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Determinants of Residential Property Location Choice of Tenants in Bosso and Chanchaga Local Government Areas of Minna, Nigeria

A. B. Ayoola[1], O. A. Kemiki[1], N. I. Popoola[1], I. Ojetunde[1] and J. B. Oyedele[2]

1. Department of Estate Management & Valuation, Federal University of Technology, Minna, Niger State, Nigeria.
2. Department of Estate Management, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

*Corresponding Author: joe_christ2001@yahoo.co.uk

Abstract

This study investigates the determinants of residential location choice in Bosso local government area (LGA) and Chanchaga local government area (LGA) of Minna, Niger State, Nigeria. Structured questionnaires were administered on tenants who are household heads in the study area to weigh 15 factors that influence their choice of current homes. The discriminant function analysis was employed. The empirical results exhibit statistically significant and largest discriminant loading of factors such as availability of fence wall and large floor area of apartment (dwelling attributes) and location of property in a particular neighbourhood (neighbourhood attribute) as the determinants of residential location of tenants in the study area. The study therefore recommends that all stakeholders in residential property sector in the study area should ensure that building accommodation details are allocated adequate space to meet the needs of tenants and buildings are fenced before offer for letting. The study also recommends that policy makers and planners should ensure that efforts are geared toward restructuring of the unplanned neighbourhoods in Bosso and Chanchaga local government areas (LGAs) whilst maintaining and improving the available facilities and services in planned neighbourhoods. These to a great extent will proportionately enhance satisfaction and shape the residential location decisions of tenants resulting in maximum investment returns to all residential property investors across all the neighbourhoods in Minna.

Keywords: dwelling attributes, neighbourhood attributes, accessibility attributes, residential location choice

Introduction

The physical and economic developments of cities across the globe are tied to the structure and network of urban land use. Meanwhile, in every city around the world, residential land use form the vast majority of land use among various competing land uses as it offers shelter role to every mankind and a major household decision is that of residential location (Harris, 1996; Obateru, 2005; Olayiwola, Adeleye, & Oduwaye, 2006; Acheampong & Anokye, 2013). Moreover, residential location choices are central to the understanding of people

aspirations and expectations (Curtis and Montgomery, 2006). Taking advantage of this will assist residential property investors to tap maximum investment returns; while on the other hand, the policy makers can capitalize on residential location choice of people for direct policy implications (Kim et al. 2005a; Kim, 2010).

Although, the study of residential mobility and housing choice has captured the interest of scholars in a diverse range of disciplines, the circumstances under which people select their residential locations especially in Africa have been given little consideration (Curtis and Montgomery, 2006; Nkeki and Erimona, 2018). Minna, the study area is a city in West Africa. The city is the capital of Niger State in North-Central geopolitical zone of Nigeria. In urban areas, residential buildings in rental market often suffer a void period which is contrary to global investment motive of profitability (Oladokun, 2011). Minna is not an exception. These often void periods experienced at the urban residential property rental market give credence to the fact that a tenant will prefer a particular dwelling type for its peculiar attributes despite similar dwelling alternatives for a population. Understanding therefore the circumstances under which tenants select their residential locations will give insight to their desires. When residential property investors and policy makers capitalize on such desires, voids in residential accommodation are likely to reduce and good investment returns realized.

It is within this analytical context that this paper will identify significant determinants of residential location choice of tenants using a variety of dwelling, accessibility and neighbourhood attributes in Bosso and Chanchaga LGAs of Minna, Niger state, Nigeria. The remainder of this paper is organized as follows. Section 2 starts with an overview of the determinants of residential location choice and reviews residential location choice analysis. Section 3 describes the study area. Section 4 presents methodology including summary statistics of the characteristics of the respondents for the study. In section 5, results are presented. Conclusions along with policy implications are discussed in section 6.

Understanding Residential Location Choice

One of the driving forces of urban households' activities and travels is their residential location (Schirmer, van Eggermond and Axhausen, 2014; Babakan and Alimohammadi, 2016). In urban economics, the monocentric bid-rent model underlines the traditional residential location model which historically has its roots in von Thunen's (1826) agricultural land use model, which suggests that land rent varies with distance from a central marketplace (Ingram, 1977; Kim et al., 2005a; Rivera and Tiglao, 2005; Schirmer et al., 2014). Thereafter, the bid-rent concept was applied in residential location models (Alonso, 1964; Lowry, 1964; Muth, 1969). This influential model of location choice is known as utility maximization theory and sometimes called the transportation and land cost 'trade-off'. The model suggests that households will select a housing location which provides greater

accessibility to their place of work by minimizing commuting costs or alternatively accept increased commuting costs in exchange for less expensive housing further from single center employment opportunity (Kim, Horner and Marans, 2005b; Curtis and Montgomery, 2006; Kim, 2010; Feitosa and Monteiro, 2012; Sanit, Nakamura, Tanaka and Wang, 2013). The monocentric model has contributed significantly to the development of urban and spatial economics thus becoming the representative residential location model, yet being subjected to a range of criticism due to some of its simplified theoretical assumptions and limited applicability to the real world (Kim, 2010; Feitosa and Monteiro, 2012).

