DETERMINANTS OF RESIDENTIAL HOUSING CHOICE IN LAGOS STATE, NIGERIA

By

AJIDE, KAZEEM BELLO
B.Sc (Economics) ,Ibadan
M.Sc (Economics) ,Ibadan

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ABSTRACT

The developing world is changing from one of rural villages to that of urban dwellings. The population of Lagos, which stood at 270,000 in 1952/53, rose to 5.69 million in 1991 and was estimated to be 18 million in 2010. This has created excessive demand for housing. Available statistics on housing production showed that between 1974 and 1989, 11422 units of houses were produced. This number fell precipitously to 8162 units between 1994 and 2004. The estimated housing deficit for Lagos in 2010 was 5 million representing 28% of the estimated national housing deficit. The gap between housing delivery and housing demand, engendered by population growth, has necessitated competition and choice making from the available housing alternatives. The literature hardly takes adequate account of the economic and related factors influencing residential housing choice decisions in Third World cities. This study, therefore, investigated the socio-economic determinants of residential housing choice in Lagos, Nigeria.

A multinomial logit model, based on the neoclassical consumption framework augmented by hedonic pricing approach, was used to determine the socio-economic determinants of residential housing choice. The specific variables considered were household income, housing price, household size, marital status, ethnicity, gender, and age. The model allowed for the classification of housing units as single-household, multi-household houses, a flat in a block of flats, duplexes, a room in the main building and squatters' settlements, across high, medium and low density areas. It also has the advantage of comparing the various residential housing choices with the base category (multi-household houses). Cross-sectional data from 4,433 randomly selected rented dwellings across the 20 local government areas in Lagos were used. Diagnostic tests, the variance inflation factor and Box-Cox transformation were used to correct for multicollinearity and functional specification problems.

Household income, housing price, household size, marital status and age were the main determinants of the residential housing choice of households. The effects of gender and ethnic variables were not statistically significant. Household income would increase preferences and probabilities for flats, duplexes and single household houses by 7.24, 4.87 and 3.23 times respectively over multi-household houses. The probabilities, however, decreased by 0.02 and 0.85 times for squatters' settlements and a room in the main building relative to multi-household houses. Households preferences would increase for flats and duplexes by 4.58 and 3.50 times relative to multi-household houses when there is an

increase in housing price. The probabilities for squatters' settlements and a room in the main building are likely to fall by 0.33 and 0.47 times respectively relative to the base category. All these results were statistically significant at the 5.00% level. Other factors such as household size, marital status and age were also statistically significant at the 10.00% level across different residential density areas.

Household income and housing price stood out prominently as the major determinants of residential housing choice in Lagos. Economic factors were more important than demographic variables across different residential density areas. Meeting residential needs would require policies aimed at improving incomes and setting appropriate housing prices.

Key words: Household income, Housing price, Residential choice, Residential densities, Multinomial logit model

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CERTIFICATION

I certify that this work was carried out by Mr.Kazeem.Bello Ajide in the Department of Economics, University of Ibadan,Ibadan.

I. D. POLOAMINA

B.Sc (Econs), M.Sc (Econs),Ph.D,(Ibadan)
Supervisor and Chairman, Thesis Committee
Senior Lecturer of the Department of Economics,
University of Ibadan, Nigeria.

O. OLANIYAN

B.Ed (Econs), M.Sc (Econs),Ph.D,(Ibadan)
Member, Thesis Committee
Senior Lecturer of the Department of Economics,
University of Ibadan, Nigeria.

C. O. OLATUBARA

B.Sc (Geog.),(Ife), MURP (Ibadan),Ph.D,(Ibadan),FNITP,RTP
Member, Thesis Committee
Professor of the Department of Urban and Regional Planning,
University of Ibadan, Nigeria.

DEDICATION

This thesis is dedicated to the glory of the Almighty Allah, the Creator of the earth and the universe

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CHAPTER ONE
INTRODUCTION

1.1 Problem Statement

One of the prominent features of developing countries is the high rate at which the population is growing compared to the rather low rate of developed nations. Globally, the population growth rate has been steadily declining from its peak of 2.2% in 1963, but growth remaining high in East Asia and Pacific, Latin America and sub-Saharan Africa[1] (SSA hereafter). The population growth rates in these regions are more profound in the urban centres than rural areas. The urban population growth rates of North America and Europe, for instance, which averaged 2.0% and 1.8% respectively between 1950 and 1975, dropped steeply to 1.2% and 0.6% over 1975 to 2000 and has been projected to decline further to1.0% and 0.04% from 2000 to 2030. In contrast, the urban population growth rates of East Asia and Pacific, Latin America and SSA were 3.7%, 4.2% and 4.9% respectively, between 1950 and 1975. From 1975 to 2000, East Asia and Pacific has risen by 4% and that of Latin America fell precipitously to 2.7%, while sub-Saharan Africa dropping marginally to 4.7%. The projected percentages from 2000 to 2030 for the three regions are 2.2, 1.5 and 3.6 respectively. On the other hand, the rural population growth rates for Latin America, East Asia and Pacific range from 1.8% to 0.1 % between 1950-75 and 1975-2000 respectively, while that of SSA lies between 2.0% and 2.0% over the same periods.[2] The projected percentages from 2000 to 2030 for the regions are -0.3%, -0.8% and 1.3% respectively. These statistics show that the developing world is irreversibly changing from one of rural villages to that of urban dwellings.

In recent years, mega cities[3] world over have witnessed a very strong population growth. Mega cities are beginning to emerge in the Third World countries with attendant growth of urbanisation. For instance, the rate of urbanisation in Seoul is 7.8 %, Mexico city 5.5%, Bogotá 5.4%, and Nigeria (Lagos city) is 15% per annum (Olatubara, 2008). While the developed countries continuously respond to the rapid rate of urbanisation, this rate seems to exceed the speed with which urban managers and policymakers in the developing world are able to respond to the dynamics of the phenomenon. Consequently, the rapid urbanisation results in excessive demand for housing. This has created a wide gap between demand for and supply of housing units. Housing problem is expected to be worse in Nigeria with an

[1] See Ron Nielson, The little green handbook, 2006.
[2] The details of the population statistics can be seen in United Nation (2002) and World Bank (2002).
[3] The megacities used in this context relate to cities with population greater than 10 million.

explosive population of over 150 million. For instance, experts on Nigerian housing argue that there is a yawning gap between the need for urban housing (and housing generally in the country) and the available stock of dwelling units, and that this gap is still widening since the number of units constructed annually falls short of the growth in demand by households (Agunbiade, 1986; Ajakaiye and Akinbinu, 2000). In view of the shortages occasioned by excess population growth, determining the type of housing that people want as well as catering for their residential choices become important because housing expenditure represent a significant proportion of household income.

