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## PERFORMANCE AND RISK-RETURN CHARACTERISTICS OF RESIDENTIAL PROPERTY CAPITAL RETURNS IN NIGERIA. CASE STUDY OF KANO METROPOLIS

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### ABSTRACT

*Residential property investment is ascribed because of its diverse returns potential, disentangling the risk and returns potential of residential property capital returns has been an up-hill task. This study evaluates the performance of residential property investment capital returns. The paper emphasis risk-return features of tenement, two and three-bedrooms property for investment purpose, with a view to advance the understanding of the property market dynamics in Kano metropolis, Nigeria. Quantitative research strategy was utilised using questionnaire survey technique to collect from branch manager of estate firms' primary data, on capital values of residential properties. This data was subsequently converted into capital returns and put to Phillip-Perron unit root test (stationarity). The study used both the descriptive and inferential statistical approaches for analysis. Findings from the study shows that capital returns from residential property range from 3.62% to 9.52%. with risk-return ratio ranging from 01.71% to 97.11% within the property market, Badawa/GRA property had the lower risk features hence ideally secured location for residential investment. It is on these findings that the study recommended Badawa/GRA property market for risk conscious investors*

**Keywords:** Performance, residential property, risk-returns, trend line, capital return

### INTRODUCTION

Rural-urban drift increases demand for housing and provides prospects in the urban spaces for residential estate market to strive. The various returns producing potential of residential property investment and it hedge against inflation have been attributed as primary rational for attributing to it as preferred investment portfolio (Dabara 2015; Ho & Atkinso 2018) by investors. The problem of choice in establishing the rational bases and criteria for decision making become emanate in the property investment market as a result of it diversity nature (Hargitay & Yu, 1993). In order words, the heterogeneity in the investment market have necessitate the utilization of different approach to diverse scenario because property development is shrouded with uncertainty. Due to the uncertainty nature of the property market investors decision must be focused on fact not intuitions (Olaleye, et al 2014) this give credence to the utilisation of capital return in this study owing to the speculative nature of emerging market and global economic instability, Capital Return (CR) is critical to real estate investment (Dabara, 2015). In fact, it is fundamental to old and potential residential investors that have preference for outright sales after development, because it depicts the level of returns after development and allow the investors to make market comparison with other class of investment. But alas, untangling capital returns and risk associated with a residential investment in various property market has typically been a challenge to investors most especially in the study area.

Real estate investment decision based on speculative drive is cloaked with uncertainty in terms of capital returns and risk associated with the residential investment to be included in a firms' portfolio (Hargitay & Yu, 1993). These uncertainty is a potential indicator to higher risk, specifically in terms of capital returns to investors that have flair for outright sales of residential property after development.

A positive capital return profile of residential portfolio can compel investors to invest their capital outlay. Unravelling capital return-risk profile of residential property can be accomplished by quantitatively evaluating historical performance so as to make projection trends (Salihu et al. 2020).

Quite a number of literature had attempted to illuminate the understanding of the performance of residential investment from various viewpoint. For example, some studies (Mfam & Kalu, 2012; Oyewole 2013; Udobi et al. 2018; Kingsley & Chukwuemeka, 2019, Osa & Ekenta) try to establish a comparative assessment of commercial and residential properties, and results reveal that commercial property investment is more viable than residential property, although the type of sampling technique used and the accurate number of property chosen are not specified, only the number of estate surveying and valuation firms that provide the information are stated. Likewise, Dabara (2015) focused on the inflation hedge performance and risk-returns attributes of residential flat, the study did not lay prominence on segregating the types of residential flats. However, Ma et al (2012) concentrated on retrofitting.

Similarly, other studies (Wahab et al 2017; Nwankwo et al 2018; Nissi et al 2019; Okonu et al 2019; Salihu et al 2020) on residential property performance operationalised various sampling approach and the outcome shows that the location, type and condition of property to a large extent determine residential property investment returns. However, these studies de-emphasised tenement buildings and capital return (Aliero et al 2022) in their studies, the former is a primary kind of residential property and the later a type of return in Kano metropolis the study locale.