Therefore, with modern society, it has been observed that as cities' complicacy grew, the urban spatial structures have become polycentric due to many economic focal points, so other than housing and commuting costs, there are other factors influencing residential location decisions of households' (Blijie, 2004; Curtis & Montgomery, 2006; Kim, 2010; Oladapo, 2010). Consequently, the determinants of residential location choice reported in residential location choice literature can be generally grouped into six (6) categories. These are dwelling attributes such as dwelling type, house price, floor, number of bedrooms, toilet and other similar aspects and availability of utility facilities (Kim et al. 2005a; Zondag and Pieters, 2005; Shawal and Ferdous, 2014; Opaluwa and Aribigbola, 2015; Xifilidou, Mangina, Spatalas and Tsioukas, 2015; Ubani, Alaci, and Udoo, 2017) socioeconomic attributes including age of household head, household size, workplace location and household income (Zondag and Pieters, 2005; Rivera and Tiglao, 2005; Hunt, 2010; Sanit et al., 2013; Opaluwa and Aribigbola, 2015) and accessibility variables such as access to school, health and medical facilities and access to public transport stop (Kim et al. 2005a; Animashaun, 2011; Jun & Morrow-Jones, 2011; Sanit et al., 2013; Opaluwa & Aribigbola, 2015; Oyetunji and Abidoye, 2016; Ubani et al., 2017). Others are neighbourhood characteristics such as neighbourhood security, neighbourhood preference and less traffic congestion (Kim et al., 2005b; Jun and Morrow-Jones, 2011; Acheampong and Anokye, 2013; Nkeki ans Erimona, 2018), socio-cultural attributes such as communal living and closeness to relatives or family ties (Acheampong and Anokye, 2013; Shawal and Ferdous, 2014; Ubani et al., 2017; Nkeki and Erimona, 2018) and although not common is the environmental attributes such as size of natural areas and outdoor environmental quality (Kim et al., 2005b; Oyetunji and Abidoye, 2016).

Previous Studies on Residential Location Choice

There is a substantial body of research literature that focuses on housing location choice of households. A study by Animashaun (2011) concentrated on 12 push factors to evaluate the relative significance of the factors in urban residential mobility of households in Calabar, Nigeria. The author noted that factors such as difficulty of access to work and/or market place, eviction notice, insufficient space in the housing, dislike for type of houses, the exterior of dwelling, family composition and dislike for the type of neighbours are prioritized

in household decisions compared to other factors related to house ownership, dislike for the type of house tenure, interior size or layout of the house, high house rent, noise and similar intrusions from outside the house. The results of the study suggest that accessibility, dwelling and socioeconomic attributes play significant roles in explaining residential location choice other than variables related to neighbourhood.

In Ghana, a study by Acheampong and Anokye (2013) showed that family relations, proximity to work place, relatively low land price and house rents were the most important explanatory variables for residential location choice in two of Kumasi's peri-urban settlements. The results of their study indicate that sociocultural, dwelling and accessibility considerations play significant roles in explaining the location decisions of people in the study area. Like Animashaun (2011), Acheampong and Anokye (2013) found that neighbourhood attributes are significantly less important in the minds of households.
The research by Opaluwa and Aribigbola (2015) employed multinomial logistic regression to analyse the residential location choice of households in Lokoja, Kogi State. Their results revealed that accessibility to work, distance to health/medical facilities and housing cost in particular have strong impact on households' residential location choice for all dwelling types. The findings of the study is somewhat similar to those of Acheampong and Anokye (2013) which indicated that accessibility and dwelling attributes are almost constant explanatory variables for the considered dwelling types while attributes related to socioeconomic are less important.

Interested in student residential submarket, Oyetunji and Abidoye (2016) employed weighted mean score (WMS) and discriminant function analysis (DFA) to identify significant predictors of residential location choice of students in Federal University of Technology Akure, Nigeria. The authors analysed a variety of dwelling (rental value of property, type of dwelling, level of facilities provision, size of room, privacy provision and aesthetic of building), accessibility (proximity to campus, access to transport, nearness to market and access to medical facilities), neighbourhood (neighbourhood characteristics and security of the neighbourhood) and environmental (outdoor environmental quality) attributes. The authors found that access to transport, type of dwelling and level of facilities provision are the strongest predictors of the residential location choice of students. The results of their findings indicate that accessibility and dwelling attributes are most successful predictors than attributes related to the neighbourhood and environmental.

A study of Nkeki and Erimona (2018) employed factor analysis and multinomial logit (MNL) model to identify the significant predictors of residential location choice of people in 5 residential districts of Benin City. The authors modeled the residential location choice process as a function of 12 factors including 2 socioeconomic variables (household size and household income); 2 sociocultural variables (closeness to relatives and ease of access to

home town and village); 3 variables of neighbourhood (safety/security, good road network and clean/well planned area) and 5 accessibility variables (closeness to place of work, place of worship, access to good children school, vacant land and cheap accommodation). Their factor analysis extracted variables related to sociocultural, accessibility and neighbourhood as the the most prominent determinants of household choice of residential location in the study area while socioeconomic attributes are significantly less important. When they estimated the logit models of residential location choice, Nkeki and Erimona found that the factors effectuate decisions of people differently, meanwhile like Animashaun (2011), neighbourhood attributes such as safety and security in particular increases the probability of choosing residential location across almost all the residential districts.