Lagos State is a promising mega city in Nigeria with an estimated population of over 18 million. In fact, Lagos epitomises the phenomenal growth in urban population, typical of most African cities (Aluko, 2004). Lagos city has continued to attract people from within and outside the country owing to the high level of commercial activities and increased job opportunities as well as basic amenities in the city. Further, as an important cultural as well as social metropolis in Nigeria, Lagos has continued to be a centre of attraction with an attendant rapid demographic growth, which has triggered excessive housing demand. Expectedly, the problem of housing in Lagos State is worse than that of any other state in Nigeria. For instance, the population of Lagos State which stood at 270,000 in 1952/53, rose dramatically to 5.69 million in 1991 and was estimated to be 18 million in 2010. This situation created excessive demand for housing. Available statistics on housing production showed that between 1974 and 1989, 11422 units of houses were produced but which fell precipitously to 8,162 units between 1994 and 2004. The estimated housing deficit for Lagos in 2010 was 5 million, representing 28% of the estimated national housing deficit. The gap between housing delivery and demand engendered by population growth has necessitated competition and choice making from the available housing alternatives.

The extent of the housing shortage in Lagos State is enormous. The inadequacies are far-reaching and the deficit is both quantitative and qualitative; even households with shelter are often subjected to inhabiting woefully deficient structures as demonstrated in the multiplication of slums from 42 in 1985 to over 100 by January 2010. In a city like Lagos, the population of residents in those settlements runs into hundreds of thousands (NEST, 1991). With no commensurate supply of housing units in the future, the problem of housing will become more evident and chronic as the population of Lagos City grows. The situation may possibly results in selecting out of the available residential alternatives as dictated by the limit imposed by scarce housing resource which makes the issue of residential choice a vital one. In line with the foregoing, residential choice decisions can, therefore, be largely

attributed to shortages necessitated by housing supply and proportion of housing expenditure in the overall individual spending budgets. For example, while some people choose to live in the city centre, others may prefer sub-urban or even intermediate-urban locations. Also, within these different residential locations, people may make a choice of living in a single household house, multi-household houses, while some may decide to choose flats, duplexes, a room in the main building or at best, squatters' settlements as the case may be. The reasons for making all these choices among different people vary. These include access to employment, business, educational, cultural or recreational opportunities and affordability. Other factors are familiarity with or type of location, perhaps as a result of growing up there; characteristics of the dwelling such as age, number of rooms, types of appliances or facilities available; or emotional attachment to a place or a lifestyle (Garling and Friman,2002; Gbakeji and Magnus, 2007). Thus, having a clear understanding of the dynamics of residential housing choice leads to well-informed decisions on how housing policy reformulation should be pursued with a view to curbing housing demand crisis.

The thrust of this study, therefore, is to evaluate the determinants of residential housing choice in Nigeria's largest commercial centre, in an attempt to answer some pertinent questions such as: What are the factors driving households' residential housing choice? Are there differences in these determinants across various residential density areas? What are the plausible policy implications of the foregoing?

1.2 Objectives of the Study

The main purpose of this study is to determine empirically the factors that influence residential housing choice in Lagos State, Nigeria. To achieve this, the study focuses on the following specific objectives. These are to:

(1) Examine the nature, structure and pattern of the residential housing markets in Lagos State, Nigeria.

(2) Analyse the determinants of residential housing choice in Lagos State, Nigeria.

(3) Analyse if variations exist in these determinants across different residential density areas in Lagos State, Nigeria.

1.3 Justification for the Study

Residential choice behaviour has stimulated renewed interest and consequently generated a large body of empirical studies. However, the greater part of these studies is focused on developed countries. There are few related studies conducted thus far in

developing economies[4]. From the housing literature, various factors have been adduced as reasons why people take, locate, prefer and live in some residential areas and not in others. These reasons differ both conceptually and empirically.

From the theoretical perspective, *residential location theory* indicates that the determinants of households' choice of residence include income of the household choice maker, family size, population density, rent and transport cost (Wingo, 1961; Alonso, 1964; Kain, 1968; and Muth, 1969). *Hedonic pricing theory* equalises peoples' residential choice preference to their demand for housing characteristics which include among others: structural factors (like lot size, average room size, number of bedrooms, ground floor space); neighbourhood factors (like pollution, school quality, recreational facilities and security) and locational attributes (for instance, average distance to Central Business Districts (CBDs), average distance to hospitals and airports). Under the *theory of consumer behaviour*, household choice is also analysed as a classical maximisation problem in which the consumer maximised utility function subject to budget constraints having as arguments: housing prices, income of the household, socio-demographic variables like age, education, occupational status and gender as determining factors influencing the choice of residence.

Empirical studies, on the other hand, have shown the influences of each of these different factors on residential location behaviour. Studies on influence of workplace on residential location are numerous (Guest and Cluett, 1976;Cooke, 1978, 1982; Desalvo, 1985; Quigley, 1985; Blackey and Follain; 1987; Broughton and Tanner, 1987; Evers, 1990; Olatubara, 1997, 2008). A number of studies have also looked at the relationship between accessibility of transport modes on residential choice (Weisbrod, Lerman and Ben-Akiva,1980; Waddel, 1996; Srour, Kockelman and Dunn,2002, Molin and Timmerman, 2003; Blijie, 2005). Some others have examined residential mobility and location (Ioannides, 1987; Kah, 2002; Pinto,2002). Individual travel pattern and residential location preference (Handy, 1996; Sermons and Seredich, 2001; Srinivasan and Ferreira, 2002; Cervero and Duncan, 2002; Schwanen and Mokhtarian, 2003). Residential location choice (for example, McFadden, 1978; Gabriel and Rosenthal, 1989; Weisbrod et al, 1980; Hunt, McMillan and Abraham, 1994; Sermons and Koppelman, 2001). Occupational status and residential choice (Massey and Denton, 1988; Dodson, 2004; Yates, 2005). Race and residential preferences (Wienk, Simonson and Eggers, 1979; Yinger, 1991; Zubrinsky and Bobo; 1996; Farley,

[4] Examples of related studies conducted on the developing nations include among others: Adedibu and Afolayan,(1989);Abiodun,(1990);Abumere,(1994);Arimah,(1994),Asiedu,(1999),Olatubara,(1994,1998, 2008),Sanni and Akinyemi,(2009).