As a result of the foregoing, this study seeks to assess the performance of tenement, two and three-bedrooms residential property. By finding answers to the following research questions: What were the trends in capital returns (CRs) on residential property in the Kano metropolis between 2010-2019? What were the risk-return features of capital returns of residential properties in the Kano metropolis between 2010-2019? What is the trend forecast of capital returns of residential properties in the Kano metropolis from 2020- 2023? This study will offer potential and old, local and foreign investors an improved understanding of the returns and risk surrounding investing in residential property in the Kano metropolis. It will also aid in narrowing the gap in literature on North-West Nigeria in this domain of residential property performance trend. More so, it will bring to the fore practical answers for increasing returns and curtailing uncertainty surrounding residential investment decision. The subsequent part of the study encompasses: introduction section; methodological strategy employed for the study is in section two; while section three is the result and conclusion and area for future research.

## METHODOLOGY

This study utilised a questionnaire survey to collect quantitative data. The questionnaire (fill in) was designed to draw tangible information for aggregate average capital values of

residential properties. The properties are found across Badawa, Naibawa, Rijiyar-zaki and Hotoro/GRA in Kano metropolis from 2010 to 2019. These properties are mainly tenement, two and three-bedrooms properties for investment purpose owing to their ability to generate capital growth and rental incomes.

Branch manager of registered estate surveying and valuation firms situated in the study areas provided annual data on capital values of these class of properties for the study periods, because they are the custodian of this data (Salihu et al 2020) that established value of property and their interest. Purposive sampling techniques was used to select 14 estate surveying and valuation firms that have been in practice for the past 10 years so as to have credence on the data collected. 10 estate firms responded representing 71.14% of the sample estate firms. Similarly, a sample size of 412 properties was collected from the firms for the study and was well thought out to be sufficient (Krejcie & Morgan, 1970, Salihu et al. 2021). Hence, it is the cumulative average capital value of the selected properties that were used for analysis.

Both descriptive (percentages, weighted means and standard deviation, coefficient of variation) and inferential statistic (Analysis of variance “ANOVA” and Mean Score) were employed for analysing the quantitative data. This aided in showing if any, an overall statistically significant difference exist in capital returns among the considered properties in the Neighbourhoods (Table 4, 5 and 6).

The cumulative average capital values (transaction price) were calculated for each year from the fill in questionnaire by respondents (estate surveyors and valuation firms only), and Hoesli & MacGregor (2000) formula was then use to convert the aggregate average capital value into capital returns as expressed below:

$$\text{Capital return } CR_t = \frac{CV_t - CV_{t-1}}{CV_{t-1}} \quad \dots\dots\dots (1)$$

Where:

$CV_t$  = Capital return for period  $t$ ;

$CV_t$  = Capital value beginning of the year (end of period  $t-1$ );

$CV_{t-1}$  = Capital value end of period  $t - 1$ .

First, the transformed data (capital return data) was put to inferential test (analysis of variance and Mean score) to see if there was variation (statistically significant difference) in capital returns across the study properties.

Second, the transformed data was also, put to Phillip-perron test of unit root to test for stationary. This was employed to perceive the data integration and stationarity where the data was not stationary the difference of the data was taking to make it stationary to be able to make a precise prediction (Ma & Liu, 2010; Dabara, 2015; Salihu et al. 2020). Thus, test regression for the Phillip-Perron tests is:

$$\Delta y_t = \beta' D_t + \pi y_{t-1} + U_t \quad \dots\dots\dots(2)$$

Where  $U_t$  is  $I(0)$  which is the difference level and may be heteroskedastic. Phillip-Perron stationarity tests take the null hypothesis that  $y_t$  is trend stationary. As earlier stated if  $y_t$  is

not stationary. The study takes first difference of tenement data from Naibawa and Badawa, two bedroom from Naibawa and for three-bedroom Naibawa, Rijiyar-zaki and Badawa to make the data becomes stationary at a point. Decision rule: if there is a unit root problem (stationarity characteristic of data set) to accept or reject the Null hypothesis at 10%, 5% and 1% significant level for capital returns. Consequently, the study takes a first difference of the data in these location to establish stationarity, before other analysis (Ma & Liu, 2010; Dabara, 2015; Salihu et al. 2020).

