

An Investigation into the Significance of Location as a Determinant of Office Rental Values in Port Harcourt, Nigeria

OBA, Peter Tomonidie

Department of Estate Management
Kenule Saro Wiwa Polytechnic, Bori, Nigeria
E-mail: petermonidie@yahoo.com

Abstract

In recent times, office space rental values for Port Harcourt and its environs has been on the rise. This is in spite of the general opinion that the national economy is contracting across most sectors including Rivers State. The aim of this research is to test the significance of location as a rental value determinant across some selected commercial districts in Port Harcourt. It also seeks to examine the role of locational elements such as proximity to the Central Business District (CBD) in influencing rental levels. Six commercial districts with differences in distance to the (Central Business District) were selected for the study. With the use of questionnaires, primary data on office rents over a five year period (1999 - 2013) was supplied by office occupiers and Estate Surveyors & Valuers. This is in addition to data on explanatory variables such as physical characteristics of building, neighborhood characteristics and Lease/Contract term. The data set was analyzed using multiple regression and analysis of variance (ANOVA) techniques. The results indicate that there is a variation of rental values amongst these six commercial districts and this not by chance. Secondly; the locations closes to the CBD commands higher rental values. Thirdly; in land use decisions; location is considered more important above other factors such as physical attributes of the building, lease/contract terms and economic factors. These results further confirms the assertion of the economic theory of location that location matters. Based on these findings, it is recommended to property developers and investors that in order to reap acceptable return on investment, location is an important determinant which deserves good attention in investment decision making.

Keywords: Rental value; Location; Central Business District; Bid Theory; Gross Domestic Product

Introduction

Commercial properties are very important in this world. They constitute a large portion of a nation's wealth, DiPasquale and Wheaton (1992) cited in (Moll, 2012) and provides the environment that allows many businesses to operate efficiently. In an attempt to qualify the importance of commercial properties in the United Kingdom (UK), Currie and Scott (1991) cited in (Giusanni, Hsia, & Tsolacos, 1992) identified that the value of commercial properties in 1989 was about half that of the total equity market, that the direct contribution to economic activity amounted to around six percent of the total assets of financial institutions. In Nigeria, figures released by the National Bureau of Statistics (NBS); indicates that the real estate sector accounts for 8.01% of the nation's GDP in the second quarter of 2014.

These evidences are understandably so in view of the fact that in the real estate market, commercial properties are help either as a factor of production; a financial asset by businesses or even as an investment opportunity with the potential of providing monetary rewards.

Basically, these rewards come in the form of rents paid to property owners. Several factors influence the size or quantity of rent payable for the use of real estate, is it residential, industrial and commercial as evidenced by empirical studies. And in their decision to pay rent for any particular piece of real estate, potential tenants critically examine several factors otherwise known as rent determinants; one of which is location.

In the last few years, Port Harcourt, Nigeria has witnessed a significant increase in property development including commercial properties scattered across the city. These new buildings are flexible in design; and come with better functionality. However, there is a consensus amongst market players, particularly seemingly record impressive occupancy rates at their various locations. In urban spatial analysis, location refers to the position (latitude and longitude) of a lot on the earth's surface and it is commonly referred as a "place or site". The relationship between location and rent is well researched right from the classic era to contemporary times. We see this in the argument behind the bid-rent theory. In his bid-rent model, (Alonso, 1964) mentioned that location is important for a firm in order to achieve the desired level of profit. In contemporary times, (Kiel & Zabel, 2007) reaffirmed the common belief amongst real estate sector players that three things determine property values - Location, location, and location. According to the authors, this mantra also applies to other forms of real estate. The question therefore, is what renters consider while accepting to pay these "exorbitant" rents contrary to the subjective views and opinions of real estate practitioners. In other words, of the rent determinants as suggested in previous empirical studies, to what extent does location matter in Port Harcourt City?