Fielding and Krysan, 1997). Most of these studies do not specifically model the determinants of residential housing choice. Also, they have geographers', urban planners', civil engineers', quantity surveyors' and estate managers' orientations in their approach to the issue of residential choice behaviour. In addition, in most of these studies, the whole city is studied as a unit from which findings are generalised for the entire country. The approach has the tendency of glossing over local and sectional peculiarities[5], which might make the resulting outcomes to be taken with skepticism. Our study adds to the existing literature by attempting to unveil determinants of residential choice across residential density areas in Lagos State, Nigeria.

From the survey of the available literature, hardly has any attempt been made to test for appropriateness of the functional forms of the model used prior to estimation. In fact, quite a large number of studies on residential choice impose *a prior restriction* on their model before estimation. This may lead to model misspecification, erroneous and inconsistent estimates. In specifying a model, it is pertinent to derive information from the data itself (data-based model specification) instead of imposing an untested restriction in advance.

In addition, reviews of previous works mostly from developed nations reflect clearly the use of macro-data in their estimations (Srour et al, 2002, Molin and Timmerman, 2003; Blijie, 2005;Halicioglu,2005). Individual variations have not clearly emerged. As the picture painted by these studies is a general one, such usage of the aggregate data is likely to obscure the qualitative nature of housing characteristics. Ball (1973) notes that the use of aggregate data tends to inflate the explanatory power of the regression model. For instance, housing in one area cannot be considered a substitute for housing in another far away area. Therefore, the choice of houses as well as pricing is a local issue and national level data may obscure important economic differences between different towns, cities and regions. To capture the peculiarities of each density area, this study uses survey-based data collected for Lagos State.

This study, therefore, intends to fill these identified gaps by adding and contributing to the existing literature in the following ways: first, by explicitly modelling the determinants of residential housing choice, recognising the local peculiarities through residential areas classification between and within the units of the study areas; second, the study will test for appropriateness of the functional forms by selecting a suitable functional form through the use of Box-Cox transformation; and finally, it will take account of some vital variables which

[5] The activities of the local housing agents are so pervasive in the Nigerian housing market, most especially in the megacity of Lagos. The agency fees usually charged by the agent to the potential tenants may distort the renters' residential preference.

hitherto have not been taken into cognisance. These include ethnicity and religion as part of the variables affecting people's residential housing decisions.

1.4 Scope of the Study

This study focused on the Lagos metropolis. The choice is informed by the fact that Lagos is the city that has the largest metropolitan area in Nigeria (Ayeni, 1968, 1979). Due attention was given to the determinants of residential housing choice across the high, medium and low density residential areas. It also restricted its horizon to privately-owned and rented houses. Publicly provided houses like low-cost housing and government staff quarters were excluded. This is because rents paid on such institutional housing do not reflect prevailing market values. The area of study was classified into high, medium and low population density areas. This classification was based on the number of households per housing unit, the type of housing structure, the location and cost of land and availability of social amenities in such areas. This was carried out in collaboration with the Ministry of Works and Housing, Lagos State.

1.5 Organisation of the Thesis

The rest of this thesis is organised as follows. Following this introductory chapter, are chapters two and three which provide the background to the study wherein the structure, the pattern as well as the housing policy in Nigeria (specifically Lagos State) are presented. In chapter four, a review of the relevant literature is conducted, focusing on theoretical and empirical issues in residential choice behaviour as well as methodological differences in the literature. Chapter five presents both the theoretical framework and methodology of study. Chapter six utilises the models developed in chapter five to evaluate residential housing choice and provides the results as well as their interpretation. Finally, chapter seven summarises the findings of the thesis, discusses the policy implications that arise from the results and concludes with policy recommendations.

CHAPTER TWO
BACKGROUND TO THE STUDY

2.1 Introduction

This chapter presents the structure as well as key characteristics of the Nigerian housing market that may have major influence on the choice of residence. Thus, housing conditions such as the type of building materials used in the construction of the wall, the roof and the floor of the housing unit, safe drinking water, toilet and light are also addressed.

2.2 Structure of the Housing Market in Nigeria

Nigeria is one of the most urbanised countries in Africa, with its level of urbanisation put at 36% (Population Reference Bureau, 2001), and has the total land area of 923,769 square kms, which is more than thrice that of United Kingdom. It has the largest population in Sub-Saharan Africa (SSA) of about 140 million people from about 250 ethnic groups. Several census exercises have been conducted in Nigeria, the report of which in the early 1950's showed that there were about 56 cities in the country and about 10.6% of the total population lived in these cities. This rose dramatically to 19.1% in 1963 and 24.5% in 1985 (Ajanlekoko, 2001). With the current population, the urban dwellers constitute about 30%, due to rural-urban migration induced by the concentration of the gains from the oil sector in the urban area.

Given the phenomenal increase in the rate of population growth without corresponding increase in the housing provision both by the government and the private sector, the magnitude of housing problem in the economy becomes enormous. With the estimated population of 110 million as quoted in 1991 census report, Nigeria is said to require 720,000 housing units per annum on an estimate of nine dwelling units per 1,000 people. Olunubi (2004) estimates Nigerian housing shortage to stand at eight million units. Indeed, Abayomi (2007) states that Nigeria had a shortage of between 14 and 17 million housing units which would cost the government a total of #36 trillion to correct and that it would also take 30 years for the country to meet the demand considering its present budget.

Nigeria has six geo-political zones, namely: NorthEast, NorthWest, North Central, South South, SouthEast and SouthWest. Lagos State is in the southwest and is known to be highly concentrated with people from diverse backgrounds such that it is widely acknowledged that nearly all families in Nigeria have relatives or someone in it. Lagos State is located in the southern part of Nigeria with land area of 3577 square km (0.36 million

hectares). With the smallest land area, the State has the largest metropolis in Nigeria (Ayeni, 1968, 1979). It had been the administrative capital of Nigeria from 1914 through independence in 1960 and up till 1991 when the capital was moved to Abuja in central Nigeria. Lagos was a fishing and farming settlement in the 17th century. The arrival of the British made it to grow in importance as a centre of commerce and the administrative capital of Nigeria. It remains the dominant centre of non-agricultural production, distribution and business services in spite of the movement of the capital of Nigeria to Abuja. With the population of 1.444 million in 1963, which later rose to about 9 million, Lagos State is estimated to grow annually at the rate of 5.6 % (UN, 2002).