Third, the value of the standard deviation of the capital return assist to determine the level of volatility of the capital returns which primarily demonstrate the risk of investing in tenement, two and three-bedrooms residential properties in the study neighbourhoods express as:

$$\text{Standard deviation/Asset risk} = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n-1}} \dots\dots\dots(3)$$

Where  $n-1 = df$

$x_i$  = asset period return

$\bar{x}$  = the mean return

$n$  = number of observation

Decision rule: neighbourhoods with low risk value depict the landed property is more secured whilst those with high risk value indicate a less secured residential investment.

Fourth, the capital return data was again transformed into Capital Return Index (CRI) with aid of simple aggregate index formula 4, the CRI was employed to graphically make trend lines analysis of CRI in this study.

$$P_{01} = \left( \frac{\sum P_1}{\sum P_0} + 1 \right) * 100 \dots\dots\dots(4)$$

Where  $P_{01}$  = Capital Return Index

$\sum P_1$  = Current year capital return

$\sum P_0$  = Base year capital return

100 = Base year index value

The CRI aided in graphically demonstrating trends from 2010 to 2019 because it is a statistical measure of change in representation group of individual data points, depicting at a glance percentage increase or decrease in capital return and assisted in easing future. Equally, the  $R^2$  value was used to demonstrate the goodness of fit of the trend line. The rule of thumb is that a trend line is most precise if the  $R^2$  value is closer or at 1 or 0.5.

Last, return –risk structures (capital return) in residential investment (tenement, two and three bedrooms) were comparatively analysed to establish their peculiarities.

## RESULTS/CONCLUSION

The outcome of analysis conducted on the data are presented in this section. First, average capital returns values were calculated from 2010-2019 for tenement building, two and three-bedrooms residential properties. Second, ANOVA and Mean score was employed to establish the level of disparity in terms of capital return within the study areas. Third, risk-returns characteristic of the properties were presented and analysed. last, aggregate trend line analysis of CRI was presented. The average capital returns of these residential property are presented from 2010 to 2019 in Table 1. This was derived by calculating for each year respectively, the cumulative averages of the respondent on capital value per property type and using Hoesli and MacGregor, (2000) formula for capital returns “(1)”.

**Table 1: Average capital returns (%) for residential investment within Kano metropolis**

	Capital returns	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Tenement	Naibawa	10.63	13.13	6.41	11.09	16.18	8.65	2.70	8.21	9.40	8.77
2bedroom		1.61	4.81	5.99	7.03	3.85	4.85	0.65	2.30	2.41	2.68
3bedroom		5.39	3.83	5.11	4.88	10.89	1.82	1.63	0.77	1.57	1.57
Aggregate Mean		5.88	7.26	5.84	7.67	10.31	5.11	1.66	3.76	4.46	4.34
Tenement	Hotoro	14.70	3.22	4.08	9.37	7.59	2.26	4.24	5.84	5.82	5.49
2bedroom		11.84	9.23	5.97	5.00	2.84	7.28	6.40	2.81	3.27	5.46
3bedroom		23.41	4.19	6.22	8.03	10.10	6.01	3.65	7.85	4.38	5.07
Aggregate Mean		16.65	5.55	5.42	7.47	6.84	5.18	4.76	5.5	4.49	5.54
Tenement	Rijiyar-zaki	13.49	1.55	7.31	3.59	15.94	1.17	0.11	4.72	1.30	4.00
2bedroom		13.15	6.21	1.02	13.46	3.27	5.28	3.09	0.60	1.23	1.87
3bedroom		9.06	3.49	9.21	2.90	7.56	4.23	4.24	0.97	0.60	0.50
Aggregate Mean		11.9	3.75	5.85	6.65	8.92	3.56	2.48	2.10	1.04	2.12
Tenement	Badawa	13.68	11.04	5.62	11.44	8.45	2.10	7.63	6.64	4.86	4.12
2bedroom		10.24	5.79	3.08	7.67	4.01	11.11	0.70	12.16	5.70	6.37
3bedroom		3.59	1.28	5.28	4.27	5.50	7.41	2.02	2.58	4.24	5.06
Aggregate Mean		9.17	6.04	4.66	7.79	5.99	6.87	3.45	7.13	4.27	5.18

**Source:** Authors field survey (2019)

Table 1 shows the aggregate average scores of capital returns; it is expected to provide at a glance the differences in the residential investment trend from year to year. For tenement property, the most performed (15.94%) and least performed (0.11%) location is Rijiyar-zaki respectively, (it was discovered that this is tied to high demand by students of higher institution located in this neighbourhood). Equally, for two-bedroom property Rijiyar-zaki is the most performed location (13.46%) while Badawa is the least performed location with a value of (0.70%). For three-bedroom property Hotoro property market performed better (23.41%) while Rijiyar-zaki property market is the least performed (0.50%).