The preponderances of findings from the empirical analyses suggest that the determinants of households' residential location choices operate differently across geographical areas. It will therefore be sustainable to uncover the significant predictors of residential location choice of households across the different cities for realisation of maximum investment returns on the part of real estate investors and for direct policy implications on the part of policy makers. Thus, this paper will identify the determinants of residential location choice of tenants in Bosso and Chanchaga Local Government Areas of Minna, a major city in northern Nigeria.

The Study Area

The study area is Minna, the capital of Niger State, Nigeria. The study area has geographical cordinates of 9^0 36' 50'' North and 6^0 33' 25'' East and is located on Latitude 9^o 37' North and Longitude 6^o 33'. Figure 1 is the map of Minna showing its 25 neighbourhoods. Minna housed 2 local government areas which are Bosso LGA and Chanchaga LGA. There are 7 neighbourhoods in Bosso LGA. Of these neighbourhoods, Bosso Estate, Jikpan, Maitumbi, Sango and Tudun Fulani are medium density neighbourhoods while Bosso Town and Chanchaga are high density neighbourhoods. The remaining 18 neighbourhoods constitute Chanchaga LGA. In the local government area, Dutse Kura Gwari, Dutse Kura Hausa, Fadipe, F-layout, Tayi Village, Minna central, Makera, Nasarawa, Sabongari, Sauka Kahuta, Tudun Wada North, Tudun Wada South and Tunga Low Cost are medium density neighbourhoods. Others such as Agwandaji, Barkin Saleh, Kpakungu and Limawa are high density neighbourhoods while GRA is the only low density neighbourhood in the study. All these neighbourhoods are included in this study so as to have a holistic measure of residential location decision of tenants.

According to 2006 Population and Housing Census, the land size of Bosso LGA (1636.331 km^2) is almost 22 times than those of Chanchaga LGA (74.384 km^2). Conversely, Chanchaga LGA with lower land size has more population of people to the tune of 202,151 than population of people in Bosso LGA which is 148,136 (National Population Commission, 2006). As at 2017, the projected population of Bosso LGA and Chanchaga LGA are 223,271 and 304,682, respectively.

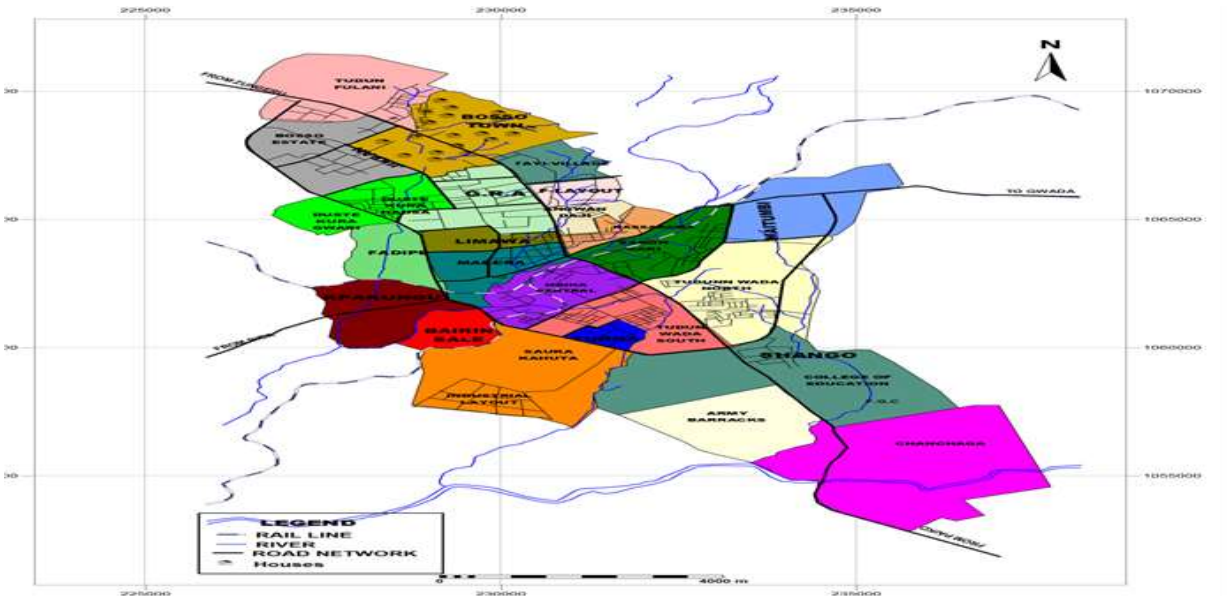

Figure 1: Minna and its Neighbourhoods (Source: Department of Urban and Regional Planning, 2013)

Materials and Methods

This paper employed disaggregate revealed reference method to harness why tenants have chosen their current residential locations. The qualitative survey based research involved a design of 15 items structured questionnaire to obtain primary data on a variety of dwelling (floor numbers, floor level, adequacy of public rooms, number of bedrooms, number of bathrooms, number of toilets, availability of garage, large floor area and availability of fence wall), neighbourhood (property location in a particular neighbourhood and secured neighbourhood) and accessibility (access to clinic/hospital, primary school, secondary school and workplace) attributes from household heads (respondents) who are tenants in the study area. The tenants' behaviour in residential location choice is studied because studies have shown that tenants constitute category of residential property occupants more likely to move than homeowners (Aliyu, 2010; Acheampong and Anokye, 2013).

