

On Risk-adjusted Return Performance of Publicly Traded Real Estate Securities in an Emerging Market

Stephen ARO-GORDON,
Faculty of Computing and Applied Sciences,
Baze University, Abuja, Nigeria.
Email: stephen.aro-gordon@bazeuniversity.edu.ng

Abstract

Despite widespread concern for the inherent illiquidity in private real estate, research has not fully explored the alternative investment approach of publicly traded real estate securities, particularly in emerging market economies like Nigeria. The general belief is that real estate-backed security offers the benefits of property ownership without the attendant concerns of being a landlord such as the need for active management and specialized local expertise. In this paper, the idea was investigated further by describing recent risk-adjusted return performance of publicly traded real estate-backed securities as innovative financial instruments in Nigeria, Africa's biggest economy and most populous nation. Publicly available market and corporate financial data of sample real estate operating company and real estate investment trust trading on the Nigerian Stock Exchange were used in testing the Sharpe Model, one of the widely-accepted risk-adjusted performance metrics thought to improve modern investment process by helping to balance risk against expected returns. General market and risk-free rates of return, spanning 2000 – 2013, were selected as benchmarks for our analysis aided by Microsoft Excel spread sheet programme. Among other findings, the analysis demonstrates emerging real estate securities' superior performance on risk-adjusted basis, thus reinforcing conceptual support for using qualified property-backed securities to enhance investment diversification strategy. Some policy implications for effective and sustainable delivery of real estate and financial services towards improved quality of life, especially in emerging markets like Nigeria, were highlighted.

Keywords: *Emerging Market, Real Estate Securities, Risk-adjusted Performance Metrics, Risk-free Rate, Sharpe Model*

JEL Code: *C58, G11, I2, J32, J38*

1. Introduction

Choosing from among a large number of securities in today's globalised financial markets remains a critical challenge for many investors. Each set of securities or asset class in the financial system puts investor's money to work in different ways by posing particular risks that may not be characteristic of the other asset classes. In this context, intelligent asset allocation will invariably depend on the investor's risk appetite and the risk-return behaviour of individual securities, thus making proper investment analysis an imperative in asset management practice. In this context, the 'unique' behaviour of real estate security, its superior return potentialities, coupled with its relatively low-risk and portfolio diversification value, have been widely speculated. Additionally, real estate historically provides investors with a source of relatively stable, income, hence its inherent diversification, long-term value has a strong motivation for institutional and retail investors across jurisdictions (Young & Graff, 1995). This is perhaps while real estate remains a major contributor to rapid economic growth rates of 2 billion people global frontier market economy (MSCI, 2015).

The search for improved efficiency and better liquidity in real estate investment has led to the development of real estate securitisation, a widely used term for describing the creative or financial engineering process of transferring direct ownership of real property (land and buildings) into indirect ownership through investment in marketable stocks while preserving for the investor the rewards of income and revenues generated from the operations, leasing and sale of such real property (Ministry of Land, 2001; Lohmeier, 2003; Vickery, 2009; Ola, 2007). There are broadly four types of real estate securities, namely, public equity, private equity, public debt, and private debt (Appraisal Institute, 2001). This paper focuses on real estate-backed public equities including publicly traded Real Estate Investment Trusts (REITs) as real estate-backed collective investment schemes, and Real Estate Operating Companies (REOCs) that are engaged in direct property development activities. While REOCs are common, studies on REITs have not been thoroughly explored in Nigeria perhaps because REITs are relatively new phenomena in the country; they were introduced into the country's financial landscape by Investment and Securities Act in 2007. The paradigm shift from direct real estate ownership, to indirect real estate ownership has caused many of investors and wealth managers to reorganize and develop sophisticated risk management systems (Souza, 2011).

While the Nigerian real estate capital market has attracted appreciable level of research interest since its emergence fifteen years ago, one persisting area of concern relates to inadequate evidence-based knowledge of the risk-return nature of real estate securities as

relatively new investment tools in Nigeria. Research to date in the Nigerian context has yielded mixed findings. In addition, the results from previous studies are largely based on data prior to the 2008-2009 global financial crisis and it is unclear if the conclusions from these contributions are still valid. The issue is that empirical application of finance theories to the emerging secondary property market in Nigeria has not been thoroughly explored and the specific question as to whether real estate securities sustainably outperform the market in risk-adjusted return terms remains unresolved. In this paper, we argue that since private real estate investment has been historically rewarding to long-term investors, securitized real estate as an alternative investment platform, is expected to be no less attractive in nominal and risk-adjusted terms.

