IMPACT OF HOUSING ATTRIBUTES
ON RENTAL VALUES OF RESIDENTIAL PROPERTIES
IN MINNA, NIGERIA

USMAN MUSA

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(WRITER’S SIGNATURE) (SUPERVISOR’S SIGNATURE)
ASSOC. PROF. SR. DR. WAN
ZAHARI WAN YUSOFF

Permanent Address:
Department of Estate Management,
Niger State Polytechnic, Zungeru,
Niger State,
Nigeria.

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DR. KHADIJAH BINTI MD ARIFFIN
Faculty of Technology Management and Business
Universiti Tun Hussein Onn Malaysia

Examiners:

PROF. MADYA SR. DR. ANUAR BIN ALIAS
Faculty of Built Environment
Universiti of Malaya

DR. MOHD LIZAM MOHD DIAH
Faculty of Technology Management and Business
Universiti Tun Hussein Onn Malaysia
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ON RENTAL VALUES OF RESIDENTIAL PROPERTIES
IN MINNA, NIGERIA

USMAN MUSA

A Thesis submitted in
fulfilment of the requirements for the Award of the
Degree of Master of Science in Real Estate and Facilities Management

Faculty of Technology, Management and Business
Universiti Tun Hussein Onn Malaysia

APRIL, 2016
DECLARATION

I hereby declare that the work in the thesis is my own except for quotations and summaries which have been duly acknowledged

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USMAN MUSA

Date: ........................................................................................................................................

Supervisor: ..................................................................................................................................

ASSOC. PROF. SR. DR. WAN ZAHARI WAN YUSOFF
DEDICATION

This work is dedicated to my late Parents and my entire family.
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ABSTRACT

Analysis of the impact of housing attributes on rental values of residential properties over the years has been a major challenge in the global housing market. This phenomenon arises due to the complexity, uniqueness and heterogeneity of housing commodity coupled with the diverse socio-economic characteristics of housing locations in various residential neighborhoods of different geographical regions. The purpose of this study was to examine the impact of various housing attributes such as dwellings, location and neighborhood characteristics on rental values of residential properties in Minna, Nigeria. Three (3) residential neighborhoods were randomly selected each from high density, medium and low density areas of the metropolis for the study. Structured questionnaires with closed ended questions were administered randomly to three hundred and eighty five (385) respondents across the three neighborhoods. A total of three hundred and thirty seven (337) questionnaires were returned out of which three hundred and twelve (312) questionnaires were considered valid for the analysis of the data obtained from the field survey. Three (3) categories of residential properties which include one bedroom, two bedroom and three bedroom apartments respectively were adopted for the study. Descriptive analysis and Standard Multiple regression analytical techniques were employed in analyzing the research data. Results from the analyses indicated that the entire independent variables used as predictors are statistically significant to the prediction of rental values of residential properties in Minna metropolis. The results also revealed that condition of building components is the major predictor of rental values of residential properties in the study area with neighborhood’s attributes, location and adequacy of building facilities respectively following the former. The findings of this study will be useful to the practicing estate surveyors and valuers, town planners and the government agencies responsible for property rating assessment as well as property owners and users; and other related stakeholders in housing investments and management.
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<td>Adequacy of Building Facilities</td>
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<td>AMA</td>
<td>Accra Metropolitan Assembly</td>
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<tr>
<td>ANN</td>
<td>Artificial Neural Network</td>
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<td>ANOVA</td>
<td>Analysis Of Variance</td>
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<td>BC</td>
<td>Building Components</td>
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<td>NIGIS</td>
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<td>NSP</td>
<td>Niger State Polytechnic</td>
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<td>NSFDSS</td>
<td>Non-Structural Fuzzy Decision Support System</td>
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<td>Royal Institute of Chartered Surveyors</td>
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<td>SPSS</td>
<td>Statistical Package For Social Sciences</td>
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<td>USA</td>
<td>United State of America</td>
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CHAPTER 1

INTRODUCTION

1.1 Background of study

Housing according to Golubchikov and Badyina (2012) is one of the basic social conditions that defines the quality of life and welfare of the people and places. Housing is globally accepted as second most important human need after food and is considered as one of the most valuable economic asset of every nation (Jiboye, 2013). It is indeed a complex goods which consist of many different aspects including structures which comprises all the physical characteristics of the dwelling, accessibility and facilities that constitute a bundle of services related to housing as well as neighborhood attributes which include the environment and the society in which the dwelling exist (Edward, 1997). Housing being an essential ingredient that stimulate the growth of Gross Domestic Product (GDP) of any nation, encompasses various attributes which jointly function to determine the market value of the commodity.

However, since the middle of the 20th century, house owners, housing investors and house users have struggled to identify the basic factors that influences residential property prices in the global housing market (Fernandez et al., 2011). This problem has attracted a lot of interest from researchers, real estate surveyors and other relevant stakeholders concern with housing development, investment and management. For instance, rental values of a residential properties in a particular residential neighborhood in most cases differs significantly with rental values of similar residential properties in another residential neighborhood within the same metropolis. Similarly, rental values of similar houses within the same residential neighborhood also differs due to various silent reasons.

