



# Real estate security and other investment assets

Real estate security

## A comparison of investment characteristics in the Nigerian stock markets

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### Abstract

**Purpose** – Quite a substantial number of academic papers have examined the performance of both direct and indirect real estate relative to other investment assets. While these studies are valuable in the field of real estate investment performance measurements, a gap still exist in the literature on the comparative performance of investment assets in the various sectors of the stock markets of most emerging economies. This paper aims to fill the gap by providing analysis of the historical performance of real estate and other securities in the Nigerian capital market.

**Design/methodology/approach** – Annual open and closing market prices of shares and dividend of sampled listed companies in addition to data on all share index (ASI), consumer price index (CPI) and yield on 90-days T-Bill were obtained for the period 1999-2005. These were then analysed using descriptive, risk-adjusted measures and regression models.

**Findings** – The empirical evidence suggests that while real estate outperformed the market on a nominal basis, it underperformed the market stock on a risk-adjusted basis over the time period of analysis. Unexpectedly, real estate security did not provide a good protection against inflation and is also uncorrelated with the stock market.

**Originality/value** – This paper provides empirical evidence of the investment characteristic of indirect real estate investment in Nigeria. The results suggest that real estate security does not after all provide a good substitute to direct real estate investment.

**Keywords** Stock markets, Real estate, Assets, Nigeria, Capital markets

**Paper type** Research paper



### 1. Introduction

Investment generally entails the commitment of a lump sum now for future streams of income flow and/or for capital appreciation. Puts in a different context, it is an acquisition of an asset by an individual or institution with a view to earning returns, either through its income or capital gains. In investment market, investors are generally faced with numerous alternative investments where fund could be ejected.

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These include stocks and shares, bonds, unit trusts, bank deposit and landed property. This diversity eventually creates the problem of choice, which according to Hargitay and Yu (1993) is one of the fundamental problems of investment decision-making. This requires investors to choose from myriad of opportunities that differs not only in the amount of required initial capital outlay, but also in the timing and amount of expected future flows and the degree of confidence that can be placed in the expectations. The choices are expected to take into consideration the characteristics of the various assets and the linkages among them (Hoesli and MacGregor, 2000) since investment funds will only flow to the sectors that promise the most attractive return in the light of expected risks and returns trade off.

The implication of the foregoing is that investors usually have to reckon with the problem of choice, which requires the establishment of criteria and rational basis for assessing the desirability or otherwise of the acquisition of an individual investment proposition. Success, in this regard, is most dependent upon finding strategically appropriate investment opportunities and being able to accurately forecast their past performance (Faragher and Klieman, 1999). Such forecasting must also consider the performance of the investment media relatives to other similar assets and to different types of investment assets (Hargitay and Yu, 1993; Hwa, 2002).

Property is not only an investment asset, but an asset that has clearly established itself as a strategic role player in the multi-asset portfolio due to its effectiveness as a diversifier of risk in a mixed asset portfolio. Empirical studies have also suggested that one of the principal reasons investors favour property investment relative to other investment media has been attributed to the superior investment performance (see for example Wendt and Wong, 1965; Coyne *et al.*, 1980; Ibbotson and Siegel, 1984; Karplan, 1985; MacGregor and Nanthakumuran, 1992; Newell and Webb, 1996, 1998; Corgel *et al.*, 1998; and Hoesli *et al.*, 2002).

In the past, property investment decisions, based on the foregoing, was majorly an acquisition of direct investment in real property through private market that consists of buildings owned and managed by investors or their agents. But, with the development of the new financing arrangements for real estate in the capital markets, investors now have the opportunity to include property in a diversified portfolio by acquiring a security backed by direct real estate investment through public markets. The public markets consist of securities of firms specialising in the management or trading of property: property companies in the UK and Nigeria, real estate investment trusts (REITs) and real estate operating companies (REOCs) in the US.