The significance of this paper can be seen from three perspectives. First, a common understanding and approach on risk-adjusted return performance of innovative financial instruments like real estate securities is crucial to the effective and successful implementation of risk management strategy of CEOs, analysts, entrepreneurs, managers, investors and regulators in today's increasingly volatile global financial market. Secondly, in the Nigerian context, characterisation of real estate securities is essential for harnessing capital market means by which infrastructure development and investment management can be enhanced to address the country's perennial \$300 billion (₦60 trillion) housing finance deficit (Moghalu, 2011; Onuoha, 2012). This is an imperative, given the on-going Economic Transformation Agenda of the national government which include, among others, the task of deepening the country's capital market with new wealth management products such as property-backed financial instruments. Thirdly, by providing post-2008 global financial crisis dataset, this paper is expected to improve our knowledge of risk-adjusted performance evaluation model as a strategy execution tool, a major challenge facing corporations across the globe (Sull, Homkes, & Sull, 2015). The idea is to ensure that people are provided with the information necessary to make informed decision towards maximizing their quality of life (Iyiegboniwe, 2007; SEC Nigeria, 2015). This paper is therefore expected to add substantially to the body of literature on applied investment portfolio theory.

Next is a general review of the literature and conceptual theoretical framework for the study, with emphasis on the competitiveness of securitized real estate investment paradigm. After briefly examining the status of empirical research on the subject, particularly in the context of the Nigerian capital market development, we present the methodology adopted for the present contribution, thereafter highlighting our findings and offering some

explanations. The concluding sections of the paper point attention to some major implications for investment portfolio management practice, particularly in Nigeria.

2. Measuring Competitiveness of Asset Risk and Return

The theoretical justification for the present study is premised upon the Modern Portfolio Theory (MPT) of asset selection and performance analysis, which is rooted in a long history of literature (Markowitz, 1952 & 1991; Fama, 1965; Treynor & Black, 1973; Sharpe, 1963, 1966, 1992, 1994 & 1975; Klarman, 1991; Fama & French, 1993). It is posited that an integrated approach offers a robust framework for deeper understanding of the risk-adjusted return performance of capital assets. This is because, the two major issues involved in asset behaviour analytics are calculation of risks and returns and the relationship between the two (Graham & Dodd, 2008; Raji, 2003). Hence, risk-return trade-off concept is vital in stock behavioural analysis because what is ultimately being assessed is the way security prices respond to investors' perception of their investment return, given the uncertainty in the business environment. Despite the question marks raised by the likes of Sullivan (2012), MPT remains the most commonly used financial methodology used in analysing the behaviour of stocks by comparing them to market indices using such statistical measures such as Sharpe Ratio, based on the assumption that educated investors and trustees of funds who are concerned about returns, would want to ensure that their portfolios do not earn less than a risk-free or reference rate (Mohd. Ali, 2006; Durand, Jafarpour, Kluppelberg, & Maller, 2010).

Competitiveness of real estate investment return relative to other assets in the financial market is pivotal for sustainable real estate finance in Nigeria, given the desired linkage of real estate and capital markets in emerging market. Investors buy a security because it offers them the prospects of a fair return for its risk. They want to know what yield or reward they are obtaining on their invested capital. MPT rationalizes selection and construction of assets on risk-adjusted basis, rather than on mere nominal terms (Ashamu, 2009). Thus, MPT rests on the implicit financial risks associated with investments in stocks and shares which managers dealing in these financial assets face as regards the respective performance of the underlying the businesses (Herring, Diebold, & Doherty, 2010). The concept of risk-adjusted return thus refers to an investment's return determined by measuring how much risk

is involved in producing that return. It is a risk-based profitability measurement framework for analysing financial performance, thus providing a more consistent view of profitability across businesses or industries than just the nominal return measurement.

We know that numerous risk-adjusted performance metrics (RAPMs) or performance indices exist in the financial world today; these include Modigliani's M^2 , Sortino's downside risk measures, Jensen's alpha, Treynor's average excess return to beta ratio, and Sharpe model, (Treynor & Black, 1973; Sortino & Satchell 2001). We also know that in almost any kind of investing, returns have at least some relationship with the risk-free rate of return, with investors demanding higher returns for greater risk. However, while investment analysis, whether *ex ante* or *ex post*, is widely acknowledged as pivotal to effective strategizing, there is no consensus as to best approach to conducting it, hence the need for further research in the field.