Lagos State offers an important linkage with the different economies of Nigerian localities through infrastructural facilities like roads, telecommunications, airports, seaports and markets. It also provides employment opportunities to a large number of people with varying skills both in the industrial and commercial sectors. The state also accounted for 62% of gross industrial output and 61% of the total national industrial value-added due largely to integration to the larger global economy through investment and trade (Abiodun, 1997). The effect of these developments is the increase in the population of the state. The influx of people from other parts of the country has led to an upsurge in the demand for houses. The resulting industrial and commercial growth, coupled with increasing population and rising rate of family formation have since then continued to put greater pressure on demand for housing. Over 90% of housing in metropolitan Lagos is provided by the private sector (Abiodun, 1997). Most of the houses are delivered to the market at exorbitant prices. The high cost of renting and the weak purchasing power of the low income earners result in overcrowding, emergence of slums, and substandard housing in several parts of Lagos. This is largely due to the fact that poverty has been identified as a major challenge facing the city. The estimated poverty level of 70% in Lagos State makes it one of the poorest of the world's largest cities (Ministry of Economic Planning and Budget, 2004).

Lagos State has always been the most populous in Nigeria except for 2006 census which reported that Kano State had the highest population of 9.383 million which is marginal when compared with that of Lagos State of 9.014 million. Table 2.1 reveals that the proportion of Lagos state population as a ratio of the entire country's population has been increasing steadily. The proportional increase was quite substantial as at 1991 census figure which jumped from 1.7% in 1952/53 to 6.4% in 1991, but later declined marginally to 6.3% in 2006.

The Tables 2.1 to 2.3 provide visual descriptions of the population and the extent of the housing problem encountered by the country.

Table 2.1: POPULATION CENSUS ACTUAL FIGURES OF NIGERIA AND LAGOS STATE

ITEMS	**1952/53**	**1963**	**1991**	**2006**
Total(in millions)	30.4	55.7	88.5	140
Proportion of Lagos State population in total population(in percentage)(B**)**	1.7	2.6	6.4	6.3
Lagos State population	0.270	1.444	5.686	9.014

Source**:** *Compiled from F.O.S* (various issues)

Table 2.2: NUMBER OF CONSTRUCTED BUILDINGS IN NIGERIA

ITEMS	**1994**	**1995**	**1996**	**1997**	**1998**
Number of buildings started(in tens)	110	130	501	588	646
Number of buildings completed(in tens)	49	109	261	262	293

Source: *Compiled from F.O.S* (various issues)

Housing provision has been left to the private sector, with government acting in the capacity of an enabler, promoter and facilitator to individuals and cooperating housing efforts rather than being a direct implementer of housing policy (Budley et al 1993). Table 2.3 shows that the prices at which these houses are delivered into the market are not within the reach of the low income groups.

Table 2.3: COST OF RENTING HOUSES PROVIDED BY THE PRIVATE SECTOR DEVELOPERS IN LAGOS STATE

LOCATIONS	TYPE OF HOUSING	COST OF RENTING PER ANNUM	POPULATION DENSITY AREAS
Lekki phase 1	5 B/R Semi-detached house with pent house plus BQ	#2.5 million	Low
Oniru Estate	5 B/R ensuite detached house with swimming pool, good environment and access road	#3.5 million	Low
Ikoyi	Block of flats apartment with each having 3 bedroom (New house)	#5 million per flat	Low
Park view	5 B/R detached house with BQ	# 6 million	Low
Lekki phase 1	3 B/R flat,	#1.3 million	Low
Surulere	3 B/R flat with 2 toilets and bathroom	#400,000	Medium
Ifako	4 B/R flat, 3 toilets,2 baths	# 400,000	Medium
Omole	3 B/R flat	#600,000	Medium
Magodo	3 B/R flat	#550,000	Medium
Ikeja	3 B/R flat	#500,000	Medium
Ebute-metta	A bungalow of 3 bedroom with three toilets,2 baths and 1 room ensuite	#300,000	High
Lawanson	3 B/R flat	#250,000	High
Oshodi	2 B/R flat, 2 toilets and 1 bath	#170,000	High
Abule egba	3 B/R flat	#130,000	High
Mangoro	3 B/R flat,2 baths, 2 toilets	#250,000	High
Yaba	3 B/R flat,2 toilets, 2 baths	#300,000	High
Ilupeju	3 B/R flat,2 toilets, 2 baths	#250,000	High
Ketu	3 B/R flat,	#250,000	High
Ogba	3 B/R flat,	#250,000	High
Egbeda	3 B/R flat,	#200,000	High
Palmgrove	3 B/R flat,	#200,000	High

Source**:** *Compiled from* www.nairaland.com (2007)

The cost of purchasing a house is very expensive in relation to peoples' income, as well as the cost of renting an apartment in Lagos metropolis. The residential housing market is highly segmented such that the cost of renting or purchasing a house varies from one location/place to another while the cost of renting in low population residential area is more than that of the medium and high population residential areas. For example, the cost of renting a 5-bedroom semi-detached apartment with a penthouse, inclusive of boy's quarters is #2.5 million in Lekki-phase 1, the cost of a block of flats apartment with each having 3 bedrooms is #5 million per flat in Ikoyi. For comparative analysis, a 3-bedroom flat in Lekki phase 1 costs 1.3 million per annum, whereas in Lawanson and Surulere, the cost of renting the same 3 bedrooms are #250,000 and #300,000 respectively. Even in Abule Egba and

Palmgrove, they cost #130,000 and #200,000 respectively. Despite these large variations in the cost of renting houses across these residential density areas, different reasons still influence people's choice of residence. The complexities in housing choice decisions deserve thorough analytical and empirical investigations.

2.2.1 Structural Characteristics of the Nigerian Housing Market

The Nigerian housing market is dominated by a house on a separate stand or yard, which is about 14,274,444 units of the entire housing stock of 28,197,085 units constituting about 50.6%. (Table 2.4). This is directly followed by traditional/hut structure which claims about 14% of the housing stock. The distribution of room/let-in house is also substantial, given the number of units (3,861,592) but the least in the distribution comes from informal/improvised dwellings and those in ''other'' categories constituting 0.6% and 2.0% respectively. In spite of this pattern of the housing distribution in Nigeria, variations are observed across the states as shown in Table 2.4.