In response, several studies on housing prices determination have been undertaken with a view to examining the factors that influences residential property
values in the global housing market. While some of the studies are of the view that attributes of residential location are core factors that influences house prices (Fernandez et al, 2011 in Spain; Ivy & Ernest, 2013 in Ghana), others are of the view that structural attributes such as number of; bedrooms, living rooms, bathroom, toilets, structural condition among others are major determinants of house prices (Semararo & Fregonara, 2013 in Italy; Anthony, 2012 in Ghana; Bhargava 2013 in India). Other researchers have yet identified neighborhood attributes as major factors that influences house prices particularly between different residential neighborhoods (Haizan, Yan & Lin, 2013 in China; Tan, 2010 in Malaysia; Dziauddin, Alvanides & Powe, 2013 in Malaysia, Douglas et al., 2002 in USA, among others). Few Nigerian studies have also investigated the influence of the housing attributes on prices of residential properties (Oluseyi, 2014 in Ibadan; Kemiki et al., 2014 in Ewekoro; Aluko, 2011 in Lagos; Babawale & Yawande, 2011 in Lagos; Famuyiwa & Babawale, 2014 in Lagos, among others).

Despite the growing concern on the issues from both the foreign and local housing market, only a harmful of studies in that regard have been conducted in Nigeria, with no particular study found to have statistically analyzed the combined effect of dwellings, location and neighborhood attributes on rental values of residential properties. Most of the studies on the impact of housing attributes on house prices in the global housing market focused attention on studying the impact of individual housing attributes rather than analyzing the combined effect of the attributes on residential property prices. The most unfortunate is that, no study was found in relation to the impact of housing attributes and housing prices in the current area under study, as all the related studies found in Nigeria were carried out in different geographical regions of the country other than in the area currently being examined. Thus, the impact of housing attributes (dwellings, location and neighborhood) on rental values of residential properties remains silent.

The paucity of information on the benefit of investigating the impact of housing attributes on rental values of residential properties in Minna metropolis is regrettable because the information is very crucial in providing a template that will guide the estate surveyors and valuers in determining appropriate rental prices for all categories of residential accommodations across the various residential location (high density, medium density and low density) of Minna metropolis. Besides, the information is also very important to housing investors/owners, because it will provide them with clear
information on the influence of dwelling characteristics on housing prices which could in turn encourage them to carry out aggressive structural improvement that will attract higher rental value. It may also help in aiding their decisions as to the choice of the type of residential accommodation to invest and where to invest that will produce higher rental value. Policy makers will also benefit from the information because it will arouse their interest and encourage them to carry out proper environmental and neighborhood planning as well as providing adequate amenities that may lead to higher property taxes through enhanced value from property rating assessment and consequently stimulate economic growth.

This study thus, attempted to contribute to the knowledge base by exploring the influence of the various housing attributes on rental values of residential properties in the study area. The study examines the direct impact of dwellings, location and neighborhood attributes on the rental values of residential properties in Minna, Nigeria.

1.2 Statement of the problem

The increasing rate of variations on rental values of residential properties among varying residential neighborhoods in many towns and cities in Nigeria in recent time has continue to dominate discussions within the spheres of practicing estate surveyors and valuers, property; owners, investors, users, estate brokers, as well as policy makers on housing investment and management in Nigeria.

Although various studies on housing prices determination that have been carried out globally, identified condition of dwelling characteristics, attributes of residential location and neighborhood attributes as the leading factors that causes housing prices variations (MacDonald & MacMillan, 2007; Kiel & Zabel, 2008; Anthony, 2012), however, most of these studies are foreign base with only a handful of them conducted in some part of Nigeria. This implies that the impact of housing attributes on housing prices in many Nigerian towns and cities including Minna, the study area, is yet to be investigated and thus, account for the negligible attention being given to condition of residential dwellings and neighborhood attributes by homeowners, housing investors and the policy makers.
The condition of dwellings and neighborhood attributes in many part of Nigerian towns and cities for instance, are in deplorable state and are in dear need for urgent attention (Julius, 2010 and Owoye & Omole 2012). While it was observed that some residential neighborhoods within the towns enjoys good and accessible location with good condition of dwellings and quality neighborhood attributes, the situation in some other parts of the towns and cities is pathetic. The researchers observed that most part of major towns and cities in Nigerian were developed without regards to Urban-planning laws and with few to no functional neighborhood amenities. They echoed that the non-planning of many residential neighborhoods has led to unregulated buildings which in turn has created some negative impact in the natural urban environment that negatively affects the quality of dwellings, living environment and consequently affects residential property values (Owoeye & Omole, 2012).

Minna, the study area in Nigeria is not isolated in this regard. Most part of the city and particularly the high density areas which accommodate over 70% of the city population are characterized with unregulated developments, substandard buildings and almost zero provision of neighborhood facilities coupled with uncontrolled neighborhood disamenities (Niger state government, 2011). The residential neighborhoods particularly in the high and medium density areas in Minna metropolis were also observed to be placed at disadvantage locations with respect to place of employment, central business district (CBD), shopping areas and accessibility to public transportation among others (Researcher field observation, 2015).

In the low density residential neighborhoods however, the situation is different as buildings in those areas are standard, well maintained, well regulated, and the neighborhoods are well planned. The low density neighborhoods are also provided with adequate and functional neighborhood amenities and without trace of neighborhood disamenities like noise pollution, crime, environmental contamination among others (Researcher’s field survey, 2015). For the medium density neighborhoods, the situation is not as good as the low density areas but also not as bad as the high density areas (Researcher’s field survey, 2015).

