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An Analysis of Relative Inflation Hedging Capacities of Prime Commercial Properties in Lagos

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Received: 25 October 2011 Accepted: 20 November 2011 Published: 1 December 2011

Abstract

The major concern to any investor is the achievement of the desired return of investment as well as his return on investment. Real estate has an age long reputation of being perceived as a hedge against inflation, a fact for which various empirical studies undertaken in some other countries have produced varying results. In this line, the study was aimed at empirically establishing the inflation hedging properties (or otherwise) of commercial properties in prime locations of Lagos state. To achieve this, the Ordinary Least Square model as proposed by Fama and Schwert (1977) was used to regress real estate rates of returns against actual, expected and unexpected inflation rates. The results show that, for prime locations around Victoria Island and Ikoyi, commercial properties provide a perverse hedge against actual inflation, Whereas, commercial properties within Ikeja and environs have been seen to present a complete hedge against actual inflation.

Index terms— inflation hedging, commercial properties, inflation, Lagos.

1 Introduction

he aim of every rational investor is to maximize profits on investments while as much as possible reducing the risks involved. This is the reason why it is important to acquire an investment perceived to be a hedge against inflation. In the bid to establish which is the "perfect" investment, studies have been done on items like stocks and equities, gold and real estate. In one of such researches, Alagidede and Panagiotidis (2007) observed that in Nigeria a 1% rise in goods prices (rate of inflation) elicits 0.12% rise in stock returns. Thus the stock market only provides a partial hedge against rising inflation Over the years, investment in Real estate has been professed to offer a hedge against inflation (Amidu and Aluko, 2006), which in simple terms means that it has the power to protect the investor's funds against the eroding power of inflation. With a current inflation rate as high as 12.3% and bank lending rates as high as 29% (CBN, 2010), an investor needs to be sure that investing in real estate will cover not only current but also future risks. However, despite the fact that investors are risk averse and will prefer more return to less and less risk to more (Olaleye, 2008), the Nigerian property market has Author : 4, Akinbayode Street, Papa-Ajao, Mushin, Lagos, Nigeria, E-mail : tenigbade@yahoo.co.uk frequently been characterized by naive decisions.

Different studies have been carried out to confirm the inflation hedging capabilities of investments in real estate. The results have shown a varying pattern. **??**ama and Schwert (1977) carried out some of the earliest studies on the subject. They opined that private residential estates were the only form of investment that provided a complete hedge against expected and unexpected inflation when compared with government debt instruments and returns on human capital. Voigtländer and Demary (2009), while studying the inflation hedging properties of real estate in Canada, USA, Finland, France, Germany, Ireland, the Netherlands, Sweden and the UK, found out that investment in real estate equities did not protect the investor against inflation. Quingping (2008) concluded that the housing sector plays an important role in Taiwan's economy as it is able to hedge against inflation in the long-run. In Singapore, commercial properties establish not only a perfect one-to-one correspondence relationship with the inflation rate, but they also increase at a faster rate than the increase in the inflation rate. (Sing and Low, 2001) In Nigeria, Bello (2005), while studying the Inflation Hedging Characteristics of Residential Property

Investment in Nigeria between 1996 and 2000, established that real estate investment in Nigeria is not an all time hedge against inflation.

The foregoing forms the background for this study. As closely related as the various researches are, they have all produced different results. This disparity can be attributed to various factors including varying timeframes, fluctuating economic conditions, and differences in microeconomic and macroeconomic indicators among other issues. The problem is also drawn from the expectations and fears of investors in Nigeria about the security of their investments and the lack of information in the property market to address such fears.

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Property has traditionally been seen as a hedge against inflation but fears have been expressed recently about whether it really is a hedge against the background of economic volatility and recession that has characterized the economy. Inflation rates, where they are higher than the rate of return on an investment devalues the return on the investments in real terms.

5 II.

6 LITERATURE

Inflation is generally considered as a purely monetary phenomenon. It is the rate of increase in prices over a given period of time (Oner, 2010). In simpler terms, inflation is 'too much money chasing too few goods' thereby causing a hike in prices of commodities. Accountants suggest that high inflation render historical cost accounting measures of income and prediction techniques useless. Inflation is however erroneously commonly taken to be an appreciation on real value whereas it is an increase in the volume of money and credit leading to a rise in the general level of prices and consequent erosion of purchasing power (Appraisal Institute, 2008). Loungani and Swagel (2001) identified four sources of inflation in developing countries viz:

1. Money growth and exchange rates, variables suggested by the fiscal view; 2. The output gap and a measure of the world business cycle; 3. Changes in the price of oil and non-oil commodities, to capture cost shocks; 4. Past realizations of inflation, to reflect the inertial component of inflation.

