A Field Study to Ascertain Property Determinants around Tertiary Institutions in North Central Zone of Nigeria

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ABSTRACT
Landed properties are mostly bequeathed from Parents to their offspring in the traditional Nigerian setting but with increase awareness and arising from the fact that Land is about the only wealth whose value appreciates overtime the need for acquisition of landed property and the desire to keep such is on the increase. In this paper, a field survey was carried out to in order to ascertain property determinants around tertiary institutions of learning in North-Central Geo-Political zone of Nigeria. Based on convenience sampling technique six tertiary institutions from three States in the zone were selected for the study. Furthermore, for uniformity, in each of the selected states, one University as well as one College of Education were sampled. This study was conducted using both quantitative and qualitative approaches in order to extract detailed information contained in the attributes listed above. Besides direct field measurement and observations, majority of the quantitative data were collected from the questionnaires administered, reports, and data information from the stakeholders and government. Qualitative data were collected from the interviews with the professional bodies and from the questionnaires. Using Correlation study as method of analysis, the study found out that there are high locational coefficients between Kogi State University, Anyegba and Federal College of Education, Okene; between Nasarawa State University, Keffi and College of Education, Akwanga; and between Federal University of Technology, Minna and Federal College of Education, Kontagora. Based on this, recommended that in the administration of land for tertiary institution purpose focus should be centred on the provision of environmental factors that is aimed at cushioning distance-effects.
Keywords: Landed Property, Property Determinants, North-Central, Correlation Study and Tertiary Institutions

INTRODUCTION
In traditional Nigerian settings, landed properties are legacies that children inherit from their parents but with increase in awareness and the fact that the landed property is about the only wealth that its value appreciate over time, the need to acquire one as well as keep it is on the

increase. Due to this very important value attached to Landed property which is a key component of real estate, its contribution to the Gross Domestic Product (GDP) of the nation cannot be wished away. In order to achieve this, data concerning real estate in whatever form has to be aggregated, computed and added to the computation of the GDP data. This objective seems to be far from been achieved, the reason Igbinosa (2011) stressed the need to assist real estate professionals obtain information on the influence of property characteristics on residential property values. This was further stressed by Eriki & Udegbunam (2008), Onwuanyi (2020) where the authors emphasized that there are not enough data on the real sector. One of the objective this paper set out to achieve is to contribute meaningful to the dearth of data in the real estate sector of the Nigeria economy.

In real estate land prices and values have generally been analyzed and valued by the hedonic model (Araghi & Nobahar, 2013), Ahamad (2019). Hedonic model reveals the effect of environmental attributes such as the surrounding environment quality, distance, and environmental amenities on land values in relation to a landmark feature such as an institution or even a growth pole development site (Kimengi & Fombe, 2015). These attributes affect the characteristics and directly change the real estate pricing. This model also has been used to compare the value of two different properties or in other words it could be used to estimate and value the price differentials based on the significant attributes Abidoye & Chan (2017). However, in the Literature search, only very few of the works employed the use of correlational studies in property determinants in/around tertiary institutions in Nigeria. This is the research gap this study seeks to fill using data obtained from Six randomly selected tertiary institutions from the North Central Geo-Political zone of Nigeria. The preceding Section of this Paper discusses the Literature review while Section 3 is concern with the methodology of the study, Section 4 presents the research data as well as the results and the final Section gives some brief concluding remarks and the recommendations.

Determinants of Property Values

The demand for commercial properties itself is affected by changes in population, planning and development schemes, legislation, and availability of good road networks (Olayiwola, Adeleye & Oduwaye, 2006). Theories exist in Literature that generally believe that sites adjacent to main transport routes have relative advantages over those located some distance away, and other sites located at route intersections possess relative advantage with greater advantages belonging to sites located at focus of transport system. According to Oyebanji (2003), and Abidoye & Chan (2016), a number of factors affect property values in Nigeria. These include population change, change in fashion and taste, institutional factors (culture, religious belief, and legislation), economic factors, location, complementary uses, transportation and planning control. He stated further that good spread of road network has tendency to increase accessibility with certain areas becoming less accessible as a result of traffic congestion thereby causing value to shift to areas that are accessible.