Regrettably, the few studies from the Nigerian context that have examined the impact of the housing attributes on housing prices, aside from been conducted outside the study area being currently examined, most of the studies examined the impact of only one individual attribute of housing on house prices. While some uses few explanatory variables of the housing attributes on housing prices in drawing a general
conclusion. Few among the studies include the study of Kemiki, Ojetunde & Ayoola (2014) on the impact of noise and dust level on rental prices of residential properties around Lafarge cement factory in Ewekoro town, Nigeria. The study of Ukabam (2004, 2008) on the relationship between housing characteristics and residential property value in Lagos, and the studies of Egberta (2001), Sule (2009), and Mbachu & Lenon (2005), offered good examples.

As stated by Sirmans et al. (2005), the impact of housing attributes on house value at different geographical region may be different. Therefore making generalization to relate to a particular geographical region may be unrealistic. Similarly, Okewole & Aribigola (2006) and Ebong in Fumilayo (2012), all stressed that housing encompasses many characteristics which include dwelling characteristics, attributes of location and neighborhood characteristics. Thus, the study of the impact of only a component or attribute to draw a general conclusion on the entire rental value of a property without regards to other components may not be sufficient to justify a convincing result (Jiboye, 2004).

Previous studies that are closely related to the research in the study area, include the study by Ajala (2002) on appraisal of building condition and infrastructural facilities in Makunkule, Minna, Nigeria. The study did not include data on rental values of residential properties hence the impact of building condition on rental value was not examined. The study of Ojetunde & Morenikeji (2006) examined the residential quality and residence perception of quality in fifteen residential neighborhoods of Minna metropolis. The findings of the study indicated that rental values of residential properties with the same number of bedrooms in the same neighborhood and also between residential neighborhoods varies significantly. The study even though attributed the variations of house rental prices to the varying status of housing attributes in the study area, however, did not examined the impact of the housing attributes on rental values of residential properties, thus, their claim was based on assumption and personal experiences.

A conclusion cannot therefore be made to ascertained the validity of their claim on mere assumptions neither will a meaningful statistical inference be drawn from it without subjecting the variables of the housing attributes to scientific and statistical test, thus forming the basis of this research, as no previous empirical study from the literature on the impact of housing attributes on rental values of residential properties in the study area was found.
Thus, by examining the impact of housing attributes on rental values of residential properties in Minna metropolis, not only the homeowners and housing investors in the area that could benefit from the findings but also the real estate surveyors and valuers and the policy makers would as well benefit from it. Since the influence of the housing attributes on house rental value will be established, all the relevant stakeholders can better understand the causal factors for the variation of rental values of residential properties in the area. With this understanding, the estate surveyors and valuers can isolate variables and develop models about rental prices of various categories of residential properties in the study area based on dwelling status and residential neighborhood. In the same vain, policy makers can adequately plan residential environments, enforce strict adherence of planning regulations and provide effective neighborhood facilities that will attract higher rental value and stimulate economic growth in all the residential neighborhoods of the metropolis.

1.3 Research questions

1. What is the current condition of dwellings and neighborhood characteristics in Minna?
2. What are the locational characteristics of the various residential zones in Minna?
3. What is the current annual rental value of residential properties in Minna?
4. Do dwelling, location and neighborhood characteristics (Housing attributes) have an influence on rental values of Residential properties in Minna?

The research will provide answers to the above questions by collecting and analyzing the required data using appropriate research techniques.

1.4 Aim of the study

The aim of this study is to examine and analyze the impact of dwelling, location and neighborhood characteristics (Housing attributes) on rental values of residential properties in Minna Metropolis, Nigeria.

To accomplish the above aim, the following research objectives shall be pursued.
1.5 **Research objectives**

1. To assess the current condition of dwellings and neighborhood characteristics in Minna
2. To evaluate the locational characteristics of the various residential zones that affect rental values of residential properties in the study area.
3. To create profile of annual rental values of residential properties in the study area based on residential neighborhood.
4. To evaluate the impact of dwellings, location and neighborhood characteristics (Housing attributes) on rental values of residential properties in Minna.

1.6 **Scope of the study**

For the reason of interest and available resources at researcher’s disposal, the study lent itself only on the study of housing attributes (neighborhood, location and dwelling characteristics) as it affect rental values of residential properties in Minna Metropolis, Nigeria. The study also focused on residential properties only and specifically those in the category of 1, 2 and 3 bedroom apartments. Due to interest, available data and time constraint, other types of property such as commercial and industrial properties were not considered. Residential properties other than the category mentioned above were also isolated because of convenience and also for the fact that the demand for the categories of apartment selected, were more frequent, stable and have available records of transaction data in Minna (Babatunde & Co, 2014). The study period is one year, covering January, 2015 to December, 2015.

To effectively carry out the research and to produce bias free result, the metropolis was grouped in to three clusters of residential zones based on similar features. One residential neighborhood was selected from each group to represent the group. The study hence focused on three residential neighborhoods only and covered residential properties that are mainly for rental purposes. Rental values of residential property were used as the dependent variable. The choice of rental value order than capital value was as a result of the availability of records of rental transaction data found in the portfolio of practicing estate surveyors and valuers in the area which is
not so with the capital value. The reason is that people rent house more often than buying.

