INVESTMENT PROPERTY TYPOLOGY ANALYSIS; EVIDENCE FROM NIGERIAN URBAN PROPERTY RETURNS AND MACROECONOMIC VARIABLES

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The study examined the return characteristics of investment-properties on typology basis in Abuja, Nigeria and quantified the impact of macroeconomic-variables on the return. Quantitative primary and secondary data were gathered for the study. Structured questionnaire was administered on 420 investment-properties available in the portfolios of practicing Estate Surveying Firms (ESFs) in the study area. Both descriptive and inferential statistics were adopted for data analyses with mean, growth rate, standard deviation, correlation and regression coefficients. The result showed a constant yield range for the study area, but variations in the return, risk and return/risk among the property-types and a mixture of negative and positive relationships between/among the property-types. The result further showed that returns on most property-types do not correspond with their risks and detached house with boy's quarter exhibits an out-performance over all other property-types. However, in relation to the economy, property-return exhibits a strong negative relationship with the currency exchange rate and a weak negative relationship with interest rate, but none of the macroeconomic variables statistically explain or drive return on the property. This study contributed to the literature on Nigeria property-investment analysis by providing guiding information for a better knowledge of the Abuja property market dynamics that can enhance decision making of investors towards an improved market rewards analysis. Despite the observed variations in the return characteristics in the study area, an appropriate mix of property-types can still bring about improved performance benefit to the investors. The study is beneficial to investors through reduction in the wide gap between investment expectation and actualization through appropriate and specific investment prescriptions. The notable variation between the yield and return on property suggests that investors cannot rely solely on the yield of an investment analysis as their investment guide, rather they should extend to the reward characteristics. This is one of the few studies on Abuja direct property market reward analysis on property-type approach that explored the sensitivity of property return to the Nigeria economy.

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INTRODUCTION

Real estate or property investment has been noted to have some seeming prospects and benefits over other forms of investment; making it to be gaining more acceptance in the general investment market. However, among other objects of investment, property generally requires a huge capital outlay for the acquisition. According to Olawore (2014), the fund invested on property by foreign investors in Africa totals about 2.9 billion US dollars. In Nigeria, Babawale (2014) observed that property market capitalization rate is far above N20 trillion while capital market capitalization rate is less than N14 trillion indicating that more funding is devoted to the property market in Nigeria than capital market. Since the main motivation towards this huge investment on property as an object of investment is the reward coming from it, this has therefore necessitated the understanding of its reward analysis through return indices as a guide to the local and international investors.

Level of performance of property investment has now become a major and growing concern of conscious investors needing information on forces governing the variation in its specific performance. However, according to Olapade et al (2019); Olaleye and Adebara (2019), the compilation of transaction based direct property indices is yet to be given full attention in the Nigerian property market, making it opaque and immature due to lack of large property transaction database with consequences on property market predictability and its non-attractiveness to the foreign participants. The first attempt to compile property indices in Nigeria was in 2013 by the Nigerian Institution of Estate Surveyors and Valuers (NIESV, 2013) with a pilot survey on Abuja, Port-Harcourt and Lagos; but this was purely on estimates or appraisal basis for both capital and rental values, not on return. In addition, the compilation just gives a range of value expected on typology of investment properties, but not specifically on the actual rental values or capital values generated on individual properties.

It was noted that some property investors both local and international who rely on these estimates were grossly misled or wrongly guided by these compiled value estimates. This is because their actual investment realization differs significantly from their expectation due to the use of non-precise data. The wide variation was attributed to assumptions that each property typology has full occupation and that there was no vacancy on them; the issue of outgoing on gross rental value was not well considered and yearly variation or fluctuation in the income generated from year to year was not considered. However, in view of the fact that different type of investment-properties currently exists in most urban property markets, it suggests that the investment peculiarity of one type of property will be different from other on an empirical basis.

Furthermore, for property investment analysis to be more comprehensive, both the inherent and adherent factors that may influence its performance must be considered simultaneously, hence a need to consider the state of the economy

with the return analysis of the investment property. These variables are expected to serve as indicators signaling the current trend in the economy of any given nation. This type of analysis is desired in the developing and the developed economy of the world, because macroeconomic variables are key factors in the determination of the operation of property investment (Ezeokoli, 2019). There is therefore a link (forward effect or backward effect) between the property market and the economy of any nation. Linking the returns generated on investment-properties with the national economy will explore its sensitivity to the exogenous macroeconomic variables. Though macroeconomic factors may seem not to have direct link with investment generally, but they do influence the investment behaviour either directly or indirectly. Numerous studies on hedonic analysis of return structuring, determinants and prediction of investment-properties have been documented locally and internationally (Ojetunde et al., 2011; Oyewole and Ajayi 2013; Udoekanem et al 2015; Ezeokoli et al ., 2019; Nzalu 2013; Gruma and Govekarb 2016; Sivinitanides 2018 and Kroencke et al 2018 among others). However, the current study exceptionally examined the return characteristics of the various types of direct investment-properties and measure their differential effects on the urban property market in relation to the national economy with focus on developing (Nigeria) market. This is a notable vacuum in property investment literature that required empirical information.