Table 2.4: DISTRIBUTION OF HOUSEHOLDS BY TYPE OF HOUSING UNITS IN NIGERIA 2(TYPE OF HOUSING UNITS)

	House on a Separate or Yard	Traditional/ Hut Structure	Flat in Block of Flat	Semi-detached House	Room/Let In House	Informal/ Improvised Dwelling	Other	Total
LAGOS	438,103 (20%)	11,040 (0.5%)	433,613 (19.7%)	96,831 (4.4%)	1,174,972 (53.5%)	7,818 (0.4%)	33,465 (1.5%)	2,195,842 (100%)
ABUJA	139,708 (46%)	5,568 (1.8%)	68,410 (22.5%)	22,678 (7.5%)	64,014 (21%)	1,466 (0.5%)	1,748 (0.6%)	303,592 (100%)
KANO	730,211 (45.5%)	332,224 (20.7%)	85,580 (5.3%)	314,295 (19.6%)	87,540 (5.5%)	17,797 (1.1%)	35,688 (2.2%)	1,603,335 (100%)
ENUGU	464,971 (64%)	28,237 (3.9%)	69,593 (9.6%)	42,423 (5.8%)	83,262 (11.5%)	4,878 (0.7%)	32,403 (4.5%)	725,767 (100%)
RIVERS	654,113 (58.2%)	63,796 (5.7%)	198,513 (17.7%)	58,114 (5.2%)	132,714 (11.8%)	6,408 (0.6%)	10,340 (0.9%)	1,123,998 (100%)
NIGERIA	14,274,444 (50.6%)	3,944,091 (14%)	2,762,955 (9.8%)	2,638,932 (9.4%)	3,861,592 (13.7%)	158,022 (0.6%)	557,049 (2.0%)	28,197,085 (100%)

Source: *National Population Commission*,(2006).

For instance, majority of the housing units in Lagos State comprised rooms/let-in houses which are over half of the entire housing stock. In quantitative terms, rooms/let-in house are about 1,174,972 units (53.5%), flats have 433,613 units (19.7%) but the proportion of traditional/hut structure (0.5%) is negligible. The structure and pattern of the type of housing units in Abuja and Rivers is similar with housing units on a separate stand/yard and flats in blocks of flats respectively. The house on a separate stand/yard is conspicuously common in all the states except Lagos State where rooms/let-in houses are more pronounced. The housing market in Kano State presents a distinct housing structure since traditional/hut

structure type of housing units appear to be substantially more pronounced after the house on a separate stand/yard with 332,224 units (20.7%). Figure 2.2.1.1 provides a visual description of the various types of Nigerian housing unit provided in the market.

In Table.2.5, it is observed that the tenure status that is associated with the Nigerian housing units is predominated by owner-occupier houses which are 19,316,441 units (68.5%) out of 28,197,085 units. This suggests by implication that the home-ownership rate is high in Nigeria when compared to other types of tenure status. The proportion of rented houses is also substantial, considering the number which is 6,407,257 units representing 22.7% of the country's housing stock. Apart from Lagos State and Abuja, other states are dominated by owner-occupied houses.

Table 2.5: DISTRIBUTION OF HOUSEHOLDS BY TENURE STATUS OF DWELLING UNITS IN NIGERIA

	Owned	Owned but not yet paid off	Rented	Occupied rent free	Squatting	Other	Total
LAGOS	386,744 (17.6%)	12,106 (0.6%)	1,663,621 (75.8%)	114,124 (5.2%)	11,923 (0.5%)	7,324 (0.3%)	2,195,842 (100%)
ABUJA	101,819 (33.5%)	16,575 (5.5%)	161,830 (53.3%)	19,860 (6.5%)	2,144 (0.7)	1,364 (0.4)	303,592 (100%)
KANO	1,322,394 (82.5%)	77,735 (4.8%)	131,248 (8.2%)	46,508 (2.9%)	19,796 (1.2%)	5,654 (0.4%)	1,603,335 (100%)
ENUGU	509,760 (70.2%)	15,298 (2.1%)	160,545 (22.1%)	33,845 (4.7%)	4,707 (0.6%)	1,612 (0.2%)	725,767 (100%)
RIVERS	709,025 (63.1%)	11,025 (1.0%)	11,995 (1.1%)	302,007 (26.9%)	89,974 (8.0%)	8,309 (0.7%)	1,123,998 (100%)
NIGERIA	19,316,441 (68.5)	655,503 (2.3%)	6,407,257 (22.7%)	1,525,320 (5.4%)	214,361 (0.8%)	78,203 (0.3%)	28,197,085 (100%)

Source: *National Population Commission,(*2006).

In Lagos State, for instance, well over 70% of the entire housing units are rental in nature. This is clearly depicted by the number of rented housing units of 1,663,621(75.8%) out of 2,195,842 units with the remaining (24.2%) being shared by other types of tenure status. In Abuja, rented houses constitute about 53.3% while the proportion of owner-occupied houses is 33.5%. Out of the states under consideration, we observed that the number of owner-occupied houses is more substantial and conspicuous than any other tenurial arrangement. It is quite interesting also to note that houses that are being occupied free of charge are more prevalent in Rivers State than any of the considered states. In fact, houses that are rent free constitute about 26.9%. The negligible proportion of rented houses in the state could be attributed to the prevalence of many houses that are rent-free. Predominance of 'rent free' buildings in Rivers state might owe much to presence of abandoned buildings in the state.

These are buildings abandoned by fleeing Igbo owners during Nigeria's civil war of 1967-1970, and are still classified ' abandoned' to date. In sum, owner-occupier and rented houses constitute the highest proportion of tenure status of dwelling units in Nigeria.

Table2.6 presents the ownership status of dwelling units in Nigeria ranging from head of household to spouse of head of household, other household members, relatives but not household member, privately-owned (Landlord), private employer, other private agency, government and those in 'other' category other than those earlier mentioned. As can be observed, the bulk of the housing units owned by the head of household constituted about 65.4% of the 28,197,085 housing units. This is followed by private-owners (landlord) with 12.6% and other household members with 12.3%.