However, it has been argued that for real estate securities to be reasonable substitute for direct real estate investment, they should provide investment characteristics similar to those of direct investment. These, according to Kaplan and Schwartz (1995) are assumed to be competitive return/risk relationships, hedge against inflation and low correlations with the security markets returns over time. Several studies, in line with this proposition, have examined these characteristics, with the more recent ones being Glascock (1991), Glascock and Davidson (1995), Matysiak and Brown (1997), Ling and Narango (2002), Bond *et al.* (2003), Ooi and Liow (2004), and Amidu and Aluko (2006) for property and real estate related companies; Titman and Wanga (1986), Howe and Shilling (1990), Sagalyn (1990), Redman and Manakyan (1995), and Sanders (1997) for REITs; Chan *et al.* (1990), for EREITs; and Kaplan and Schwartz (1995), and Wang and Erickson (1997) for MLPs.

While these studies have made a significant contribution to knowledge in the field of real estate investment performance measurements, a gap still exists in the literature on the comparative performance of investment assets in the various sectors of the stock market with a particular reference to Nigeria experience. The purpose of this study is to fill the gap. In particular, the paper is to analyse the comparative investment performance of the major companies in the various sectors of the Nigerian stock market and to determine whether or not real estate security returns are uncorrelated with the stock market and also provide a hedge against inflation.

There are few reasons we think the performance of real estate security relatives to other investment assets provides an interesting arena for examination. First, from a prospective investor' perspective, there is a growing concern for risk diversification, which the stock markets provides more opportunity for as opposed to the direct real estate market. Second, from the viewpoint of the proposed integration of real estate into the Nigerian securities market, it is necessary to examine the investment characteristics of both markets, thus providing an economic justification for such an arrangement.

The empirical study will first examine the historical performance and volatility of real estate and other securities traded in the Nigerian stock market. This would be followed by the test of whether real estate security provides a hedge against inflation and whether they are uncorrelated with the stock market.

The remainder of the paper is constructed as follows. Initially a brief review of the relevant existing literature is presented, while the data requirements and the methodology adopted in the study are then discussed. The following section provides details of the empirical study, while the final section provides concluding comments.

## 2. Literature review

The performance of real estate relative to other investment assets is a wide research topic in the real estate literature. Focusing primarily on direct real estate investment, the pioneering study of Wendt and Wong (1965) examined the return performance of 20 FHA section 608 apartments from the san Francisco Bay Area relative to 76 randomly chosen industrial stocks from COMPUSTAT tapes and came to the conclusion that real estate outperforms common stock as a result of leverage and tax shelter effects. Being a pioneering attempt, several shortcomings limit the validity of the performance implications arising from this study. First, in terms of generalisation, since only one property type (residential) in one geographical location was included in the study. Second and much more importantly is the fact the return measure (internal rate of return) utilised in the study did not explicitly account for risk in addition to assuming an implicit reinvestment rate.

Contrary to Wendt and Wong (1965), Coyne *et al.* (1980), Karplan (1985) and Robickek *et al.* (1972) employed risk-adjusted period returns rather than the internal rate of return. Coyne *et al.* (1980) found that residential real estate exhibits higher risk-adjusted returns relative to stocks and bonds. In addition, real estate was established as an important diversification tool due to its low or inverse correlation with stocks and bonds. Both Karplan (1985) and Robickek *et al.* (1972) also discovered that farm real estate offers returns that are comparable to stock returns in addition to serving as an effective diversification tool. These findings, notwithstanding their complimentary role, are also limited in terms of generalisation as observed in the study of Wendt and Wong (1965). In addition they only considered total risk (standard deviation) rather than systematic risk.

Considering more than one property type, the studies of Friedman (1971) and Webb and Sirmans (1980) also demonstrated that real estate not only offers diversification opportunities, but, also affords superior investment performance relative to other assets. Friedman (1971) further discovered that a mixed-asset portfolio reduces portfolio risk (with real estate returns covary inversely to common stocks) while Webb and Sirmans (1980) further indicated that heterogeneous risk and return characteristics are associated with different property types.