3. Previous Studies

The Sharpe Ratio (SR) (or Sharpe Model) has pervasive usage as a simplified model for portfolio analysis and useful for maximizing the return to risk trade-off (Durand *et al*, 2010; Olowe, 2011). SR became a recommended RAPM because it is seen as an improvement to the traditional approach that focuses only on expected asset return. The approach simply attempts to summarize two pivotal statistical measures (mean and variance) with one metric – the SR. The SR idea suggests that assets should be selected on the basis only of their risk-adjusted returns. This requires robust understanding of the relevant mathematical methods and how they can be applied to compute SRs for various assets or investment portfolios, particularly new ones like real estate securities. Kalpakam and Gopalakrishnan (2014) used risk-adjusted returns to evaluate midcap mutual funds in India between January 2008 and June 2014 based on 91-day Treasury bill as it is the practice in the Industry. The Indian researchers' work established the validity of risk-adjusted measures of performance as more appropriate in the assessment of asset returns as opposed to using widely quoted benchmarks popularised in the press.

However, in the Nigerian context, we know less concerning whether or not returns from real estate securities outperform the market portfolio in risk-adjusted terms (Oteh, 2011). Moreover, findings from previous studies remain largely inconclusive while there is no intellectual consensus on the acclaimed superior investment performance of real estate securities, even in the more developed markets (Ooi & Liow, 2004). The debate therefore

continues regarding whether or not the acclaimed ‘unique’ risk-return behaviour of real estate stocks is merely a stylized fact of capital theory (Kaldor, 1961).

In a pioneering study on the subject in Nigeria, Sharpe Model was deployed to appraise the performance of listed construction and real estate companies in the country by Amidu and Aluko (2006). The authors used average quarterly prices for some selected securities in Nigeria, monthly all-share index, and a risk-free rate of 12.26 per cent (which was the prevailing rate of the Nigerian Government Development Stock as at 2005) for their analysis. In that work, the Nigerian Real Estate Operating Company (N-REOC) type of real estate security was found to have under-performed on a risk-adjusted basis. This was perhaps due to a declining profitability experienced by the N-REOC at the time. However, pre-2008 assessment by Amidu, Aluko, Nuhu, and Saibu (2008) using the same risk-adjusted performance evaluation model found that real estate securities out-performed the market portfolio *both* nominally and on a risk-adjusted basis.

More recently, the Sharpe Model was applied to appraise the performance of Nigeria’s Pension Fund Administration (N-PFA) investments from 2006 to 2014, and the impact of inflation on Retirement Savings Accounts (RSA) during the same period, again, using risk-free rate of government securities (Atuanya & Edozie, 2015). Notably, the PFA study reported a negative SR (-0.81) for the N-PFA portfolio during the study period. This means that the Sharpe Model is perhaps popular among Nigerian scholars and practitioners and can be a valuable tool to apply to other asset classes.

Understandably, given the relative infancy of the secondary property market in Nigeria, most of the cited studies seem to pay little attention to the behaviour of emergent REIT variant of real estate securities. Thus, the crucial question is whether what we know about the risk-return nature of the Nigerian real estate securities remains valid post-2008 global financial meltdown. The present study is an attempt to combine a more comprehensive pre- and post-2008 dataset on the subject, using the Sharpe Model financial research approach.

4. Methodology and Samples

In this paper, we adopt the optimality property of a maximum SR portfolio, that is, a portfolio that achieves the maximum value in equation (1):

$$SR_{(x)} = \frac{(R_x - R_f)}{\delta_{(x)}} \quad \dots (1)$$

Where,

x is asset or portfolio

R_x is the average rate of return for asset or portfolio x

R_f is the average rate of return of a 'riskless' security, that is the Nigerian 91-day Treasury Bills

δ is the standard deviation of R_x

As we observed in the review of the literature, this textbook RAPM has long been used in asset management theory and practice either for an *ex ante* purpose to decide on optimal allocation, or *ex post* as a portfolio evaluation research tool, as adopted in the present study (Durand *et al*, 2010). In this case, we did not need statistical hypothesis testing procedures to make our inferences (Sidhu, 2006); the higher the SR, the better an investment, x . As the reference rate for the computation of SR of the sample portfolios including market portfolio (R_m), we took the average rate of return, over the period 2000-2013, of the Nigerian 91-day Treasury Bills, which are regarded as the safest forms of investment because they are backed by the full faith and credibility of the national government (Brealey, Myers & Allen, 2014). R_m was derived from the market price-earnings ratios (PERs) obtained from the Nigerian Stock Exchange (NSE). We conducted our analysis using Microsoft Excel spread sheet programme. We have assumed normal distributions; thus, additional measures may be needed to capture possible sub-rational or super-rational levels of investor utility, but these considerations would be outside the scope of this paper.

