Comparative Analysis of The Performance of Residential Investment Real Estate In South-Eastern Nigeria, From Year 2000-2016.

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Abstract: *This study is important,particularly now that emphasis is on investment performance analysis all over the world and especially in South-Eastern Nigeria, where decisions are often made to invest inreal estate with little or no recourseto performance measurement. Two states were chosen out of the five south eastern states, and from each, three locations were isolated for the study; bungalows, blocks of flats and detached houses on two floors were used for the study.136 estate surveyors and valuers in private practice (Owerri: 56, Enugu: 80)) supplied data on annual rental and capital values of the properties managed by them. The yearly returns on investment were computed from the appraised capital values and annual rental values of the various types of residential properties in the study area between 1999 and 2016;using the Holding Period Return (HPR) method. Investment performance was computed by finding the risk- return ratio of various property investments. Risk was calculated by finding the standard deviation of the yearly returns from the mean HPR. Results of the study showed that in Enugu, 4-bedroom bungalow in Trans-Ekulu and block of 6 flats in Achara layout, had the best performance; having the lowest risk-return relationship (covariance) of 0.421, while 5 bedroom detached house in Trans-Ekulu, had the least performance with a risk-return covariance of 0.69.In Owerri, 4-bedroom bungalow in Aladinma had the best performance; having the lowest risk-return relationship (covariance) of 0.403, while 2bedroom bungalow in Aladinma, had the least performance with a risk-return covariance of 0.94. It is recommended that investors that investorsin the study area should consider investing in 4-bedroom bungalow in Aladinma, Owerrior in Trans-Ekulu and block of 6 flats in Achara layout, Enugu. Investors who already have investments in the study area should seek performance measurement of their investments to know if set objectives are being met and if not, the way forward.*

Keywords: *Performance Measurement, Residential Investment Real Estate, South-Eastern Nigeria.*

I. Introduction

Investment real estate is the type of real estate investment that is income producing or that generates income for the owner.According to Igbinosa (2011) real estate investment was generally seen as a legacy which parents bequeath to their descendants but with the realization that real estate is a major source of capital appreciation and a good hedge against inflation, the real estate market is coming close in popularity and importance to the money and capital markets.Before the '80s people considered real estate as a dwelling place, work place, play ground or farmland and according to Greycourt (2009), it was not until the 1980s that investors started considering real estate as an investment and it was only in the 1990s that they started including commercial real estate as part of their overall portfolio.Investment in real estate is regarded as a specialized form of investment which involves the highest risk, and so requires the highest skills to provide the highest return in an economic and optimal manner. It means that when one makes an investment, it is important to consider the characteristics of the underlying real estate because the performance of those characteristics will impact the performance of one's investment. When an investor is looking at the underlying real estate, one of the most important criteria aside from location is the type of property. When considering an investment, an investor needs to ask himself whether the underlying properties are, for example, residential, shopping malls, warehouses, office towers or a combination of any of these (Ryder:2012). Each type of real estate has a different set of drivers influencing its performance therefore; an investor cannot simply assume one type of property will perform well in a market where a different type is performing well. In Nigeria and indeed the whole developing world, decisions are often made to invest in property with the primary objective of financial return. Unfortunately, most investors in these areas attach little importance to the measurement of the level of performance being achieved by their investment. Most real estate investors in Nigeria invest without having quantitative information on how much profit to expect or the growth rate of their investment. This is a pointless exercise because intelligent property investing requires an assessment of both the past and the future.

II.   Aim And Objectives

This paper aims at analyzing the performance of residential investment real estate in South-Eastern Nigeria from year 2000-2016. The objectives include:
1.   to determine the annual rent of the residential properties in Owerri and Enugu from 1999-2016.
2.   to determine the capital values of the residential properties in Owerri and Enugu from 1999-2016.
3.   to determine the returns on the residential property investments in Owerri and Enugu from 2000-2016.
4.   to determine the performance of investment real estate in Owerri and Enugu from 2000-2016.

III.   Literature Review

According to Oyewole (2013) the study of performance of real estate investment is very important particularly now that emphasis is on investment performance analysis in many parts of the world and this is even more important in Nigeria where only few studies have been carried out on the level of performance achieved by property investments. Moreover, the impact of the ongoing changes in the global and localeconomies on the performance of real estate investment is serving to highlight the need for its careful consideration in the investment decision making process. hrough the monitoring and analysis of an investment's performance, an investor can gain valuable insight into the investment characteristics and behavior of the various assets included in their portfolio (Hargitay and Yu: 1993, Kalu: 2001). y measuring performance, the degree of achievement against set objectives and targets can be expressed in quantitative terms. The shortfall or excess, relative to targets can then be analyzed and useful conclusions and explanations drawn for decision-making. Performance analysis is a very vital component of the decision-making process. It would be virtually impossible to make rational decision at any level without quantified evidence of past performance and a reasoned assessment of likely future performance of an investment. alu (2001) enumerated the objectives of performance measurement to include: the measurement of the rate of return, the assessment of how these rates compare with other assets in the portfolio, examination of the timing of asset acquisition, good asset and portfolio selection, consistency in achieving good performance, assessment of the risk profile, examination of the portfolio diversification and sources of the portfolio returns.ccording to Hargitay and Yu (1993), the results and conclusions of performance measurement are summarized in a performance report and are expected to: quantify historic performance and measure it against some chosen standard, provide explanations for good or bad performance, assess in quantitative terms the expected future performance to see if the prospective performance is likely to meet the target set, and assist in the re-assessment of investment strategies and to point to possible adjustments. From a financial point of view, risk is seen as the variability that is likely to occur in the future returns on an investment. According to Kalu (2001), risk has to do with the possibility that the actual outcome may be a deviation from what is expected. This could mean the possibility of difference between the actual and expected income flows. Before 1952, risk element was either assumed away or treated qualitatively in financial literature. However, (Markowitz, 1952) propounded the Modern Portfolio Theory which brought the issue of risk to the lime light and made it a great concern to investors and investment analysts. The risk of an investment cannot be measured without reference to the returns and according to Hoesli and MacGregor (2000), the expected risk for investment decisions is important but is often a proxy of historical values on the assumption that the spread of historical returns is a good indication of the spread of future returns. It is difficult ordinarily to determine with accuracy what the future holds for returns and the associated risk because a decision to invest in any investment media is beclouded by uncertainty even when historical data are available. Chandra (2005),was of the opinion that risk can be measured in several ways but, the two most common measures of risk are variability and beta.Kalu (2001) and Evans (2004) opined that the most common measure of risk is the variance or standard deviation. Kalu(2001) further emphasized that from statistical models, expected cash flows or returns and their variance could be calculated and from the variance, the standard deviation which represents the risk could also be calculated. The formula is stated thus:

Expected Return $E(r) = \sum r_i p_i$ …………………….. (1)

Variance $\sigma^2 = E(r^2) - E(r)^2$ …………………….. (2)

Standard Deviation/Risk $\sigma = \sqrt{\sigma^2}$ …………………. (3)

Real estate return measures are valuable tools for property investors when evaluating the viability and profitability of real estate investment opportunities, thus allowing them to sort out potentially good investment opportunities from bad ones. Real estate investors would also want to ensure whether the expected return is worth the risk that is being taken.According to Hargitay and Yu (1993), there are two principal modes of performance appraisal: the historic or retrospective mode, and the prospective mode. The measures and indicators used in the retrospective mode and the prospective mode are the same, but while the historic measures can be objectively determined, the indicators of prospective performance can only be assessed on a subjective basis. The measurement of investment performance may be carried out in absolute terms and/or relative to the performance of other portfolios or investment opportunities. It is worthy of note that the measurement of

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investment performance without subsequent analysis does not have any virtue as far as decision-making is concerned.

The measurement of return is to show the effectiveness of utilization of capital. According to Hargitay and Yu (1993) and Kalu (2001), this is done at three levels: -
1. Appraisal of the performance of individual assets.
2. Appraisal of the performance of the various asset sectors
3. Appraisal of the performance of the portfolio.

Assessment of returns from individual properties helps fund managers to take decision on single properties. Assessment of returns from sectors enables the fund managers to compare their contribution to the overall performance. Measurement of returns of the propertyportfolio enables the fund managers to make meaningful comparison between property performance, other investments in the fund and the market generally.According to Udoetuk (2008), the evaluation of property performance is difficult as it is based on the changes in the capital value of the investment flow and the income generated by the investment. Udoetuk (2008) and Kalu (2001) $\sqrt{}$ assert that real estate, unlike other types of investment is unique in nature and location; real estate may not be regularly revalued and if the property has not been tested in the market, there will be no specific evidence in terms of rental value, yields, capital value, etcetera. The figures so obtained are usually based on historic cost data from which comparable evidence can be drawn.Based on the unique nature of real estate, it is difficult to assess future trends from historic data and estimate changes in the real estate investment market. Udoetuk (2008) opined however that a careful analysis of the past can equip an investor with an idea of the future returns from an investment, the type of property to invest in and in what location to invest in. Hall (1981) suggested that real estate performance measurement can be examined on the following bases: income/cost, income/value, value/cost, income growth, rental value growth, time weighted total return and money weighted total return. Hargitay and Yu (1993) opined that approaches to performance measurement fall into two approaches: (1) approaches derived directly from the portfolio theory and (2) pragmatic approaches. They suggested that performancemeasurement requires a lot of computations and the availability of a considerable amount of data, but that the availability of computer technology has made the computational load easier. Hargitay and Yu (1993) concluded that because of the presence and involvement of risk and uncertainty and a considerable degree of subjectivity, the whole process can never be regarded as absolutely correct and totally reliable. Kalu (2001) opined that the data required for property performance measurement include: rental value, income and outgoings, details of leases, capital value, and property market indicators. He further opined that the most fundamental unit of performance measurement is the holding period return (HPR) which is the amount of money earned over the investment period in relation to the amount of money invested, plus capital appreciation. The HPR is mathematically represented as:

$$HPR = \frac{(CV_t - CV_{t-1}) + RV_t \times 100}{CV_{t-1}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

Where CV_t = Capital value for the current year
CV_{t-1} = Capital value for the previous year
RV_t = Rental value for the current year

Kalu (2001) concluded that the three measures of performance are: Money Weighted Rate of Return, Geometric Mean Return or Time Weighted Average Return and the Arithmetic Mean Return. Arithmetic Mean Return: this is the sum of the returns divided by the number of periods. If quarterly returns are being assessed for example, then the sum of the quarterly returns divided by the number of quarters gives the arithmetic mean return. It is a simple average and is used extensively in statistical studies involving long periods. It ignores compounding and does not represent the equivalent single quarterly rate of return for the year. The average or mean rate of return is useful forforecast of performance of future quarterly returns depending on how large and representative the sample is (Kalu, 2001). Geometric Mean Return: this is the single per period return that gives the same cumulative performance as the sequence of actual return. It involves the calculation of the geometric average through the compounding of the actual period by period returns and finding the equivalent single period return.

The geometric mean return is represented mathematically as follows:

$$R_G = \sqrt[n]{(1+HPR_1)(1+HPR_2)\dots(1+HPR_n)} - 1 \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)$$

Where n is the number of years
HPR is the holding period return
R_G is the geometric mean return.

Many firms of practicing surveyors in the United Kingdom (UK) have set up systems for measuring property performance using basically, capital and rental indices. According to Kalu (2001) these firms also

publish UK market statistics from data gathered from institutional portfolios on the basis of confidentiality. Kalu (2001) made a comparative study of four property measurement services available in the UK; and concluded that there is no standard form of measurement set by the professional body for property performance.

IV. Methodology

Fifty-six(56) surveyors and valuers in private practice were used to generate data for this study. The surveyors supplied information on the annual rental values and capital values of the properties managed by them. Three(3) locations were selected each from Enugu and Owerri for the study which includes Independence Layout, Achara Layout, Trans-Ekulu and Ikenegbu, Aladinma, Works Layout respectively. The residential properties include 2, 3 and 4-bedroom bungalows, blocks of 4and 6 flats and 5-bedroom detached houses. The Holding Period Return (HPR) method was used to calculate the returns on investment. The yearly returns on investment data were computed from the appraised capital values and annual rental values of the various types of residential properties in the study area between 1999 and 2013. The performance of the investments was computed by finding the risk- return ratio (coefficient of variation) of the various property investments. Risk was calculated by finding the standard deviation of the yearly returns from the mean HPR (MHPR)

Mean HPR ($\overline{HPR}$) = $\sum HPR/n$ ……………………………… (6)

Where n is the number of periods.

