DETERMINANTS OF COMMERCIAL LAND VALUE IN ZARIA URBAN AREA, NIGERIA

By

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ABSTRACT

Numerous researches have been conducted to examine the factors that influence residential land values in various cities. However, not much has been done to explain the variables that influence commercial land values. This study is an attempt to analyse the determinants of commercial land value in urban Zaria, Nigeria. In order to achieve this, a questionnaire survey was conducted on occupiers of commercial properties, with 23 sampling transects taken from around the various urban centre and sub-centres in the area. A sample size of 235 respondents was utilised during the survey; while multiple regression analysis was utilized to test a null hypothesis on the relationship between commercial land value and the many explanatory variables identified. The results show that most of the selected variables had a positive correlation with land value which implies that the hypothesis was rejected. It revealed that factors like nearness to Central Business District (CBD) (with a B regression value of 966.5), higher institutions of learning (942.9), urban sub-centres (703.1), land use type (410.3), population density (132), and road quality (95.9) significantly influence commercial land value. It was therefore, suggested that the two urban local governments should make planning arrangements for areas that show potentials of becoming commercial activity centres in a way that they can generate revenue from land value taxation.

Key words: Central Business District, Commercial, Land value, Sub-centres, Zaria

INTRODUCTION

The Central Business District (CBD) of a city is also known as central commercial district, retail business section, downtown business district, or central area. It is true that retail business and office uses predominate and give the district its primary character, but there are marked variations in the concentration of these activities within the CBD. From a point or area of maximum business activity and land values, there is, ordinarily, an uneven gradation outward towards an indefinite boundary (Murphy, 1971).

For that reason, land close to the CBD would have the highest bidding as well as highest utility. Activities therefore, bid competitively in a land market for use of different locations (Phe and Wakely, 2000). In the long run, this competitive allocation process results in a tendency for the overall land-use pattern to adjust, so that each location is occupied by the activity which can pay the highest price/rent. This yields an ordered pattern of land use in which all activities are optimally located, in the sense that utilities are maximized (Adams, 1994). In short, this model

implicitly assumes that land using activities have different needs to locate close to the CBD and would bid for land accordingly. This results in a gradient of intensities of land uses and land prices which declines outwards from the CBD. According to Adams (1994), price for land or property is either the amount sought (asking price) or the sum received (price paid); while the value of land or property are price estimates that reflect subjective expectations and perception of worth. In this study, commercial land value is seen as the rent estimates that reflect subjective expectations and perceived worth of a rental commercial property or business apartment. In other words, it is taken to be the estimated rates paid by the occupiers of a built-up commercial property.

The bid-rent formulations, according to Alonso (1964), rest upon the assumption that different activities would have bid-rent curves, which vary in form according to their need to be at the centre of the city. This, in turn, depends upon the nature of activities, their ability to take advantage of highly priced central sites and their sensitivity to transport costs (Kivell, 1993). The theory provides the basis for the arrangement of land uses and values, which shows that there are three major land use activities, which are commercial, industrial and residential. Most industrial activities have a need to be close to the city centre, at least for reasons of labour availability, transport and marketing services. However, their need is less than that for commercial uses and they are less sensitive to small variations in accessibility, hence their rent gradient is less steep and they cannot compete successfully for the very central locations. Then residential uses, usually the largest user of land in the city, may desire a fairly central location, but cannot derive sufficient profit to outbid commercial and industrial uses. Consequently, they become a residual use, left to the lowest levels of the bid-rent curve with locations furthest from the CBD.

The CBD is the specialized retail focus not only of the city but also of the region for which the city may be considered the central place. Outside the CBD but dispersed within the service area are subsidiary centres or what may be called suburban centres or Neighbourhood Business Centres (NBCs). The number and order of these subsidiaries are related to the order of the city as a central place and therefore to the order of its CBD (Murphy, 1971). This understanding of the relationship between the CBD and central place theory aids to further appreciate the concept of urban sub-centres or Neighbourhood Business Centres (NBCs). That is, the city has subsidiary centres outside the CBD. Such centres could have similar effects as the CBDs on the pattern of land value.