The 2003 household data for the neighbourhoods were obtained from Sanusi (2006) and subsequently projected at an annual growth rate of 3.80% (National Population Commission, 2006) for the 14 year time lag covering 2003 to 2017. The total number of households in Bosso LGA is 31,599 while those of Chanchaga LGA is 85,271. The details are as shown in Table 1.

Table 1: Neighbourhood Household Size in Minna

S/No	Neighbourhoods	Household Size (2003)	Household Size (2017)
	Bosso LGA		
1	Bosso Estate	306	552
2	Bosso Town	6,717	12,003
3	Chanchaga	4,505	8,050
4	Jikpan	1,475	2,636
5	Maitumbi	2,377	4,248
6	Sango	512	915
7	Tudun Fulani	1,788	3,195
	TOTAL	**17680**	**31599**
	Chanchaga LGA		
1	Agwandaji	2,535	4,531
2	Barkin Saleh	984	1,758
3	Dutse Kura Gwari	1,538	2,749
4	Dutse Kura Hausa	2,307	4,123
5	Fadipe	769	1,374
6	F-Layout	825	1,475
7	Tayi Village	1,659	2,965
8	GRA	581	1,038
9	Minna Central	4,495	8,032
10	Kpakungu	2,984	5,332
11	Limawa	4,650	8,309
12	Makera	4,582	8,188
13	Nasarawa	5,179	9,254
14	Sabongari	5,748	10,270
15	Sauka Kahuta	527	943
16	Tudun Wada North	4,809	7,164
17	Tudun Wada South	3,620	6,468
18	Tunga Low Cost	726	1,298
	TOTAL	**48,518**	**85,271**

Source: Adapted and modified from Sanusi (2006)

Moreover, according to Amenyah and Fletcher (2013), roughly 40% of the world's population lives in rented housing. With that in mind, 40% of the total households of 31,599 amounting to 12,639 households occupied rented properties in Bosso LGA as at 2017. In Chanchaga LGA, based on 40% of the total households of 85,271, it means that 34,109

households live in rented properties (Table 2). The sample size of the tenants to be administered questionnaire at the study area is then determined by formula for finite population as propounded by Kothari (2004). This formula is;

$$n = \frac{Z^2 \times N \times \sigma^2}{(N-1)\, e^2 + Z^2 \sigma^2}$$

Where n is the sample size, Z is the standardized normal value and for this study it is taken as 1.96 for a 95% confidence interval, σ is the standard deviation which was put at 0.5 depicting a safe decision enhancing large enough samples, N is the number of rented dwellings and e is the margin of error put at +/- 5%. In passing, 372 and 481 tenants represent the sample sizes in Bosso LGA and Chanchaga LGA respectively for questionnaire administration. 277 and 424 questionnaires were subsequently retrieved from the local government areas representing response rates of 74% and 88%, respectively. Table 2 shows the breakdown of the questionnaire administered and retrieved.

Table 2: Questionnaire Distribution to Tenants in the Study Area

S/No	Neighbourhoods	Proportion of Rented Dwellings	Sample Size	Questionnaire Administered	Questionnaire Retrieved
	BOSSO LGA				
1	Bosso Estate	221	7	12	6
2	Bosso Town	4,801	141	146	96
3	Chanchaga	3,220	97	102	76
4	Jikpan	1,054	30	35	25
5	Maitumbi	1,699	49	54	36
6	Sango	366	11	16	8
7	Tudun Fulani	1,278	37	42	30
	TOTAL	**12639**	**372**	**407**	**277**
	Chanchaga LGA				
1	Agwandaji	1,812	20	25	24
2	Barkin Saleh	703	8	13	8
3	Dutse Kura Gwari	1,100	12	17	17
4	Dutse Kura Hausa	1,649	18	23	23
5	Fadipe	550	6	11	8
6	F-Layout	590	7	12	9

7	Tayi Village	1,186	13	18	17
8	GRA	415	5	10	7
9	Minna Central	3,213	35	40	40
10	Kpakungu	2,133	23	28	28
11	Limawa	3,324	37	42	28
12	Makera	3,275	36	41	41
13	Nasarawa	3,702	41	46	46
14	Sabongari	4,108	45	50	50
15	Sauka Kahuta	377	4	9	4
16	Tudun Wada North	2,866	38	43	33
17	Tudun Wada South	2,587	28	33	33
18	Tunga Low Cost	519	5	10	8
	TOTAL	**34,109**	**381**	**471**	**424**

Source: Authors Computation (2017)

The resulting survey provided a perceptual rating of the identified factors as they influence the tenants' choices of residential properties during the search period. Respondents were asked to assess each of the factors on a 5 point likert type scale with 'not important' assigned a score of 1; 'less important' rated as 2; 'moderate as 3; 'important' as 4 and 'very important' rated as 5. The survey also collected data on annual rents paid by tenants' for different residential property types (tenement building, self-contained room, bungalow, flat, house and duplex) as well as their socioeconomic characteristics. The discriminant function analysis was employed to analyse the 15 variables identified as factors that influence choice of residential properties in Bosso and Chanchaga LGAs which are the dependent variable groups. The essence of the analysis is to determine whether these variables will discriminate between respondents' choice of residential locations in Bosso LGA and Chanchaga LGA. The analyses were achieved through IBM SPSS Statistics version 21.