Methods

In this research, the system of questionnaires and systematic sampling was deployed. The entire study area was divided into six (6) zones from the central business district (CBD). Each of these areas is traversed by at least a major motorway with multiple linkages. For convenience, these areas are identified municipally by the names of these motorways and they include Aba Road, Olu-Obasanjo Road, Ikwerre Road, Ada George Road, Air Force Road and Trans-Amadi Road. Most offices cluster on these roads and all are located northward of the Central Business District.

Systematic sampling involves selecting a respondent at a randomly chosen starting point and progressing to ever n^{th} element (10 in this case) in succession from the simple frame. This method is not only simple, but very easy to draw, check and it is inexpensive. Questionnaire survey as a data collection method is economical and has the ability to generate a large volume of data over an extensive area. However, this advantage is often times frustrated by low response from potential respondents. The nature of the data elicits the use of both Descriptive and Inferential statistics in the data analysis process. For the purpose of providing clarity and credibility, both approaches are adopted in this study. The descriptive method is a way of presenting the raw data in a form which allows for simple interpretation and identification of patterns or trend inherent in the sample. In addition, the description statistics do not allow for a statistical commentary on the result nor does it allow for the testing of the hypothesis whereas the inferential statistics as a technique allows for hypothesis testing and make conclusions which can be generalized for the whole population. In this study, test of correlation, test of significance - (Analysis of variance (ANOVA) and multiple regression analysis (MRA) were used.

Results

To determine the relationship and impact between locational properties such as proximity of business districts to the central business district, good road access, low level of externalities, nearness to business support services, agglomeration and neighbourhood characteristics and rental values in the six business districts a multiple regression as well as correlation analysis was performed for the six locations the results of these evaluations are presented below:

Aba Road

The result of the multiple regression analysis indicating the relationship between the locational parameters and rental values in aba road business district is presented in table 1 below:

Table 1: Multiple Regression model for Aba Road Business District (Source: Author's)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.621024	0.562746	17.09657	0.0000
NCBD	0.265950	0.124301	-2.139557	0.0401
ACC	0.121418	0.097060	1.250951	0.2200
EXT	0.096588	0.061631	1.567184	0.1269
NBSS	0.138908	0.108140	1.284518	0.2082
AGM	0.068668	0.070858	0.969092	0.3398
NBC	-0.105894	0.107840	-0.981957	0.3335
R-squared	0.187107	Mean dependent var		9.742331
Adjusted R-squared	0.034689	S.D. dependent var		0.452311
S.E. of regression	0.444397	Akaike info criterion		1.376950
Sum squared resid	6.319626	Schwarz criterion		1.675538
Log likelihood	-19.85052	F-statistic		1.227592
Durbin-Watson stat	1.518702	Prob. (F-statistic)		0.318266

The table depicts a positive relationship between proximity of business districts to the central business district, good road access, low level of externalities, nearness to business support services, agglomeration and rental values while neighbourhood characteristics were found to be negatively related to rental values in Aba road area. This finding depicts that the closer commercial property is to the CBD the higher the rentals on the property. However, only proximity of business districts to the central business district was found to be significantly associated with rental values indicating that it was also a significant determinant of rental values in the Aba area when locational characteristics are concerned.

With respect to the general significance of the explanatory variables, the R-squared value implies that the locational variables were only able to explain about 18.7% change in the rental values in Aba Zone indicating that other factors such as physical attributes, lease terms and economic factors could be the major determinants of rental properties in the Aba Road area. The F-statistic, a measure of the overall significance of the regression, shows that the explanatory variables employed are significant at the 10% level, which is supported by standard error of regression equation signifying minimized sum of squared error. The Durbin-Watson statistics for the equation shows that we reject the null hypothesis of no autocorrelation and conclude that there is positive autocorrelation of the first order among the variables of the model. This is because the d^* falls in the autocorrelation region: $d^* < d_L$ that is, $0.686 < 0.82$.

The results indicate low autocorrelation amongst the variables as well as showing that negative relationship exists between rental values and all the locational attributes in Aba study area except nearness to central business districts and agglomeration.