We have confined the illustration to the direct use of historical data due to their predictive ability and also for us to err on the side of conservatism (Sharpe, 1994; Durand *et al*, 2010; Malloy & Bower, 2012; Seaman & Smith, 2012). We used available market and corporate financial data sourced from the Nigerian Stock Exchange (NSE) (2012 & 2013) and Central Bank of Nigeria (CBN) (2013) covering 2000 to 2013. A compilation sheet was designed that enabled us to accurately transfer data in the order in which they appear in the source document. Since this was an *ex post* asset risk-adjusted performance research, the sample securities were selected based on relative length of trading recorded on the Exchange. The study period was justified on the need to bring data up to date as much as possible. Consequently, out of the REOC and REITs (UAC-Prop,

SKYESHELT, UHOMREIT, and UPDCREIT) on the main board of the NSE that constituted the population for this study, UAC-prop and SKYESHELT were selected as good proxies for the Nigerian real estate security risk-adjusted performance analysis.

Two reasons stand out for using the Nigerian case in this study. First, in recent years up to 2013, the Nigerian capital market has been relatively dominated (60%) by foreign portfolio investors (NSE, 2013). Nigeria is a recurring name in the frontier market world and frontier market economies are believed to facilitate diversification strategy of international investors because of frontier markets' relatively lower degree of correlation with most developed and emerging markets (MSCI, 2015). Secondly, the country is constantly in the radar of educated investors, being the largest economy in Africa, the global economy's last frontier (Moghalu, 2014).

The outcome of validity tests conducted on the study suggests general consistency with the literature as well as expert views (Durand *et al*, 2010; Brealey *et al*, 2014; Atuanya & Edozie, 2015). The unstandardized variables were considered in this study since the data of all the variables, notably, R_i , R_f , and R_m had been in similar terms.

5. Results and Discussion

As output of this research, Table 1 presents the nominal and risk-adjusted return performance matrix of the Nigerian real estate securities assessed over the study period, 2000 – 2013. The analysis recorded the average nominal rates of return for R (N-REOC), R (N-REIT), R_m , and R_f as 12.25 per cent, 7.6 per cent, 6.21 per cent, and 10.52 per cent respectively. The foregoing result demonstrates, at the outset, the superior investment performance of the real estate class when compared with the stock market. Notably, the average rate of nominal return from N-REOC real estate security variant almost doubled the average rate of return from market portfolio; the asset class also on the average outperformed the riskless portfolio as predicted by finance theory (Brealey *et al*, 2014). A key factor in the performance of REITs in particular might be related to the fact that a REIT company usually pays out least 90-95 per cent of its taxable income as dividends to shareholders, which would be a major attraction to income-seeking investors (Deloitte, 2014). The superior risk-

adjusted performance of evolving N-REITs might have also been influenced positively by managers' emphasis on such critical success factors as income-generating capacity of the underlying real assets, assets' location and quality of tenancies.

In the same vein, the highest SR of 0.23 recorded by N-REOC evidenced the risk-adjusted performance superiority of the asset-backed security which makes it a more desirable asset relative to the market portfolio, which recorded SR of -2.44. This means that N-REOCs outperformed N-PFA's which have an estimated SR of -0.81 (Atuanya & Edozie, 2015). Thus, from the results presented in Table 1, it can be deduced that the N-REOCs might have been 'safer' assets than the portfolio conventionally regarded as 'risk-free' in the literature.

Table 1: Nominal and risk-adjusted return performance matrix of the Nigerian real estate securities (2000 – 2013).

Portfolios	Average nominal rate of return per annum	Risk-adjusted return performance (Sharpe Ratio)
N-REOC	12.25%	0.23
N-REIT	7.6%	-0.83
Market Portfolio (<i>R_m</i>)	6.21%	-2.44
Nigerian Treasury Bills (<i>R_f</i>)	10.52%	0

Sources: Research survey and Microsoft Excel spread sheet analysis (2014)

Interestingly, despite being in the same real estate asset class that derives their income streams from landed property assets, the Sharpe model was sharp enough to uncover the divergent investment performance of securities within the same asset class. REIT's average return performance (7.6 per cent) appears inferior to REOC (12.25 per cent). Similarly, in risk-adjusted performance terms, N-REOC did better (0.23) than N-REIT (-0.83), probably because REITs by structure could not sustainably fund growth with retained earnings, although there could have been opportunities for them to fund growth strategies by issuing new securities.