From a mean-variance criterion perspective, the study of MacGregor and Nanthakumuran (1992) demonstrated that property dominates bonds in the UK by exhibiting attractive return and risk characteristics when valuation-based series are used. Similar conclusion was reached in the studies of Newell and Webb (1998) for Australia and Canada and Newell and Webb (1998) for New Zealand and South Africa. Extra caution is, however, required in the interpretation of the results from these studies as the data employed did not span a full property cycle. Besides, the issue of smoothing of valuation indices was not considered; although with the de-smoothed valuation based series, property appeared still as an attractive assets class from the study of Corgel *et al.* (1998).

The overall conclusion from the literature is that direct investment in property provides superior returns and also serves as an important diversification tool when included in large portfolio. In the recent time, however, the resurgence of securitisation coupled with the deficiencies with direct real estate investment data have prompted most authors to sift their attention to real estate securities. Numerous studies have, for instance, analysed the historical performance of REITs but, with mixed findings on their superior returns. Sagalyn (1990), for example, came to the conclusion that REITs offered superior returns, indicating that real estate is a good diversification tool when included in investment portfolios. Studies like Titman and Wanga (1986), Chan *et al.* (1990), Howe and Shilling (1990), Kaplan and Schwartz (1995), Redman and Manakyan (1995), and Sanders (1997) failed to detect any evidence of superior return and attributed the findings in Sagalyn (1990) to an illusion arising from an omission of certain fundamental factors in the estimates of risk (Liu *et al.*, 1995). On the performance of real estate firms and real estate related companies, Glascock (1991) and subsequently Glascock and Davidson (1995) observed that real estate firms under-performed the market on a nominal and risk adjusted basis.

From an international perspective, Ling and Narango (2002) and Bond *et al.* (2003) examined the performance of real estate securities and observed that there are little abnormal returns to be earned in international real estate markets; although, substantial variations in real estate returns were found to exist across different markets and over different periods. A significant variation was equally observed in the performance of individual companies within a country. Ooi and Liow (2004) also examined the risk-adjusted returns of real estate securities traded in seven developing economies of Asian region. The findings indicated that the traded real estate sector in five of the countries under-performed the general stocks between 1992 and 2002. The study concluded that the risk adjusted returns of real estate stocks in the countries are dictated to a large extent by macroeconomic factors.

A large body of empirical studies in real estate literature points to underperformance of real estate securities relative to stocks on both nominal and risk adjusted basis. This clearly points to the fact that real estate securities may not

after all provide a good substitute for direct real estate investments. It is, however, noted that these studies are based on real estate securities traded in the developed and developing economies. Little research efforts have been made; apparently because of the difficulty in developing a good information infrastructure for real estate market research and the low patronage of real estate securities, in under developed economies like Nigeria, which has different institutional and market structures from the developed and developing economies.

The pioneering attempt in real estate investment performance analysis in Nigeria was made by Olaleye (2000). The study examined the performance of property portfolio in Lagos and found that while portfolio in Ikeja performed better in terms of their means returns when compared with the risk free rate, portfolio in Yaba under-performed the investor's targeted rate. A major shortcoming of this study, however, is the emphasis on the performance of management as opposed to the performance of the investment itself. Bello (2003) bridged the gap by examining the relative performance of residential property investment and investment in securities. The study found that property under-performed ordinary shares in terms of internal rate of return and risk adjusted measures. This contradicts the position of similar studies conducted in other part of the world; although valid only in the context of direct real estate investment. The recent study of Amidu and Aluko (2006) examined the investment performance of listed property and construction companies relative to stock on the Nigerian stock market. The findings revealed that both property and construction companies stocks under-performed stock on a risk-adjusted basis. On the other hand, listed property and construction vehicles were found to offer portfolio diversification when included in an equity investment portfolio due to their low correlation with the stock market. One of the limitations of the study is the exclusion of dividend from the return calculations. Besides, the study did not examine the inflation hedging characteristics of the securities employed in the analysis. This paper contributes to knowledge by examining the performance and volatility of real estate and other securities in the various sectors of the Nigerian stock market and answer the fundamental question of whether real estate securities provides reasonable substitute to direct real estate investment in Nigeria.