The above scenario shows that the values of commercial properties are affected by location in relation to central area or subcentres. However, several other factors may combine to determine the general pattern of property value in an area. Road network, according to Aderamo (in Oni and Ajayi, 2011) and accessibility (Lean and Goodall, 1977) have effect on the value of properties. Studies on commercial land value, in particular, are hard to come by. Therefore, while several studies tried to determine the factors for residential land value, such as Amenyah (2013) in Accra, Ghana, and Uju and Iyanda (2012) in Seirra Leone, this study examines the factors influencing commercial land value, with case study in urban Zaria, Nigeria. To execute the task, the following hypothesis has been posited, that "There is no significant relationship between land value and some explanatory variables such as distance from the CBD, distance from sub-centres, neighbourhood quality, population density, proximity to the campuses of institutions of higher learning, availability of infrastructural facilities, land use type, topography, road quality, development potential and ethnic composition.".

THE STUDY AREA

Zaria is located on the central plain of northern Nigeria, about 950km from the sea, approximately between Latitudes 11º 00' - 11º 10' North of the Equator and Longitudes 7º 36' - 7º 45'East of the Greenwich Meridian (Figure 1). It is the second largest town in Kaduna State, after Kaduna, the state capital. Zaria town is made up of Zaria and Sabon Gari local government areas (LGAs). They form the study area, with the Kubanni River as the boundary that separates the two LGAs. The Headquarters of Zaria LGA is located in Zaria city, near the Emir's palace, while that of Sabon Gari is located at Dogarawa.