Table 3 provides a summary statistics of the characteristics of the respondents for the study. The mean annual rents in 2017 in Bosso LGA and Chanchaga LGA are N84,687.27 and N66,207.14, respectively for the whole samples but characterized with large variance. The gender statistics show that the male population of household heads is almost twice than those of female in both local government areas. The household heads with family and single person households are the major categories of household type in the both LGAs. Single person households constitute more than half (52.3%) of the sample in Bosso LGA with family households accounting for 42.2%. Conversely, in Chanchaga LGA, family households accounted for 59.4% of the sample while single person households constitute 33.7%. In Bosso LGA, occupation components of the sample are almost equally distributed with government employee (28.5%) and student who are tenants (31.0%) slightly higher than private employee (16.2%) and self-employed (21.7%). In Chanchaga LGA, the proportion of

self-employed (46.7%) is twice than those of the self-employed respondents in Bosso LGA, while government employee (25.5%) is slightly higher than private employee (10.1%) and student (12.7%). The statistics also show that a reasonable percentage of the respondents (83.4% in Bosso LGA and 77.3% in Chanchaga LGA moved to new homes within 10 years prior to the survey. Kim et al. (2005b) argued that the respondents that moved within this period will be able to remember clearly the circumstances on which they chose their current residential location. The outcome of the responses from the respondents will therefore be reliable for this study. In both local government areas, income distribution tells us that the percentage of respondents in low levels of income is much higher than those in higher income levels.

The mean annual rents in 2017 in Bosso LGA and Chanchaga LGA are ₦84,687.27 and ₦66,207.14 respectively for the whole samples but characterized with large variance. As expected, with gender of respondents (household heads), the male population is almost twice that of the female in both local government areas. The household heads with family and single person households are the major categories of household type in the both LGAs. Single person households constitute more than half (52.3%) of the sample in Bosso LGA with family households accounting for 42.2%. Conversely, in Chanchaga LGA, family households accounted for 59.4% of the sample while single person households constitute 33.7%. In Bosso LGA, occupation components of the sample are almost equally distributed with government employee (28.5%) and student (31.0%) slightly higher than private employee (16.2%) and self-employed (21.7%).

In Chanchaga LGA, the proportion of self-employed (46.7%) is twice that of the self-employed respondents in Bosso LGA, while government employee (25.5%) is slightly higher than private employee (10.1%) and student (12.7%). The statistics also show that a reasonable percentage of the respondents (83.4% in Bosso LGA and 77.3% in Chanchaga LGA moved to new homes within 10 years prior to the survey. Kim et al. (2005b) argued that the respondents that moved within this period will be able to remember clearly the circumstances on which they chose their current residential location. The outcome of the responses from the respondents will therefore be reliable for this study. In both local government areas, income distribution tells us that the percentage of respondents in low levels of income is much higher than those in higher income levels.

Table 3: Descriptive Summary of Demographic and Socio-Economic Characteristics of Respondents

Variables	Variable Type	Bosso LGA		Chanchaga LGA	
		Mean	Standard Deviation	Mean	Standard Deviation
PANEL A (Continuous Variable)					
Annual Rent	Continuous	84687.27	64370.42	66207.14	62086.15
		Min	Max	Min	Max
		10,000	350,000	10,000	350,000
PANEL B (Binary/Categorical)					
		Frequency	Percentage (%)	Frequency	Percentage (%)
Gender of Household Head:	Binary				
Male		174	62.8	283	66.7
Female		103	37.2	141	33.3
Marital Status	Categorical				
Single		145	52.3	143	33.7
Married		117	42.2	252	59.4
Separated		6	2.2	7	1.7
Divorced		2	0.7	3	0.7
Widowed		6	2.2	14	3.3
Missing Response		1	0.4	5	1.2
Occupation:	Categorical				
Government Employee		79	28.5	108	25.5
Private Employee		45	16.2	43	10.1
Self Employed		60	21.7	198	46.7
Student		86	31.0	54	12.7
Unemployed		7	2.5	19	4.5
Missing Response				2	0.5
Length of Stay:	Categorical				
Less than 3 years		114	41.2	124	29.2
Between 3 - 6 years		82	29.6	151	35.6
Between 7 - 9 years		35	12.6	53	12.5
10 years and above		43	15.5	85	20.0
Missing Response		3	1.1	11	2.6
Range of Monthly Income:	Categorical				
Less than N10000		15	5.4	42	9.9
N10000 - N29999		81	29.2	107	25.2
N30000 - N49999		63	22.7	140	33.0
N50000 - N69999		38	13.7	52	12.3
N70000 - N89999		13	4.7	19	4.5
N90000 - N109999		23	8.3	23	5.4
N110000 and above		24	8.7	23	5.4
Missing Response		20	7.2	18	4.2
	No. of Sample	277		424	

Results and Discussion

Case Processing Summary of Discriminant Function Analysis

The result of the case processing of the simple discriminant function analysis involving the 2 groups of Bosso LGA and Chanchaga LGA is reported in Table 4. The valid questionnaires accepted by the discriminant system for the analysis is 92.6% of the 701 questionnaires recovered generally. Hence, 649 questionnaires of which there is no missing discriminating variable were utilised for the analysis.