### 3. Data and methodology

For the purpose of this study, all the listed companies on the Nigerian stock exchange were stratified into seven sectors and the top rated companies (in terms of the market price of their shares) were selected as samples for the study. They include:

- First Bank of Nigeria Plc. (FBN): banking;
- Unilever Nig. Plc. (UNILEVER): manufacturing;
- UACN Property Development (UACN): real estate;
- Julius Berger Nigeria Plc. (JBERGER): construction;
- Mobil Oil Nigeria (MOBIL): oil and gas;
- Okomi Oil Palm Plc. (OKOMI): agriculture; and
- Niger Insurance Co. Plc. (NIGER): insurance.

The study period is seven years and starts from 1999 to coincide with the period when all the financial information on the individual companies is available. It also marks the beginning of the country's return to democratic governance after a long period of military rule.

Annual open and closing market price of shares and dividend data were collected for the above listed companies. Data were also compiled on all share index (ASI), consumer price index (CPI), local risk free rate (yield on 90 days T-Bill) on an annual basis for the same study period.

The first objective of study; to examine the historical performance and volatility of sampled companies was achieved using both descriptive and risk-adjusted measures of performance analysis. The descriptive measure comprises the rate of return calculation without explicitly considering risk, standard deviation and coefficient of variation. The rates of returns ( $r$ ) were computed for each company as follows:

$$r_t = \frac{P_{t+1} - P_t + D_t}{P_t} \quad (1)$$

Where  $r$  is returns on stock,  $P_t$  and  $P_{t+1}$  denote the market price of stock at time  $t$  (beginning of the year) and  $t + 1$  (end of the year) respectively.  $D_t$  is the intermediate dividend payment.  $D$  was excluded in the computation of annual percentage change for ASI and CPI.

To measure the risk or volatility of the stocks standard deviation was used. It is a summary of how much the value deviate from their steady state, which is:

$$\delta = \sqrt{\frac{\sum_{t=1}^T [r_t - \bar{r}]^2}{T}} \quad (2)$$

Where  $\bar{r}$  is the mean value of  $r_t$ , and  $T$  is the number of observation. The coefficient of variation was calculated as follows:

$$CV = \frac{\delta}{\bar{r}} \quad (3)$$

In addition to the above, the Sharpe index and a market model were utilised to generate a risk-adjusted performance ranking of the companies. The Sharpe index adjusts returns by both the risk free rate of return and the standard deviations of the returns. This is shown below:

$$S_i = \frac{r_i - r_f}{\delta_i} \quad (4)$$

Where  $r_i$  is the nominal rate of return for stock  $i$ ,  $r_f$  is the risk free rate of return and  $\delta_i$  is the standard deviation of returns for stock  $i$ . As denoted by the denominator, the Sharpe index evaluates the stock on the basis of total risk, which encompasses both rate of return performance and diversification.

The market model equation used is:

$$R_t = \alpha_t + \beta_t R_m + \ell_t \quad (5)$$



where  $R_t$  is the annual return of asset,  $\alpha_t$  is asset intercept,  $\beta_t$  is asset beta (regression coefficient),  $R_m$  is annual percentage change in ASI used as a proxy for the market index in the model and  $\ell_t$  is the error term.