Table 2 shows the ANOVA result for the three selected classes of property in Kano metropolis. The result indicates that the F-statistics for tenement and two bedroom properties and three bedroom properties (1.92, 1.47 and 1.41) are not significant at p-value (0.144, 0.238 and 0.062)

greater than 0.05 level of significant. This shows that variation in the capital returns for a tenement and two-bedroom and three-bedroom property across the study locations in Kano metropolis are not statistically significantly different. This insignificant and significant difference in means, between and across property types in the locations/market might be associated to location factors.

**Table 2: Analysis of variance in total returns for tenement, two bedrooms and three-bedrooms residential properties investment in Kano metropolis**

Type of Property	Source of variation	DF	Sum of Square	Mean Square	F	P-value
Tenement	Between Group	3	99.1	33.0	1.92	0.144
	Within Group	36	620.3	17.2		
	Total	39	719.5			
Two Bedroom	Between Group	3	53.9	18.0	1.47	0.238
	Within Group	36	438.7	12.2		
	Total	39	492.7			
Three Bedroom	Between Group		112.2	37.4	14.4	0.062
	Within Group		516.8	14.4		
	Total		629.0			

Source: Analysis of survey data Table 1

Although, result in Table 3 of ANOVA one-way for tenement property showing the Mean score of each location suggest that even though variation in capital return is not statistically different, Naibawa has a better CR followed by Badawa, Hotooro and Rijiyar-zaki.

**Table 3: Mean score for tenement property**

Individual 95% CIs For Mean Based on Pooled StDev				
Property type	N	Mean	StDev	
Tenement Naibawa	10	9.517	3.656	(-----+-----+-----+-----+)
Tenement Hotooro	10	6.261	3.617	(-----*-----)
Tenement Rijiyar	10	5.318	5.409	(-----*-----)
Tenement Badawa	10	7.558	3.636	(-----*-----)
				-----+-----+-----+-----+
				5.0 7.5 10.0 12.5

Source: Analysis of survey data Table 1

Equally, Table 4 of ANOVA (one-way) for two-bedroom property show the Mean score of each location indicating that even though variation in capital return is not statistically different, Badawa had a better CR followed by Hotooro, Rijiyar-zaki and Naibawa.

**Table 4: Mean score for two-bedroom property**

Individual 95% CIs For Mean Based on Pooled StDev				
Property type	N	Mean	StDev	
2bedroom Naibawa	10	3.618	2.032	(-----*-----)
2bedroom Hotooro	10	6.010	2.891	(-----*-----)
2bedroom Rijiyar-z	10	4.918	4.776	(-----*-----)
2bedroom Badawa	10	6.683	3.667	(-----*-----)
				-----+-----+-----+-----+
				2.0 4.0 6.0 8.0

Source: Analysis of survey data Table 1

Also, Table 5 of ANOVA (one-way) for three-bedroom property shows the Mean score of each location suggesting that even though variation in capital return is not statistically different, Hotoro had a better CR followed by Rijiyar-zaki. Badawa, Naibawa.

**Table 5: Mean score for three-bedroom property**

Individual 95% CIs For Mean Based on pooled stDev				
Property type	N	Mean	StDev	
3bedroom Naibawa	10	3.746	3.044	(-----*-----)
3bedroom Hotoro	10	7.891	5.812	(-----*-----)
3bedroom Rijiyar-z	10	4.276	3.320	(-----*-----)
3bedroom Badawa	10	4.123	1.829	(-----*-----)
				-----+-----+-----+-----+-----
				2.5 5.0 7.5 10.0

Source: Analysis of survey data Table 1

Capital returns-risk performance profile of the selected residential property in the study areas are summarise and discuss in Table 6 Formula “(3)” aid in demonstrating the return-risk performance; and then the ranking and comparison across the study areas. It pertinent to note that a positive trend in risk-return ratio profile are influential in choice of a type of investment to be included in a firm portfolio, because it aids in minimize investment risk in a mixed residential type investment portfolio (Dabara, 2015; Salihu *et al.*, 2020).