The superior return performance of real estate-backed securities in Nigeria may be attributed to several reasons, majorly grossly inadequate housing stock and lack of a robust mortgage finance system. While shelter remains one of the three basic human needs, access to adequate and affordable housing remains a critical challenge for people across Africa whose current population of 1.1 billion is projected to double by 2050 (World Bank, 2015). Nigeria, the continent's most populous nation is facing unpalatable housing conundrum accentuated by rapid population growth rate estimated at 2.8 per cent per annum. Additionally, the country is one of the three countries (including India and China) together expected to account for 37 per cent of the projected growth of the world's urban population between 2014 and 2050 (United Nations, 2014). The country's perennial housing deficit has worsened from 7 million in 1991 to 15 million in 2008 with current estimates being in the region of 17 million which continues to drive demand in the primary property markets. This is a particularly common experience in the country's major urban centres like Lagos, Abuja, and Port Harcourt, where about 68 per cent of mid-income earners live in rented houses, as well as other major cities across Africa (BGL Research, 2011; Fontaine, 2015). Other critical supply-demand challenges include prohibitive mortgages with an interest rate of between 22 – 24 per cent, high level of unemployment, lack of easy access to land, and high cost of building materials. With regards to mortgage finance deficiency in particular, the gap in this regard is evidenced by the 66, 000 applications recently received by government for just 10,000 available mortgage opportunities (Okogu, 2015).

Thus, fuelled by scarcity of quality residential and commercial housing, as the available real estate appreciates in value, real estate securities become more valuable and the stock-market price tend to rise steadily. Also, the belief that property investment works on a different set of values among which are regular income and social prestige could also be a contributory factor (Ifediora, 2009). The superior returns that characterize the real estate securities as demonstrated in this article, bring to the fore the high potentialities of Nigeria's \$32 billion (₦6.43 trillion) real estate sector as a critical tool for advancing the economy, particularly in redressing its current dismal contribution (at less than 10 per cent, compared to 30–40% and 60-80% in emerging and developed markets respectively) to the country's

rebased GDP through a robust capital market-driven strategy (Osamwonyi, 2006; Eleh, 2007; Sangosanya, 2008; Mabogunje, 2008; National Bureau of Statistics, 2014). Thus, as Sharma and Jeon (2010) observe, there may be a need for asset managers and regulators concerned with the development and management of optimal portfolios, particularly in Nigeria, to treat real estate securities collectively as a 'special' class of securities separate from other common stocks, in order to take advantage of the asset class's superior risk-adjusted return performance.

Another noteworthy result from our study is the existence of negative risk premium (that is where $R_f > R_x$) as noted by Ajao (2014). We observed a situation under which investment in government debt securities ('riskless' asset) was higher-yielding and attractive investment vehicle than otherwise viable economic opportunities in the real-sector represented by publicly traded real estate equities. The implication is that a regime of persistently high treasury bill return rate could be a major disincentive to the much-needed deepening of the capital market, not only because it would discourage real sector development efforts, but also because of the negative implications for public finance in terms of the resultant high debt-repayment burden on the part of the government. Some practitioners have expressed concern about Nigeria's \$23 billion (₦4.6 trillion) pension funds going more (62.77%) into risk-free government securities than (11.79%) invested in quality, long-term equities, with the resultant crowding-out effects on the real economy (Sotubo, 2015). Thus, the presence of a pervasive negative risk-adjusted return situation in the Nigerian Capital Market provides a worrisome evidence of the structural anomaly in the business environment that can negatively affect the country's quest for sustainable development finance and economic transformation. Current findings from this study may therefore serve as a basis for renewing stakeholders' call for the creation of a sustainable private-sector-driven Nigeria.

Overall, the results from this study has gone some way to demonstrate the competitiveness of Nigerian real estate securities, given that *both* the nominal and risk-adjusted performance of the appraised real estate securities exceed that of the entire market over time, contrary to the experience in developed markets (Carricko, 2008), thus supporting international portfolio diversification theory mentioned earlier in this paper. This result is consistent with findings from previous studies,

notably Kalpakam and Gopalakrishnan (2014), Amidu *et al* (2008), and evident in real estate being one of the dominant sectors in frontier markets (MSCI, 2015). Synchronous with Knight Frank Residential Research (2006), the output of our study provides a good basis for enhancing the linkage of real estate and capital markets for rapid capital formation, economic growth and development. Taken together, the implication of all the foregoing results is that an investor in real estate-backed security can achieve a higher return without necessarily assuming a higher level of risk. This appears contrary to the risk-return trade-off assumption in finance theory, hence the acclaimed unique investment attributes of real estate securities thus validating the “special” or “abnormal” investment character of the asset class (Lohmeier, 2003; Vickery, 2009; Ebrahim & Hussain, 2010; Oteh, 2011; Olowe, 2011). Real estate security in frontier markets may thus offer investors the prospects of a near-ideal investment; one that provides investors with safety, liquidity and maximum income.