Evidently, different studies (Emele and Umeh, 2013; Oyewole and Ajayi 2013; Onwuanyi 2018; Ezeokoli et al 2019; and Ekwebelem and Emoh 2020) have established the different macroeconomic factors as the determinants of real estate prices, value and return in Nigeria. However, most of these studies focus on estimates of income (distribution/dividend) and/or market capitalization of indirect property investments, none has specifically focused on the actual return generated on transaction basis of direct property investment typology in the federal capital city of Nigeria. Direct application of analysis on financial assets or public real estate on direct real estate may produce spurious and mis-leading results, due to variations in determinants.

The focus of the existing studies is either on rental value (Yakub, et al, 2013; Iroham, et al, 2014; Udoekanem, et al, 2015 among others) or on capital value (Chegut et al, 2013; Olowofeso, et al, 2013; Olaleye, et al, 2015). Few literature are available on total return i.e. the combination of income return and capital return and such includes among others: Bello (2012); Emele and Umeh (2013); Oyewole and Ajayi (2013) and Ekwebelem and Emoh (2020). Most of the related available literature are concentrated on property markets of the developed economies of Europe and U.S.A. Since different locality are subject to separate return dynamics, the economic climate of those developed countries and volume of available data is different from that of an emerging property market of Africa like Nigeria. In addition, most of the indigenous work on local property market return in Nigeria focused on other city centers like Lagos, Port-Harcourt and some state capital cities. Abuja, the federal capital territory is another hub of property transaction in Nigeria, being the seat of government expected to have unity of data generation as well as potential of unbiased responses from the

respondents, still remains relatively under-researched with respect to its investment-property market.

Return on investment-properties as previously stated, is influenced not only by specific property related factors (supply side), but also the macroeconomic-variables (demand side) (Fisher, et al, 2007). None of the studies seem to have combined the supply and demand side of return on property typology exclusively. There is therefore a need for quantitative evidence and analytic procedure on different types of investment-properties variation, in terms of the return characteristics and their nexus with the macroeconomic variables to guide the local and foreign investors in properties in Nigeria. This work therefore empirically analyzed the return characteristics of investment-properties in Abuja, Nigeria (considering the status as the seat of federal government) towards understanding its property market rewards dynamics and macroeconomic-variables mechanisms to be able to supply information to property stakeholders, test assumptions and make informed property investment decision. The outcome of this study will not be limited in use for Nigeria property market only, but also in comparison with other developing economies, especially in Africa. This paper has been structured into 5 sections. Next to this introductory section is the review of literature; third section is devoted to the research methodology while section four is on the data, its results and discussion. Section five concluded the study.

LITERATURE REVIEW

Investment-property is property bought or developed purposely to earn an income (reward) through renting, leasing or price appreciation, but excluding the owner occupied (Bello, 2012). Return as a property reward is however coupled with risk i.e. the variability of returns that are associated with an investment owing to movements in financial variables. Substantial empirical work has been undertaken to shed light on the relationship between common stocks, listed real estate, and direct real estate returns. Listed real estate however dominated the direct real estate in most of these empirical studies. Ghysels et al., (2013) has provided a comprehensive review of this literature and warned that if the risk and return characteristics of listed and direct real estate have different economic sources, results obtained from investigating the listed real estate market might not carry over to the direct real estate market. However, academics as well as practitioners are surprisingly divided in their opinion as to the fundamental driving factors behind the returns and risks of real estate investments (Ghysels et al., 2013). This section of the study is therefore structured into the empirical documentations of property performance analysis from the developed economies and Nigeria property markets.

Evidence from developed economies
As indicated previously, most of the studies on return on property are derived from the developed economies. One of such is Filotto et al., (2018) that evaluated the impact of macroeconomic condition and real estate price trend on the amount of loan advanced to residential property for the period of 2007-

2015 in Europe. The study found a GDP shock in Europe with impact on the GDP, real estate prices and residential mortgages. The study concluded that for the real estate, macroeconomic and housing price shocks matter and that the impact/effect of the shock vary from short term to medium term, country to country and level of variation in the financial development of the country. Although, this study links the property prices with the economy variables to the extent of loan/mortgage, its analysis was not on all property typology nor multiple macroeconomic variables.

The study was not really on property investment performance, but on property investment feasibility analysis. While providing a potential explanation of how a combination of risk factors might simultaneously drive the risk premia in three different property markets in the US, Kroencke, et al (2018) analyzed the joint stochastic properties of common stocks, listed real estate, and direct real estate and the results show that listed real estate and direct real estate are likely to be driven (up to a large fraction) by common risk factors. It also shed new light on the risk-characteristics of real estate returns and are of high interest for academics, regulators, and portfolio managers alike. The study focused on inter-investment analysis, but has no link with the economy of the country of study. Amonhaemanon (2013) examined whether real estate in Thailand can hedge against ex post and ex ante inflation during the 1987-2011. Following the Fama and Schwert (1977)'s framework, the study finds that real estate returns have positive relation with both ex post and unexpected inflation over the period, even though the statistical evidence does not strongly support this. In addition, after separating the time series into sub-periods to control for the possible structural changes in the economy, the study finds that the relationship between inflation and real estate returns change under various economic environments.