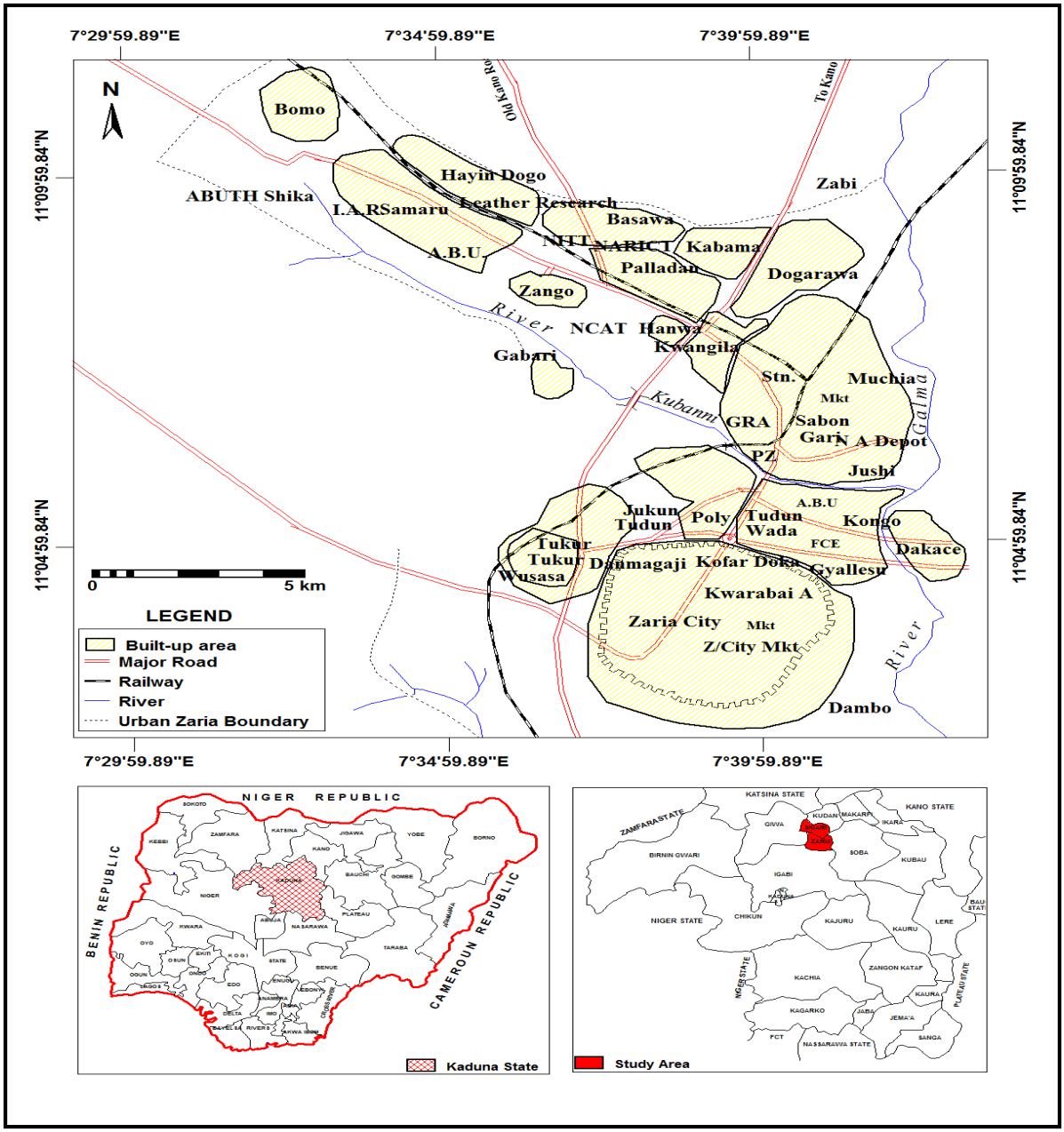

Fig. 1: The Study Area – Urban Zaria
Source: Adapted and Modified From Topographic Map of Zaria Sheet 102 S.W

Zaria, being in the heart of the Hausaland is predominantly occupied by the Hausa speaking people, traditionally known as Zage-zagi or Zazzagawa, who largely occupy the old walled city. Outside the city wall are other Hausa elements, who originally migrated into Zaria from the northern states. These are especially found in Tudun wada. The non-Hausa in-migrants to the area are predominantly found in areas like Sabon Gari, Palladan and Samaru. According to the 2006 population census, the two LGAs that make up the Zaria urban area have a combined population of 698,348 (with S/Gari having 291,358 and Zaria 406,990) (NPC, 2009). According to Buttler (2015), Zaria is among the top ten most populous urban areas in Nigeria. Indeed it has been ranked 8th, and is the only non-state capital amongst the top ten.

The growth of urban Zaria, though influenced by historic circumstance and political authority it wielded prior to the 19th century, is also the result of deliberate establishment of educational institutions (Bello, 2000). Hence, it has been noted that twelve out of the seventeen tertiary institutions in Kaduna State are located in Zaria, while there are about fourteen manufacturing industries and major commercial establishments. As a result of this and many other developments in the area, Bello (2000) has found that between 1962 and 1992, Zaria as an urban centre has been transformed from an educational centre to a rapidly growing manufacturing industrial city sprawling for more than 25km stretch along Kaduna-Sokoto high way.

MATERIALS AND METHODS

The study started by identifying all major sub-urban centres located at different points in the two LGAs that make up urban Zaria. A sub-urban centre according to Craig (1996) should be an area with a high employment density than its surrounding areas. McMillen and McDonald (2000) were also of the view that employment densities and economic activities are the best measures to use for the identification of urban sub-centres. And in particular, a sub-centre should be expected to serve as an attraction to surrounding areas. Thus, according to McDonald and McMillen (1998) and Craig and Ng (2001) local knowledge of an area is necessary to identify urban sub-centres. The researcher, therefore, made use of ample knowledge of the Zaria environment to identify the sub-centres.

Purposive sampling technique was adopted whereby all sub-centres identified and the CBD constituted the population of localities for the study. From each of these localities, at least two transects, radiating in different directions, were selected for the purpose of questionnaire administration. The level of land use density was the criterion for the selection of the direction of the two transects from the central point of each urban sub-centre. In other words, areas around each urban sub-centre where land use intensity was high were deliberately selected for questionnaire administration. The total number of transects so selected were 23, while the centre and sub-centres were eight (8), as shown in Figure 2.