Various literatures have shown that the importance of the inclusion of real estate in investment portfolios cannot be under-estimated. Every investment tools that real estate can be used as which makes it an attractive investment. These are:

? a source of diversification;

? a generator of attractive risk-adjusted return;

? a hedge against unexpected inflation or deflation;

? a component of the investment universe; and

? generator ? a strong cash flow Hoesli (1994) However, the volatility of inflation rates, especially in unstable economies like Nigeria invalidates this equation as it does not take unexpected inflation into consideration. Scofield (1997) asserted that there are five possible shocks that may cause the delivered real return to vary from the required real return theses are: unanticipated inflation (otherwise known as unexpected inflation); changes in inflationary

There is a real danger that the inflation rate in Nigeria is outstripping the rate of return on property. The property market has seen voids and unsold properties which tend to suggest supply outstrips the demand for properties. Many estate agents have been quoted as saying that the 'market is dull'. At the same time, the inflation rate has been suggested as being at about 12.3 per cent. One naturally begins to question whether the rate of return on property is keeping pace with the inflation rate. Investors particularly would wish to obtain clarifications on this issue so as to make decisions on whether to include property in their portfolio investment. The problem is amplified by the lack of studies in this area. The only study so far in Nigeria has been that of Bello (2005) who examined the inflation hedging characteristics of residential property between 1996 and 2000. However, this study, now outdated, focused on Lagos as a whole and moreover addressed only residential properties, whereas the commercial property class in Lagos has also become an attractive investment commodity owing to its increased demand.

This study is aimed at empirically establishing the inflation hedging properties (or otherwise) of commercial properties in prime locations of Lagos state.

This study follows the pattern of some of the initial works done on the subject. (Fisher, 1930) postulated that when prices are rising, the rate of interest tends to be high but not so high as it should be to compensate for the rise; and when prices are falling, the rate of interest tends to be low, but not so low as it should be to compensate for the fall, The result is that during a period of inflation the interest rate is raised cumulatively, so that at the end of this period when the price level is high, the interest rate is also high. Consequently he noted

that the nominal interest rate is an addition of the real interest rates and the expected inflation rate, hence the equation:E(Rj t |? t-1, Î?" t) = E(ij t |? t-1) + E(Î?"t|? t-1) + ? j [Î?" t -E(Î?"t|? t-1)] (II)

Where: Î?" t -E(Î?"t|? t-1) = Unexpected inflation rate between times t-1 and t. This equation was then based on a regression model:Rj t = ? j + ? j E(Î?"t|? t-1) +? j [Î?" t -E(Î?"t|? t-1)] + ?j t (III)

Where: ? j, ? j and ? j are regression coefficients and ?j t is the random error term Schofield (1996) was of the opinion that methodologies using regressions to test hypotheses concerning inflation hedging are inappropriate. He suggested a form of sensitivity analysis which he referred to as a cash flow based scenario assessment to be more appropriate methodology. This approach may however not be considered appropriate in a volatile economy like Nigeria's. The result of a sensitivity analysis may only be considered appropriate if the indicators will be sure to be stable for a reasonable period of time. Moreover, there is need to have a model to accurately and empirically show the relationship between inflation and real estate returns.

There has also been a long standing issue on the use of cointegration techniques as a more accurate measure for inflation-heding properties in real estate when the time frame being examined is over a long period of time. To this end, various authors have used this technique (Hamelink & Hoesli, 1996). Tarbert (1996) argued that a static regression method would be unlikely to adequately capture any responses from inflation to property since the property market hardly adjusts instantaneously to changes in inflation. Static a) The Lagged Treasury Bill rates b) Correction to the measure of the lagged treasury bill rates -This proxy was suggested due to the fact that the use of lagged treasury bills as proxy can lead to biases due to factors such as the possibility that the real return on short-term rates may not be constant. The correction can be formulated as follows:?(? ?) = ? ??1 ? ? 1 ? ? ? ? ?? ??1 ? ??ð ?? ? ??? ? ??? ??1 ?? ?=? ?=??1

where y is the short-term rate and x represents the frequency of the data. c) First order autoregressive model d) ARIMA (1,0,3) e) ARIMA (1,1,3 f) ARIMA (0,1,1). The respective proxies are assessed using the following model:Î?" t =? + ?E (Î?") t +? t (V)

where Î?" is the actual inflation rate and E(Î?") is the respective proxy for expected inflation.