Ada George Road

This section presents the results of analysis for Ada George Roads found in table 2 below:

Table 2: Multiple Regression model for Ada George Road Business District (Source: Author's)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.418850	1.479032	5.692136	0.0001
NCBD	0.108191	0.134972	0.801579	0.4372
ACC	-0.045892	0.307471	-0.149257	0.8836
EXT	0.260755	0.234404	1.112415	0.2861
NBSS	-0.174244	0.116564	-1.494837	0.1588
AGM	0.143195	0.098171	1.458633	0.1684
NBC	-0.093494	0.134265	-0.696338	0.4985
R-squared	0.233145	Mean dependent var.		9.511156
Adjusted R-squared	-0.120789	S.D. dependent var.		0.274075
S.E. of regression	0.290156	Akaike info criterion		0.632422
Sum squared resid.	1.094478	Schwarz criterion		0.980928
Log likelihood	0.675778	F-statistic		0.658725
Durbin-Watson stat	1.558360	Prob. (F-statistic)		0.683930

The table depicts a positive relationship between proximity of business districts to the central business district, low level of externalities, agglomeration and rental values while neighbourhood characteristics, good road access and nearness to business support services were found to be negatively related to rental values in Ada George road area. This finding also shows that the closer commercial property is to the CBD the higher the rentals on the property. However, none of the locational variables were found to be significantly associated with rental values in the Ada George area.

With respect to the general significance of the explanatory variables, the R-squared value implies that the locational variables were only able to explain about 23.3% change in the rental values in Ada George Area indicating that other factors such as physical attributes, lease terms and economic factors could be the major determinants of rental properties in the Aba Road area though they were included in the model. The F-statistic, a measure of the overall significance of the regression, shows that the explanatory variables employed are significant at the 10% level. The results indicate also low autocorrelation amongst the variables as well as showing that negative relationship exists between rental values and all the locational attributes in Aba study area except externalities and agglomeration.

Air Force Road

The result of the multiple regressions for Air force Road is shown in tables 3 below:

Table 3: Multiple Regression model for Air Force Road Business District (Source: Author's)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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C	-14.02542	10.82009	-	0.4183
NCBD	3.799069	1.978989	1.919702	0.3057
ACC	0.002315	0.302562	0.007652	0.9951
EXT	3.747858	1.577608	2.375658	0.2536
NBSS	0.556607	0.356069	1.563200	0.3623
AGM	0.154703	0.337944	0.457777	0.7267
NBC	-1.148182	0.744489	-	0.3662
R-squared	0.925747	Mean dependent var		9.225063
Adjusted R-squared	0.480227	S.D. dependent var		1.088516
S.E. of regression	0.784769	Akaike info criterion		2.023703
Sum squared resid	0.615862	Schwarz criterion		2.093214
Log likelihood	-1.094813	F-statistic		2.077902
Durbin-Watson stat	1.797196	Prob. (F-statistic)		0.486199

For Air Force road all the locational variables proved to be positive determinants of rental values in the area except neighbourhood characteristics. The variables all proved however to be insignificant determinants of rental values in the Air Force Area. This can however be linked to small sample size that was utilized for the analysis.

Though the variables were not significant, the R-square shows that the account for about 92.6% of the variation in rental values in the study location. The F-statistic shows that the explanatory variables employed are significant at the 10% level supported by standard error of regression equation signifying minimized sum of squared error. The Durbin-Watson statistics for the equation shows that we reject the null hypothesis of no autocorrelation and conclude that there is positive autocorrelation of the first order among the variables of the model. The results indicate low autocorrelation amongst the variables as well as shows a positive negative relationship exists between rental values and all the locational attributes in Air Force area except nearness to central business districts and agglomeration which were found to be positively correlated to rental values.