This is a return/macroeconomic variable limiting to inflation only and did not examine the property typology in its analysis. Chegut et al. (2013) used a comprehensive data-set of transactions from Estates Gazette interactive and real capital analytic, highlighted the return characteristics of the repeat-sales sample over the 1996 to 2011 periods and related the logarithmic returns of income-generating property to weight time dummies. Although this work improves with date, highlights the return characteristics, but it solely depended on secondary data on repeat sales, collected from Estates Gazette interactive and was neither on property typology nor connect the prices with the economy. It is intuitive that real estate investments are related to the general economic activity of a region or country and a sound economic structure are perceived to be significant factor in respect of its ability to attract foreign real estate investors. In attempt to provide guidelines for improvement towards attraction of international capital allocation (through real estate) to a potential host nation, Lieser and Groh (2011) explored how different social-economic demographic and institutional characteristics affect commercial real estate investment activity of a region or nation. The study provided evidence that the economic growth, rapid urbanization and compelling demographics are the major factors attracting real estate investments while lack of transparency in the legal framework, administrative burdens of doing real estate business,

sociocultural challenges and political instability of a country are the factors that reduce international real estate allocation to nations. In the UK, Sivitanides (2018) validated and quantified the effect of key macroeconomic drivers on London house prices using annual data over the period 1983–2016 with the estimate of alternative error-correction and partial-adjustment models (PAMs). The results verified the existence of a strong long-term relationship between London house prices and key macroeconomic variables, such as UK GDP, London population and housing completions. The study although linked the property prices of a capital city of a nation to its national economy, but was unable to indicate the link to the investment property. Gruma and Govekarb (2016) investigated the macroeconomic factors (unemployment rate, the current account of the country stock index, gross domestic product and industrial production) that are most significant with property prices in relation to the Slovenia, Greece, France, Poland and Norway different cultural environments. The study found statistically significant correlations between the prices of residential real estate and selected macroeconomic factors. The results show a distinct pattern that applies to France, Greece, Norway and Poland, where the price of real estate observed statistically significant association with the unemployment. In the case of Slovenia, the results show that a statistically significant relationship reflects to a share index only. That was illustrated by the finding that prices in Slovenia on an annual basis, between the observed cultural environments in the observed time interval, most declined.

Most of these studies exhibit the characteristics of mature markets having robust data for their analysis. This obviously is at variance with what is obtained in Nigeria urban markets confronted with lack of the required data for property market analysis. However, the empirical studies on Nigeria property market is the focus of the next section of this study.

Evidence from Nigeria, a typical developing economy
As earlier indicated, in Nigeria the development of transaction based real estate indices was hampered by lack of large real estate databases. Babajide *et al.* (2014) corroborated this while examining the implications of property market forecast to real estate valuation in Nigeria and revealed that real estate forecasting is yet to be given full attention by the stakeholders in the Nigerian property-market, probably due to lack of property index. Ekemode and Olaleye (2015) used the time frame of 1998 to 2012 to analyze and compare the return/risk performance profiles of direct and indirect real estate, relying on data from direct commercial property collected from estate surveying firms in Lagos, share prices and dividend of UACN Property Company and publication of Nigerian Stock Exchange. The study concluded that real estate exhibits higher return performance and higher downside risk to investors. The study is on comparative analysis of real estate investment, it neither embrace property typology nor link the property performance to the nation macroeconomic variables. Bello (2012) is another inter-property investment comparison which analyzed the risk and returns profile of commercial property in South West Nigeria with selected stock market investment between 2000 and 2009. The study concluded that stock market investment offered attractive higher return

when compared with commercial property, although with higher risk and there could be diversification benefits of combining commercial property with stocks-investment. This work is limited to commercial property without linking to the nation's economy; it was also not on the investment-properties typology.

Linking property return with the national economy, previous study has shown that there exist a significant negative relationship between residential real estate prices and interest rate and a positive relationship between real estate and the GDP and level of money supply (Ojetunde et al. (2011); GDP contributed significantly to the growth of real estate (Nzalu, 2013) and Nigerian macroeconomic factors influence return on specialized property investments (Ezeokoli et al., 2019). Ojetunde et al (2011) in their study of the interaction between the Nigerian residential property market and macro economy with empirical evidence using vector autoregressive (VAR) model found that macro economy shocks explain 28% of the variation in residential property rents and exogenous influence of the economy account for 31.4% of the variation within the residential property market. The study was limited to rent of residential property, but not on total return on property typology. In a similar direction with Ojetunde et al (2011), Udoekanem *et al.* (2015) explored the dynamics of office rents on 36 commercial properties in Minna, by obtaining their rental values data from practicing estate surveying firms engaged in the commercial property market for the period 2001-2012. The findings revealed that the rental growth factor for office properties for the study period is 1.056. The study concluded that real GDP growth and vacancy rates are the major drivers of office rental change in the commercial property market in Minna. Although, the study established the need for real estate practitioners in the study area to get a better understanding of the characteristics of rental fluctuations, but was limited to the rental value of the office property, it did not expand to have a total return of property typology.

Ezeokoli et al (2019) explored the influence of selected macroeconomic variables on the return of events centres as an investment property in Akure, Nigeria between 2005 and 2014. The study discovered that both inflation rate and exchange rate have significant effect of 69.5% and 21% respectively on the return of event centres in the study area. The study adopted only two macroeconomic variables to the event centres. The outcome of event centres analysis cannot be applied to property typology due to the peculiarity variation.