It is worthy of note that the concept of investment in indirect real estate is not a very common one in Nigeria. With less than ten property and construction companies listed in the stock exchange market, the potentials of securitized properties are yet to be fully explored. Amidu et al (2008) suggest that in Nigeria, real estate security does not after all provide a regressions, he said are unable to differentiate between adjustments to a long-run equilibrium and short-run dynamic movement. He therefore advocated the use of cointegration techniques to obtain an estimate of any long-run equilibrium relationship. For real estate investments to be a long-run hedge against inflation, then long-run components of inflation and nominal returns should co-vary over the long run consistently.

Most studies after Fisher (1930) have decomposed inflation into its expected and unexpected components. Different researchers have also adopted various proxies for expected inflation. Stevenson (2001) tested six alternatives in order to arrive at the most reliable proxy and consequently the most accurate empirical analysis. These proxies are good substitute to direct real estate investment. This they explained is because the risk/return performance of indirect real estate is a function of the behaviour of the securities' market as opposed to the direct real estate investment whose performance depends largely on the underlying asset. However, buying shares in investment companies specializing in real estate is also gradually becoming a common form of indirect property investment in Nigeria (Amidu and Aluko, 2006).

(ERV) growth; changes in real ERV growth expectations; and changes in the real required return. Unexpected inflation has been defined to be the difference between actual inflation and expected inflation. Hence the stance of Fama & Shcwert (1977) when they decomposed actual inflation into its expected and unexpected components. The unexpected rate of inflation is by definition uncorrelated to the expected rate of inflation therefore Fisher's initial equation can be rewritten to be: expectations; unanticipated real Estimated Rental Value Stevenson (2001) also made use of the hedged approach to provide a data series. This data series both utilizes information available in the capital markets and overcomes potential biases that may be present in either appraisal techniques or in the methods used in index construction. It is also used in portfolio studies to eliminate the interference of the risk measures present in direct investment and to avoid unreliable empirical results. It should be noted that the use of hedged data diminishes the diversification benefits that direct real estate investments provides in an investment portfolio (Georgiev, 2002).

REITs are considered less advantageous as against direct real estate investment. The performance of the REIT is usually tied to the performance and leverage of the parent company. Also, equity returns are known to be more volatile compared to direct real estate investments (Voigtlander & Demary, 2009). Georgiev , Montezuma (2004) showed the importance of the knowledge of inflation hedging abilities of residential real estate as he identified three criteria used to evaluate residential property as an institutional group include:

? Private rental market value relative to institutional wealth; ? Mean-variance performance; and ? Hedge against inflation.

In the study by Hoesli et al. (2006), they noted that whether inflation is high or low is a product of real supply shocks or monetary shocks such that, in both the U.K. and the U.S., public market asset returns are linked in the long run to anticipated inflation but not to unexpected shocks in inflation. Voigtländer (2009) offered some explanations as to the ability of real estate to hedge inflation. He proposed that residential Property offers a hedge against expected and unexpected inflation because rents are often indexed and because good housing

cannot be substituted and therefore must continually be invested in. He stated that offices protect only partly against inflation, because worsening economic perspectives (inflation) alleviate the demand for office space. He further stated that retail property does not provide an inflation-hedge because retailers cannot shift inflation to customers. Amenc et al (2008) also noted that real estate and commodities ha ve particularly attractive inflation hedging properties over III.

7 Methodology

The primary data for this research work were collected from interviews with three Estate surveyors that have been practicing and have offices in both Ikeja and the Lagos Island for over fifteen years. They were randomly selected as sources for data on real estate annual income and capital values. These values of subject properties were extracted from their records. The secured data was treated as follows to derive the Annual rate of returns on real estate investment: R = (Opening CV -Closing CV) + Annual Income Where :(VI) Opening CV R = Annual Rate of Returns CV = Capital Value

The data for actual inflation was gathered from secondary sources. For Nigeria, inflation rates are derived from the Consumer Price index (CPI) and computed by the National Bureau of Statistics (NBS). The composite CPI measures the average level of retail p rices of goods and services consumed by households living in all parts of the country. The expected inflation in this study like various preceding studies uses the 90-day Global Journal of Human Social Science Volume XI Issue X Version I longhorizons, which justify their introduction in pension funds' liability-matching portfolios.