Variance (σ^2) = (HPR- $\overline{HPR}$)^2/n ……………………........... (7)

Standard deviation (σ) = $\sqrt{\sigma^2}$ …………………………….. (8)

Coefficient of variation = σ/MHPR …………………........... (9)

V. Findings

Table 1: Capital Values of Properties in Aladinma from 1999-2013

YEAR	2BEDROOM BUNGALOW	3BEDROOM BUNGALOW	4BEDROOM BUNGALOW
1999	5,000,320	6,000,000	7,000,000
2000	5,000,320	6,000,000	7,000,000
2001	6,249,600	7,500,000	7,875,000
2002	6,249,600	7,500,000	7,875,000
2003	7,500,480	9,000,000	8,400,000
2004	7,500,480	9,000,000	9,450,000
2005	9,375,600	10,000,000	10,500,000
2006	9,375,600	10,000,000	11,200,000
2007	11,250,720	11,500,000	12,250,000
2008	13,125,840	13,500,000	13,300,000
2009	13,125,840	15,000,000	14,700,000
2010	15,000,960	16,500,000	15,750,000
2011	16,876,080	18,000,000	17,500,000
2012	18,751,200	20,000,000	19,250,000
2013	18,751,200	22,500,000	21,000,000
2014	21,876,400	24,000,000	22,050,000
2015	23,126,480	26,000,000	22,750,000
2016	25,001,600	27,500,000	24,483,200

Table 2: Capital Values of Properties in Ikenegbu from 1999-2013

YEAR	BLOCK OF 4 FLATS	BLOCK OF 6 FLATS
1999	10,008,960	11,998,080
2000	10,008,960	11,998,080
2001	12,318,720	14,997,600
2002	13,834,500	14,997,600
2003	15,398,400	17,622,180
2004	15,398,400	17,622,180
2005	19,248,000	20,996,640
2006	19,248,000	20,996,640
2007	23,097,600	23,996,160
2008	23,097,600	26,995,680
2009	25,664,000	29,995,200
2010	28,230,400	29,995,200
2011	30,796,800	34,994,400
2012	34,646,400	37,993,920
2013	38,496,000	39,993,600
2014	41,062,400	41,993,280
2015	44,912,000	44,992,800
2016	48,761,600	49,992,000

Table 3: Capital Values of Properties in Works L/out from 1999-2013

YEAR	4BEDROOM DETACHED HOUSE	BLOCK OF 6 FLATS	5BEDROOM DETACHED HOUSE
1999	8,006,400	9,998,400	9,024,000
2000	8,006,400	9,998,400	9,024,000
2001	9,007,200	11,998,080	10,828,800
2002	10,008,000	11,998,080	12,633,600
2003	10,675,200	14,997,600	12,633,600
2004	10,675,200	14,997,600	14,483,400
2005	12,009,600	17,622,180	16,243,200
2006	13,344,000	21,996,480	18,048,000
2007	14,344,800	23,996,160	18,048,000
2008	16,012,800	27,995,520	19,552,000
2009	17,347,200	27,995,200	21,056,000
2010	20,016,000	31,994,880	24,064,000
2011	20,016,000	35,994,240	24,064,000
2012	23,352,000	35,994,240	30,080,000
2013	26,688,000	39,993,600	36,096,000
2014	28,356,000	44,992,000	39,104,000
2015	30,024,000	47,992,320	42,112,000
2016	33,360,000	51,991,680	45,120,000

Enugu

Table 4: Capital Values of Properties in Independence Layout from 1999-2013

YEAR	BLOCK OF SIX FLATS	4BEDROOM BUNGALOW	5BEDROOM DETACHED HOUSE
1999	17,001,600	20,000,000	28,140,000
2000	17,487,360	20,000,000	28,140,000
2001	19,430,400	22,400,000	33,768,000
2002	19,430,400	22,400,000	37,520,000
2003	21,373,440	25,600,000	42,210,000
2004	21,373,440	28,000,000	46,900,000
2005	22,344,960	30,400,000	51,590,000
2006	22,344,960	33,600,000	58,156,000
2007	24,288,000	36,000,000	65,660,000
2008	29,145,600	40,000,000	75,040,000
2009	34,003,200	48,000,000	84,420,000
2010	38,860,800	56,000,000	93,800,000
2011	43,718,400	64,000,000	103,180,000
2012	48,576,000	72,000,000	112,560,000
2013	54,405,120	80,000,000	112,560,000
2014	58,291,200	88,000,000	131,320,000
2015	61,205,760	96,000,000	140,700,000
2016	63,148,800	104,000,000	150,080,000

Table 5: Capital Values of Properties in Achara Layout from 1999-2013

YEAR	BLOCK OF 4 FLATS	BLOCK OF 6 FLAT
1999	12,000,000	16,008,000
2000	12,000,000	16,008,000
2001	15,000,000	18,708,480
2002	15,000,000	21,381,120
2003	17,500,000	21,381,120
2004	17,500,000	24,053,760
2005	21,000,000	24,053,760
2006	24,000,000	26,726,400
2007	24,000,000	30,289,920
2008	27,000,000	30,289,920
2009	30,000,000	33,408,000
2010	30,000,000	33,408,000
2011	33,750,000	37,862,400
2012	37,500,000	40,089,600
2013	37,500,000	44,544,000
2014	45,000,000	51,225,000
2015	52,500,000	60,134,400
2016	60,000,000	66,816,000

Table 6: Capital Values of Properties in Trans-Ekulu from 1999-2013

YEAR	4BEDROOM BUNGALOW	5BEDROOM DETACHED HOUSE
1999	8,000160	15,000,000
2000	8,571,600	16,500,000
2001	9,143,040	16,500,000
2002	11,428,000	18,750,000
2003	14,286,000	22,500,000
2004	17,143,200	26,250,000
2005	17,143,200	30,000,000
2006	20,000,400	33,750,000
2007	20,000,400	33,750,000
2008	22,857,600	37,500,000
2009	22,857,600	37,500,000
2010	24,000480	45,000,000
2011	25,714,800	52,500,000
2012	28,572,000	60,000,000
2013	28,572,000	60,000,000
2014	32,000,640	67,500,000
2015	34,286,400	75,000,000
2016	36,572,160	90,000,000