**Table 6: Summary statistics showing capital weighted return, return-risk ratio of residential properties in Kano metropolis (2010-2019)**

Type of property	Min	Max	Weighted return	Rank (weighted)	Std. Dev.	Coefficient of variation	Rank (COV)
Tenement	2.7	16.18	9.517	1 <sup>st</sup>	3.6563	0.3842	2 <sup>nd</sup>
Two bedroom	0.65	7.03	3.618	4 <sup>th</sup>	2.0325	0.5618	3 <sup>rd</sup>
Three bedroom	0.77	10.89	3.746	4 <sup>th</sup>	3.0442	0.8127	4 <sup>th</sup>
ACR Naibawa			16.881	3 <sup>rd</sup>	8.733	0.5173	2 <sup>nd</sup>
Tenement	2.26	14.7	6.261	3 <sup>rd</sup>	3.6165	0.5776	4 <sup>th</sup>
Two bedroom	2.81	11.84	6.01	2 <sup>nd</sup>	2.8914	0.4811	1 <sup>st</sup>
Three bedroom	3.65	23.41	7.891	1 <sup>st</sup>	5.8122	0.7366	2 <sup>nd</sup>
ACR Hotoro			20.162	1 <sup>st</sup>	12.3201	0.6111	3 <sup>rd</sup>
Tenement	0.11	15.94	5.318	4 <sup>th</sup>	5.4091	1.0171	1 <sup>st</sup>
Two bedroom	0.6	13.46	4.918	3 <sup>rd</sup>	4.7763	0.9711	4 <sup>th</sup>
Three bedroom	0.5	9.21	4.276	2 <sup>nd</sup>	3.3205	0.7765	3 <sup>rd</sup>
ACR Rijiyar-zaki			14.512	4 <sup>th</sup>	13.5059	0.9307	4 <sup>th</sup>
Tenement	2.1	13.68	7.558	2 <sup>nd</sup>	3.6356	0.4810	3 <sup>rd</sup>
Two bedroom	0.7	12.16	6.683	1 <sup>st</sup>	3.667	0.5487	2 <sup>nd</sup>
Three bedroom	1.28	7.41	4.123	3 <sup>rd</sup>	1.8295	0.4437	1 <sup>st</sup>
ACR Badawa			18.364	2 <sup>nd</sup>	9.1321	0.4973	1 <sup>st</sup>

Calculated from Table 1.

\*\*\*ACR= Aggregate Capital Return,

Table 7 shows the descriptive statistics of the capital returns and risks-return ratio profile of the residential rental properties in Naibawa, Hotoro/ GRA, Rijiyar-zaki and Badawa neighbourhoods. It indicates that for tenement property the highest level of capital returns generated is (9.52%) (Weighted returns) in Naibawa property market and a proportionate risk-

return ratio of (38.42%), while Rijiyar-Zaki (5.32%) property market generated the least capital returns with a corresponding low risk-return ratio of (1.02%).

Also, for 2 Bedroom properties, Badawa property market generated the highest capital returns (Weighted returns) with a value of (6.68%), having a corresponding second place level of risk-return ratio at (54.84%), equally Rijiyar-zaki property market generated the lowest rate of capital returns value of (4.92%) with a proportionate risk-return ratio of (97.11%).

For 3 Bedroom properties, the result also shows that Hotoro property market generated a high capital returns (7.89%) and a proportionate second place risk-return ratio of (73.66%) whilst Rijiyar-zaki property market generated the lowest capital returns (3.75%) and a proportionate (81.3%) risk-return ratio.

Equally, on the aggregate capital returns, Hotoro/GRA property market is ranked first with a coefficient of (20.16%) and a risk-return ratio (61.11%) whilst Rijiyar-zaki generated the lowest aggregate capital returns (14.51%) and a proportionate risk-return ratio (93.07%). Residential property risk-returns trend profile serve an investor from uncertainty and complexity associated with the heterogonous nature of real estate investment, hence the need to unbundle real estate specific market.