Systematic sampling method was used to select the specific commercial properties. The procedure involves selecting the first property on the street and then every fifth commercial properties as they flanked both sides of the sampling transects. A total of 323 copies of questionnaire were administered during the survey, out of which 235 copies (roughly 73%) were successfully returned completed.

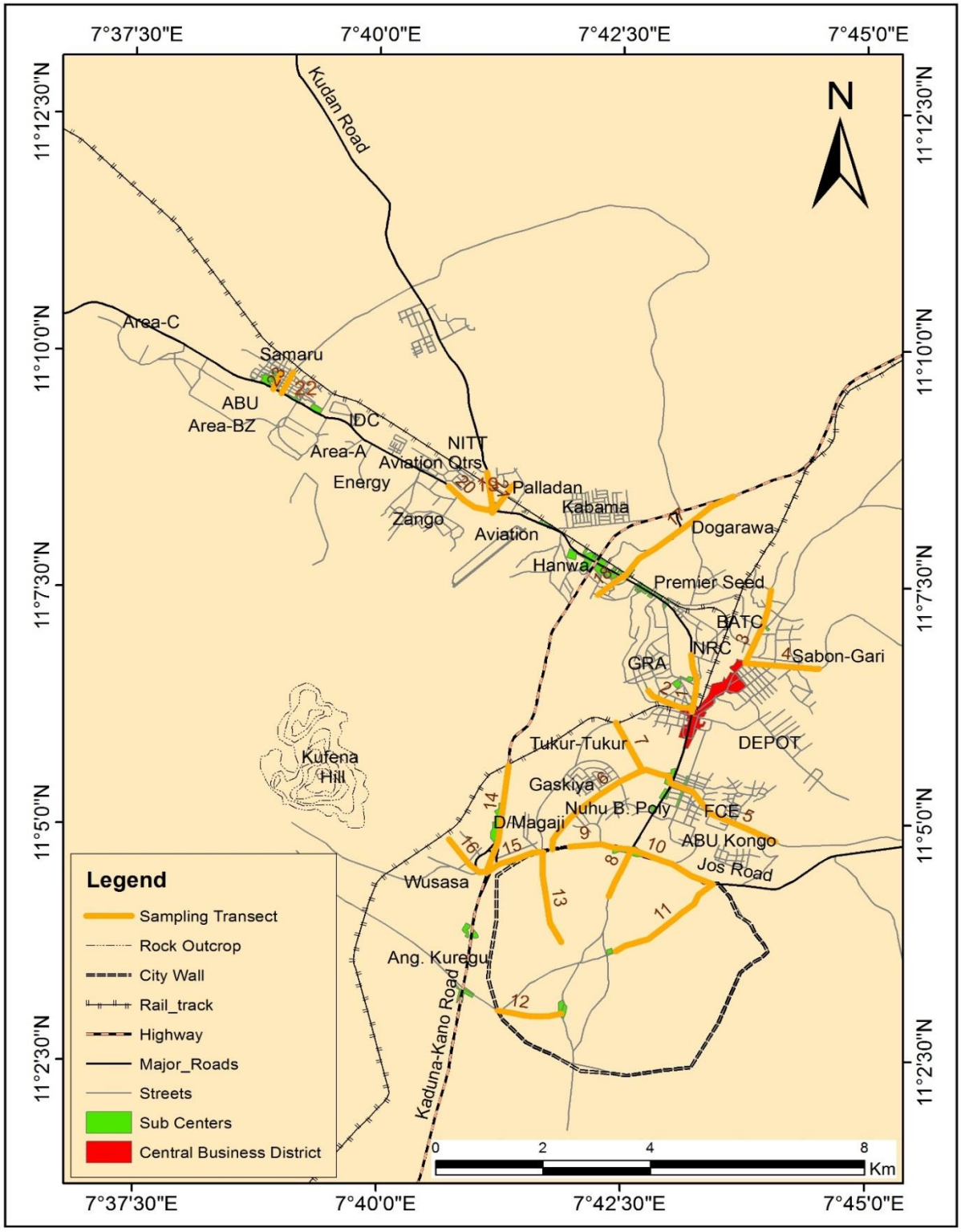

Fig. 2: The Study Area Showing Sampling Transects, the CBD and Sub-centres
Source: Adapted and Modified From Topographic Map of Zaria Sheet 102 S.W