Table 7: Rent Passing on Properties in Aladinma from 1999-2013

YEAR	2BEDROOM FLAT	3BEDROOM BUNGALOW	4BEDROOM BUNGALOW
1999	80,000	120,000	200,000
2000	80,000	120,000	200,000
2001	100,000	150,000	225,000
2002	100,000	150,000	225,000
2003	120,000	180,000	240,000
2004	120,000	180,000	270,000
2005	150,000	200,000	300,000
2006	150,000	200,000	320,000
2007	180,000	230,000	350,000
2008	210,000	270,000	380,000
2009	210,000	300,000	420,000
2010	240,000	330,000	450,000
2011	270,000	360,000	500,000
2012	300,000	400,000	550,000
2013	300,000	450,000	600,000
2014	350,000	480,000	630,000
2015	370,000	520,000	650,000
2016	400,000	550,000	700,000

Table 8: Rent Passing on Properties in Ikenegbu from 1999-2013

YEAR	2 BEDROOM FLAT	3 BEDROOM FLAT
1999	78,000	120,000
2000	78,000	120,000
2001	96,000	150,000
2002	100,000	150,000
2003	120,000	180,000
2004	120,000	180,000
2005	150,000	210,000
2006	150,000	210,000
2007	180,000	240,000
2008	180,000	270,000
2009	200,000	300,000
2010	220,000	300,000
2011	240,000	350,000
2012	270,000	380,000
2013	300,000	400,000
2014	320,000	420,000
2015	350,000	450,000
2016	380,000	500,000

Table 9: Rent Passing on Properties in Works Layout from 1999-2013

Year	3bedroom Flat	4bedroom Detached House	5bedroom Detached House
1999	100,000	240,000	300,000
2000	100,000	240,000	300,000
2001	120,000	270,000	360,000
2002	120,000	300,000	420,000
2003	150,000	320,000	420,000
2004	150,000	320,000	480,000
2005	180,000	360,000	540,000
2006	220,000	400,000	600,000
2007	240,000	430,000	650,000
2008	280,000	480,000	700,000
2009	300,000	520,000	750,000
2010	320,000	600,000	800,000
2011	360,000	600,000	900,000
2012	360,000	700,000	1,000,000
2013	400,000	800,000	1,200,000
2014	450,000	850,000	1,300,000
2015	480,000	900,000	1,400,000
2016	520,000	1,100,000	1,500,000

Table 10: Rent Passing on Properties in Independence Layout from 1999-2003

Year	3bedroom Flat	4bedroom Bungalow	5bedroom Detached House
1999	175,000	250,000	300,000
2000	180,000	250,000	300,000
2001	200,000	280,000	360,000
2002	200,000	280,000	400,000
2003	220,000	320,000	450,000
2004	220,000	350,000	500,000
2005	230,000	380,000	550,000
2006	230,000	420,000	620,000
2007	250,000	450,000	700,000
2008	300,000	500,000	800,000
2009	350,000	600,000	900,000
2010	400,000	700,000	1,000,000
2011	450,000	800,000	1,100,000
2012	500,000	900,000	1,200,000
2013	560,000	1,000,000	1,300,000
2014	600,000	1,100,000	1,400,000
2015	630,000	1,200,000	1,500,000
2016	650,000	1,300,000	1,600,000

Table 11: Rent Passing on Properties in Achara Layout from 1999-2013

Year	2bedroom Flat	3bedroom Flat
1999	48,000	72,000
2000	48,000	72,000
2001	60,000	84,000
2002	60,000	96,000
2003	72,000	96,000
2004	72,000	108,000
2005	84,000	108,000
2006	96,000	120,000
2007	96,000	136,000
2008	108,000	136,000
2009	120,000	150,000
2010	120,000	150,000
2011	135,000	170,000
2012	150,000	180,000
2013	150,000	200,000
2014	180,000	230,000
2015	210,000	270,000
2016	240,000	300,000

Table 12: Rent Passing on Properties in Trans-Ekulu from 1999-2013

YEAR	4BEDROOM DETACHED HOUSE	5BEDROOM DETACHED HOUSE
1999	140,000	200,000
2000	150,000	220,000
2001	160,000	220,000
2002	200,000	250,000
2003	250,000	300,000
2004	300,000	350,000
2005	300,000	400,000
2006	350,000	450,000
2007	350,000	450,000
2008	400,000	500,000
2009	400,000	500,000
2010	420,000	600,000
2011	450,000	700,000
2012	500,000	800,000
2013	500,000	800,000
2014	560,000	900,000
2015	600.000	1,000,000
2016	640,000	1,200.000

Table 13: Returns on Properties in Aladinma, Owerri

| Year	Return On 2 Bedroom Investment (%)	Return On 3 Bedroom Investment (%)	Return On 4 Bedroom Investment (%)
2000	14.30	10.5	8.0
2001	12.89	17.69	10.20
2002	11.76	8.8	7.43
2003	10.84	8.37	9.42
2004	10.07	8.0	11.09
2005	17.23	12.89	13.65
2006	8.37	12.2	9.10
2007	14.30	11.27	11.88
2008	18.16	14.75	11.05
2009	13.16	12.89	13.05
2010	10.43	11.76	9.59
2011	9.73	10.89	13.65
2012	12.89	12.89	12.51
2013	8.43	14.3	11.58
2014	10.77	8.37	7.4
2015	7.07	10.07	7.53
2016	9.49	8.46	10.08
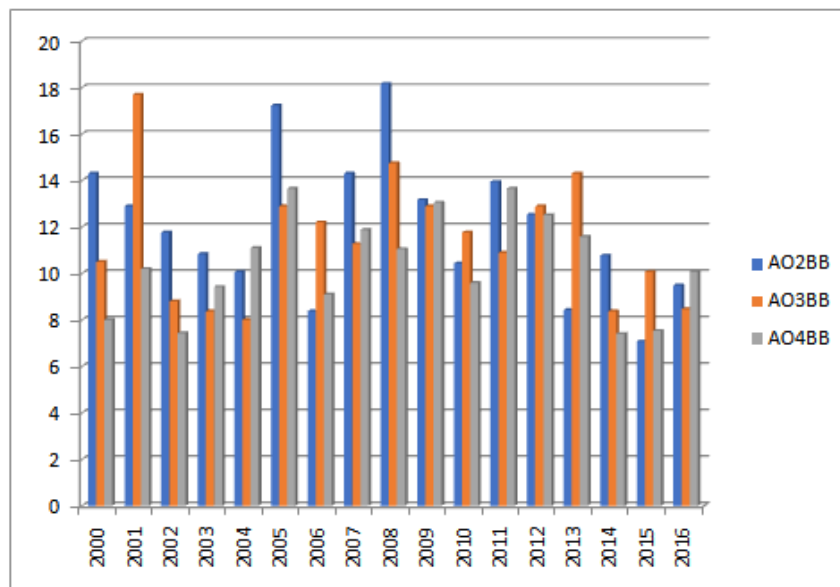
Fig 1: Returns On Investment In Aladinma Owerri