6. Conclusions

This paper has tried to demonstrate that the emerging investment vehicles for real estate investment in Nigeria, particularly N-REITs and N-REOCs, remains a veritable source of superior returns to investors in nominal and risk-adjusted terms, and therefore, one with high potentialities for serving as veritable means for inclusive wealth generation, wealth preservation, and societal progress. The superior risk-adjusted performance of the Nigerian REITs and REOCs in the face of a rather burdensome business environment (rising unemployment rate, high cost of funds, unstable inflation rate, opaque regulatory policies, general insecurity issues, deficient public infrastructure, and so on), indicates the resilience of real estate investment portfolios in frontier markets and the tremendous societal prosperity waiting to be realized if and when these socio-economic challenges are resolved. The findings from this study, corroborating some past studies on the subject, notably Amidu *et al* (2008), Durand *et al* (2010), and Kalpakam and Gopalakrishnan (2014), suggest the need for appropriate reforms towards increasing the level of local and foreign portfolio investment in the emerging frontier real estate sector. The 2010 wide-ranging tax-waivers for N-REITs that were introduced through the Nigerian Debt Management Office was a step in the right direction; these incentives should

be well-implemented to encourage listing of more real estate securities on the Nigerian Stock Exchange. Additionally, members of Real Estate Developers Association of Nigeria (REDAN), national and state-owned housing corporations can be given appropriate regulatory support (such as tax incentives, access fee waivers) in order to attract their quotation on the Exchange, thereby deepening the capital market with viable property-backed securities, for sustainable wealth generation and wealth preservation in today's volatile global financial market.

Some caveats are noteworthy. Due to data accessibility constraints, the empirical financial data used for the present analysis could be out of date. Although we had simplified our analysis by using aggregate market data as benchmarks, perhaps, if the data were available during the research, we could have used other reference rates such as NSE-30 or NSE Foods/Beverages to deepen knowledge towards meaningful comparative assessment of asset returns. Similarly, while the present work was limited to REOC- and REIT-backed public equities, further studies may need to include other evolving property-backed financial instruments like mortgages and bonds. The Sharpe model used in this article is not necessarily sacrosanct; application of other RAPMs like the Sortino Ratio or Jensen's alpha can be attempted in future works so as to compliment the evidence database provided in this paper.

References

- Ajao, M. G. (2014). Equity premium puzzle and the Nigerian financial market. *Journal of Management and Entrepreneurial Studies*, (1), 3 & 4, 106 – 115.
- Amidu, A., B. T. Aluko, M. B. Nuhu & M. O. Saibu (2008). Real estate security and other investment assets: A comparison of investment characteristics in the Nigerian stock market. *Journal of Property Investment and Finance*, 26, 2, 151-61.
- Amidu, A., & B. T. Aluko (2006, May – August). Performance analysis of listed construction and real estate companies in Nigeria. *Journal of Real Estate Portfolio Management*. 12, 2, 177-85.
- Appraisal Institute (2001). *The appraisal of real estate*. (12th ed.). Chicago: Appraisal Institute.
- Ashamu, S.O. (2009). *Financial investment and management analysis*. Lagos: Molofin Nominees.

- Atuanya, P., & I. Edozie (2015, March 11). Retirement savers lose as pension funds fail to beat inflation. *Businessday*, pp. 1 & 4.
- BGL Research. (2011, December 11). The Nigerian real estate industry: the need for critical solutions to perennial housing challenges. *Thisday*, pp. 30 – 32.
- Brealey, R.A., S. C. Myers, & F. Allen (2014). *Principles of corporate finance*, 11th edn. London: McGraw-Hill.
- Carricko, R. (2008, December 6). REITs battered down to eye-catching levels. *The Globe Mail*. Retrieved on May 26, 2013, from www.reportonbusiness.com.
- Central Bank of Nigeria (2013). *2013 statistical bulletin*. Abuja: Central Bank of Nigeria.
- Deloitte (2014, November). Are tax exemptions available to REITs in Nigeria untapped? Retrieved from www2.deloitte.com/ng/en/pages/tax/a on November 9, 2014.
- Durand, R. B., H. Jafarpour, C. Kluppelberg & R. Maller (2010, Summer). Maximize the Sharpe Ratio and minimize a VaR. *The Journal of Wealth Management*, 91 – 102.
- Ebie, S. P. O. F. (2011, August 8). State of the Nigerian housing market. A presentation at the International Housing Finance Workshop organized by Pison Housing Company, held in Lagos on 8-10 August, 2011.
- Ebrahim, M. S., & S. Hussain (2010, January). Financial development and asset valuation: The special case of real estate. *Journal of Banking and Finance*, 34 (1), 150-162.
- Eleh, E. (2007, July 2). Appreciating quest for affordable housing in Nigeria. *Financial Standard*. pp. 38, 39.
- Fama, E.F., & K. French (1993). Common risk factors in the returns on stocks and bonds. *The Journal of Financial Economics*, 33, 3 – 56.
- Fama, E.F. (1965, January). The behaviour of stock market prices. *The Journal of Business*, 38 (1), 34 -105.
- Fontaine, A. (2015, April). Housing: Kinshasa is for the rich. *The Africa Report*, no. 69, p. 56.
- Graham, B., & D. Dodd (2008). *Security analysis*. 6th Ed. New York: McGraw-Hill.
- Herring, R., F. X. Diebold & N. A. Doherty (2010). *The known, the unknown, and the unknowable in financial risk management: Measurement and theory advancing practice*. Princeton, N. J: Princeton University Press.
- Hughes, F., & Arissen, J. (2005). Global real estate securities – where do they fit in the broader market? Retrieved on May 28, 2010, from www.epra.com.
- Ifediora, G. S. A. (2009). *Appraisal framework*. Enugu: Iwuba Ifediora & Associates.
- Investment and Securities Act, 2007.