Oyewole and Ajayi (2013) used multiple regressions to establish the relationship between the trend in property returns and selected macroeconomic-variables. The results showed that GDP, interest rate and employment rate are the only significant determinants of office property-return. This study is restricted to office property-investment of institutional investors, but did not include the public and individual private investors in its analysis. Olaleye et al. (2015) provided information on the trends in the Nigerian capital market to domestic and international investors by analyzing the movements in the indirect real estate assets prices and its determinants from the perspective of African emerging market. The study found that Nigerian property listed stocks appeared to be highly sensitive and aggressive when related to six macroeconomic-variables except the composite price index.

The study concluded that decision to invest in property listed stocks in Nigeria should be a short or medium term basis, because long term basis may gradually erode the investment due to the high sensitivity to interest rate, inflation rate and exchange rate. This study was limited to capital gain (stock price movement) of indirect real estate, and not total return analysis on direct property typology.

The extent at which the economic principles of price and value guide in explaining the asking prices of property in the two Nigerian urban cities (Abuja and Lagos) was evaluated by Onwuanyi (2018) mainly to resolve whether the property price in Abuja is higher than Lagos to ascertain the true indicative of property market buoyancy. This was done by relying on the data collected from the property marketing publication named Castles weekly with adoption of averages and relative importance analysis. The study found that property prices in Abuja were consistently higher than that of Lagos and that Abuja has higher vacancies and unsold properties after more than one year of listing. This study was limited to the asking price only, it did not extend to return on property typology, nor link it with the country macroeconomic variables.

Olaleye et al (2015) is one of the few studies that focused on the relationship between asking prices, time-on-market and sales prices of property from Nigeria (emerging) property market point of view, using transaction data on listed prices, time-on-market and sales prices involving 113 residential properties accessed through the practitioners in Lagos property market. The finding shows a strong significant relationship between the asking price of properties and sales price and concluded that offering about 84% of asking prices of residential property in Lagos, Nigeria could be used to predict their sales prices. This study limited its scope to property prices prediction and not specifically on property performance analysis.

The most related to this study is Ekwebelem and Emoh (2020) that assessed the driving forces of value chain of residential property market in Abuja and examined the effects of macroeconomic variables on them. This was done by assessing the risk- return performance of the rent and price of the residential property in the sub markets of the study area and their linkages with the macroeconomic factors. Results showed that Gwarimpa market exhibited high risk-return performance for the residential property with a noted fall of interest rate and that residential properties were significantly influenced by macroeconomic indicators in nine of the twelve identified sub markets while three markets were not significantly influenced. The study therefore concluded that macroeconomic policy has significant effect in Abuja residential market. The study was not generally on income generating properties, it was restricted to only two property typology (3B/R and 4B/R accommodation) of residential properties across the sub markets in the study area.

From the foregoing, most of the work done on investment return were on financial assets and indirect real estate investments (public listed real estate company), little was actually done on direct real estate and more of the studies were foreign derived (developed market) with few local studies, most of which focused on Lagos and some other state capital cities. Abuja (Nigeria) has been

little researched in term of investment-properties analysis especially in property typology analysis. The data used for most of the foreign studies were made available through property databases (NCREIF, IPD and NAREIT), but lack of large property database in Nigerian property-market compelled the use of transaction based data more than the appraisal data by most Nigerian authors including the current study that actually combined the property related factors with the economic related factors on property types analysis.

RESEARCH METHODS

Cross sectional survey research design was adopted by collecting data on the sampled investment-properties available in the portfolio of the Estate Surveying Firms (ESFs) who had established their practice in Abuja on or before 2006. Abuja was selected being a fast growing hub for real estate with its official status of being the administrative capital of the federal republic of Nigeria. It has witnessed and still witnessing a continuous influx of Nigerian business class and foreigners alike for business and official transactions with government both in real estate and other sectors of the economy, making it a real estate investment destination of the highest property value in Nigeria (National Bureau of Statistics, NBS 2015). In addition, with 139.7% growth rate between 2000 and 2010, Abuja was the fastest growing cities in the world followed by Al-Hudayda in Yemen with a growth rate of 108.1% (Boumphrey, 2010). While most international literature on reward of property investment focus on the capital cities of the nations (Johannesburg in South Africa, Kuala Lumpur in Malaysia, Helsinki in Finland among others), Nigerian local literature on reward of property investment is dominated by work done with the focus mostly on commercial centres like Lagos, the former federal capital city of Nigeria and other notable state capital cities. Quantitative primary and secondary data were collected. Primary data such as rental income (transaction-based) and the capital value (appraisal-based) were collected. Secondary data collected include; yield, gross domestic product; interest rates on capital, currency exchange rates, unemployment rates, foreign direct investment and inflation rates; searched and retrieved from government and non-government publications electronically and by print. A total of 2101 properties were listed and stratified into 11 property-types. These property types include: semi-detached house without boy's quarter, detached duplex with boy's quarter, semi-detached house with boy's quarter, detached house without boy's quarter, detached house with boy's quarter, semi-detached house with boy's quarter, semi-detached duplex without boy's quarter, block of flats, terrace house, lock up shops and office apartment/open offices. Twenty percent of this sample frame representing 420 properties was randomly selected from each stratum and questionnaire was administered on each in line with the data requirement. Five macroeconomic variables: property-return, the interest-rate, the inflation-rate, the gross domestic product, the unemployment-rate, the currency exchange-rate and the foreign direct investment were linked with the property return.