In this study, the dependent variable (*Y*) is land value, which is the rental charge in the Nigerian Naira per square metre per annum. Data on these were obtained from questionnaire administered on tenants in commercial properties located along the sampling transects. On the other hand, the independent variables (*x*) were measured in various ways. Multiple regression analysis was used to test the relationship between the dependent variable (land value) and the independent (explanatory) variables. This was also used to test the hypothesis that ‘‘There is no significant relationship between land value and selected urban related variables’’. The multiple regression model used is in of the form of:

$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots + b_nx_n + e$

Where,

Y = dependent variable (value of commercial, residential and vacant lands)

a = constant

$x_1, x_2, x_3\ldots\ldots, x_n$ are independent urban related variables (distance from the CBD, distance from sub-centres, neighbourhood quality, population density, proximity to the campuses of higher institutions, availability of infrastructural facilities, land use type, topography, road quality, development potential and ethnic composition)

$b_1, b_2, b_3\ \ldots\ldots\ldots b_n$ are the regression coefficients which determines the contribution of the independent variables

e = residual or stochastic error (which reveals the strength of $b_1x_1\ldots\ldots b_nx_n$. If *e* is low the amount of unexplained factors will be low and vice versa.

Using the factors mentioned above, the functions analysed using the regression model are:

LV(CLv/RLv/VLv) = f (Dist_CBD, Dist_SC, Prox_HI, L_Use, Neb_Q, Pop_D, Topog, Infras, Ethn_Co, Road_Qu, Devt_po)

Where:

LV = the value of land or rent for commercial property, charged per square metre

Dist CBD = the distance from CBD

Dist SC = the distance from Sub-centres

Prox HI = the proximity to higher institutions of learning

L Use = the Land Use

Neb Q = neighbourhood quality

Pop D = population density

Topog = topography

Infras = infrastructure

Ethn Co = ethnic composition

Road Q = road quality

Devt po = development potential of an area

Based on the above, our multiple regression equation now takes the following form:

$Y(CLv/RLv/VLv) = a + b_1Dist\ CBD + b_2Dist\ SC + b_3Prox\ HI + b_4L\ Use + b_5Neb\ Q + b_6Pop\ D + b_7Topog + b_8Infras + b_9Ethn\ Co + b_{10}Road\ Qu + b_{11}\ Devt\ po$

Where, *a* is the regression constant and b_1 to b_{11} are the value rating for the independent variables.

RESULTS AND DISCUSSION

Occupiers of commercial properties (like retail stores), were asked questions in order to ascertain the rental value of the premises they occupied at the time of the survey. The mean rental values determined for each year are contained in Table 1. The second column shows the sampling transects (23 in number), the five columns show the land value by years under study for the different transects.

Table 1 further shows that the highest mean value in a year recorded was N5761/m^2 around the PZ area in 2014. It was followed closely with a value of N5480/m^2, as shown in the 7th column. The lowest mean value recorded in a year occurred around the Basawa junction and in parts of the old city, N4/m^2 and N5/m^2, respectively in 1982. In line with the work of Oni (2009), a mean value for years under study (1982 – 2014) was calculated for each transect, the result of which is contained in column 8 of Table 1. Finally, the last column presents the categories of commercial land values in descending order – the highest being N2688/m^2. That is, those under 'A' had the highest value, followed by 'B', 'C' down to 'E', with the lowest value. The lowest mean values occurred within the old city.