Ikwerre Road

The result of the multiple regression analysis indicating the relationship between the locational parameters and rental values in Ikwerre road business district is presented in table 4 below:

Table 4: Multiple Regression model for Ikwerre Road Business District (Source: Author's)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.14662	0.398262	25.47727	0.0000
NCBD	0.142088	0.088595	1.603789	0.1432
ACC	0.053679	0.070538	0.760993	0.4661
EXT	0.104084	0.058994	1.764316	0.1115
NBSS	-0.086747	0.071254	-1.217424	0.2544
AGM	-0.024623	0.047754	-0.515627	0.6185
NBC	-0.278921	0.097490	-2.861013	0.0187
R-squared	0.610226	Mean dependent var		9.708258
Adjusted R-squared	0.350377	S.D. dependent var		0.301099

S.E. of regression	0.242683	Akaike info criterion	0.305516
Sum squared resid	0.530056	Schwarz criterion	0.643524
Log likelihood	4.555870	F-statistic	2.348384
Durbin-Watson stat	2.221951	Prob(F-statistic)	0.120382

The table depicts three positive and three negative relationships between locational characteristics and rental values. Specifically, a positive relationship was found between proximity of business districts to the central business district, good road access, low level of externalities and rental values while nearness to business support services, agglomeration and neighbourhood characteristics were found to be negatively related to rental values in Ikwerre road area. However, an only neighbourhood characteristic was found to be significantly associated with rental values.

With respect to the general significance of the explanatory variables, the R-squared value implies that the locational variables were able to explain about 61.0% change in the rental values in Ikwerre Zone indicating that the remaining 39.0% can be attributed to other variables of factors not included in the model. The F-statistic indicates that the explanatory variables employed are significant at the 10% level, which is supported by standard error of regression equation signifying minimized sum of squared error.

The Durbin-Watson statistics for the equation shows that we reject the null hypothesis of no autocorrelation and conclude that there is positive autocorrelation of the first order among the variables of the model. The correlation result in table 4 indicates low autocorrelation amongst the variables. As per relationship the result shows negative correlation between rental values and proximity of business districts to the central business district, good road access, nearness to business support services and neighbourhood characteristics and a positive relationship between rental values and low level of externalities and agglomeration.

Olu-Obasanjo Road

The results for Olu-Obasanjo Roads are depicted in table 5 below:

Table 5: Multiple Regression model for Olu-Obasanjo Road Business District

(Source: Author's)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.87749	1.419389	7.663501	0.0000
NCBD	0.043398	0.168419	-0.257676	0.8014
ACC	-0.035659	0.180457	-0.197604	0.8470
EXT	0.103079	0.147634	0.698210	0.4995
NBSS	-0.328765	0.253581	-1.296491	0.2213
AGM	-0.142537	0.180997	0.787509	0.4476
NBC	-0.035344	0.187827	-0.188175	0.8542
R-squared	0.327003	Mean dependent var		9.927380
Adjusted R-squared	-0.040086	S.D. dependent var		0.674503
S.E. of regression	0.687889	Akaike info criterion		2.374923
Sum squared resid	5.205105	Schwarz criterion		2.721179
Log likelihood	-14.37431	F-statistic		0.890801
Durbin-Watson stat	2.159700	Prob. (F-statistic)		0.533438

Four of the locational variables were found to have positive impact on rental values in Olu-Obasanjo road besides proximity of business districts to the central business district and low level of externalities. The variables were all found to be insignificant at 10% level of significance. With respect to the general significance of the explanatory variables, the R-squared value implies that the locational variables were only able to explain about 32.7% change in the rental values in Olu- Obasanjo indicating that other factors not included in the model account for the remaining 66.3%. The F-statistic is significant at the 10% level, which is supported by standard error of regression equation signifying minimized sum of squared error. The Durbin-Watson statistics for the equation shows that we reject the null hypothesis of no autocorrelation and conclude that there is positive autocorrelation of the first order among the variables of the model.

The results indicate low autocorrelation amongst the variables. Besides, there is a negative relationship between rental values and all the locational attributes in Olu-Obasanjo study area except agglomeration.