Data collected were screened for normality using Skewness and Kurtosis. Skewness shows that tail of the return curve on the left side is longer than that

of the right side of the curve by virtue of negative values for 6 property-types. The skewness shows that tail on the right side is longer than the left side of the curve by virtue of positive values for remaining 5 property-types. The kurtosis shows that all property-type have platykurtic kurtosis because their values are less than 3, meaning that their distribution produces less extreme deviations/outliers than the normal distribution. The use of Cronbach alpha coefficient, calculated as 0.835 indicated that the questionnaire used in this study is deemed to be adequately reliable and valid for interpretations (Kvale, 2006). Gross rental value on each property was deflated with the supplied percentage of all inclusive outgoing to arrive at the net rental income. Total returns were analyzed with the use of growth rate, study period-returns (annual/mean), correlation coefficients, regression, standard deviation, return/risk ratio. Annual growth rate was calculated based on the following equation:

$$GR = \frac{T1-T0}{T0} \quad \text{......(1)}$$

Where GR represents the growth rate, T1 is the succeeding year value while T0 represents the preceding year value. Annual total return was calculated with the equation:

$$Rt = \frac{CVt - (CVt\text{-}1) + RI}{CVt\text{-}1} \quad \text{......(2)}$$

Where: Rt is the total/annual return on investment over time period of t, CVt represents the property capital value at the end of period t, CVt-1 represents the capital value of property at the beginning of period t and RI represents the rental income. Mean return was therefore calculated with the equation:

$$\overline{X} = \frac{\sum Rt1\text{-}n}{N} \quad \text{......(3)}$$

$\overline{X}$ Represents the mean return, $\sum$ represents the summation of all returns while Rt1-n represents an annual return for year 1 to n year, N is the number of years for the study period.

The standard deviation was calculated to assess the level of risk of the investments while the study period return to risk trade off of each investment-property was measured with the mean return/risk ratio. The standard deviation (risk) was calculated as:

$$SD = \frac{\sqrt{\sum (Xi \ - ×)2}}{n} \quad \text{......(4)}$$

Where SD is the standard deviation of returns; Xi is the set of returns for each property-investment considered for the study, n is the number of observations or returns. × is the mean of ranking of observations or returns. Return to risk ratio was expressed as the division of × by SD. The relationship between returns was investigated with the use of correlation coefficients.

For the macroeconomic variables, percentages of annual change of the considered variables for the period 2007-2016 were related to the study period return of the investment-properties to evaluate the specific contribution of each of the property return. Retrieved macroeconomic-variables data were converted to a yearly basis before the calculation of their indexes. Multiple regression coefficients were used to test for statistical significance of the contribution of these macroeconomic-variables to return. Relating the property-return with macroeconomic-variables has to do with interrelationships of dependent and independent variables (exploratory variables). The relationship takes the following form of equation:

$$Y = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \ldots \beta_k X_{kt} + \mu_t \qquad (5)$$

Where Y represents the asset's return, α represents the constant, β represents the beta coefficient, X_{1t} -X_{kt} represents the return of an underlying market multiple independent variables, while μ_t represents the error term. Therefore, to adequately capture the multiple independent variables, a predictive log-linear multiple regression/causal model of the property-return time series needs to be regressed on macroeconomic-variables with the following equation:

$$MR = \alpha + \beta_1 INT_t + \beta_2 INF_t + \beta_3 GDP_t + \beta_4 UEM_t + \beta_5\ EXC_t + \mu_t \qquad (6)$$

Where the time series MR is the investment-properties mean return representing the dependent variable, α represents the constant, β represents the beta coefficient of independent variables, INT_t is the interest rate on real estate loan, INF_t is the inflation rate, GDP_t is the growth rate of the nation's economy, UEM is the unemployment rate and EXC represents the currency exchange rate, plus a random error or residual term μ_t.

The study adopted transaction data for income return and appraisal data for capital return to derive the total return which does not require de-smoothing as stated by the earlier study of Edelstein and Quan (2006) that reflected that appraisal and transaction based portfolio returns have equal or near equal volatility that may not let their de-smoothing be necessary. Augmented Dicker Fuller (ADF) test was carried out on all the data series to examine the extent of their stationarity and showed that all the variables are stationary at first order of difference; indicating the suitability of the variables for the regression analysis. All analyzed quantitative data were presented in a fraction of 2 decimal places.

DATA ANALYSIS AND DISCUSSION OF RESULTS

Data analysis

Total of 420 questionnaires was distributed and 272 were successfully administered representing 62.38% response rate and the results of analysis is shown in Table 1. The yearly mean of return were related or linked to the 5 selected macroeconomic variables.

Table 1: Investment property-types and the sample sizes

Types of Investment-Properties	Sample Frame	Planned-Sample	Actual-Sample
Detached house without boys quarter (DH-BQ)	179	36	22
Detached house with boys quarter (DH+BQ)	221	44	28
Semi-detached house without boys quarter (SDH-BQ)	58	12	6
Semi-detached house with boys quarter (SDH+BQ)	122	24	12
Detached duplex with boys quarter (DD+BQ)	211	42	22
Semi-detached duplex without boys quarter (SDD-BQ)	71	14	6
Semi-detached duplex with boys quarter (SDD+BQ)	156	32	18
Terrace house (TH)	182	36	24
Block of flats (BOF)	623	124	111*
Lock-up shops (LOS)	88	18	4
Office apartment and open offices (OA&OO)	190	38	20
Total	2101	420	272

*Block of Flats has 78 residential use and 33 commercial use components. Source: Field Survey (2017)

Descriptive statistics/analysis of return characteristics on property-type basis

To explore the unique variations in reward of property-type, Table 2 shows the average yield of 0.04 for all the property-types for the study period; but semi-detached house without boy's quarter, detached duplex with boy's quarter and semi-detached house with boy's quarter exhibited a yield of 0.05 being the highest. This is followed by detached house without boy's quarter, detached house with boy's quarter, semi-detached house with boy's quarter, semi-detached duplex without boy's quarter, block of flats, lock up shops and office apartment/open offices which exhibit the same yield of 0.04 while terrace house exhibits the lowest yield of 0.03.