However, the crux of the matter is to analyse the factors that influence the pattern of commercial land value in urban Zaria. Several factors that affect land value were identified from the literature, local knowledge of the study area as well as from discussions with stakeholders in real estate business. About twelve factors/variables were shortlisted. In order to test our null hypotheses, the multiple regression model was utilized. The variables were represented in a model, thus: commercial land value = Y (CLv), distance from CBD = Dist CBD, distance from sub-centre = Dist Sc, proximity to higher institutions of learning = Prox HI, land use = L Use, population density = Pop, neighbourhood quality = Ne Qual, water supply = Water s, quality of road = Road Q, ethnic composition = Ethn Com, topography = Topo, development potential = Devt Pot., and Season =season. The results of the multiple linear regression model are presented in Table 2.

The model to highlight the result of the fitting is presented in the following equation:

> Y (CLv) = 4050.94 + 966.55Dist CBD + 703.06Dist SC + 942.95Prox HI + 410.28L Use +132.02Pop D + 5.98Neb Q - 141.08Water S + 95.91Road Q + 0.67Ethn Co - 146.03Topo

From the equation, one can deduce that there is a positive relationship between commercial land value and the explanatory variables, except water supply and topography. Therefore, it is expedient to reject the null hypothesis, and accept the alternative. This means that, as distance from CBD, sub-centres and the campuses of high institutions increased, land value decreased. Similarly, the higher the population of an area, the higher the rent for commercial properties. Also, the closer an area is to commercial land use, the higher its value.

Table 1: Mean Annual Rental Value of Commercial Properties in Urban Zaria

S/N	Transect	Commercial rent (Naira/m^2) per annum						Category
		1982 (A)	1992 (B)	2002 (C)	2012 (D)	2014 (E)	Mean	
1	PZ to Polo Field	20	716	1820	4733	5761	2610	A
2	PZ(Union Bank) to Abu H College(GRA)	20	800	2594	4545	5480	2688	A
3	S/G Mkt to D/Bauchi Rd (River)	8	445	1761	3912	4263	2078	B
4	Aminu Rd to Kings Rd (GCC)	8	29	1514	3371	3721	1729	C
5	Agoro to FCE	11	480	1035	2975	3339	1568	C
6	T/Wada Mkt to NUBA Poly	11	480	1269	2850	3152	1552	C
7	Agoro to Dental Rd	10	320	1933	3016	3169	1690	C
8	K/Doka to Prison Rd	5	55	208	1400	2150	764	E
9	K/Doka -State library to Bridge (Kd Road)	N.A	N.A	777	2322	2322	1807	C
10	K/Doka to new Jos Rd	7	444	1451	2276	2525	1341	D
11	Emir's palace to B/Zazzau	5	25	208	1734	2028	800	E
12	Z.City Mkt to Kofar Kuyambana	6	66	1417	1911	2173	1115	D
13	B/Dodo to Kofar kibo	5	55	672	1454	1454	726	E
14	D/Magaji f/o to Kano Rd Bridge	N.A	35	752	1417	1602	761	E
15	D/Magaji F/o to Wapah foam/Pepsi	5	25	591	1294	1517	686	E
16	D/Magaji f/o to Kufena Hill	5	20	1272	2275	2275	1169	D
17	Salama Hosp. to Inner Kwangila	N.A	N.A	1272	3125	3125	2507	A
18	Yan-goro(Hanwa) to Hanwa-makera	6	199	611	1547	2050	883	E
19	Basawa/Aviation Rd Junc. To NITT	N.A	N.A	1000	1500	1668	1389	D
20	Basawa/Aviation Rd Junc. to Quarry site	4	199	992	1875	2375	1089	D
21	Sokoto Rd to Inner Palladan (Ang flani)	10	444	1815	2787	2870	1585	C
22	D/Iche to GDSS Samaru	12	500	1862	3128	3695	1839	C
23	Iya Road Samaru	13	640	1862	3695	3870	2016	B
	Mean Rent	**9**	**281**	**1219**	**2520**	**2850**		