1.7 Significance of the study

Housing basically constitutes an important part of the wealth of any given nation, the community and indeed the real estate owners. When real estate values appreciate, it is translated to the wealth of the nation directly or indirectly through various property taxes imposed by the government on owners. It also increases to the wealth of the community and the individual owners. Investments in housing stock stimulate the growth of Gross Domestic Product (GDP) of any nation more than any other type of investment outlet.

The study of housing attributes as it affect rental values of residential properties, became imperative as it will go a long way in addressing many un answered questions related to house prices, house quality and housing investments. Establishing the relationship that exists between rental values of residential property and the various components of housing is very crucial to Estate Surveyors and Valuers, Urban Planners and policy makers alike.

This study also became very necessary considering the fact that information in respect to the impact of various housing attributes on rental prices of residential properties which is obviously lacking within the domains of estate surveyors and valuers in the study area shall be explore. This apparently may provide a useful and significant guide to practicing estate surveyors and valuers in ascribing and determining rental values of residential properties in the study area. Estate agents and brokers may also find the outcome of this study very useful as it will help them to aid their decision with respect to giving advice to their client on the choice of residential neighborhood to live.

The study is also necessary as it is expected to bring to light the social and economic consequences of mixing incompatible land uses which could adversely affect the potential rental values of residential properties. Urban Planners may be guided in this direction when designing a layout or Master plan for an area. The findings of this study may also assist in drawing the attention of the government and other relevant bodies concerned with housing and environmental health in realizing
the need to enforce quality housing provision and decent environment as the health and economic implication of poor quality housing and environment will be exposed.

Housing investors may also find the study useful as it will assist them in making crucial investment decisions with respect to the type and quality of houses and residential location that could yield maximum returns.

1.8 Statement of the hypothesis

The research hypotheses have been formed and were tested in this study. The independent variables are the dwellings characteristics which are broken into two separate variables (condition of building components and adequacy of building facilities), the locational attributes and the neighborhood attributes. The dependent variable is the house rent. It is however worthy to state here that, the statement of hypotheses were used alongside research questions because the hypotheses are built in the last research question. According to Creswell (2014), both the research questions and hypotheses can be used if the hypotheses are built on the research questions.

H1: Condition of building components and services has significant impact on rental values of residential properties.

H2: Adequacy of building facilities has significant impact on rental values of residential properties.

H3: Locational attributes have significant impact on rental values of residential properties.

H4: Neighborhood attributes have significant impact on rental values of residential properties.

1.9 Research methodology

In order to vigorously pursue the research objectives and accomplish the research aim, quantitative research design with post positivism philosophical approach was adopted. The data was obtained through survey method which according to Fowler (2009) is most appropriate with quantitative research design. Direct observations were also made to further support the questionnaire survey. Descriptive mean scores and Multiple regression analytical tools were used as techniques for data analysis. Detailed
discussions in respect to the research methodology was devoted in chapter three of this thesis.

1.10 Summary and link

Extensive discussions on the background of the study and problem statement of the research were carried out in the above chapter. Research questions were raised and the study objectives and aim have been highlighted. The research scope and limitations were clearly defined and the significance of the study buttressed. Also in the above chapter, research hypotheses were stated and the profile of the study area briefly identified. The next chapter has examined and extensively reviewed literatures related to the study.
CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

The rental values of residential properties are influenced by various housing characteristics which are related to neighborhood, location and dwelling characteristics (McDonald & MacMillan, 2007; Aluko, 2011; Anthony, 2012).

McDonald & MacMillan, (2007) in their study of neighborhood characteristics on house value, identified two categories of neighborhood variables which could positively or negatively influence house price. The positive neighborhood variables outlined by these researchers which are termed neighborhood amenities, include schools, playground, hospitals and health centers, police station, parks and recreational facilities, sporting facilities, shopping centers, community services and other environmental considerations like good drainages and waste disposal management tools. The negative neighborhood variables termed as disamenities include industrial noise, neighborhood crime rate, air pollution, heavy traffic on streets and contaminated environment.

On location, Thorncroft (1965), Poudyal et al. (2009) and Aluko (2011) have all asserted that residential property value depends majorly on access to those locations which support related uses, such as proximity to work place, shopping centers, distance to schools, nearness to recreational facilities, accessibility to public transport, open space, proximity to place of entertainment, place of worship, distance to CBD and other related community services. The variables are however positive locational attributes that could positively impact on property value.

Tom (2003) stated that localized negative externalities such as nuisance could affect house price negatively. He emphasized that houses located at close distance to hazardous waste site or close to high voltage power transmission line or flood areas are liable to have a decline in value.
For dwelling characteristics, Thorncroft (1965) and Anthony (2012), identified various dwelling characteristics that influences residential house values. These attributes highlighted include the forms and quality of estate with regards to it layout, structure and design, age, condition of dwelling facilities, fences and gates, number of rooms, floors adequacy of ventilation, availability of garage, swimming pools, landscape, material type and quality used for construction, quality of finishing and available land area.

2.2 Empirical literature on neighborhood characteristics that affects house prices

MacDonald & MacMillan (2007) asserted that the analysis of market for housing in an urban area cannot be divorced from neighborhood factors. Houses and apartments are complicated commodity that contains numerous features which have value for the consumer. The market is often characterized by complicated, highly durable units each of which is located in a neighborhood with many attributes. The neighborhood amenities according to Anthony (2012) are the necessary attractions and services that make life comfortable and easy for the inhabitants. House price on the other hand reflect the attributes of the house and lot, and the characteristics of the neighborhood in which the property is located.