Mean return of 0.08 was the peak return of property-type and this was noted in 4 property-types (detached house with boy's quarter, semi-detached duplex without boy's quarter, block of flats and lock up shops). Three property-type (semi-detached house without boy's quarter, detached duplex with boy's quarter and semi-detached house with boy's quarter) documented the mean return of 0.07, 3 other property-type; semi-detached house with boy's quarter, terrace house, and office apartment/open space) exhibited a mean return of 0.06 while only the detached house without boy's quarter exhibited a mean return of 0.05.

In term of the investment-risk, range of 0.02- 0.15 with an average of 0.06 was documented. However, lock up shops is the most risky property-type (0.15) while detached house with boy's quarter and semi-detached house without boy's quarter are the less risky property-type (0.02). The implication of more return than risk confirms what operates in the literature that an appraisal based property data are known to display low level of variability (Ekemode and Olaleye 2015).

Analysis of return/risk reflects an overall of 1.17 with a range of 0.53- 4.00. Detached house with boy's quarter has the highest unit of return/risk (4.00) followed by semi-detached house without boy's quarter (3.50). Lock up shops however exhibited the least return/risk (0.53). Further analysis of return/risk reflects that only terrace house exhibits equality of value in term of its return and risk. Three property types exhibited low return to high risk and they are detached house without boy's quarter, semi-detached house with boy's quarter and lock up shops. Seven property-types displayed high return to low risk: detached-house with boy's quarter, semi-detached house without boy's quarter, block of flats, office apartment/open office, detached-duplex with boy's quarter, semi-detached duplex without boy's quarter and semi-detached duplex with boy's quarter.

Table 2: Analysis of return characteristics of property

Property-type	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Rental yield	Total Return	Risk	Risk// return	Skewness	Kurtosis
Detached house without boys quarter	0.06	0.11	-0.02	0.22	0.08	0.04	0.06	0.05	0.01	-0.07	0.04	0.05	0.08	0.63	0.70	1.86
Detached house with boys quarter	0.09	0.08	0.04	0.10	0.09	0.09	0.09	0.04	0.09	0.04	0.04	0.08	0.02	4.00	-0.90	-1.28
Semi-detached house without boys quarter	0.07	0.06	0.08	0.05	0.09	0.05	0.10	0.07	0.08	0.03	0.05	0.07	0.02	3.50	-0.30	-0.25
Semi-detached house with boys quarter	0.04	0.10	-0.04	0.12	0.19	0.04	0.06	0.13	0.03	-0.08	0.04	0.06	0.08	0.75	-0.21	-0.14
Detached duplex with boys quarter	0.10	0.08	0.08	0.10	0.03	0.05	0.11	0.07	0.11	-0.04	0.05	0.07	0.05	1.40	-1.63	2.84
Semi-detached duplex without boys quarter	0.06	0.11	-0.02	0.08	0.13	0.04	0.17	0.19	0.04	0.00	0.04	0.08	0.07	1.14	0.23	-0.94
Semi-detached house with boys quarter	0.07	0.05	0.03	0.08	0.18	0.02	0.02	0.17	0.05	0.01	0.05	0.07	0.06	1.17	1.23	0.32
Terrace house	0.04	0.09	0.15	0.10	0.06	0.04	0.10	0.01	0.03	-0.06	0.03	0.06	0.06	1.00	-0.45	0.80
Block of flats	0.09	0.08	0.04	0.12	0.07	0.08	0.10	0.08	0.06	0.04	0.04	0.08	0.03	2.67	0.04	-0.15
Lock up shops	0.00	0.04	0.17	0.36	0.04	0.07	0.21	-0.05	0.15	-0.17	0.04	0.08	0.15	0.53	0.24	0.52
Office apartment & open offices	0.06	0.09	0.07	0.06	0.08	0.08	0.07	0.00	0.04	0.02	0.04	0.06	0.03	2.00	-1.04	0.27
Average	**0.06**	**0.08**	**0.05**	**0.13**	**0.09**	**0.05**	**0.10**	**0.07**	**0.06**	**-0.03**	**0.04**	**0.07**	**0.06**	**1.71**	**-0.19**	**0.35**

Source: Field Survey 2017

The correlation coefficients measuring the degree of relationship of total returns among the properties were displayed in Table 3 showing how the mix of property typology can bring about an improved performance of the property-investment in the study area. However, the result shows the mixture of zero, negative and positive relationships between the combinations of property-types.