In Nigeria, as well as in other parts of the world, rent review clauses have steadily become a norm for any real estate investment. In more developed countries, the intervals are longer, say, 5 -15 years for leases. However, in developing and unstable economies like Nigeria, with a constantly increasing rate of inflation, the intervals within these rent review periods are relatively short. Cash flows therefore move in step with overall price inflation and are protected from cash erosion. Peyton, Park, & Lotito (2008) however suggest that this is only applies when real estate markets are in equilibrium and that the mechanism comes under pressure when markets become oversupplied. They concluded that the property market fundamentals are the driving forces behind rent inflation or deflation rather than movements in the consumer or producer prices indexes.

Treasury bill rate as a proxy. This can also be sought from the National Bureau of Statistics (NBS). The secondary data containing 90-day treasury bill rates and inflation rates were retrieved from the records of the Central Bank of Nigeria and the National Bureau of Statistics.

From Literature, various methodologies have been adopted to determine the relationship between real estate returns and rate of inflation. However, this study adopted the Ordinary Least Square (OLS) regression modeas used by **??**ama and Schwert (1977).E(Rj t |? t-1, Î?" t) = E(ij t |? t-1) + E(Î?"t|? t-1) +? j [Î?" t -E(Î?"t|? t-1)]

(II) Where:

Î?" t -E(Î?"t|? t-1) = Unexpected inflation rate between times t-1 and t. This equation was then based on a regression model:Rj t = ? j + ? j E(Î?"t|? t-1) +? j [Î?" t -E(Î?"t|? t-1)] + ?j t (III)

Where: ? j, ? j and ? j are regression coefficients and ?j t is the random error term suggests that direct real estate investment provides diversification benefits, while securitized real estate (REIT) investment does not. Yobaccio et al. (1995) also confirm that REITs act as poor hedges against any measure of inflation with the poorest performance relative to unexpected inflation. Real estate is a heterogeneous asset class and its inflation-hedging properties are determined by the nature of an investor's exposure. Hence, while real estate is generally offered as a favourable inflation-hedging investment, securitised REITs are noticed to show the same negative relationship found with equities (Adrangi, Chatrath, & Raffiee, 2004). **??** 2002) This study covers commercial properties in metropolitan Lagos. However, this study is limited to prime Locations as investments in these areas are usually more attractive to investors than other parts of the state. The following areas were considered for the study: Ikoyi South-West, Victoria Island, Opebi, Allen Avenue, Ikeja GRA., Obafemi Awolowo way. The study considered rates of returns on investment in prime commercial properties in Lagos State. This study considered office spaces per square metre (sqm) as these property classes represent the most transacted classes of properties in the study areas.

These coefficients ascribe weights to the independent variables (expected and unexpected inflation) in the equation, telling us how exactly they An asset is said to be a partial hedge against inflation if its coefficient of regression lies between 0 and 1. If an asset has a coefficient of regression which is more than 1, the asset is said not only to be a hedge against inflation on its own but also a hedge against inflation for other assets in its portfolio. The signs of the regression coefficient determine if the asset is a 'positive' hedge or a 'perverse' hedge against inflation. a) Data Analysis To determine the rates of return on investment in commercial real estate in prime locations in Lagos state between 1999 and 2010. The above table is a comprehensive compilation of Consumer Price Indices, 90 -day treasury bill rates and rates of returns on commercial and residential properties in prime locations within the relate with the dependent variable (Annual rate of returns on investment) The results are analysed as follows: When ? j = 1.0, the asset is a complete hedge against expected Inflation; the expected nominal return on the asset varies in one-to-one correspondence with the expected inflation rate, and the expected real return on asset is uncorrelated with the expected inflation rate. When ? j = 1.0, the asset is a

complete hedge against unexpected inflation; the nominal return on the asset varies in one-to-one correspondence with both the expected and unexpected components of the inflation rate.

study period. The rates show no particular order signifying instability in the economy. This analysis is done in line with previous studies (Brown, 1991; **??**ewell, 1996) Property returns have displayed different correlation attributes with inflation. Commercial property returns in the Mainland area have positive correlation with inflation, which means that as inflation rises commercial property returns keep going up and also Mainland commercial properties also display a positive correlation relationship with inflation. The performance for Island commercial properties is expected since the area has the highest 6.6 6.9

18.9 The analysis above is however, not enough to conclude that property returns is an effective hedge against inflation. A more detailed method is needed to examine the degree of protection against inflation offered by these properties using the Fama and Schwert (1977) regression model. Source : Field Survey 2010 inflation rates and commercial real estate rates of return.