Stratton (2008) conducted a study of the spatial concentration of office uses how their combination with other land uses affects value of office properties; this was to determine the relationship between spatial clustering of office uses and office property values. The variables used were cluster size, regional location and relationship to transportation infrastructure, internet land use mix, and transportation network. The study revealed that recent office development has continued to benefit economically from agglomeration. In addition, office property values were positively affected by intensity of office development, a central regional location, and clustering or agglomeration of office parcels. Furthermore, where a building is located will determine how easy it will be to attract customers or how that those outside the city and those closer to the center of town and major roadways are worth more than those on small or obscure side streets. The neigbourhood within which such buildings are located also determines the values and profitability of the real estate. Potential income of an office space is another factor. An investor will calculate the amount of money that a property is likely to

bring each month from renting the property. This is an important part of the commercial property analysis. Check out nearby properties to discover if they have good rates of renting and retaining tenants. Zoning law is another factor; each city has its own set of zoning laws setting forth how certain areas of town are allowed to be used.

Cloete and Chikafalimani (2001) in a study on property industry in Malawi agreed with Stratton (2008). The study identified eight factors that affect property values, which are architectural design, quality of finishing maintenance condition of the property, size of property, security, condition of the street, and location. Crompton (2001) studies the effect of a park on property value, found that park had stabilizing influence on residential property values, especially among high-valued residential properties, and lower with less-valued ones. From the aforementioned studies, it is evident that many of them came from the USA, Canada, UK and Europe and with much concentration on residential properties. In UK and Europe, there were evidences of impacts of transportation of property values varying with analysis of open market price and the impacts of transportations studied in terms of changes in demand without concentrating on the property market, land and effect of transportation on property value uplift. Also from the studies, a number of factors that determine property values were identified, which include infrastructural funding, impact of high-speed mode of transportation especially at the new station in peripheral sites where the impact is highest; nearness to rail stations, metro lines, and road especially where transport infrastructure is poor. Other factors identified in the studies include accessibility relative to location-distance of land uses, change in population, change in fashion and taste, institutional factor, economic factor, location, transportation, complementary uses, road transport network, political factor, planning regulation, environmental quality, aesthetics, and growth pattern of land use.

In the Nigeria context, earlier studies focused on land use and urban development with considerable works carried out by scholars in various disciplines to explain the determinants, structures and effects of residential

land use and land values in the urban areas. They gave little attention to the effects of public sector influence on land use and land values which interplay to determine value.

Kamali, Hojjat and Rajabi (2008) group the variables determining property values into; environmental variables, neighbourhood variables, accessibility (location) variables and property variables while Anamaria and Melchior (2007) in the study carried out on the impact produced by the presence of university campuses on land and property values, found out that in the immediate area of influence (a radius of 1km from the campus) of the two campuses studied, land and property values were expected to be impacted by proximity of the universities. Xu (2009) empirically examined the impacts of higher education institutions on local property values using a hedonic-pricing model across four sites in Maricopa County, Arizona. This study examined variables used in comparable studies employing hedonic analysis, such as real estate transactions and characteristics at the housing unit level, sale price and physical characteristics of each house, block group level census data on income and racial characteristics, environmental data, and neighborhood characteristics. This study included a combination of analytical models (classical and spatial error) and techniques incorporating Geographic Information System (GIS) functions to measure the distance of single-family houses to the selected campus site. The study also used a difference-in-difference analysis to determine whether the impact of university sites on local property values changes over time. The difference-indifference approach estimates the difference between prices of properties in the area surrounding the institution and the price of comparable properties that are outside the designated area. The analysis then examined whether the extent of this difference has changed over time and whether this change is the result of institutional development.

Aluko (2011) examined the Effects of Location and Neighbourhood Attributes on Housing Values in Metropolitan Lagos. The study examined the role of location and neighbourhood factors in the determination of house prices and it concluded that house prices vary by

neighbourhood and locational attributes in metropolitan Lagos. Khalid (2011) carried out an Econometric Analysis of the Effects of Institutions and Economic Transformation on Agricultural Land Prices: case of Malaysia. Results show that estimated coefficients of all land attributes in the model (road frontage, proximity to urban centres, population growth, land restrictions and year of sale) are significant. Ismail (2014) investigated the impact of higher education institution development on the housing market: the comparative study of Sighthill and Gorgie, Edinburgh. The overall result of this study shows that locational attributes had a significant influence only on the housing market in Gorgie where the housing price increases when the house is located near to the city centre compared to the distance from the higher education institution.

