111	-1.3003	-4.1875	-2.3076	-0.3766
2018	0.7874	0.1137	0.0303	-0.0767	-0.4132	1.7653	0.4034	-3.1805	-1.4854	-0.5186

Source: Field Survey (2019)

It can be observed that the total returns for the investments in the various locations fluctuate, which is an indication of market volatility. This observation aligns with the findings of Lu and Mei (1999) that property returns in emerging markets are volatile.

Table 2: Actual, Expected and Unexpected Inflation

Period	Actual Inflation	Expected Inflation	Unexpected Inflation
2007	5.4	6.2	-0.8
2008	11.5	8.2	3.3
2009	12.5	3.8	8.7
2010	13.7	3.8	9.9
2011	10.8	9.7	1.1
2012	12.2	13.6	-1.4
2013	8.5	10.8	-2.3
2014	8	10.5	-2.5
2015	9	9.4	-0.4
2016	11.9	10.1	1.8
2017	17.1	13.5	3.6
2018	12.1	11	1.1

Source: Central Bank of Nigeria, (2019)

Table 2 shows the actual inflation, expected inflation, and unexpected inflation from 2007 to 2018. Inflation were very high, and most of the years recorded inflation in the double digits (>10%). The inflation rates also fluctuate, which implies that the macroeconomic situation is unstable and may impact on the inflation hedging capabilities of the investments. This is in line with the findings of Amonhaemanon, Annaert and De Ceuster (2014) that the relationship between inflation and real estate returns depends on the state of the economy.

Table 3: Hedging Abilities against Actual Inflation

Investment and Location	Beta Coefficient	p-value	R-square	Type of Hedge
Yaba (shops)	-0.413	0.346	0.089	No hedge
Ikeja (shops)	-0.548	0.466	0.054	No hedge
Lagos Island (shops)	0.81	0.22	0.144	No hedge
Ikoyi (shops)	-0.264	0.60	0.029	No hedge
Victoria Island (shops)	-0.972	0.249	0.131	No hedge
Yaba (offices)	-0.186	0.747	0.011	No hedge
Ikeja (offices)	-0.408	0.504	0.046	No hedge
Lagos Island (offices)	-0.266	0.622	0.025	No hedge
Ikoyi (offices)	-0.147	0.776	0.008	No hedge
Victoria Island (offices)	-1.238	0.128	0.216	No hedge

In Table 3, one can observe that the inflation betas are not statistically significant; the p-values are above 5% and 10% alpha levels; the coefficient of determination (r^2) is too low. This suggests that no total return on commercial properties in the five locations under consideration provided a hedge against actual inflation.

Table 4: Hedging Abilities against Expected Inflation

Investment and Location	Beta Coefficient	p-value	R-square	Type of Hedge
Yaba (shops)	-0.384	0.350	0.088	No hedge
Ikeja (shops)	-0.197	0.782	0.008	No hedge
Lagos Island (shops)	-0.165	0.799	0.007	No hedge
Ikoyi (shops)	-0.22	0.640	0.022	No hedge
Victoria Island (shops)	-0.856	0.281	0.115	No hedge
Yaba (offices)	-0.806	0.113	0.232	No hedge
Ikeja (offices)	-0.319	0.578	0.032	No hedge
Lagos Island (offices)	-0.597	0.224	0.143	No hedge
Ikoyi (offices)	-0.464	0.328	0.096	No hedge
Victoria Island (offices)	-0.955	0.221	0.146	No hedge

In Table 4, it can be observed that the inflation betas are not statistically significant; the p-values are above 5% (0.05) and 10% (0.1) alpha levels, and the coefficient of determination (r^2) is too low. This means that no total return on commercial properties in the five locations under consideration provided a hedge against expected inflation.The low coefficient of determination insinuates that the change in return may be attributable to other extraneous variables that are more significant than the inflation rates (Umeh, 2017).

Table 5: Hedging abilities against Unexpected Inflation

Investment and Location	Beta Coefficient	p-value	R-square	Type of Hedge
Yaba (shops)	0.013	0.968	0.0002	No hedge
Ikeja (shops)	-0.185	0.747	-0.185	No hedge
Lagos Island (shops)	0.57	0.26	0.13	No hedge
Ikoyi (shops)	-0.008	0.983	0.00004	No hedge
Victoria Island (shops)	0.00008	0.99	0	No hedge
Yaba (offices)	0.417	0.329	0.095	No hedge
Ikeja (offices)	-0.026	0.955	0.0003	No hedge
Lagos Island (offices)	-0.235	0.564	0.034	No hedge
Ikoyi (offices)	0.217	0.577	0.032	No hedge
Victoria Island (offices)	-0.087	0.893	0.002	No hedge

In Table 5, it can be observed that the inflation betas are not statistically significant; the p values are above 5% and 10% alpha levels, and the coefficients of determination (r^2) are too low. This means that no total return on commercial properties in the five locations under consideration provided a hedge against unexpected inflation.

The findings from this study contrast with the findings of Odu (2011) that commercial investments in Lagos provide a complete hedge against inflation. This may be the result of different times of study or other unidentified factors. This position is theoretically validated by Amonhaemanon, Annaert and De Ceuster (2014) who using the case study of Thailand, found that the relationship between inflation rates and property returns is predicated on the state of the economy. Furthermore, the findings of this study validate the findings of Dabara (2014) that there is no common ground as to the inflation hedging characteristics of commercial real estate investment due to the localised nature of the property market. This is also supported by findings of Osagie, Gambo, Anyakora and Idowu (2012) that show that different investments in different sub-markets do not show a uniform reaction to inflation rates. It is observed that while the returns on the commercial property investments in the study area are declining, the inflation rates are increasing.

CONCLUSION AND RECOMMENDATIONS

The total return of the various commercial investment options did not provide any hedge against actual, expected and unexpected inflation. There is no relationship between the inflation rate, and the total returns of the commercial investment options, due to the non-statistical significance of the p values. The inflation rates on their part are in double digits (>10%) while the total returns are declining. This presents a challenge, as the implication is that inflation keeps eroding the real rate of return of the investment at a huge rate.

This paper, therefore, recommends that investors considering investments in commercial real estate in the study areas should be wary of these poor inflation hedging abilities, and should consider other proven investment options.

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