Table.2.6: DISTRIBUTION OF HOUSEHOLDS BY OWNERSHIP STATUS OF DWELLING UNITS IN NIGERIA

	Head of Household	Spouse to Head of Household	Other Household Member	Relative but not Household Member	Privately-Owned (Landlord)	Private Employer	Other Private Agency	Public/ Government	Other	Total
LAGOS	801,369 (36.5%)	58,688 (2.7%)	166,207 (7.6%)	33,812 (1.5%)	943,461 (43.0%)	52,173 (2.4%)	37,792 (1.7%)	77,411 (3.5%)	24,929 (1.1%)	2,195,842 (100%)
ABUJA	137,890 (45.4%)	5,929 (2.0%)	9,746 (3.2%)	3,570 (1.2%)	103,281 (34.0%)	7,656 (2.5%)	5,791 (1.9%)	28,062 (9.2%)	1,667 (0.5%)	303,592 (100%)
KANO	1,057,429 (66%)	33,170 (2.0%)	351,082 (21.9%)	27,355 (1.7%)	66,376 (4.1%)	14,606 (0.9%)	26,217 (1.6%)	23,252 (1.5%)	3,848 (0.2%)	1,603,335 (100%)
ENUGU	429,108 (59.1%)	21,017 (2.9%)	110,938 (15.3%)	14,816 (2.0%)	94,171 (13.0%)	9,834 (1.4%)	21,355 (2.9%)	21,766 (3.0%)	2,762 (0.4%)	725,767 (100%)
RIVERS	747,674 (66.5%)	31,541 (2.8%)	60,997 (5.4%)	44,932 (4.0%)	182,779 (16.3%)	12,239 (1.1%)	11,212 (1.0%)	27,032 (2.4%)	5,592 (0.5%)	1,123,998 (100%)
NIGERIA	18,446,049 (65.4%)	711,927 (2.5%)	3,464,016 (12.3%)	663,925 (2.4%)	3,555,258 (12.6%)	312,653 (1.1%)	359,336 (1.3%)	559,561 (2.0%)	124,360 (0.4%)	28,197,085 (100%)

Source: *National Population Commission, (2006)*

The least in the ownership status of dwellings in the distribution, apart from those in ''other category'' with 0.4%, is private employer with just 1.1%. This situation is not similar across board as it differs from state to state, most especially in Lagos where private ownership (landlords) is in the majority with about 43%. This is mostly applicable to rented buildings whose owners' interest is primarily being driven by profit motive. With the exception of Lagos State, all other states' housing ownership status is dominated by head of household. The proportion of home-ownership rate owned by head of household is more in Kano and Rivers than any of the other states as can be observed in the Table 2.6.

Having discussed the structure of the Nigerian housing market, the characteristics of the housing units will be examined by the type of materials used for the wall, roof, floor, toilet facilities, cooking fuel, lighting fuel and the method of solid waste disposal.

Table.2.7: DISTRIBUTION OF HOUSING UNITS IN NIGERIA BY THE TYPE OF MAIN MATERIALS USED FOR THE WALL

	Mud/Reed	Wood/Bamboo	Stone	Cement/Blocks/ Bricks	Metal/Zinc Sheet	Other	Total
LAGOS	51,520 (2.3%)	69,485 (3.2%)	15,963 (0.7%)	2,015,697 (91.8%)	31,670 (1.4%)	11,507 (0.5%)	2,195,842 (100%)
ABUJA	72,070 (23.7%)	4,097 (1.3%)	829 (0.3%)	215,724 (71.1%)	9,894 (3.3%)	978 (0.3%)	303,592 (100%)
KANO	920,458 (57.4%)	177,342 (11.0%)	39,691 (2.5%)	390,442 (24.4%)	57,545 (3.6%)	17,857 (1.1%)	1,603,335 (100%)
ENUGU	217,823 (30%)	22,452 (3.1%)	9,726 (1.3%)	436,348 (60.1%)	33,450 (4.6%)	5,968 (0.8)	725,767 (100%)
RIVERS	178,389 (15.9%)	69,802 (6.2%)	14,746 (1.3%)	775,091 (69.0%)	71,882 (6.4%)	14,088 (1.3%)	1,123,998 (100%)
NIGERIA	10,844,894 (38.5%)	1,909,538 (6.8%)	478,761 (1.7%)	13,627,530 (48.3%)	1,064,613 (3.8%)	271,749 (1.0%)	28,197,085 (100%)

Source*: National Population Commission,(2006)*

In Table 2.7, it is observed that cement bricks remain the most widely used walling materials accounting for 48.3% of the entire housing stock of 28,197,085 housing units. This is followed by mud or reed wall with about 38.5%. The rate of usage of wood/bamboo (6.8%) is more than that of metal/zinc sheet (3.8%). The situation of the entire country may not necessarily be reflective of the entire states of the federation. For instance, in Lagos alone, virtually all the housing units are made of cement walls (91.8%) unlike what is obtainable in other parts of the country most especially whereas in Kano, where 57.4% of the constructed houses are made of mud/reed walls. The use of wood or bamboo wall appears to be more common in Kano State. This may offer an insight as to the reasons why owner-occupied houses are in the majority in the state since the cost of procuring mud is not as expensive as that of cement or bricks. Cement or bricks enjoyed high level of patronage in all states considered except Kano

Table 2.8 reveals that cement/concrete is used in more than 50 percent of the housing units while 36.6% are floored by earth or mud bricks. This simply suggests that over 85% of houses in Nigeria are floored by either cement or earth bricks. By implication, houses in Nigeria have not attained high level of modernisation as suggested by the type of materials used for flooring. The modern materials used for flooring of houses like ceramic/marble tiles, terrazzo and vinyl tiles are not commonly used by house developers or estate managers as the

case may be. Apart from the nationwide description of the usage of flooring materials, differences are observed among the states.