RESEARCH METHODOLOGY

Research Design

This study was carried out using structured questionnaires that were distributed to experts and students within the study area which happens to be the North-Central Geo-Political region of Nigeria. The study area is very verse and comprises of six states namely: Niger, Plateau, Kogi, Kwara, Nasarawa and Benue States. In line with previous studies the geographical scope of this work covered an area of 6km radius around the institution was sampled. Further to the 6km grid, It should be noted that each of the sample institution were selected based on the premise that the adjoining geographical landscape for land development around the institution were not hindered by a natural geographical factor which could affect plots available. In fact, this was the major reason for selecting the 6km grid system used in this research. Respondents for each of the states studied were selected through the use of quota structured sampling technique.

This study was conducted using both quantitative and qualitative approaches in order to extract detailed information contained in the attributes listed above. Besides direct field measurement and observations, majority of the quantitative data were collected from the questionnaires administered, reports, and data information from the stakeholders and

government. Qualitative data were collected from the interviews with the professional bodies and from the questionnaires administered, Using convenience sampling techniques three states were selected from these six for the study and these are: Niger, Nasarawa and Kogi. In each of these states two higher institutions were randomly selected from each after drawing a frame of tertiary institutions within the state. For uniformity we listed the Colleges of Education and Universities within each of these states separately and randomly selected one college of Education and one University from this State. Table 1 gives a summary of the States and Selected institutions that was used for this study.

Table 1: Showing States and Institutions Selected for the Study

STATES	NIGER	NASARAWA	KOGI
INSTITUTIONS	1) Federal University of Technology, Minna. 2) Federal College of Education, Kontagora.	1) Nasarawa State University, Keffi. 2) College of Education Akwanga.	1) Kogi State University, Anyagba. 2) Federal College of Education, Okene.

Data Analysis Techniques: The Hedonic Regression Model

In real estate land prices and values have generally been analyzed and valued by the hedonic model (Araghi & Nobahar, 2013). Hedonic model reveals the effect of environmental attributes such as the surrounding environment quality, distance, and environmental amenities on land values in relation to a landmark feature such as an institution or even a growth pole development site (Brasington & Hite, 2008). These attributes affect the characteristics and directly change the real estate pricing. This model also has been used to compare the value of two different properties or in other words it could be used to estimate and value the price differentials based on the significant attributes (Brasington & Hite, 2008). According to this hedonic price theory (or land value in this instance), the relationship between price and characteristic can be developed as:

$$P = f(Z) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where: P: Land Price Z: Land characteristic vector

In order to expand this function and derive this equation (1), calculating with each identified as a factor of land price (value in this instance) determination. So, in this study, the price (value) equation was re-created as:

$$Pz = \frac{\partial P}{\partial Z} - (2)$$

Correspondingly, the value model was developed and the effect from the characteristic of the land in relation the institution itself (c1,c2, c3…), characteristic of neighbourhood itself (n1, n2, n3…) and environmental characteristics (e1, e2, e3…) such that from all these attributes the price function (P) will perform, either increasing or decreasing in linear and non-linear forms depending on changes in characteristics. It thus follow that:

$$P = \partial(c1,c2,c3\dots cj;\ n1,n2,n3\dots nj;\ e1,e2,e3,\dots ej) + \varepsilon - - - - - - - - - - - - - - - (3)$$

Where ∂ = under decided coefficients ε = random error

It thus follow that the hedonic price model is based on a hypothesis that examines the relationship between the attributes and the price of land (Gillard, 1981). The market price of such land can only be evaluated and determined by demand factors and housing attractiveness factors such as location, structural feature; the neighborhood where it was placed and other characteristics might have influence on the movement of the market (Freeman, 1979). In other words, put together, the land price as indicated by (So et al., 1996) could be determined by:

$$P = f(L+S+N+P) - (4)$$

Where p = price, f = attributes/ characteristics, l = location, s = structural attributes, n = neighbourhood attributes p = population.