Trans Amadi Road

The results for Trans-Amadi Roads are depicted in table 6 below. The locational variables all impacted negatively on rental values except for proximity of business districts to the central business district. This finding depicts that the closer commercial property is to the CBD the higher the rentals on the property. However, only low level of externalities was found to be significantly associated with rental values though it was negative. The R-squared value implies that the locational variables were able to explain about 50.7% change in the rental values in Trans Amadi Zone indicating that other factors such as physical attributes, lease terms and economic factors could be the major deterrents of rental properties in the area. The F-statistic, a measure of the overall significance of the regression, shows that the explanatory variables employed are significant at the 10% level, which is supported by standard error of regression equation signifying minimized sum of squared error. The Durbin-Watson statistics for the equation shows that we reject the null hypothesis of no autocorrelation and conclude that there is positive autocorrelation of the first order among the variables of the model. The autocorrelation properties amongst the series of the model as well as indicate the type of relationship that exists between the study variables. The results indicate low autocorrelation amongst the variables as well as showing that negative relationship exists between rental values and all the locational attributes in Trans Amadi study area except nearness to central business districts and agglomeration.

Table 6: Multiple Regression model for Aba Road Business District (Source: Author's)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.99853	0.623430	17.64197	0.0000
NCBD	0.015440	0.094675	0.163085	0.8741
ACC	-0.029661	0.225735	0.131397	0.8984
EXT	-0.182695	0.078960	2.313764	0.0460
NBSS	-0.009307	0.110344	0.084343	0.9346
AGM	-0.038095	0.104505	0.364527	0.7239

NBC	-0.099502	0.110560	-	0.899986	0.3916
R-squared	0.507292	Mean dependent var			9.920762
Adjusted R-squared	0.178821	S.D. dependent var			0.256493
S.E. of regression	0.232431	Akaike info criterion			0.219191
Sum squared resid	0.486218	Schwarz criterion			0.557199
Log likelihood	5.246472	F-statistic			1.544402
Durbin-Watson stat	1.880773	Prob(F-statistic)			0.267538
R-squared	0.507292	Mean dependent var			9.920762

Summarily, based on the t-tstatistics of the regression results we can thus accept the hypothesis that proximity to central business districts do have a positive impact on rental values in study areas, however this impact proved not to be a significant determinant or major determinant of the amount of rent that one pays in the districts with the exception of Olu Obasanjo Road.

ANOVA Results

The second hypothesis seeks to determine if there is a significant difference between rental values across the six business districts. The results from the ANOVA analysis for the different rental values are presented in table 7 below:

Table 7: Summary of ANOVA Analysis

Source	Sum of Squares	DF	MS	F-cal	F-tab	P
Between Group	1.19	5	2.2E+08	5.083036	0.000308	*Sig.
Within Group	4.84	112	43225494			
Total	5.94	117				

Note: DF = Degree of Freedom; M.S. = Mean Square. *significant at $p < 0.05$

The result reveals that there is a significant difference in the rental values across the six districts that were utilized for this study. The results in table 7 revealed that the F-calculated value of 5.08 is greater than the F-table value of 0.000308 at 0.05 level of significance. That is, the variation between group means is too large to be considered chance; the variability was found both within and between the groups.

Conclusions

Thus it can safely be concluded that the rental values across the six business districts are not the same. The research indicated that out of the six major locational characteristics utilized for the study, proximity to central business districts was found to have a positive impact on rental values in the all the districts except Olu-Obasanjo though it was only found to be significant in Aba Road District. The other variables that were also found to be significantly associated with rental values were low level of externalities in Trans-Amadi road and neighbourhood characteristics for the Ikwerre Business District.

In conformity with the economic theory of location, rental values in Port Harcourt are determines by location. With six variables that constitutes the location factor namely nearness/proximity to CBD (NCBD), good access (ACC) externalities (EXT), nearness/proximity to business support services (NBSS), agglomeration advantage (AGM) and neighbourhood characteristics (NC). The results of the multiple regression analysis suggest that proximity to the commercial centre (CBD) is of importance in land-use

decisions. Table 5 shows that the highest office rents are paid along Olu-Obasanjo road, a distance of 5.7 km from the CBD. In contrast, Air force road, approximately 13.4 km away from the CBD commands the least rent. In view of these findings, it is concluded that proximity to the CBD as a locational factor is significant and to some extent explains the spatial variation of office rental values in Port Harcourt.

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