The inflation edging effectiveness of real estate security was examined through the comparison of the nominal rate of returns ( $r$ ) with real rate of return ( $r'$ ). The real rates of returns were computed using:

$$r' = \frac{1 + r}{1 + r_{\text{inf}}} - 1 \quad (6)$$

where, and  $r_{\text{inf}}$  are real rate of return, nominal rate of return and inflation rate respectively. A complete hedge against inflation is defined as the case where  $r' \geq r$ . On the other hand, a partial hedge against inflation is defined as those cases where  $r' \geq 0$  but less than  $r$ . That is, there is at least some inflation protection.

To further examined the relationship between real estate security returns and inflation, the nominal rates of returns was regressed against market index and CPI, which is used as the proxy measure for the actual rate of inflation. The regression is the form:

$$R = \alpha + \beta(R_m) + \gamma(CPI) + e_r \quad (7)$$

where  $R$  is the nominal rates of return on real estate security,  $\alpha$  is constant,  $\beta$  is the coefficient of market return,  $R_m$  is market return,  $\gamma$  is the coefficient on inflation and  $e_r$  is the error term assumed to fulfil the ideal condition.

The question of whether real estate securities are uncorrelated with the stock market is answered by examining the correlation matrix of returns between the real estate security and the market index (ASI), CPI and 90-day T-Bill annual rates.

#### 4. Analysis and results

Table I presents the descriptive and risk-adjusted performance of all the sampled securities alongside the market index. Real estate (UACN) security had the highest mean annual return (42 percent) per annum. This is substantially higher than the market index and other security. However, the market index provided the least total risk (0.24) that also differs substantially for other securities including real estate. Using the coefficient of variation (CV) to provide a relative risk/return ranking, the market

Asset	Average annual return (nominal)	Average annual return (real)	Standard deviation	Coefficient of variation	Sharpe ratio
FBN	0.30	0.14	0.42	1.41	0.39
LEVERS	0.34	0.18	0.60	1.76	0.34
UACN	0.42	0.23	0.52	1.23	0.55
JBERGER	0.17	0.05	0.51	3.07	0.06
MOBILE	0.31	0.15	0.47	1.51	0.37
OKOMU	0.24	0.10	0.40	1.65	0.27
NIGER	0.15	0.02	0.59	3.97	0.02
ASI	0.31		0.24	0.78	0.73

**Table I.**  
Descriptive and risk-adjusted performance

index provided the best risk/return performance of the seven securities and the market index for the period under review. The performance superiority of market stock is further evidenced in the highest Sharpe ratio recorded; although comparable to other securities real estate still remains the most desirable asset in the market.

The results of the above table supports the conclusion that real estate security significantly outperformed other investment assets including market stock on a nominal basis contrary to the findings of Amidu and Aluko (2006). It, however, under-performed the market on a risk-adjusted basis, thus complimenting the general conclusion in literature on the performance of real estate securities in other parts of the world.

Table II summarises the market model analyses for the study period. The insurance sector (NIGER) exhibited the least systematic risk, about 25 percent of the variation in return (total risk) as measured by  $R^2$  while that of other were not statistically different. In terms of beta, the market model results are quit different. The beta differs substantially amongst the seven securities with the insurance sector once again being the riskiest security in the market. These findings (in Table II) are unexpected since they do not appear to follow the generally accepted axiom of a positive relationship between risk and returns. Nonetheless, the conclusion emanating there from is that real estate competes favourably with other investment on a risk-adjusted basis.

On whether real estate security provides a hedge against inflation, compounded annual nominal and real rates of return for all the securities were first compared (see Table I). Unexpectedly, real estate like other securities does not provide a complete hedge against inflation (the real rate of return of 0.23 against the nominal of 0.42). On a comparative basis, however, real estate provides the best investment asset that could be included in an investment portfolio on the account of its partial hedge against inflation. The results of the regression model and correlation matrix to further examine the inflation hedging potentials of real estate security are presented in Tables III and IV.