In summary, it should be noted that the hedonic price analysis for land was undertaken in this study In order to construct a best model for land value determination in relation to the location of higher educational institution and to also ascertain their statistical significance. A description of the three broad (note a and b are locational factors) attributes used in this model are described in details below:

a) Location/distance from campus: Radius of campus development to study case areas

b) Location/distance from city: Central business district range distance with case study areas

c) Location/distance from surrounding development: (excluding City center) Distance from retails parks, anchor store, industrial areas, airport, leisure facilities

d) Neighbourhood surrounding environment: Safety, traffic/noise at the residential areas, community management, Nature of development on land design types, Housing storey, housing age

Finally, it should be noted here that the template (i.e a –d) used as determinant factor was adopted from a research carried-out by Herriot – Watt University in the UK. They gave written permission to use their template for this analysis

DATA PRESENTATION AND DISCUSSION OF FINDINGS

Property attributes

Table 2: Matrices Land attributes identified and applied

Attributes	Dependent Variables	Preference for Research Study					
		KSU	FCEO	NSU	COEA	FUT	CEOK
	Distance to (km)Campus	5.41	4.41	3.78	3.23	2.13	4.71
Locational	Distance to City Centre(KM)	3.16	5.13	2.56	2.56	1.45	5.33
	Surrounding Development	4156	223	3158	765	17134	987
Neighbourhood	Residents/ Community Socio Economic Status	High	High	High	Medium	Very High	Medium
	Safety(Crime Rates)	11,123	12,133	6813	1134	13123	921
Entertainment	Available	Available	Available	Available	Available	Available	Available

Table 2 is a presentation of the data collected as attributes likely to influence

Table 3: Locational coefficients for the model fitness of Kogi State University and Federal College of Education Okene

	PRICE		D_UNI		D_CITY		D_DEV	
	KSU	FCE O	KSU	FCE O	KSU	FCE O	KSU	FCE O
Pearson Correlation	1.00	1.00	0.78	0.68	0.81	0.88	0.26	0.23
Standardized Coefficient (BETA)			0.36	0.28	0.95	0.86	0.16	0.21
P – value	0.00	0.00						
Adjusted R^2	0.63	0.75						
R Square	0.81	0.88						
Std. error of the estimate	13.3	11.23						
D-W	1.77	1.61						

Where: KSU: Kogi State University, FCEO: Federal College of Education Okene

Table 3 report very high locational coefficients of 0.81 and 0.88, (p<0.05) for Kogi State University, Ayangba and Federal College of Education, Okene respectively. This indicates that there is a significant relationship between Land Values around Institution of Higher Learning and location-based factors. Similarly, the fact that all the standardized coefficients (Beta) were low for the locational model fitness is also an indication that between land values and distance-based factors around the Kogi State University and Federal College of Education, Okene were statistically significant and acceptable, the values of land in each of the higher institution sampled in this study. For the locational attributes KSU recorded the highest distance of plots to the main university campus as opposed to FUT Minna which recorded an average of 2.13km. For the distance to city center, FUT again recorded the lowest score of 1.45km as opposed to FCOE (5.13km). From the table, FUT Minna had the highest surrounding development around it with a record of 17134 around the buffer zone used in this study. For the neighbouhood attributes assessed in this study, all the institution sampled recorded a medium to high socio-economic status. However, the total crime rate was higher for FUT.

Table 4 Locational coefficients for the model fitness Nasarawa State Univ Keffi and Collage of Educatio Akwanga

	PRICE		D_UNI		D_CITY		D_DEV	
	NSU	COEA	NSU	COEA	NSU	COEA	NSU	COEA
Pearson Correlation	1	1	0.68	0.77	0.67	0.76	0.68	0.68
Standardized Coefficient (BETA)			0.35	0.31	0.28	0.24	0.21	0.17
P – value	0	0	0	0	0	0	0	0
Adjusted R^2	0.71	0.73						
R Square	0.75	0.83						
Std. error of the estimate	15.44	15.71						
D-W	1.76	1.77						

Table 4 report very high locational coefficients of 0.75 and 0.83, (p<0.05) for Nasarawa State University Keffi and Federal College of Education, Akwanga respectively. This indicates that there is a significant relationship between Land Values around Institution of Higher Learning and location-based factors. Similarly, the fact that all the standardized coefficients (Beta) were low for the locational model fitness is also an indication that between land values and distance based factors around the Nasarawa State University Keffi and Federal College of Education, Akwanga were statistically significant and acceptable.