Table 2.8: DISTRIBUTION OF HOUSING UNITS IN NIGERIA BY THE TYPE OF MAIN MATERIALS USED FOR THE FLOOR

	Earth/Mud/Mud Bricks	Wood/Bamboo	Cement/ Concrete	Stone	Burnt Brick	Vinyl Tiles	Ceramic/Marble Tile	Terrazzo	Other	Total
LAGOS	76,030 (3.5%)	43,278 (2.0%)	1,863,080 (84.8%)	17,735 (0.8)	7,943 (0.4%)	54,163 (2.5%)	59,393 (2.7%)	66,972 (3.0%)	7,248 (0.3%)	2,195,842 (100%)
ABUJA	45,775 (15.1%)	3,024 (1.0%)	214,245 (70.6%)	1,404 (0.5%)	1,853 (0.6)	12,587 (4.1%)	16,140 (5.3%)	8,080 (2.7%)	484 (0.2%)	303,592 (100%)
KANO	901,594 (56.2%)	144,200 (9.0%)	483,459 (30.2%)	21,579 (1.3%)	14,898 (0.9%)	10,187 (0.6%)	14,474 (0.9%)	7,239 (0.5%)	5,705 (0.4%)	1,603,335 (100%)
ENUGU	197,332 (27.2%)	13,511 (1.9%)	481,716 (66.4%)	9,522 (1.3%)	4,558 (0.6%)	5,205 (0.7%)	8,478 (1.2%)	4,361 (0.6%)	1,084 (0.1%)	725,767 (100%)
RIVERS	188,101 (16.7%)	32,960 (2.9%)	807,007 (71.8%)	12,326 (1.1%)	7,618 (0.7)	30,115 (2.7%)	33,944 (3.0%)	8,226 (0.7%)	3,701 (0.3%)	1,123,998(100 %)
NIGERIA	10,325,169 (36.6%)	1,441,026 (5.1%)	14,946,627(53%)	368,660 (1.3%)	200,333 (0.7%)	257,868 (0.9%)	348,454 (1.2%)	215,531 (0.8%)	93,417 (3.3%)	28,197,085 (100%)

Source: *National Population Commission,(2006)*

In Lagos State, for example, over 80% of the dwelling units used cement as the main flooring materials whereas in Abuja, Kano, Enugu and Rivers States cement floors account for 70.6%, 30.2%, 66.4% and 71.8% respectively. A casual observation depicts that mud type of floor materials appears to be dominating in Kano State. This shows as well as offers an insight into to the types and structural designs of houses available within the state. By and large, cement and mud floor appear to be the main flooring materials used in Nigeria.

From table 2.9, it is observed that the reigning roofing sheet in use in Nigeria is the corrugated metal sheet which claims as much as 47.3% of the entire housing units. It is also interesting to note that the use of thatched roof is far higher than that of slates/asbestos while thatched roof has as much as 15.8%, asbestos has just only 10.2%. The use of wooden/ bamboo, earth/mud and cement are also substantial given their number in the total housing stock.

Table 2.9: DISTRIBUTION OF HOUSING UNITS IN NIGERIA BY THE TYPE OF MAIN MATERIALS USED FOR THE ROOF									
	Thatch/ Palm/ Leaves/ Raffia	**Wood/ Bamboo**	**Earth/Mud/ Mud Bricks**	**Corrugated Metal/Zinc Sheet**	**Slate/Asbestos**	**Cement/ Concrete**	**Roofing Tiles**	**Other**	**Total**
LAGOS	29,955 (1.4%)	54,875 (2.5%)	14,578 (0.7%)	692,204 (31.5%)	990,871 (45.1%)	347,111 (15.8%)	55,055 (2.5%)	11,193 (0.5%)	2,195,842 (100%)
ABUJA	9,179 (3.0%)	4,249 (1.4%)	7,469 (2.5%)	239,252 (78.8%)	21,616 (7.1%)	16,738 (5.5%)	3,433 (1.1%)	1,656 (0.5%)	303,592 (100%)
KANO	275,973 (17.2%)	274,816 (17.1%)	332,906 (20.8%)	522,475 (32.6%)	89,321 (5.6%)	76,120 (4.7%)	21,581 (1.3%)	10,143 (0.6%)	1,603,335 (100%)
ENUGU	67,289 (9.3%)	26,035 (3.6%)	28,888 (4.0%)	508,985 (70.1%)	26,913 (3.7%)	54,077 (7.5%)	11,460 (1.6%)	2,120 (0.3%)	725,767 (100%)
RIVERS	134,058 (11.9%)	32,609 (2.9%)	18,399 (1.6%)	743,143 (66.1%)	88,763 (7.9%)	82,583 (7.3%)	20,436 (1.8%)	4,007 (0.4%)	1,123,998 (100%)
NIGERIA	4,456,459 (15.8%)	2,317,497 (8.2%)	2,689,455 (9.5%)	13,328,987 (47.3%)	2,888,127 (10.2%)	1,860,684 (6.6%)	499,604 (1.8%)	156,272 (0.6%)	28,197,085 (100%)

Source: *National Population Commission,(2006)*

The comparative analysis of each of the roofing type among the states depicts that Lagos housing units are mostly roofed with slates/asbestos, unlike other states where the use of corrugated roofing sheets is prevalent. It is also obvious from Table 2.9 that Kano housing units are roofed mainly with traditional roofing sheets like thatched, wooden and earth/mud roofs, whereas Lagos housing market appears to be more sophisticated than Kano's. Similarity is, however, observed between Enugu and Rivers States in the sense that corrugated metal sheets and thatched roofs are the most widely used roofing materials in those states.

Apart from structural characteristics of the housing units discussed under walling, flooring and roofing materials, the availability of toilet facilities, cooking fuel, lighting fuel and method of solid waste disposal are also discussed under housing characteristics of the Nigerian housing market.

Table 2.10: DISTRIBUTION OF HOUSING UNITS IN NIGERIA BY THE TYPE OF TOILET FACILITIES								
	Water Closet (WC)	**Pit Latrine**	**Bucket/Pan**	**Toilet Facility in Another (different) Dwelling**	**Public Toilet**	**Nearby (Bush/Beach /Field)**	**Others**	**Total**
LAGOS	1,090,969 (50.0%)	871,148 (39.7%)	46,844 (2.1%)	11,400 (0.5%)	47,063 (2.1%)	121,739 (5.5%)	6,679 (0.3%)	2,195,842 (100%)
ABUJA	134,673 (44.4%)	89,518 (29.5%)	4,949 (1.6%)	1,981 (0.7%)	12,664 (4.2%)	59,152 (19.5%)	655 (0.2%)	303,592 (100%)
KANO	145,360 (9.1%)	1,173,309 (73.2%)	103,463 (6.5%)	67,221 (4.2%)	68,395 (4.3%)	38,532 (2.4%)	7,055 (0.4%)	1,603,335 (100%)
ENUGU	135,394 (18.7%)	223,159 (30.7%)	15,612 (2.2%)	23,213 (3.2%)	107,550 (14.8%)	218,371 (30.0%)	2,468 (0.3%)	725,767 (100%)
RIVERS	301,385 (26.8%)	312,966 (27.8%)	26,568 (2.4%)	21,251 (1.9%)	268,599 (23.9%)	182,293 (16.2%)	10,936 (0.9)	1,123,998 (100%)
NIGERIA	4,292,654 (15.2%)	13,882,485 (49.2%)	1,053,753 (3.7%)	686,218 (2.4%)	2,573,611 (9.1%)	5,581,159 (19.8%)	127,205 (0.5%)	28,197,085 (100%)