Table 4: Discriminant Function Analysis Case Processing Summary

	Unweighted Cases	N	Percent
Valid		649	92.6
Excluded	Missing or out-of-range group codes	0	0
	At least one missing discriminating variable	52	7.4
	Both missing or out-of-range group codes and at least one missing discriminating variable	0	0
	Total	52	7.4
Total		701	100

Factors Influencing Tenants' Choice of Residential Location in Minna

A starting point in discriminant analysis is to examine whether there are any significant differences on each of the independent variables between Bosso LGA and Chanchaga LGA groups. The results of Group statistics (Table 5), Tests of equality of group means (Table 6), Pooled within-groups matrices (Table 7), Eigenvalues (Table 8) and Wilks' Lambda (Table 9) provide evidence for the significance of the discriminant function for the study.

The inspection of the group means as depicted in Table 5 reveals marked variability in weighted means of variables such as 'large floor area of apartment', 'availability of fence wall' and 'location of property in a particular neighbourhood' which suggest their abilities of being important discriminators between the groups (Bosso LGA and Chanchaga LGA) of respondents.

Table 5: Group Statistics in the Discriminant Analysis

Local Government Area	Factors influencing residential location choice	Mean	Std. Deviation	Valid N (listwise) Unweighted	Weighted
Bosso Local Government Area	Influence of floor nos in location choice	2.704	1.43129	250	250
	Influence of level of floor in location choice	2.9	1.2871	250	250
	Adequacy of public rooms e.g living room, dining room and kitchen	3.632	1.21262	250	250
	Number of bedrooms	3.7	1.03454	250	250
	Number of bathrooms	3.824	1.02235	250	250
	Number of Toilets	3.788	1.11176	250	250
	Availability of garage	2.64	1.34074	250	250
	Large floor area of apartment	3.48	1.10929	250	250
	Availability of fence wall	4.048	1.12907	250	250
	Location of property in a particular neighbourhood	3.82	1.08087	250	250
	Availability of clinic/hospital close to property	3.888	1.04682	250	250
	Availability of primary school close to property	3.368	1.26132	250	250
	Availability of secondary school close to property	3.24	1.26046	250	250
	Location of property near workplace	3.48	1.28694	250	250
	Location of property in a secured neighbourhood	4.436	0.98069	250	250
Chanchaga Local Government Area	Influence of floor nos in location choice	2.8095	1.35573	399	399
	Influence of level of floor in location choice	2.8947	1.34461	399	399
	Adequacy of public rooms e.g living room, dining room and kitchen	3.5714	1.13389	399	399
	Number of bedrooms	3.7519	1.08024	399	399
	Number of bathrooms	3.8271	0.99378	399	399
	Number of Toilets	3.792	1.07242	399	399
	Availability of garage	2.5714	1.32592	399	399
	Large floor area of apartment	3.2306	1.20592	399	399
	Availability of fence wall	3.7419	1.20761	399	399
	Location of property in a particular neighbourhood	3.6115	1.05238	399	399
	Availability of clinic/hospital close to property	3.807	1.08222	399	399
	Availability of primary school close to property	3.5138	1.13606	399	399
	Availability of secondary school close to property	3.4436	1.10785	399	399
	Location of property near workplace	3.6466	1.16823	399	399
	Location of property in a secured neighbourhood	4.3058	1.0183	399	399
Total	Influence of floor nos in location choice	2.7689	1.38518	649	649
	Influence of level of floor in location choice	2.8968	1.32176	649	649
	Adequacy of public rooms e.g living room, dining room and kitchen	3.5948	1.1643	649	649
	Number of bedrooms	3.7319	1.06237	649	649
	Number of bathrooms	3.8259	1.0041	649	649
	Number of Toilets	3.7904	1.08689	649	649
	Availability of garage	2.5978	1.33104	649	649
	Large floor area of apartment	3.3267	1.17507	649	649
	Availability of fence wall	3.8598	1.1865	649	649
	Location of property in a particular neighbourhood	3.6918	1.06745	649	649
	Availability of clinic/hospital close to property	3.8382	1.06864	649	649
	Availability of primary school close to property	3.4576	1.18705	649	649
	Availability of secondary school close to property	3.3652	1.17224	649	649
	Location of property near workplace	3.5824	1.21706	649	649
	Location of property in a secured neighbourhood	4.3559	1.00522	649	649

Table 6 provides statistical evidence of significant differences between means of Bosso LGA and Chanchaga LGA groups for the independent variables with large floor area of apartment, availability of fence wall, location of property in a particular neighbourhood and availability of secondary school close to property producing high F values. These variables were also significant as they have p-values less than 0.05, although many of the independent variables are not significant.