Lastly, the aggregate risk factor for the selected areas was calculated employing “(3)” and the outcome suggests that Badawa had the least risk-return ratio (49.73%) establishing the most secured location for risk averse residential investors while Rijiyar-zaki had the highest risk-return ratio (93.07%) signifying a least secured location but most suitable for risk taking investors.

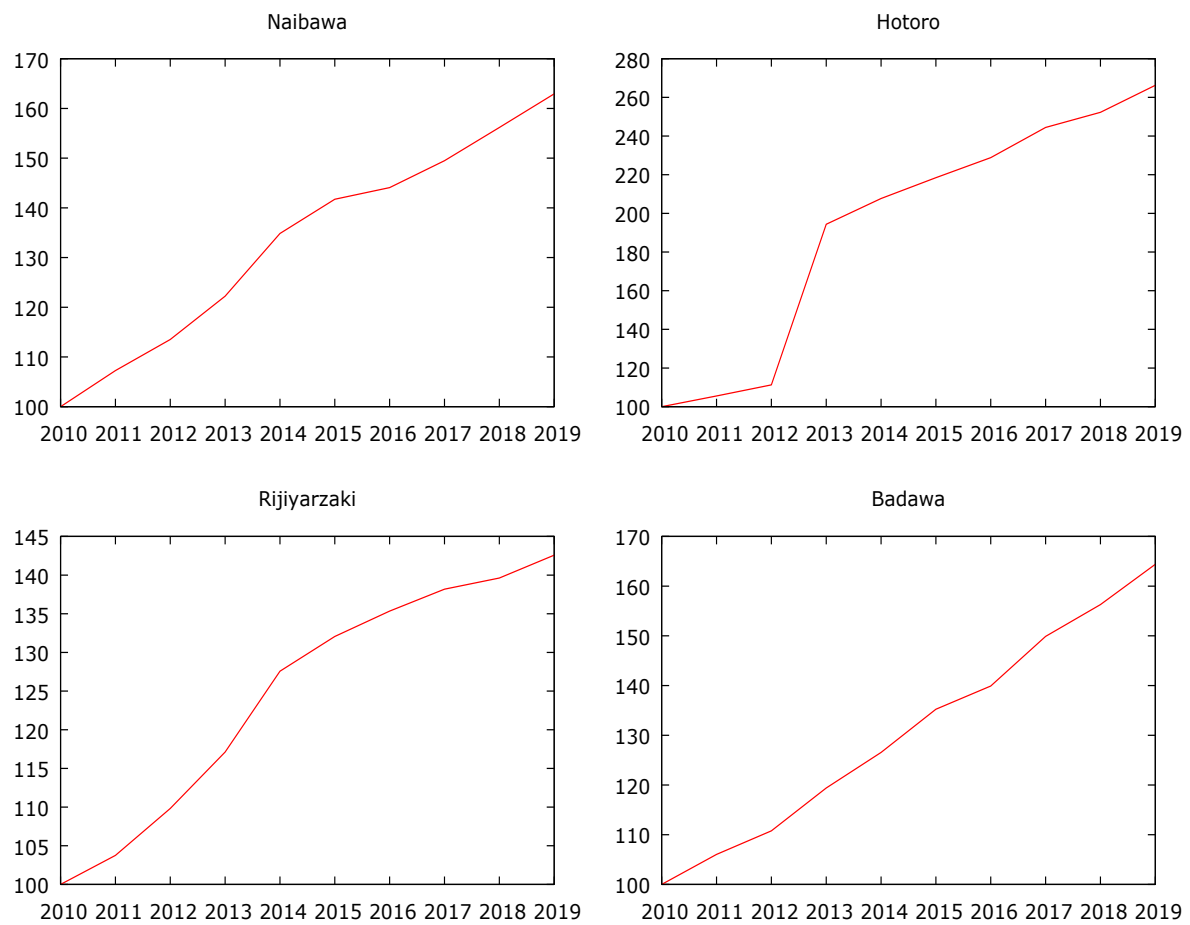


Figure1: Trend analysis showing isolated aggregate capital index for the study locations