Although, house price is established through the process of negotiation between buyer and seller, however, the actual sale will only be made if the buyer makes a bid (MacDonald & MacMillan, 2007). Most often buyers based their bids on many factors among which neighborhood characteristics plays a very significant role in influencing the decision of the buyers.

The focus of this section is to review empirical literature on neighborhood characteristics that influences house value given that lot of variables on neighborhood characteristics have been found by many researchers on housing and value, to have a statistical significant impact on house prices. The impact of both neighborhood amenities and disamenities on house prices are discussed in the next headings
2.2.1 Neighborhood amenities that influence house prices

Neighborhood amenities which influence house prices and were examined in this study includes; leisure and sport facilities; the presence and quality of educational facilities in a residential neighborhood; mixed land uses; mountains, lakes and oceans; gated guarded landscape and freehold neighborhoods; and the effect of light rail transit system on residential property values.

2.2.1.1 The impact of sport and leisure facilities, convenience of life and environmental quality on house prices

Various studies have been carried out on neighborhood amenities that influence house value. For instance, on neighborhood amenities, Chang & Lin (2012) investigated the impact of neighborhood characteristics on house price in Taipei, Taiwan, using hierarchical linear modeling. The purpose of the study was to examine the relationship between neighborhood characteristics and house price. The study adopted three neighborhood variables which include environmental quality, convenience of life; and sport and leisure facilities as the explanatory variables.

The data for the survey was obtained through secondary sources derived from 2006 survey of residential houses status by agency of construction and planning, Ministry of interior affairs, Taiwan. The data covered dwellings from 31 neighborhoods. Five point likert scale was used in measuring the satisfaction level of items comprises in each of the house characteristics and neighborhood variables adopted for the study.

The study uses the HLM sub-models which include Null model, Random coefficient regression model and the Slope as outcome model for variable explanation and analysis of empirical studies.

Findings from the empirical results indicates that average house price in various neighborhoods have significance differences. The result also revealed that impact of house characteristics on average house price varies between neighborhoods. The results further suggest that the impact of dwelling characteristics on house price is moderated by neighborhood attributes.
The study however, made use of data collected through secondary sources which was obtained six years before the study. This might possibly affect the outcome of the study as secondary data can be misleading especially when obtained long time prior to the study. The use of few explanatory variables to determine the effect of neighborhood characteristics is also not sufficient to justify a convincing result as it may lead to omitted variable bias.

Earlier study by Brown & Uyor (2004) also investigated the impact of neighborhood attributes and house characteristics on residential property price by also using hierarchical modeling technique. The house characteristics was represented by a “living area” as the micro level explanatory variable and “time to get down town” as the macro level explanatory variable representing neighborhood characteristics.

The results indicate a significant effect of neighborhood characteristics on house prices. The results further revealed that neighborhood attributes can also moderate the effects of dwelling characteristics on residential property price.

Different result was reported by Lee (2009) who on his investigation of the effects of neighborhood public facilities on house prices included two more variables on neighborhood characteristics. The variables included are: convenience of life; and sport and leisure to the earlier variable “time to get to down town” as explanatory variables.

The result from the empirical study shows that the impact of neighborhood public facilities on house prices varies between countries and towns and that the effect of sport and leisure facilities on house prices is not significant. The result however, indicated a significant relationship between house characteristics and house prices.

From the foregoing studies of Brown & Uyor (2004) and Lee (2009), it is evidenced that few explanatory variables were used in the discussion of neighborhood attributes in this study which in my own opinion are not sufficient enough to persuade justifiable outcome. Strong outcome would be achieved if more explanatory variables were used.

Again, Lee (2010) studied the impact of leisure and sport facilities on house value with an increase number of dwelling characteristics variables. The variables include the living area, number of rooms, building age, number of stories, number of floors and house structure as explanatory variables for the dwelling characteristics. The neighborhood characteristics are represented by sport and leisure facilities as explanatory variable.
The result from the empirical findings shows that sport and leisure facilities have significant effects on house prices with cross-level interaction at the same time. By implication, dwelling characteristics on house prices from the findings would be moderated by the effects of sport and leisure facilities on house prices.

The study again uses few explanatory variables to represent neighborhood characteristics which in my opinion could also lead to omitted variable bias.

Still on neighborhood characteristics, Feng & Humphreys (2012) investigated the impact of professional sport facilities on house value in US cities using the hedonic housing price model with spatial autocorrelation. The estimates were based on 1990 and 2000 census block groups within five miles of every sporting facility in US cities.

The study findings indicated that the median house values in block groups is higher in block groups closer to the sporting facilities. The result clearly showed that professional sporting facilities have positive impact on house prices. The study utilized census data where the unit of estimation is a census tract. Besides, the data used were obsolete considering the number of years the data was collected.

Furthermore, application of standard hedonic model and differences in difference approach was employed by Dehring et al. (2007) to examine the effect of an announcement for a proposed stadium in Dallas fair parks. The announcement of the proposed stadium which was later abandon jacked up the prices of nearby residential properties around the area as against the values of residential properties around Dallas’s county that was a long distance to the proposed stadium. The prices of residential properties were however reversed on the abandonment of the proposed stadium.