Table 6: Tests of Equality of Group Means of Discriminant Function Analysis

Factors influencing residential location choice	Wilks' Lambda	F	df1	df2	Sig.
Influence of floor nos in location choice	0.999	0.892	1	647	0.345
Influence of level of floor in location choice	1	0.002	1	647	0.961
Adequacy of public rooms e.g living room, dining room and kitchen	0.999	0.416	1	647	0.519
Number of bedrooms	0.999	0.366	1	647	0.545
Number of bathrooms	1	0.001	1	647	0.97
Number of Toilets	1	0.002	1	647	0.964
Availability of garage	0.999	0.408	1	647	0.523
Large floor area of apartment	0.989	6.989	1	647	0.008
Availability of fence wall	0.984	10.381	1	647	0.001
Location of property in a particular neighbourhood	0.991	5.907	1	647	0.015
Availability of clinic/hospital close to property	0.999	0.882	1	647	0.348
Availability of primary school close to property	0.996	2.323	1	647	0.128
Availability of secondary school close to property	0.993	4.663	1	647	0.031
Location of property near workplace	0.996	2.889	1	647	0.09
Location of property in a secured neighbourhood	0.996	2.586	1	647	0.108

The low intercorrelations of the independent variables as reported in Table 7 somewhat permits the use of the independent variables for the analysis.

To show the significance of the discriminant function, the eigenvalues and Wilks' lambda tables assume important role. Meanwhile, the number of groups minus 1 is the maximum number of discriminant functions generated and as such only 1 function is represented since 2 groups (Bosso LGA and Chanchaga LGA) of respondents are used.

Table 7: Pooled Within-Groups Matrices of the Discriminant Function Analysis

	Factors influencing residential location choice	Influence of floor nos in location choice	Influence of level of floor in location choice	Adequacy of public rooms e.g living room, dining room and kitchen	Number of bedrooms	Number of bathrooms	Number of Toilets	Availability of garage	Large floor area of apartment	Availability of fence wall	Location of property in a particular neighbourhood	Availability of clinic/hospital close to property	Availability of primary school close to property	Availability of secondary school close to property	Location of property near workplace	Location of property in a secured neighbourhood
Correlation	Influence of floor nos in location choice	1	0.688	0.152	0.146	0.129	0.099	0.163	0.157	0.121	0.101	0.144	0.076	0.127	0.097	0.082
	Influence of level of floor in location choice	0.688	1	0.219	0.19	0.166	0.132	0.211	0.224	0.146	0.11	0.208	0.092	0.111	0.096	0.113
	Adequacy of public rooms e.g living room, dining room and kitchen	0.152	0.219	1	0.402	0.362	0.327	0.254	0.229	0.271	0.092	0.111	0.006	0.003	0.09	0.219
	Number of bedrooms	0.146	0.19	0.402	1	0.668	0.559	0.256	0.342	0.274	0.164	0.222	0.166	0.134	0.118	0.206
	Number of bathrooms	0.129	0.166	0.362	0.668	1	0.83	0.276	0.264	0.267	0.125	0.228	0.185	0.161	0.081	0.22
	Number of Toilets	0.099	0.132	0.327	0.559	0.83	1	0.246	0.225	0.267	0.123	0.181	0.133	0.099	0.067	0.244
	Availability of garage	0.163	0.211	0.254	0.256	0.276	0.246	1	0.332	0.245	0.114	0.126	0.111	0.104	-0.008	0.168
	Large floor area of apartment	0.157	0.224	0.229	0.342	0.264	0.225	0.332	1	0.289	0.191	0.236	0.147	0.116	0.089	0.203
	Availability of fence wall	0.121	0.146	0.271	0.274	0.267	0.267	0.245	0.289	1	0.327	0.177	0.079	0.029	0.033	0.221
	Location of property in a particular neighbourhood	0.101	0.11	0.092	0.164	0.125	0.123	0.114	0.191	0.327	1	0.297	0.209	0.137	0.233	0.25
	Availability of clinic/hospital close to property	0.144	0.208	0.111	0.222	0.228	0.181	0.126	0.236	0.177	0.297	1	0.583	0.491	0.376	0.381
	Availability of primary school close to property	0.076	0.092	0.006	0.166	0.185	0.133	0.111	0.147	0.079	0.209	0.583	1	0.767	0.292	0.198
	Availability of secondary school close to property	0.127	0.111	0.003	0.134	0.161	0.099	0.104	0.116	0.029	0.137	0.491	0.767	1	0.379	0.175
	Location of property near workplace	0.097	0.096	0.09	0.118	0.081	0.067	-0.008	0.089	0.033	0.233	0.376	0.292	0.379	1	0.273
	Location of property in a secured neighbourhood	0.082	0.113	0.219	0.206	0.22	0.244	0.168	0.203	0.221	0.25	0.381	0.198	0.175	0.273	1

Table 8: Discriminant Function Analysis Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	0.053	100	100	0.225

From table 8, a canonical correlation of .225 suggests that the model explains 5.06% of the variation in the grouping variable, i.e. whether a respondent has its current residential location in Bosso LGA or Chanchaga LGA. The canonical correlation shows no much variation. In this case, the independent variables are not able to discriminate or impact the choice of residential location in the study area adequately. This scenario indicates the need to sieve and add more variables to make the model more adequate. Despite this situation, Wilks' lambda in Table 9 indicates that the discriminant function is significant since the p-value of 0.004 is less than 0.05. This means that there are significant group differences; hence, it is worthwhile to move ahead with the analysis.