- Iyiegbuniwe, W.C. (2007). *The Essence of finance: Maximizing life-time happiness*, In University of Lagos Press. Retrieved May 11, 2010, from <http://www.unilag.edu.ng/publication/ope...>
- Kaldor, N. (1961). Capital accumulation and economic growth. In Lutz, F. A., & Hague, D. C. *The theory of capital*. London: Macmillan, pp. 177 - 222.
- Kalpakam, G. & P. G. Gopalakrishnan (2014). Do Indian mutual funds with high risk adjusted returns show more stability during an economic downturn? *Proceedings of the First Middle East Conference on Global Business, Economics, Finance and Banking (ME14 Dubai Conference), Dubai, 10-12 October 2014*. ISBN: 978-1-941505-16-8.
- Knight Frank Residential Research (2006). The case for indirect investment in residential property. Retrieved June 30, 2009 from <http://www.resources.knightfrank.com/getresearchresource.ashx.id=10830>.
- Lohmeier, E. M. (2003, June 26). Real estate securities. Lecture Notes at University of Iowa MBA Class. Retrieved June 26, 2009, from <http://www.anderson.ucla.edu/zone/clubs/area/library>.
- Mabogunje, A. L. (2008). Addressing finance and resource constraints for housing and urban development in Africa. Retrieved July 3, 2009, from <http://www.housing.gov.za.amchud/content/2008%20updates/AMCHUD%20-%20-%20pdf%20files/07%20Address>.
- Malloy, C., & M. Bower (2012, December). Wall Street doesn't understand innovation. *Harvard Business Review*, pp. 28 – 29.
- Markowitz, H. M. (1991). *Portfolio selection: Efficient diversification of investments*. Cambridge, MA: Blackwell.
- _____ (1952). Portfolio selection: *Journal of Finance*, 7, 77 – 91.
- Ministry of Land, Infrastructure, and Transport, Japan. (2001). Real property securitisation in Japan. Retrieved from www.tochi.mlit.jp/./setsu_2-4eng.html.
- Moghalu, K. C. (2014). *Emerging Africa: How the global economy's 'last frontier' can prosper and matter*. Penguin Books.
- _____ (2011, August 12). FG needs ₦60 tn to address housing deficit. *The Punch*, p. 19.
- Mohd Ali, H. (2006). Modern portfolio theory: Is there any opportunity for real estate? *Malaysian Journal of Real Estate*, 1, 1, 14 – 26. ISSN 1823 – 8505.
- MSCI (2015). MSCI frontier emerging markets index. http://www.msci.com/products/indexes/country_and_regional/fm/msci_frontier_emerging_markets_index.html accessed on 26th February 2015.