Table 5: Locational coefficients for the model fitness for Federal University of Technology Minna and Federal College of Education Kotangora

	PRICE		D_UNI		D_CITY		D_DEV	
	FUT	CEOK	FUT	CEOK	FUT	CEOK	FUT	CEOK
Pearson Correlation	1	1	0.69	0.74	0.80	0.76	0.71	0.77
Standardized Coefficient (BETA)			0.13	0.1	0.06	0.02	0.21	0.04
P – value	0	0	0	0	0	0	0	0
Adjusted R²	0.75	0.77						
R Square	0.80	0.88						
Std. error of the estimate	17.65	17.93						
D–W	1.78	1.81						

Where: FUT: Federal University of Technology Minna, CEOK: College of Education Kotangora

Table 5 indicated very high locational coefficients of 0.80 and 0.88, (p<0.05) for Federal University of Technology Minna and Federal College of Education, Kotangora respectively. This indicates that there is a significant relationship between Land Values around Institution of Higher Learning and location-based factors. Similarly, the fact that all the standardized coefficients (Beta) were low for the locational model fitness is also an indication that between land values and distance based factors around the Federal University of Technology Minna and Federal College of Education, Kotangora were statistically significant and acceptable.

Table 6: Classification and order of influence degree on land (value) price in Kogi

Variables Code	Variable Beta	Beta		Order(Before test)		Order (After test) Class		Class	
	KSU	FCE O	KSU	FCE O	KSU	FCE O	KSU	KSU	FCOE
V1	Distance to HEI's	0.041	0.07	3	2	1	2	3	4
V2	Distance to City	0.02	0.07	4	4	3	3	1	4
V3	Distance to surrounding deve	0.03	0.08	5	1	4	6	2	4
V4	Entertainment	0.037	0.08	1	6	5	5	2	2
V5	Environment	0.04	0.09	2	5	6	4	1	3
V6	Housing Types	0.05	0.09	6	3	2	1	4	1

Table 6 presents the model fitness used for the classification and order of influence of locational attributes on the prices of land among higher educational institutions in Kogi State. The model fitness used for the

classification and order of influence in table 50 indicates that only distance -based factors ranked higher in the determination of the land prices.

CONCLUSION AND RECOMMENDATIONS

It was found that there is a significant relationship between Land Values around Institution of Higher Learning and location-based factors. This implies that the locational factors: distance from campus, distance to city and distance from surrounding development are the major determinants of land values around higher education institutions in North Central Nigeria. It can be concluded that distance-based factors ranked higher in the determination of the land prices. The distances from student residential locations to campus and the city centre have been tested and all these variables appear to be a linear regression relationship. The implication of this is that in sitting higher education institutions government have to take into cognizance its effect on land values in the surrounding communities. It directly leads to demand pull inflation on land. Consequently, it increases rent values and cost of living in the adjoining communities. Having looked at the influence of higher educational institution on land values and trends in prices across the institutions, this study further recommends the following:

(a) Before sitting or administering land for any growth pole project,(Higher educational institution in this instance) attention should focus on the need to assign priority thresholds to other environmental factors that could cushion the distance-effects of such institution on land values.

(b) Since in Nigeria Land Use planning and administration functions for higher educational institutions facility are often institutionally disjointed across a number of ministries, (see for example Egbu et.al 2008), this study recommends an adjustment of the institutionalization. This study further suggests an all-inclusive government-private (e.g community level) sector institutionalization that will take into account both resent and futuristic factors that are likely to affect land values on the long run.

(c)   Simplification of the land allocation and development process around institutions of higher learning that will aid spatial planning and infrastructure decisions for all tiers of government in the determination of rental values for land.

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