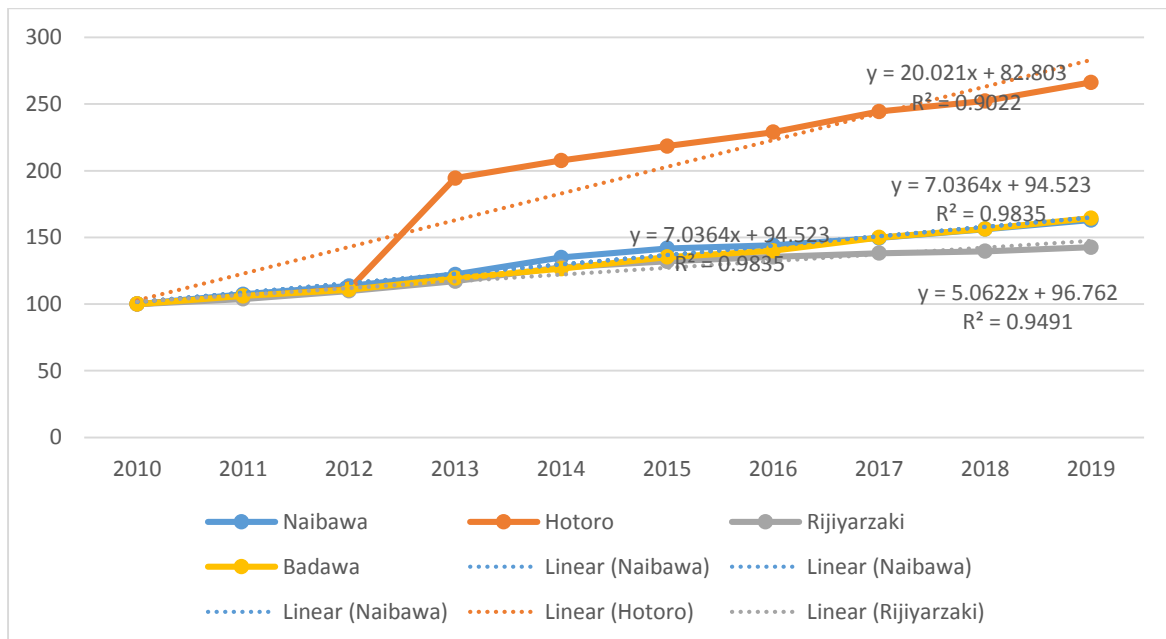


Figure 2: Trend analysis showing combined aggregate capital index for the study locations

The Figure 1 and 2 graphically shows the Trends of aggregate capital returns of residential properties in Naibawa, Hotoro, Rijiyar-Zaki and Badawa in Kano metropolis. Assessing the ACI graph shows that Hotoro has a sharp growth in capital returns in 2012 to 2013 followed by Naibawa in 2014. Thus, in the whole capital returns movement is volatile, its noteworthy that the movement in capital returns in the study areas are positive. Also, the trend equations for different property market is presented with the  $R^2$  values demonstrating the goodness of fit of the model. The rule of thumb is that the closer the  $R^2$  value to 1 or 0.5 the better the predictability. The peak of the predictability is at 98.35%. This, the study has a limitation of not been able to include some micro-economic variables that are existent in the study neighbourhood but outside the study scope. Other studies have prospect of exploring performance of income return of residential property.

## CONCLUSIONS

This paper evaluates the performance (capital returns and risk profile) of residential investment in Kano metropolis. Findings from the study demonstrate empirically that tenement, two and three-bedrooms residential properties have consistently maintained a positive capital returns profile through the study period corroborating the findings of Aliero et al (2022), Nwankwo et al (2018) in South-East Nigeria, Nissi et al (2019) in Enugu and Salihu et al (2020) in Kaduna while contextually monitoring residential and other property performance in the Nigeria property market.

Naibawa tenement property market performed better in terms of capital returns (9.52%) and a corresponding risk-return ratio (38.42%) in comparison to other neighbourhoods. capital returns have been volatile with weighted mean ranging from 3.62% to 9.52%. The highest cumulative of capital returns for all the classes of residential property is Hotoro/GRA (20.16%) and lowest at Rijiyar-zaki (14.51%) correspondingly. Likewise, the aggregate most unsecured property investment portfolio is located at Rijiyar-zaki (risk factor 93.07%) while the most secured investment location is at Badawa (risk factor 49.73%). Thus, Badawa is recommended as the most desirable location for risk conscious investors.

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