- National Bureau of Statistics (2014). Measuring better: Presentation of preliminary results of the rebased nominal Gross Domestic Product (GDP) estimates for Nigeria, 2010 – 2013, delivered by *the Statistician General of the Federation and CEO, National Bureau of Statistics, Dr. Yemi Kale, Transcorp Hilton Hotel, Abuja* on 6th April, 2014. Retrieved on 15th April 2014 from <http://www.nigerianstat.gov.ng>.
- Nigerian Stock Exchange (2013). *2013 Fact Book*, Lagos: Nigerian Stock Exchange
- _____ (2012). *2011/12 Fact Book*, Lagos: NSE, ISBN 978 0262 – 1 – 6.
- Okogu, B. (2015, March 19). Nigeria succeeding in economic diversification. *The Guardian*, pp. 6-7.
- Ola, O. (2007, February 2). Using structured finance to stimulate housing. *Financial Standard*, pp. 35-36.
- Olowe, R. A (2011). *Financial management: Concepts, financial system, and business finance*. 3rd ed. Lagos: Brierly Jones Nigeria Limited.
- Onuoha, R. (2012). CBN kicks against investing pension fund in capital market. Retrieved on December 3, 2012 from www.vanguardngr.com/2012/12cbn-kic.
- Ooi, T. L .J., & K. H. Liow (2004). Risk-adjusted performance of real estate stocks: Evidence from developing markets. *Journal of Real Estate Research*, 26, 4, 371-95.
- Osamwonyi, I. O. (2006). Utilization of the capital market for housing industry development in Nigeria, *Securities Market Journal*, 75-96.
- Oteh, A. (2011, January 28). The role of the real estate in capital market development. Opening Speech at the Nigerian Institution of Estate Surveyors and Valuers (NIESV) Seminar and Fellows Night on January 28th 2011. Retrieved December 16, 2011, from www.sec.gov.ng.
- Raji, A. (2003). Securities analysis and evaluation: Enhancing the role of stock-brokerage and issuing house analysts. In Ndanusa, S. A. and Ezenwe, S., Ed. (2003). *Nigerian capital market and the globalization challenges: Proceedings of the first annual national capital market conference*. Abuja, Securities and Exchange Commission, 33-44.
- Sangosanya, A. G. (2008). *The Estate Surveyor & Valuer in Nigeria's socio-economic development process & corporate property management and administration*. Lagos: Free Enterprise Publishers.
- Seaman Jr., J. T. & G. D. Smith (2012, December). Your company's history as a leadership tool. *Harvard Business Review*, 45 – 52.
- SEC Nigeria (2015, March 19). Public notice: Proposed new rules/amendments to the rules and regulations of the Securities and Exchange Commission. *The Guardian*, p. 63.

- Sharma, P., & Y. Jeon (2010). *An analysis of sovereign wealth funds and international real estate investments*. Massachusetts Institute of Technology. Accessed from www.dspace.mit.edu/handle/1721.1/63182 on May 5, 2012.
- Sharpe, W.F. (1994). The Sharpe ratio. *Journal of Portfolio Management*, 21 (1), 49 - 58.
- _____ (1992, Winter). Asset allocation: Management style and performance measurement. *Journal of Portfolio Management*, 7 - 19.
- _____ (1975, Winter). Adjusting for risk in portfolio performance measurement. *Journal of Portfolio Management*, 29 - 34.
- _____ (1966, January). Mutual fund performance. *Journal of Business*, 119 - 138.
- _____ (1963, January). A simplified model for portfolio analysis. *Management Science*, 277 - 293.
- Sidhu, K. S. (2006). *Methodology of research in education*. New Delhi: Sterling Publishers Private Limited.
- Sortino, F. A., & S. Satchell (2001). *Managing downside risk in financial markets (quantitative finance)*. Oxford, UK: Butterworth-Heinemann.
- Sotubo, D. (2015, March 8). Lack of investor confidence affecting economy. *The Nation on Sunday*, 09, 3148, p. 58.
- Souza, L. A. (2011). Modern real estate portfolio management: Applications to western regional apartment portfolios. *A Paper on Corporate Finance, Golden Gate University, San Francisco, CA*, obtainable from Lsouza@johnsonsouzagroup.com.
- Sull, D., R. Homkes, & C. Sull (2015, March). Why strategy execution unravels – and what to do about it. *Harvard Business Review*, 58 – 66.
- Sullivan, J. (2012). When bad things happen to good portfolios – what to do about it. Accessed on May 22, 2013 from www.advisorone.com/2012/05/25.
- Treynor, J. L., & F. Black (1973, January). How to use security analysis to improve portfolio selection. *Journal of Business*, 66 – 85.
- United Nations (2014). World urbanization prospects. Accessed from <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf> on March 15, 2015.
- Vickery, J. (2009). Real estate capital markets. MBA Course Syllabus, New York University, www.stern.nyu.edu/sternfin/vickery.
- World Bank (2015). World population growth. Accessed from http://www.worldbank.org/depweb/beyond/beyondco/beg_03.pdf, on March 15, 2015.
- Young, M. S., & R. A. Graff (1995). Real estate is not normal: A fresh look at real estate return distributions. *The Journal of Real Estate Finance and Economics*, 10, 3, 225 -259.