Generally, all the property-types have strong positive return relationship, except little ones with a weak positive relationship or a weak negative relationship. Detached-house without boy's quarter has no relationship whatsoever with semi-detached duplex with boy's quarter. However, the

combination of the block of flats and detached-house without boy's quarter (0.877) will impart a corresponding positive return performance than detached-duplex with boy's quarter (0.003). Semi-detached duplex and office apartment/open office shall have inverse return relationship (-0.227) when combine by an investor, likewise if semi-detached duplex with the terrace-house (-0.065). There exists also a negative relationship between semi-detached duplex with boy's quarter and office apartment/open offices (-0.089).

4.2 Degree of return relationship between property-types
Table 3: Correlation matrix of total return on property-type basis

	DH-BQ	DH+BQ	SDH-BQ	SDH+BQ	DD+BQ	SDD-BQ	SDD+BQ	TH	BOF	LOS	OA&OO
DH-BQ	1.000										
DH+BQ	.650	1.000									
SDH-BQ	.060	.237	1.000								
SDH+BQ	.737	.480	.374	1.000							
DD+BQ	.504	.493	.570	.298	1.000						
SDD-BQ	.464	.208	.457	.774	.286	1.000					
SDD+BQ	.346	.000	.302	.798	.003*	.605	1.000				
TH	.452	.271	.528	.226	.648	.055	-.065**	1.000			
BOF	.877*	.685	.110	.610	.562	.580	.192	.292	1.000		
LOS	.631	.549	.348	.248	.710	.047	-.121	.766	.554	1.000	
OA&OO	.364	.590	.266	.210	.265	-.089	-.227**	.669	.229	.430	1.000

* Strongest positive and weakest positive relationship ** strongest negative and weakest negative relationship
Source: Field Survey 2017

Analysis of property-return with macroeconomic-variables

To evaluate and determine the main driver of return on property-investment among the considered macroeconomic variables, the yearly mean returns (as previously analyzed) were regressed on yearly mean of the macroeconomic-variables. Table 4 reflects that all the variables experienced the mixture of rise and fall and it could be deduced that none of the variables maintained uniform rise or fall during the study period. This seems to be in agreement with the findings of previous studies that the pattern of property-returns performance is cyclical in nature, probably due to varied investment indigenous traits.

Table 4: Rate of return and the macroeconomics-variables

YEAR	RET	INT	INF	GDP	UEM	EXC
2007	6.00	16.94	6.33	15.10	14.70	125.75
2008	8.00	15.14	7.88	23.00	19.70	118.99
2009	5.00	18.99	13.03	-19.11	9.70	118.99
2010	13.00	17.59	13.26	34.50	21.50	151.09
2011	9.00	16.02	12.10	9.00	23.90	155.79
2012	5.00	16.79	11.48	8.50	16.21	159.05
2013	10.00	16.72	10.26	6.50	12.83	159.27
2014	7.00	16.55	8.08	7.10	7.83	164.88
2015	6.00	16.85	8.48	-14.60	8.19	195.52
2016	-3.00	16.82	12.27	14.58	13.90	253.49

Source: Field Survey (2017)
RET represents property-return, **INT** represents the interest-rate, **INF** represents the inflation-rate, **GDP** represents the gross domestic product, **UEM** represents the unemployment-rate, **EXC** represents the currency exchange-rate and **FDI** represents the foreign direct investment.

Table 5 reflects positive and negative correlations of the coefficients of the variables. Although, relating the return to all macroeconomic variables, return has strongest positive relationship of 0.463 with the gross domestic product, the strongest positive relationship of 0.494 exists between the inflation rate and interest rate. Also, coefficients of the variables indicate a strong negative relationship (-0.706) between unemployment rate and GDP and between return and exchange rate (-0.613).

Table 5: Correlation coefficients of return and macroeconomic-variables

The variables	Return	Interest rate	Inflation rate	Gross domestic product	Unemployment rate	Exchange rate
Return	1.000					
Interest rate	-.119	1.000				
Inflation rate	-.102	.494	1.000			
Gross domestic product	.463	-.336	.081	1.000		
Unemployment rate	-.449	-.396	.312	-.706*	1.000	
Exchange rate	-.613	-.077	.220	-.115	-.218	1.000

*Correlation is significant at the 0.05 level (1-tailed). Source: Field Survey (2017)

This result suggested that the currency exchange rate has a strong negative relationship with the return on property-investment. However, return further has negative weak relationship with the interest rate (-0.119), inflation rate (-0.102) and unemployment (-0.449), but positive relationship with GDP (0.463).

The variables were further subjected to regression analysis where the results indicated in Table 6 that the coefficient of determination R^2 is 0.539 which is seen to have a high explanatory power and interpreted that the five macroeconomic-variables explained 53.90% of variation in return of investment-properties in the study area. However, the remaining 46.10% is to be explained by other factors not included in this study. Durbin-Watson (D) statistic was used to confirm the in-dependency of the residuals and absence of auto-correlation that can hinder the accuracy of the regression and this is calculated as 1.98 in the model. Since the D-statistic is greater than R^2 this indicates no sign of spurious in regression, this fall in the range its critical value (1.645; 2.355) at 0.05 indicating that there is no significant auto-correlation or residual serial correlation in the model that may call for unit root test. The results further showed that each of the independent variables contributed differently to the variation in property-return. Beta coefficients measure the sensitivity of return to each of these five macroeconomic-variables together with the constant of 8.890. The model for the return and macroeconomic-variables is therefore presented as:

MR= 8.890 + 0.191INT - 0.120INF + 0.063GDP - 0.091UEM - 0.036 EXC…………………..(8)

Having positive effects are the beta coefficients of 0.191 for interest rate, and 0.063 for GDP. This suggests that an increase of a unit of interest rate and GDP will correspond with 19.10% and 6.3% increases in property return respectively. This confirms the earlier result of Udoekanem et al. (2015) that GDP is a driver of return on investment properties in Nigeria.