Figure 1 indicates the returns on investment in Aladinma, Owerri which appear as follows; AO2BB – 2 bedroom bungalow, AO3BB – 3 bedroom bugalow, and AO4BB – 4 bedroom bungalow. From the chart, the return on investment in Aladinma, Owerri has been fluctuating from 2000 to 2016, the return on investent of the three property types has varied in these years with each toping the other in various periods. Generally, 2 bedroom bungalows had the highest returns.

Table 14: Returns on Block of 4 Flats and Block of 6 Flats at Ikenegbu

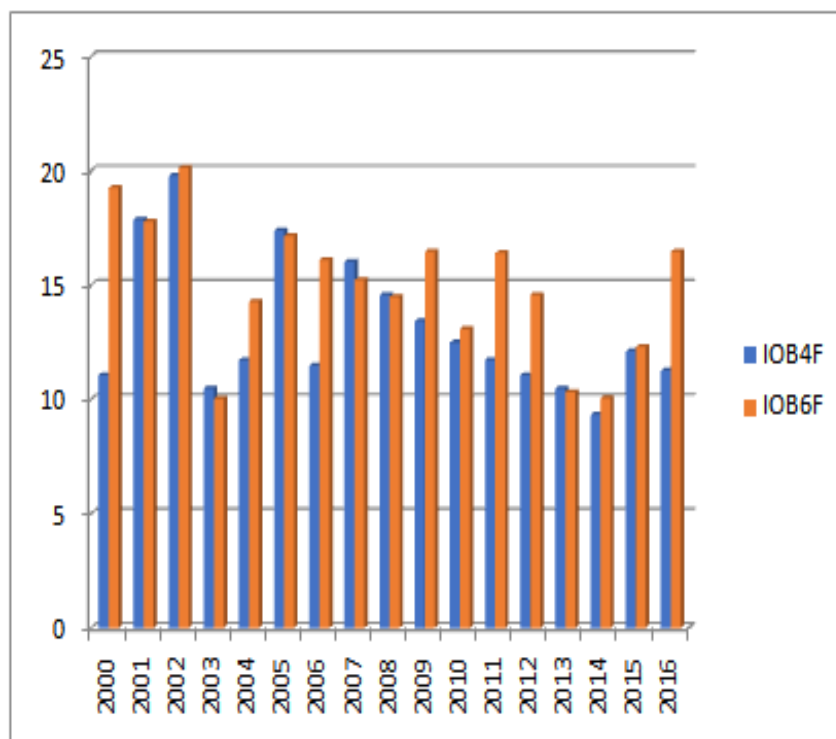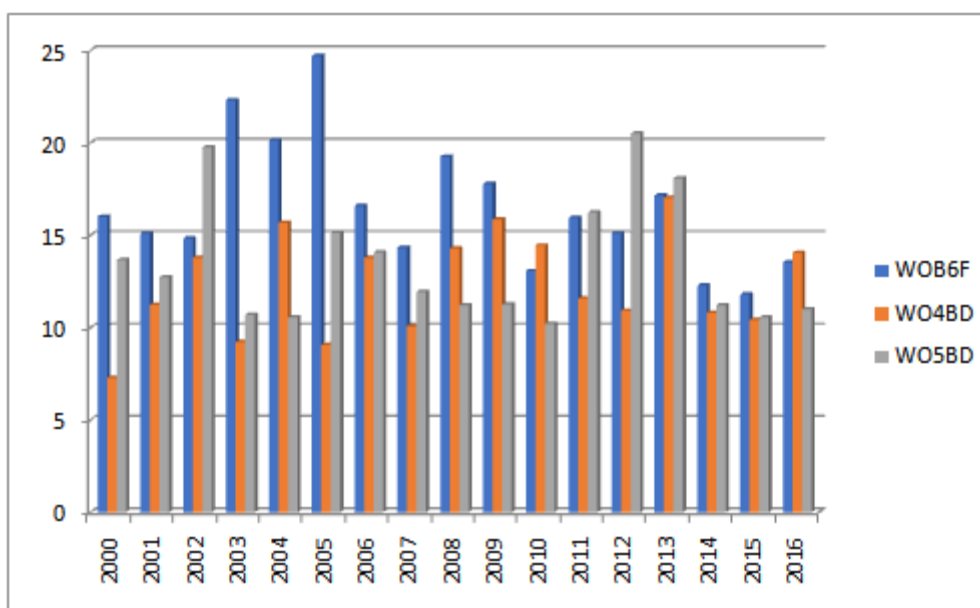| YEAR	RETURN ON BLOCK OF 4 FLATS (%)	RETURN ON BLOCK OF 6 FLATS (%)
2000	11.05	19.25
2001	17.85	17.78
2002	19.78	20.13
2003	10.48	10.03
2004	11.71	14.27
2005	17.39	17.16
2006	11.48	16.10
2007	16.01	15.21
2008	14.57	14.48
2009	13.43	16.45
2010	12.49	13.07
2011	11.71	16.4
2012	11.05	14.57
2013	10.48	10.32
2014	9.33	10.04
2015	12.1	12.29
2016	11.27	16.45