Source: Field work, 2016

Table 2: Results of the Regression Analysis for Commercial Land Value

Explanatory variables	Unstandardised coefficients		Standardised coefficients		
	B	Standard Error	Beta	*t*	*P* value
1 (Constant)	4050.941	688.804		5.881	.000
Dist CBD	966.547	231.786	.268	4.170	.000
Dist Sc	703.063	347.853	.116	2.021	.044
Prox HI	942.952	246.848	.240	3.820	.000
L Use	410.277	122.117	.200	3.360	.001
Pop	132.018	392.112	.018	.337	.737
Ne Qual	5.982	60.883	.10	.098	.922
Water S	-141.077	216.588	-.075	-.651	.515
Road Q	95.909	106.693	.050	.899	.370
Ethn com	.665	.218	.200	3.046	.003
Topo	-146.027	74.954	-.103	-1.948	.053

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Again, areas that enjoy good road networks, good neighbourhood quality and those that have a cosmopolitan ethnic composition tend to attract higher land values. This is in conformity with the finding of Adebayo (2006) that property values tend to be high in those areas that enjoy easy accessibility (through road network) and that of Oni (2009) that the neighbourhood within which buildings are located also determines the value and profitability of the real estate. On the other hand, data analysis further show that water supply in an area has not been a major determinant of commercial land value, and that there also exist a negative correlation between topography and commercial land value, that is, the more hilly or undulating an area, the lower the value.

As an example, the more a business is located around the CBD or sub-centre, the easier it would be accessed by consumers/pedestrians and the more would be the turnover and consequently profit. Hence, both staff and students of the many high institutions in the city contributed to increase the demand for commercial services. Where there is the added impetus of high population density around, especially a cosmopolitan one, would go to further accentuate the demand for goods and services.

From the analysis in Table 2, the *p* values for distance to CBD, sub-centre, proximity to higher institutions of learning, population density, land use and ethnic composition were less than 0.05, meaning that there are statistically significant relationships between commercial land values and the five variables at 95% confidence level. Conversely, for the variables with *p* value above 0.05, such as population density and neighbourhood quality, it means that there is no significant relationship between them and commercial land value.

In summary, Table 3 presents an Analysis of Variance of the relationship between commercial land value and explanatory variables.

Table 3: ANOVA of the Relationship between Commercial Land Value and the Explanatory Variables

Model	Sum of squares	Df	Mean square	F	p value
1 Regression	4.129E8	10	4.129E7	26.291	0.001
Residual	3.533E8	225	1570297.889		
Total	7.662E8	235			

R^2 = 73.9%
R^2 adjusted for df = 71.8%
Standard Error of Est. = 125.311

The calculated *p* value of 0.001 in Table 3 is less than 0.05. This means that the null hypothesis is rejected, implying that there is a significant relationship between commercial land value and the variables analysed. The R^2 is 73.9%, while the adjusted R^2, which is a more appropriate measure for a correlation estimate that accounts for the presence of multiple independent variables, was also determined. The adjusted R^2 obtained is 0.718, indicating that the regression model is highly significant, as it has explained about 71% of the land value variation in the study area.

CONCLUSION

It is evident from the study that about six key factors play significant roles in determining the value of commercial properties in urban Zaria. These include nearness to CBD, Institutions of higher learning, urban sub-centres, land use type, population density and road quality, in that order. Thus, the null hypothesis earlier postulated that 'There is no significant relationship between land value and the explanatory variables' was rejected. This is because there is a positive correlation between most of the variables, excepting about four (population density and neighbourhood quality, water supply and road quality).

Since land value is affected by proximity to major commercial activity centres and higher institutions, there is the need for the government to take advantage of this by making planning arrangements for areas that show potentials of becoming sub-centres, for instance Dogarawa junction on the Zaria – Kano dual carriage way. The two local governments (Sabon Gari and Zaria) can utilize such planned areas to obtain lands for future sales or to generate revenue from taxes based on land values. They can as well undertake projects such as low-cost shopping stores around the sub-centres in order to generate internal revenue and create job opportunities for our teeming unemployed youths.

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