The coefficient of inflation as contained in Table III is nominally negative but not statistically significant. Similarly, real estate security exhibited little negative correlation with the CPI, but very strong positive correlation with the short-term interest rates. The CPI was used as a proxy for actual inflation while the T-Bill was used as a measure of expected inflation. These results further reject the assumption that real estate security may provide a good hedge against inflation, and, it is

Asset	Adjusted $R^2$	$\alpha$ (Intercept)	$\beta$ (Beta)	DW text <sup>**</sup>
FBN	-0.325	0.347 (0.649)	-0.078 (-0.136)	1.308
LEVERS	-0.332	0.377 (0.494)	-0.033 (-0.0570)	1.180
UACN	-0.319	0.556 (0.855)	-0.103 (-0.179)	1.927
JBERGER	-0.333	0.117 (0.182)	0.190 (0.033)	1.130
MOBILE	-0.313	0.495 (0.900)	-0.123 (-0.215)	2.323
OKOMU	-0.329	0.198 (0.382)	0.055 (0.096)	2.189
NIGER	-0.250	0.474 (0.664)	-0.249 (-0.446)	1.593

**Table II.**  
Regression results for all  
the securities on  
market index

**Notes:**  $t$  statistic in parentheses; <sup>\*</sup>  $t$ -tests are all not significant at the 0.05 level; <sup>\*\*</sup> not significant at the 0.05 level; there is no evidence of autocorrelation



consistent with Rubens *et al.* (1989) who provided an explanation for the poor inflation adjusted performance by indicating that assets performed well in terms of anticipated inflation, but poorly in terms of unanticipated inflation.

The correlation of real estate security returns with the market index also exhibited a low and negative coefficient, meaning that real estate is uncorrelated with the stock market.

## 5. Summary and conclusions

The results of the study suggest that real estate security provides returns which outperformed the market and other investment asset on a nominal basis but, under-performed the market stock on a risk-adjusted basis over the time period of study. In addition, based on a comparison of coefficient of variation, all other securities exhibited higher risk/return ratios (coefficient of variation) than the stock market or real estate. Consequently, it can be concluded that only real estate security provided risk-adjusted returns that were competitive with the market index for the period under review. The results of the regression model also support this conclusion with all the securities exhibiting above average systematic risk (as measured by  $R^2$ ) except the insurance sector.

For the period under review, the real rate of real estate return falls below its nominal rate of return. Besides, real estate security exhibits little and insignificant negative correlation with the rate of inflation, as proxied by the CPI, but strong positive correlation with short term interest rates, as proxied by the 90-day T-Bill rates. The paper does not, therefore, support as assumption that real estate security in the Nigerian stock market provides a complete and good edge against inflation. But, given the risk/return relationship demonstrated in this analysis, only real estate security appeared to be a good choice for inclusion in the investment portfolio during the period of analysis.

Lastly, real estate security exhibits a negative low correlation with the stock market. As such, it can be concluded that real estate security is uncorrelated with the stock market, and, hence provide minimal diversification benefits when included in an investment portfolio.

Variable	Coefficient	<i>t</i> ratio	<i>F</i>	$R^2$
Market index	- 4.445	- 1.489	1.216	0.097
CPI	- 18.005	- 1.544		
Constant	4.572	1.721		

**Table III.**  
Real estate security return, market return and inflation (CPI)

Asset	UACN	ASI	CPI	90 Day T-Bill
UACN	1			
ASI	- 0.103	1		
CPI	- 0.220	- 0.904*	1	
90 Day T-Bill	0.819	0.466	- 0.713	1

**Table IV.**  
Correlation matrix on return on real estate security, market return, CPI and 90 day T-Bill

**Notes:** \*Correlation is significant at the 0.05 level (two-tailed)

Although the results of this study are constrained by the limited time period of analysis and small sample size (there is only one listed property company on Nigerian stock market and that actually informed the idea of picking the top rated companies in other stratified sectors of the market), a scenario emerges regarding the behaviour of indirect real estate investment. This scenario suggests that indirect real estate investment does not after all provide a good substitute to direct real estate investment. This 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.

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