Fig 12: Returns On Investment In Ikenegbu Owerri

The chart above, indicates the returns on investment in Ikenegbu, Owerri which appear as follows; IOB4F – block of 4 flats, IOB6F – block of 6 flats. From the chart, the return on investment inIkenegbu, Owerri has been fluctuating from 2000 to 2016, the return on investent of the two property types has varied in these years with each toping the other in various periods.
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Table 15: Returns on Investment at Works L/out

Year	Return On Investment In Block Of 6 Flats (%)	Return On Investment In 4 Bedroom Detached (%)	Return On Investment On 5 Bedroom Detatched (%)
2000	16	7.29	13.66
2001	15.09	11.23	12.72
2002	14.83	13.78	19.77
2003	22.31	9.22	10.70
2004	20.13	15.68	10.55
2005	24.71	9.06	15.13
2006	16.60	13.78	14.07
2007	14.33	10.08	11.93
2008	19.25	14.30	11.21
2009	17.78	15.85	11.27
2010	13.06	14.44	10.21
2011	15.94	11.58	16.24
2012	15.09	10.92	20.51
2013	17.16	17.03	18.09
2014	12.28	10.8	11.21
2015	11.79	10.42	10.56
2016	13.53	14.04	10.99

Fig 3: Returns On Investment In Works Layout Owerri

The chart above, indicates the returns on investment in Works Layout, Owerri which appear as follows; WOB6F – block of 6 flats, WO4BD – 4 bedroom detached house, and WO5BD – 5 bedroom detached house. From the chart, the return on investment in Works Layout, Owerri has been fluctuating from 2000 to 2013, the return on investent of the three property types has varied in these years with each toping the other in various periods. Generally, block of 6 flats had the highest returns.

Table 16: Returns on Investment in Independence Layout

Year	Return On Investment In Block Of Six Flats (%)	Return On Investment In 4 Bedroom Bungalow (%)	Return On Investment In 5 Bedroom (%)
2000	7.94	1	0.85
2001	16.60	13.12	21.02
2002	11.48	1	12.06
2003	10.64	15.23	13.46
2004	11.00	10.47	12.06
2005	8.63	9.66	10.01
2006	8.5	11.63	13.69
2007	10.60	8.21	13.87
2008	25.93	12.22	15.26
2009	22.43	21.2	13.46

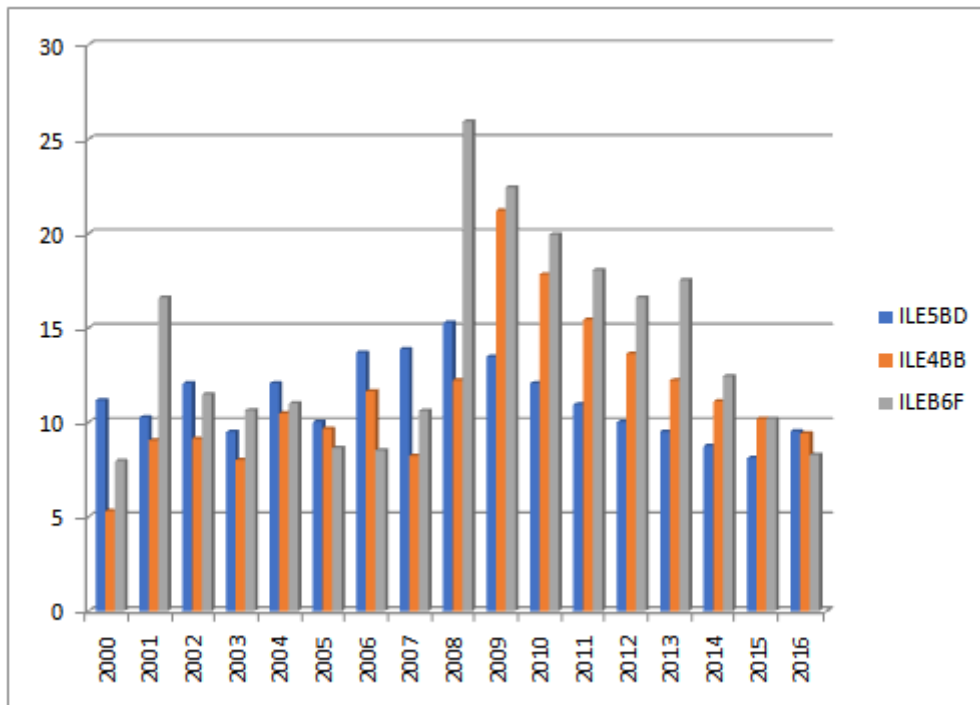| 2010	19.93	17.83	12.06
2011	18.06	15.43	10.94
2012	11.66	13.6	10.02
2013	17.53	12.22	0.85
2014	12.44	11.1	8.74
2015	10.19	10.18	8.1
2016	8.27	9.42	9.52

Fig 4: Returns On Investment In Independence Layout Enugu

The chart above, indicate the returns on investment in Independence Layout Enugu which appear as follows; ILE5BD – 5 bed room detached house, ILE4BD – 4 bed room bungalow, ILEB6- block of 6 flats. From the chart, the yearly return on investments in Independent Layout has varied from 2000 to 2016, with block of 6 flats having the highest returns from 2008-2013