Hence, a test was carried out to ascertain whether real estate provide a positive real return over the period. The tests of inflation hedging against expected inflation is conducted by running the empirical model given by R t = ? + ?EI. The result of the regression is given by table **??** The regression equation reveals positively signed beta for all properties. Victoria Island/ Ikoyi properties have a standardized highest beta coefficient of 0.606 with R 2 of 0.367 recorded for Victoria Island and Ikoyi commercial property rates. This implies that about 37 percent of the increase in property returns could be attributed to changes in expected inflation. The commercial properties in Ikeja/Opebi/Allen came through as a complete hedge while residential property in Victoria Island/ Ikoyi displayed a partial hedge against expected inflation. The regression given by equation R t = ? + ?AI tests the hedging ability of property against actual IV.

8 CONCLUSION

It has been empirically proven in this study that as attractive as commercial real estate investment in prime areas in Lagos seems to be, they do not provide an all time hedge against inflation. The results however show that this is not enough reason to totally sideline these investments. The results from the correlation analysis show that investment in real estate, though it may not totally hedge against inflation will minimize the risk of returns erosion due to inflation. Moreover, recent developments in the stock market have shown the importance of the inclusion of real estate in any investment portfolio because of its risk bearing capacity. It is also probable that economic stability will have a positive effect on the inflation hedging capacity of real estate. [1] [2] [3] [4] [5]

Figure 1:

I

Year	Inflation Rates			Rate for Commercial Properties	
	Actual	Expected	Unexpected	VI/IKOYI	IKEJA
1999	6.60	18.25	-11.65	1.40	3.00
2000	6.90	15.25	-8.35	1.80	1.30
2001	18.90	18.34	.56	2.40	
					1.60
2002	12.60	18.35	-5.75	3.20	
					3.90
2003	14.00	15.02	-1.02	.90	
					2.80
2004	10.00	14.21	-4.21	1.80	.80
2005	8.60	7.00	1.60	1.60	
					1.70
2006	8.20	8.80	-.60	.90	.80
2007	5.40	6.90	-1.50	1.30	
					1.40
2008	11.50	9.00	2.50	1.60	
					2.90
2009	12.60	9.20	3.40	1.50	.80
2010	13.80	6.60	7.20	.70	.80

Figure 2: Table I :

II

LOCATION	Correlation with CPI% Change
IKEJA	0.088
VI/IKOYI	0.258

Source : Field Survey 2010

Figure 3: Table II :

III

	Unstandardized Coefficients ?	Standardized Coefficients Std. Error	R Square	Type of hedge	
(Constants)	5.233596	3.703491			
VI/IKOYI (COMMERCIAL)	26.40063	21.06571	0.606	0.367 hedge	Complete
IKEJA (COMMERCIAL)	11.92461	13.17325	0.524	0.274 hedge	Complete

Source : Field Survey 2010

b) Hedging Against Expected Inflation

Figure 4: Table III :

IV

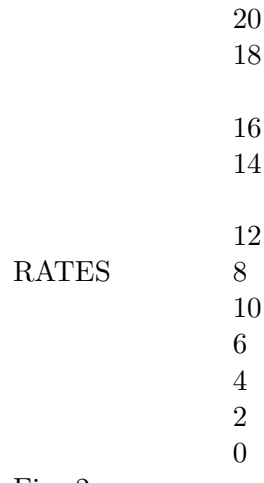

Fig. 2 :

Model	Unstandardized Coefficients		Standardized Coefficients Beta
	?	Std. Error	
(Constants)	1.667729	3.269004	
VI/IKOYI	-7.70074	18.59432	-0.359
(COMMERCIAL) IKEJA			-0.409
(COMMERCIAL)	-9.40549	11.62779	

Source : Field Survey 2010

Figure 5: Table IV :

V

Model	Unstandardized Coefficients		Standardized Coefficients	R Square	Type of hedge
	B	Std. Error			
(Constants)	6.901326	3.697636			
VI/IKOYI			0.258	-0.027	Complete hedge
(COMMERCIAL)	18.69988	21.03241			
IKEJA			0.088	-0.091	Complete hedge
(COMMERCIAL)	2.519118	13.15243			

Source : Field Survey 2010

d) Hedging against Actual Inflation

Figure 6: Table V :

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