Table 9: Wilks' Lambda of Discriminant Function Analysis

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig
1	0.949	33.279	15	0.004

Furthermore, the relative importance of the significant predictors from the independent variables to the choice of residential location in Minna hinges on the standardized canonical discriminant function coefficients or weights of the variables.

Table 10: Standardized Canonical Discriminant Function Coefficients

Factors	Function
	1
Influence of floor nos in location choice	-0.289
Influence of level of floor in location choice	0.09
Adequacy of public rooms e.g living room, dining room and kitchen	0.022
Number of bedrooms	-0.386
Number of bathrooms	0.164
Number of Toilets	-0.165
Availability of garage	-0.071
Large floor area of apartment	0.424
Availability of fence wall	0.398
Location of property in a particular neighbourhood	0.317
Availability of clinic/hospital close to property	0.359
Availability of primary school close to property	-0.301
Availability of secondary school close to property	-0.236
Location of property near workplace	-0.362
Location of property in a secured neighbourhood	0.187

From Table 10, large floor area of apartment (with discriminant coefficient of 0.424) was the most important predictor. Availability of fence wall (0.398) was next in importance as a predictor, followed by location of property in a particular neighbourhood (0.317). These 3 variables (as earlier revealed significant in Tests of Equality of Group Means table) with relatively large coefficients stand out as variables that importantly predict where tenants live either in Bosso LGA and Chanchaga LGA. Access to secondary school that was statistically significant (p-value $0.031<0.05$) had negative and relatively low coefficient (-0.236). This variable appears less important to predict where tenants allocate in both local government areas. Access to clinic/hospital had large coefficient (0.359) but was not found statistically significant (p-value $0.348 >0.05$). As such, access to clinic/hospital and the remaining independent variables (having p-values > 0.05) are less successful as predictors.

The use of standardized canonical discriminant function coefficients has been criticized by

researchers for its inaccuracy as it does not suggest threshold value to delineate between important and less important variables. The structure matrix correlations based on structure coefficients or discriminant loadings of 0.30 as cut-off between important and less important variables have therefore been considered more accurate than the standardized canonical discriminant function coefficients (Oyetunji & Abidoye, 2016). Consequently, the structure matrix correlations revealed the discriminant loadings for each discriminate function. Following the logic of the loadings of cut-off of 0.30, availability of fence wall (with discriminant loading of 0.548), large floor area of apartment (discriminant loading = 0.45) and location of property in a particular neighbourhood (discriminant loading = 0.413) were clearly loaded on the discriminant function making them the most important factors that influence tenants' choice of residential location in Bosso LGA and Chanchaga LGA.

Conclusively, the major finding of this study indicates that dwelling attributes (availability of fence wall and large floor area of apartment) and neighbourhood attribute (location of property in a particular neighbourhood) are important explanatory variables influencing choice of residential location choice in Bosso and Chanchaga LGAs of Minna while accessibility attributes are less important. This finding is in agreement with previous finding of Benjamin and Paaswell (1981) that was reported almost 4 decades ago that transport and accessibility play only a limited role in explaining residential location choice of households. The finding concurred with the finding of Molin and Timmermans (2003) in Belgium and the Netherlands that accessibility attributes are significantly less important than attributes related to housing and the neighbourhood. Also, the finding of this study strengthens the finding by Zondag and Pieters (2005) in Netherlands that the role of accessibility is significant but rather small compared to the effect of demographic factors, neighborhood amenities and dwelling attributes in explaining residential location choice.

Conclusions

In this paper, discriminant function analysis was employed to investigate the role of 9 variables of dwelling attributes, 2 variables of neighbourhood attributes and 4 variables of accessibility attributes in determining residential location decisions of tenants in Bosso and Chanchaga LGAs of Minna. Out of the attributes of dwelling, accessibility and neighbourhood considered, availability of fence wall, large floor area of apartment and location of property in a particular neighbourhood have the greatest impacts on residential location choice of tenants in the study area. The study concludes, based on revealed preference approach that dwelling and neighbourhood attributes are dominant explanatory variables influencing residential location choice of tenants in Bosso and Chanchaga LGAs of Minna, a major city in North-central Nigeria while accessibility attributes are significantly less important to them. These findings are within the confine of findings in the literature. Unfortunately, the groups of housing variables employed did not cover all categories of housing attributes on residential location choice. The categories employed therefore are not enough to adequately discriminate or impact the choice of residential location in both local

government areas. Therefore, in future study, the choice of housing variables will be explored more based on existing literature of residential location choice modelling.

Notwithstanding, the findings have substantial implications for satisfaction of tenants' residential location and its consequent application will be to the advantage of landlords for realization of maximum investment returns in the study area. To tap good investment returns, stakeholders including landlords, property developers, real estate consultants and other professionals in the residential property sector should ensure that building accommodation details are allocated adequate space to meet the needs of tenants and buildings fenced before offer for letting. The outcomes of this research would also indicate that policy makers and planners should ensure that efforts are geared toward dealing with urban sprawl particularly the restructuring of the unplanned neighbourhoods in Bosso and Chanchaga LGAs. These will go a long way to ensuring satisfaction of tenants' residential location across all the neighbourhoods in Minna.

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