Table 17: Returns on Investment in Trans Ekulu

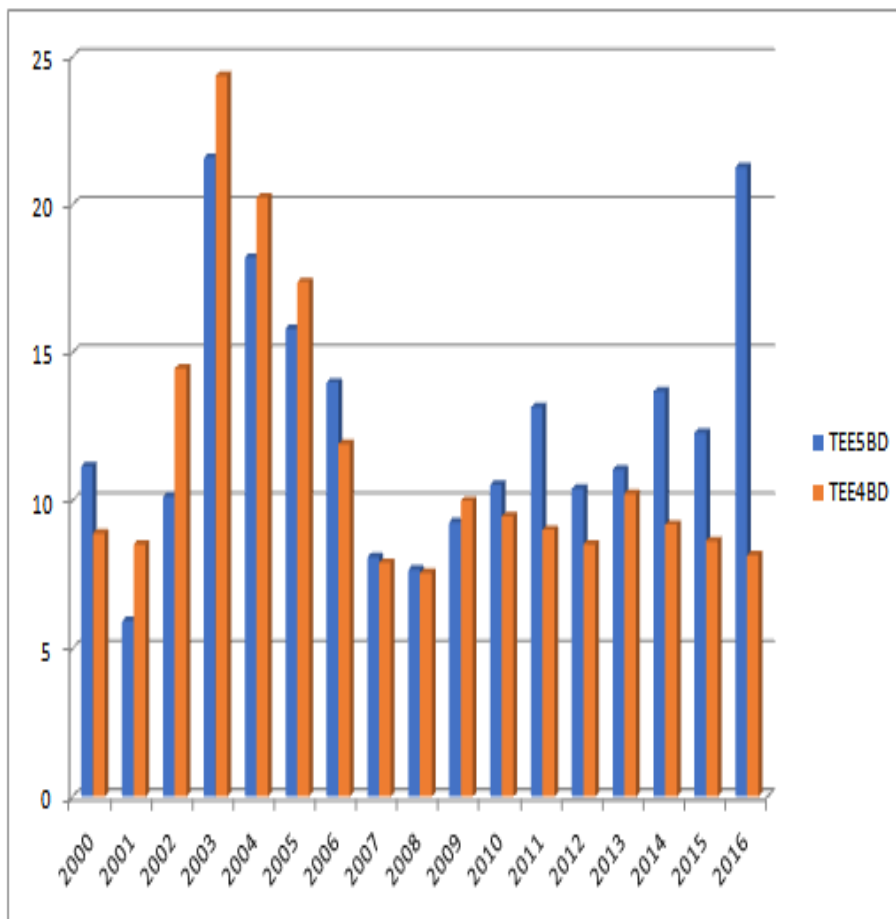| Year	Return On Investment 5 Bedroom Detached House (%)	Return On Investment On 4 Bedroom Bungalow (%)
2000	11.17	8.64
2001	1.07	8.16
2002	114.85	26.74
2003	21.28	26.76
2004	17.91	21.68
2005	15.51	1.4
2006	13.7	18.3
2007	1.07	1.4
2008	12.3	15.89
2009	1.07	1.4
2010	21.28	6.47
2011	17.91	8.64
2012	15.51	12.6
2013	1.07	1.4
2014	13.7	9.2
2015	12.3	8.64
2016	21.28	21.28

Fig 5: Returns On Investment In Trans-Ekulu Enugu

The chart above, indicates the returns on investment in Works Layout, Owerri which appear as follows; WOB6F – block of 6 flats, WO4BD – 4 bedroom detached house, and WO5BD – 5 bedroom detached house. From the chart, the return on investment in Works Layout, Owerri has been fluctuating from 2000 to 2013, the return on investent of the three property types has varied in these years with each toping the other in various periods. Generally, block of 6 flats had the highest returns.

Table 18: Returns on Investment in Achara Layout

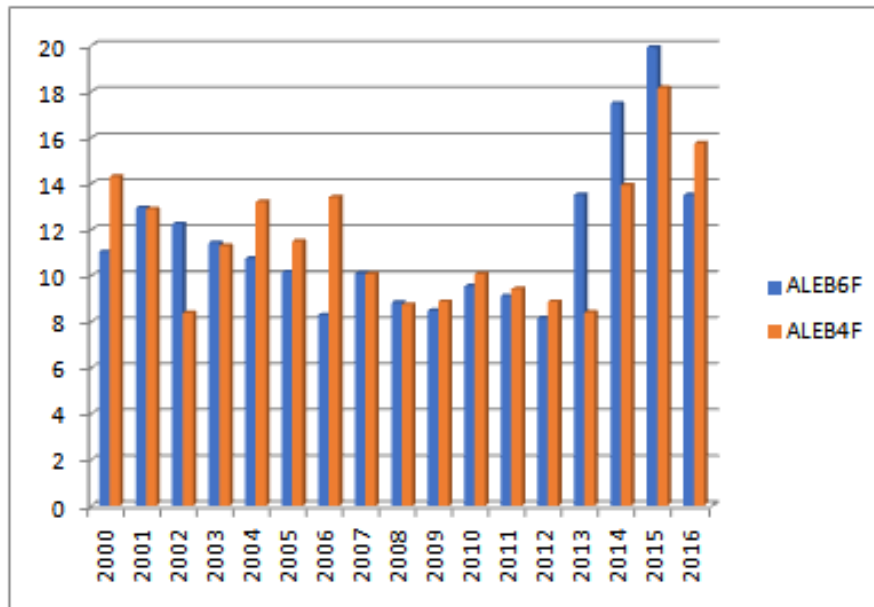| Year	Return On Investment Block Of Six Flats (%)	Return On Investment On Block Of Four Flats (%)
2000	11.03	14.3
2001	12.95	12.9
2002	12.25	8.37
2003	11.43	11.3
2004	10.75	13.21
2005	10.16	11.49
2006	8.29	13.41
2007	10.09	10.07
2008	8.82	8.74
2009	8.48	8.86
2010	9.54	10.07
2011	9.11	9.42
2012	8.16	8.86
2013	13.51	8.4
2014	17.48	13.94
2015	19.92	18.16
2016	13.51	15.75

Fig 6: Returns On Investment In Achara Layout Enugu

The chart above, indicates the returns on investment in Achara Layout Enugu which appear as follows; ALEB6F – block of 6 flats, ALEB4F – block of 4 flats. From the chart, the return on investment in Trans-Ekulu varied from 2000 to 2016, the returns have varied in these years with each toping the other in various periods. Generally, the highest returns for both investment types occurred between 2014 and 2016.