Dehring et al. (2007) also found that three announcement made separately on another proposed stadium in Arington which was undertaken affects residential properties negatively. Though, each of the announcement was not significant individually, the combined effects of the three announcement was negatively and statistically significant. The total net effect from the findings shows an accumulated rate of about 1.5% decline on prices of residential properties in Arington. The study however produced a bias and inconsistence estimates of the impact of sport facilities on house prices as the two models adopted fell short in giving a clear account for spatial autocorrelation.

Similarly, Tu (2005) investigated the effects of a new sport stadium on housing prices using Fed Ex field as a case study. He adopted the standard hedonic price model
as an analytical technique to measure price variation between houses located around the Fed Ex field and other similar properties which are far distance away from the stadium. The result of his findings indicated that houses located within one mile radius from the stadium commands lower value as compared to those houses that are located outside the miles impact areas. The reason for this negative outcome may be attributed to people’s belief in the area that the presence of a stadium constitute nuisance (disamenities) instead of being amenity. Therefore, those properties that are located closer to the stadium site in these areas, are prone to command lower rental values as people would prefer to live in an area where they believed is more environmental friendly and is devoid of noise and pose no security threat to their lives and properties which to them is associated with the presence of a stadium.

Contrary opinion was however expressed by Alhfeldth and Maening (2010) who also investigated the effects of multi-purpose sporting facilities on property prices in Berlin. Their findings indicated that sporting facilities increases the value of some residential houses located within 3km of sport facilities. The result however noted that values of residential houses decline as the distance progresses further away from the sport facilities. Some level of negative but not statistically significant impact was also recorded.

Hedonic price model was also used by Kiel et al. (2010) to determine the relationship between proximity to football stadium and residential property values. Their finding shows no relationship between residential property values and proximity to the football stadium.

Coates & Humphreys (2005) stated that empirical studies on non-financial effects of professional sport teams and facilities recently carried out in recent times, shows variations across the globe.

Generally, results from the review of empirical literature above shows clearly that professional sporting facilities generate externalities whose net effect could either be positive or negative.
2.2.1.2 The impact of the presence and quality of educational facilities in a residential neighborhood on house prices

Still reviewing neighborhood effects on house prices, Feng & Lu (2010) conducted a study to assess the impact of educational facilities on residential property prices in Shangai, China. Two factors: the school quality and school quantity, and two batches of the government naming process of “experimental model high school” were used as explanatory variables. Monthly panel data of housing prices and fifty two regional distributions of high schools were collected.

The result indicated that presence of high number of quality schools could increase house prices by over 21% on average. However, the presence of inferior schools, were also found to increase house prices by little above 5%. The result also revealed that educational facilities are neighborhood amenities that could positively impact on house prices.

The use of high quality school as an estimating factor could only be justified if the area or district is known to be a school district. For non-school district, the best explanatory variable that ought to be adopted is the proximity to school from the house. The use of only a particular school category in isolation of other categories does not fairly represent educational facilities and thus, could affect the outcome of the findings.

In a related study, Haizan, Yan & Lin (2013) evaluated the impact of various educational facilities on house values using data on housing value and educational facilities of 660 communities in Hangzhou, China. Traditional hedonic pricing model and the spatial econometric model was used in analyzing the impact of the educational facilities on house prices.

The finding revealed that educational facilities have positive capitalization effects on house values. The results further stated that houses located at close distance to high quality schools will attract higher value than those houses located further away from the schools.

Similar study was earlier undertaken by Wang (2006). The study among other things found that the addition of Kindergarten, nursery and primary schools as well as secondary schools in a neighborhood within 500m could attract an increase in residential houses by 2.7% in Shangai, China. The hedonic housing prices model was also used for the estimation.
The study of Wang (2006) is however at variance with the study of Wen & Jia (2004) who had earlier reported that schools and kindergartens have no neighborhood house value. Also, Li & Fu (2010) asserted that only high quality schools with outstanding academic performance can positively influence house prices. That the impact of schools with the general minimum standard will have little or no significance on house prices. The result equally revealed that the presence of higher institution in a neighborhood has no statistical significant effects on house prices.

Furthermore, Wang, Zhang & Feng (2007) also found proximity to high standard and quality schools in a neighborhood to have an effect on house prices. The findings of Wang & Ge (2010), Haung (2010) and Zhang (2010) have all confirmed the study of Wang, Zhang & Feng (2007).

It was however noted from the study that most of the empirical literature on the impact of neighborhood characteristics on house prices which are related to educational facilities, dwell more on influence of school quality with little or no emphasis on accessibility to educational facilities which may equally have great impact on house prices. Ignoring this factor may lead to deviation of estimation results. Besides educational facilities, house prices are also related to many neighborhood attributes which also need to be taken in to consideration in determining neighborhoods effects on house prices. The total avoidance of these factors may cause regression deviation. The boundary fixed effects (BFE) approach and spatial econometric model suggested by Haizan, Yan & Lin (2013) should have being used.

Haizan, Yan & Lin (2013) stressed that the analysis of the effects of educational facilities on house prices has both the practical and theoretical significance and may provide a reference point for the articulation of the education equity policy.