The result on inflation variable translates that a unit decrease in the inflation rate will correspond with an increase in return by 12%; a unit decrease in the currency exchange rate will correspond with 3.6% increase in return while a unit decrease in unemployment rate will correspond with 9.1% increase in property-return. On the negative influence are the inflation rate (-0.120), exchange rate (-0.036) and unemployment rate (-0.091).

Table 6: Model evaluating the macroeconomic contribution to property return

Model	Abuja Property Return	Macro-Economic Variables	Coefficient	T	Sig.
R	0.735	(Constant)	8.890	0.263	.805
R Square	0.539	Interest Rate (INT)	0.191	0.099	.926
Adjusted R Squar	-0.036	Inflation Rate (INF)	-0.120	0-.150	.888
Std. Error	2.919	Gross Domestic Product (GDP)	0.063	0.614	.572
F- statistic	2.178	Unemployment Rate (UEM)	-0.091	0.224	.834
P	0.040	Exchange Rate (EXC)	-0.036	-1.090	.337
D Statistics	1.986				

Source: Field survey, 2017

Discussion of results

Noted variations in the reward characteristics of property type in this study is a sign of caution for investors not to accept a generalized reward characteristics specified for investment property. Rather, they will need to study the varying characteristics of each property reward in terms of yield, return, risk and return/risk analysis. Also, the established relationship between pair of property typology will guide the investors in determining the property type that can be combined and the ones that cannot, for improved investment performance. Relating the property return to the macroeconomic variables, the result on interest rate as the main driver of property return in the study area is expected on the mortgage driven property-investment because the interest rate and investment-return is inversely related. The more the interest rate, the less likely the investment-return and vice versa. A mortgage driven investment may strive well at a reduced interest rate than at a higher interest rate. Thus, if the interest rate is higher, it may deep into the investment profit in form of reduction of the net rental income, prolong the payback period or make the investment not re coup-able with a great effect on property-return. GDP positive growth rate as next driver of property return indicates that as level of economic activities in Nigeria increases, more transactions take place to influence the ability to pay for occupation of investment-properties by occupiers which may in turn leads to a subsequent increase in return to the property owners. The statistically significant relationship between return and currency exchange rate might be due to the Central Bank of Nigeria foreign exchange policies that negatively impacted on currency exchange rate by widening the gap between the official and parallel market rates of Naira to Dollar and other currencies; having a great effect on the inflow of foreign direct investment fund into Nigeria economy. The decrease in unemployment is an indication of increase in household income, ability and willingness to spend on goods and services, hence, a reduced unemployment rate attracts increase in property-

return. It needs stressing that the Nigerian Economic Recovery and Growth Plan (FGN, 2017) anticipates a reduction of unemployment rate in Nigeria from 13.90% in 2017 to 11.23% in 2020. In summary, while there is notable corresponding relationship between the return on property and macroeconomic variables through their correlation and regression, the coefficients in the model generally explain the investment-property return. However, the model suggests that none of these macroeconomic-variables specifically determines or explains the return of investment-properties in the study area because none of them is statistically significant (the t-statistics and the significant level in Table 6).

CONCLUSION

The study examined the returns characteristics of investment-properties on typology basis in Abuja, Nigeria and quantified the impact of macroeconomic-variables on them. The result showed a constant yield range for the study area, but variations in the return, risk and return/risk among the property-types. The results further showed that except the terrace house, returns on most property-types do not correspond with their risks and detached house with boy's quarter exhibits an out-performance over all other property-types. Relationships of returns among the property-types indicate a strong positive and a weak negative relationship between most pairs. The notable variation between the yield and return on property may mean that investors must not rely solely on the yield of an investment analysis as their investment guide, rather they should extend to its return characteristics generally. Despite the observed variations in the return characteristics in the study area, an appropriate mix of property-types can still bring about improved performance benefit to the investors. However, in relation to the economy, property-return exhibits a strong negative relationship with the currency exchange rate and a weak negative relationship with interest rate, interest rate and GDP attempt to be the main drivers of property return, but in real sense of it, none of the macroeconomic variables statistically explain or drive return on the property during the study period. This study has therefore contributed to the literature on Nigeria property-investment analysis by exposing the Abuja property market dynamics that can enhance decision making of investors towards an improved market rewards analysis. It will also guide the investors in the reduction of wide gap between investment expectation and actualization through appropriate and specific investment prescriptions. This seems to be one of the few studies on Abuja property market that combined direct property-type approach of reward analysis and explored its sensitivity to the Nigerian national economy. However, due to the emerging nature of the property market, the study is limited to investment-properties with a minimum of ten years period, a small data-set. The model derived from the study explains the real estate return generally, but it cannot be used to explain the macroeconomic variables. Capital return element of the total return analysis was based on appraisal and estimates, not transaction based. Nevertheless, the highlighted limitation of this study do not invalidate the results therein but points a direction for further researches.

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