Table 19: Performance of Residential Investment Real Estate in Owerri from 2000-2016

location	house type	mean hpr	mean variance	risk/standard deviation	covariance
aLADINMA, oWERRI	2 BEDROOM BUNGALOW	11.76%	8.74	2.96%	0.25
aLADINMA, oWERRI	3 BEDROOM BUNGALOW	11.48%	6.46	2.54%	0.22
aLADINMA, oWERRI	4 BEDROOM BUNGALOW	10.48%	3.97	1.99%	0.19
iKENEGBU,oWERRI	bLOCK OF 4 FLATS	13.07%	8.46	2.91%	0.22
iKENEGBU,oWERRI	bLOCK OF 6 FLATS	14.35%	7.96	3.0%	0.21
wORKS l/OUT, oWERRI	bLOCK OF 6 FLATS	16.46%	9.02	3.4%	0.21
wORKS l/OUT, oWERRI	4 BDRM. DETACHED .HOUSE..	12.32%	9.17	3.03%	0.23
wORKS l/OUT, oWERRI	5 BDRM DETACHED HOUSE	13.52	11.22	3.22%	0.24
iNDEPENDENCE l/OUT, eNUGU	bLOCK OF 6 FLATS	13.64%	27.72	5.26%	0.39
iNDEPENDENCE l/OUT, eNUGU	4 BEDROOM BUNGALOW	12.46%	16.8	4.1%	0.33
iNDEPENDENCE l/OUT, eNUGU	5BEDROOM DETACHED HOUSE	12.63%	7.81	2.79%	0.22
aCHARA l/OUT, eNUGU	bLOCK OF 6 FLATS	11.5%	8.09	2.84%	0.25
aCHARA l/OUT, eNUGU	bLOCK OF 4 FLATS	11.57%	13.1	3.62%	0.31
tRANS-eKULU, eNUGU	4 BEDROOM BUNGALOW	11.44%	22.2	4.71%	0.41
tRANS-eKULU, eNUGU	5 BEDROOM DETACHED HOUSE	12.59%	18.79	4.33%	0.34

The MHPR for 2 bedroom bungalow in Aladinma, Owerri is 11.76%, risk is 2.96% and COV is 0.25. Therefore, 0.25 unit of risk was taken for every unit of return earned. The MHPR for 3 bedroom bungalow is 11.48%, risk is 2.54% and COV is 0.22. Therefore, 0.22 unit of risk was taken for every unit of return earned. The MHPR for 4 bedroom bungalow is 10.48%, risk is 1.99% and COV is 0.19. Therefore, 0.19 unit of risk was taken for every unit of return earnedMHPR for block of 4 flats in Ikenegbu, Owerri is 13.07%, risk is 2.91% and COV is 0.22. Therefore, 0.22 unit of risk was taken for every unit of return earned. MHPR for block of 6 flats is 14.35, risk is 3% and COV is 0.21. Therefore, 0.21 unit of risk was taken for every unit of return earned.MHPR

for block of 6 flats in Works Layout, Owerri is 16.46%, risk is 3.4% and COV is 0.21. Therefore, 0.21 unit of risk was taken for every unit of return earned. MHPR for 4 bedroom detached house is 12.32%, risk is 3.03% and COV is 0.23. Therefore, 0.23 unit of risk was taken for every unit of return earned. MHPR for 5 bedroom detached house is 13.52%, risk is 3.22% and COV is 0.24.Therefore, 0.24 unit of risk was taken for every unit of return earned.MHPR for block of 6 flats in Independence Layout, Enugu is 13.64% the risk is 5.26% and the coefficient of variation (COV) which is the risk to reward ratio is 0.39. This means that 0.39 unit of risk was taken for every unit of return earned. The MHPR for 4 bedroom bungalow is 12.46%, risk is 4.1% and COV is 0.33. Therefore, 0.33 unit of risk was taken for every unit of return earned. The MHPR for 5 bedroom detached house is 12.63%, risk is 2.79% and COV is 0.22 Therefore, 0.22 unit of risk was taken for every unit of return earned.MHPR for block of 6 flats in Achara layout is 11.5%, risk is 2.84% and COV is 0.25. Therefore, 0.25 unit of risk was taken for every unit of return earned. The MHPR for block of 4 flats is 11.57%, risk is 3.62% and COV is 0.31. Therefore, 0.31 unit of risk was taken for every unit of return earned.MHPR for 4 bedroom bungalow in Trans-Ekulu is 11.44%, risk is 4.71% and COV is 0.41. Therefore, 0.41 unit of risk was taken for every unit of return earned. The MHPR for 5 bedroom detached house is 12.59%, risk is 4.33% and COV is 0.34. Therefore, 0.34 unit of risk was taken for every unit of return earned.

The results of the study showed that:
1. block of 6 flats in Works Layout, Owerri had the highest MHPR of 17.31%, while while4 bedroom bungalow in Aladinma Layout had the least MHPR of 10.87% within the study period.
2. 2   block of 6 flats in Independence Layout, Enugu had the highest MHPR of 11.7%, while block of 6 flats in Achara layout, Enugu had the least MHPR of 10.33%.
3. 5 bedroom detached house in Works Layout, Owerri had the highest risk of 3.35%, while 4 bedroom bungalow in Aladinma had the lowest risk of 1.93%.
4. block of 6 Flats in Independence Layout,Enugu had the highest risk of 5.49%, while block of 6 flats in Achara Layout, Enugu had the lowest risk of 1.68%.
5. in Enugu, 4bedroom bungalow in Trans-Ekulu and block of 6 flats in Achara layout, had the best performance; having the lowest risk-return relationship (covariance) of 0.421, while 5 bedroom detached house in Trans-Ekulu, had the least performance with a risk-return covariance of 0.69.
6. in Owerri, 4 bedroom bungalow in Aladinma, block of 6 flats in Ikenegbu and block of 6 flats in Works Layout had the best performance; having the lowest risk-return relationship (covariance) of 0.18, while 5
7. bedroom detached house in Works Layout had the least performance with a risk-return covariance of 0.24.

VI.   Conclusion
From the findings of the study we concludethat performance measurement is a very important tool for investment decision making in the real estate investment sector and that real estate investments in Owerri generally performed better than real estate investment in Enugu since most of the property types had lower covariance than their counterparts in Enugu.

VII. Recommendations
1. It is recommended that investors should always seek the advice of estate surveyors and valuers to know the best type of residential property to invest in and at what time to invest.
2. Investors who already have properties within the study location should at least once in a year ask for a performance measurement of their investment from their property managers so as to know whether or not the objective of their investments is being achieved.
3. It is true that if an investment has performed well in the past, is not a guarantee that it will perform well in the future but since past performance is a basis for future decision, it is recommended that investors seeking to buy property within the study area should consider investing in 4 bedroom bungalow in Aladinma, block of 6 flats in Ikenegbu and block of 6 flats in Works Layout, Owerri; or 4 bedroom bungalow in Trans-Ekulu and block of 6 flats in Achara layout, Enugu

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