2.2.1.3 The impact of mixed land uses in a residential neighborhood on house prices

In another study of neighborhood characteristics, Hans & Jan (2012) examined the impact of mixed land uses on residential house prices in Rotterdam city region, Netherland, using hedonic semi parametric estimation techniques. The purpose of the study was to explore the impact of mixing employment and residential land uses on
house prices. The study also aimed at investigating how house owners value mixing of employment and residential land uses.

The study analyzed data based on three data sets obtained from: Dutch Association of Brokers (NVM) which consists of 10,152 houses transaction of 2006; Data from chambers of commerce which also comprises data from all firms / establishments located within Rotterdam city region; and Data obtained from the office of statistics, Netherland which provides number of households living in a post code. The entire database were married into a single database which contains information on transaction price of each house, structural attributes and number of neighborhood variables that relates to mix land uses. To avoid the “curse of multidimensionality”, partial linear hedonic price model was estimated.

The results among other things indicate that acceptable mixture of land uses such as business and leisure activities could result to an increase in house prices significantly which may not be same to houses located on mono-functional areas. The result further indicate that land uses such as manufacturing and wholesale are incompatible with residential land uses and may lead to negative impact on house prices. The findings also revealed that apartment occupiers may be willing to pay higher prices for a diversified neighborhood but less for additional employment in some specified sectors.

Similar study much earlier conducted by Song & Knaap (2004), uses the full parametric hedonic price technique to evaluate the effect of mixed land uses on house values. Their result also revealed that the mixture of commercial land uses with residential land uses will impact positively on residential property values. However, a negligible positive impact on ratio of employment to residents was recorded. The study did not make clarification regarding the type of commercial land uses that are compatible to residential land uses as there are some commercial land uses which when mixed with residential land uses could adversely affect house prices.

It is also noted that the impact of some neighborhood disamenities such as crime rate and noise which are associated with mixed land uses have not been estimated by the researchers which could possibly give room for debate on the outcome of these findings. Above all, the provision of sufficiently rich variety of functions in a neighborhood that will ensure it inhabitants realized all it daily activities without noise and security threat and without recourse to moving to other part of the city will attract higher residential property value.
2.2.1.4 Impact of mountains, lakes and oceans on residential neighborhood on house prices

Benson et al. (1998) examined the impact of series of views to ascertain their effects on residential property value in Bellingham and Washington. The results indicate that the existence of mountains, lake and ocean on a residential neighborhood attract a significant increase on house prices. The study of Colombo (2012) in the Italian housing market using the hedonic housing prices model also revealed that availability of neighborhood amenities leads to higher property value.

2.2.1.5 Impact of gated guarded landscape and freehold neighborhood on house prices

In furtherance of study of neighborhood characteristics on house prices, Tan (2010) conducted a study on neighborhood preference of house buyers in Klang Valley, Malaysia. The purpose of the study was to examine the impact of neighborhood characteristics on residential property prices. Data on structural, location and neighborhood attributes and house prices were obtained. 14 variables from structural, location and neighborhood characteristics were used. The neighborhood variables which are the independent variables include the gated guarded landscape neighborhood and the freehold neighborhood. The house price is the dependent variable for the study.

Questionnaire survey was conducted in 2007 for the collection of the study data directly from home owners in Klang Valley, Malaysia. Information about the dwellings of the respondents including internal characteristics, outdoor environment, location and neighborhood characteristics were obtained. Transaction prices data and housing attributes of 333 dwelling units were obtained from home owners. A random sampling technique was adopted in selecting the 333 dwelling units from eight districts within the Klang Valley. Interview survey was also used to support the questionnaire survey in getting data from identified residential areas. Semi-log hedonic price model, weighted least squares and covariance matrix estimators were used for data analysis.
The results of his study suggested that the two neighborhood variables, that is the Freehold neighborhood and the gated guarded landscape compound neighborhood have significant relationship with house prices. The results also show that gated guarded landscape compound neighborhoods attract higher house market prices. The result further revealed that buyers may be willing to pay averagely more than 18% additional price to live in a gated guarded landscape compound neighborhood. For freehold neighborhoods, the market prices are about 23.7% higher than the market prices of the leasehold neighborhoods in the study area.

The study used few explanatory neighborhood variables to measure the impact of neighborhood characteristics which may lead to omitted variable bias and cannot be solved by a tight fisted specification of the hedonic price function. The sample size adopted for the study was not clearly defined on how it was arrived at and thus may raise question on the objectivity of the sample to the entire population of the study.

2.2.1.6 Impact of light rail transit system on residential property value

Again in Klang Valley, Malaysia, Dziauddin, Alvanides & Powe (2013) carried out a study on the effects of Light Rail Transit (LRT) system on residential property values using the hedonic pricing model. The purpose of the study was to investigate the impact of Kelana Jaya line on house prices in Klang Valley, Malaysia. The study uses secondary sources of data which was obtained from the database of the department of Valuation and Services of Malaysia. Transactional data on houses selling prices, structural attributes, land uses and social economic characteristics were obtained.

The study estimated the impact of house prices on various houses located within the radius of two kilometers from the Kelana Jaya LRT station. Correlation analysis and modified step wise procedures were used in identifying the most significant variables which were eventually used for the study. Geographic information system (GIS) and spatial analysis techniques were used in measuring the distance between the LRT station and other amenities from a given house and were also used in managing the large spatial database.

Findings from their study indicate a positive relationship between the house prices and LRT station. They further revealed that houses that are located within close
distance to the station, commands a higher value as compared to long distance houses from the LRT station.

The study however, fall short in measurement techniques adopted for the study. Local analytical models like geographically weighted regression (GWR), spatial expansion method and multilevel modeling techniques may be more appropriate to effectively estimate local rather and will also allow for the inclusion of local geography of house prices and house characteristics relationship.

Earlier study by Al-Mosnaid et al. (1993) also used the hedonic pricing model to examine the relationship between proximity to light-rail transit and house prices. The result of their findings among other things expressed a contrary view to the findings of Dziauddin et al. (2013). Their own findings revealed that LRT may generate negative externalities as a result of the inherent danger it poses to nearby houses and thus could cause the prices of the nearby houses to fall.

Many studies previously carried out on the effects of heavy and light rail transit on house value, have established positive relationship between light rail transit and house prices. Researchers on light rail transit and house prices, such as Weinberger (2000), Carvero & Ducan (2001, 2002), Garret & Castelazo (2004), Du & Mulley (2006), and Hess & Almeida (2007) have all highlighted the positive relationship between light rail transit systems and house prices.

Other group of researchers on similar study much earlier had reported that there is no positive relationship between light rail transit and house prices. The group of researchers on light rail transit and housing price study with contrary opinions include Forest et al. (1996) and Ryan (1999).

In conclusion, it has been noted from the foregoing literature that the outcome of the empirical evidences presented by the various researchers on the relationship between light rail transit system and housing prices are inconsistence. The inconsistencies may be due partly to methodological approaches and partly to quality of data collected for the individual study.

Dziauddin et al. (2013) stated that, if an appropriate method of estimation and quality data are employed for studying the relationship between light rail transit and housing prices, positive relationship would be recorded.
2.2.2 Neighborhood disamenities that affects residential house prices

Property prices may be negatively affected by the presence of some externalities in a residential neighborhood. Some of the neighborhood disamenities whose presence adversely affect residential property prices includes flooding; industrial and other related noise; dusty environment; presence of social elements and contaminated environment; surface street traffic and religious buildings among others. The effects of these attributes on house prices are reviewed from previous related studies below.

2.2.2.1 The effect of flooding in a residential neighborhood on house prices

On neighborhood disamenities, Chris (2002) studied the long term effects of flooding on residential property values in Sydney, Australia, covering a period of between 1984-2000. An observation survey was carried out by the researcher for the purpose of inspecting both the flood prone areas and flood free areas within the axis. The inspection was to determine the type and level of development in the flood liable and flood free areas. 22 streets that were flood prone and were developed with either detached single residential or low-rise medium density residential unit complexes were identified. 22 adjoining streets which were free from flooding and in all cases similar with the developments on the flood liable areas were also surveyed.

Residential sale transaction data for all the 44 residential streets were obtained for the period stated from a commercial electronic database. The data were analyzed on annual basis to determine the average annual sale prices for the two areas under study. A comparative analysis of the results were done to determine the annual trend, average annual price movement, returns and risk for all categories of residential houses.

The result indicates a price differences between houses in free-flood areas and similar houses in liable-flood areas. Higher house values were recorded in the free-flood areas and lower house prices in the flood-prone areas. The study findings however, fall short on methodological approach adopted. Descriptive statistics was used in analyzing the data instead of an appropriate estimating technique like hedonic housing price model which can measure the significant effect of the flooding to house values. Much earlier findings by Guttery et al. (1998) on the effects of flooding on
residential property values was similar with the results reported by Chris (2002). The above study had earlier reported that houses that are flood-prone or located on wet lands suffers price decline when measured with houses located on dry lands or flood-free areas.

Using Ala River in Akure, Nigeria, Bello (2007) investigated the impact of flooding on residential property prices and among other things found out that the houses located closer to the flood plain decline in value and even more when the house is much closer.

### 2.2.2.2 The effect of noise and dust in a residential neighborhood on house prices

Again on neighborhood disamenities, Duarte & Tamez (2009) embarked on a study in order to ascertain whether noise has a stationary effect on house prices using Barcelona Metropolitan in Spain as a study reference. The data collected for the study were analyzed using the geographically weighted regression (GWR) technique. The result of the findings indicated that aside from the structural attributes, socio-economic characteristics and accessibility, environmental noise has an influence on the spatial formation of house prices.

Similar study on the effects of traffic noise was earlier carried out by Wilhemsson (2002). The purpose of the study was to determine whether traffic noise as an impact on single family houses in Stocholm Municipality. The result of the study indicated that prices of single family houses declined by about 30% when the house is located on or close to high noise road. The result from the finding has affirmed that traffic noise is a negative externality that has significant impact on house prices.

The studies of Brecker & Lavee (2003), Berazini & Ramirez (2005) and, Marmolejo and Ramono (2009) presented divergent opinion on the effects of noise on housing prices. They argued that the effect of noise is not linear over space. They asserted that noise has much effects on sub-urban residential house prices on areas that are nearer to rural areas where house values reduces with increase in noise. They further emphasized that noise affect values of residential housing prices more on areas that were tipped to be noise free.

Benjamin & Sirmans (1996) also studied the effects of noise emanating from public transportation facilities and the airports. They found noise from public transport