Source**:** *National Population Commission,(2006)*

The main toilet facility that is used extensively is the pit latrine which has the highest percentage of 49.2%, and defaecating in the nearby bush/ beach amounting to 19.8%. This, in effect, depicts worsening state of the Nigerian toilet system as the modern toilet facility is observed to be uncommon. An improved toilet condition is, however, observed in some states of the federation like Lagos State and Abuja where the use of water closets appears to be prevalent. For instance, exactly half of the dwelling units make use of water closets in Lagos State while that of Abuja is about 44.4% but the proportion of users of same toilet facility in states like Kano, Enugu and Rivers are small comparatively. A preponderance of the states in the federation are using the unsanitary ways and filthy method of defaecating as depicted by the distribution of the type of toilet facility across the considered states with the exception of Lagos and Abuja. In Enugu, a large percentage (60.7%) of houses use pit and nearby bush as means of defaecating while in Rivers, water closets, pit latrines and public toilets remain the most patronised and available toilet facilities in use. Of the states in Nigeria, the use of pit latrine remains the main mean of defaecating in Kano as it accounted for about 73.2% as compared to other states.

Table 2.11 reveals that the firewood and kerosene provide the main cooking fuel type used extensively by households in Nigeria. In concrete terms, 57.0% of households makes use of firewood while 28.7% uses kerosene for cooking. All together over 80% find the use of firewood and kerosene more accessible and affordable to use over other available alternatives.

Table 2.11: DISTRIBUTION OF HOUSING UNITS IN NIGERIA BY THE TYPE OF MAIN COOKING FUEL									
	Electricity	**Gas**	**Kerosene**	**Fire-Wood**	**Coal**	**Animal dung/Saw Dust/Coconut Husk**	**Solar**	**Other**	**Total**
LAGOS	76,995 (3.5%)	141,104 (6.4%)	1,771,036 (80.7%)	140,651 (6.4%)	51,679 (2.4%)	3,045 (0.1%)	965 (0.04%)	10,367 (0.5%)	2,195,842 (100%)
ABUJA	15,175 (5.0%)	30,374 (10%)	143,456 (47.3%)	105,593 (34.8%)	6,991 (2.3%)	337 (0.1%)	129 (0.04%)	1,537 (0.5%)	303,592 (100%)
KANO	318,313 (19.9%)	49,305 (3.1%)	241,187 (15%)	950,749 (59.3%)	24,829 (1.5%)	11,422 (0.7%)	3,914 (0.2%)	3,616 (0.2%)	1,603,335 (100%)
ENUGU	57,336 (7.9%)	17,325 (2.4%)	174,470 (24.0%)	415,608 (57.3%)	54,097 (7.5%)	3,388 (0.5%)	2,021 (0.3%)	1,522 (0.2)	725,767 (100%)
RIVERS	37,935 (3.4%)	85,952 (7.6%)	549,789 (48.9%)	437,204 (38.9%)	7,671 (0.7%)	2,198 (0.2%)	1,081 (0.1%)	2,168 (0.2%)	1,123,998 (100%)
NIGERIA	2,147,347 (7.6%)	724,620 (2.6%)	8,087,203 (28.7%)	16,063,532 (57.0%)	906,080 (3.2%)	163,694 (0.6%)	41,786 (0.1%)	62,823 (0.2%)	28,197,085 (100%)

Source: *National Population Commission,(2006)*

The use of electricity, gas and coal is in varying percentages though substantially small , as the main cooking fuel in Nigeria. In terms of state comparisons, it is observed that a substantial number of households use kerosene (80.7%) as the main cooking fuel in Lagos State. This is not the same with other states like Kano (15%) and Enugu States (24%) where firewood serves as their main cooking fuel. Gas enjoys more patronage in Abuja(10%) while in Kano, the use of animal dung, sawdust and coconut husk is more prevalent as depicted by the usage of about 0.7% in relation to other states.

The distribution of households by the type of main lighting fuel in Nigeria is presented in Table 2.12. The table reveals that 58.2% of the households use kerosene as their main fuel for lighting. A possible explanation for this may be the incessant failure of electric power supply by the Power Holding Company of Nigeria (PHCN) which is the sole supplier of electricity in Nigeria. Another main source of lighting in Nigeria is through electricity which accounted for as much as 37% of the entire lighting fuel types. The use of gas and candle also serve useful purpose as far as lighting is concerned in Nigeria. The use of solar is quite negligible as it only accounted for 0.3% of the entire source of lighting fuel types in the country.

Table 2.12: DISTRIBUTION OF HOUSING UNITS IN NIGERIA BY THE TYPE OF MAIN LIGHTING FUEL							
	Electricity	**Gas**	**Kerosene**	**Candle**	**Solar**	**Other**	**Total**
LAGOS	1,891,540 (86.1%)	17,618 (0.8%)	240,355 (10.9%)	34,462 (1.6%)	2,635 (0.1%)	9,232 (0.4%)	2,195,842 (100%)
ABUJA	183,528 (60.5%)	3,035 (1.0%)	104,026 (34.3%)	9,838 (3.2%)	461 (0.2%)	2,704 (0.9%)	303,592 (100%)
KANO	446,968 (27.9%)	31,012 (1.9%)	1,022,096 (63.7%)	85,354 (5.3%)	9,148 (0.6%)	8,757 (0.5%)	1,603,335 (100%)
ENUGU	256,050 (35.3%)	9,676 (1.3%)	435,339 (60.0%)	20,122 (2.8%)	1,879 (0.3%)	2,701 (0.4%)	725,767 (100%)
RIVERS	437,765 (38.9%)	18,151 (1.6%)	638,052 (56.8%)	21,781 (1.9%)	1,887 (0.2%)	6,362 (0.6%)	1,123,998 (100%)
NIGERIA	10,422,427 (37.0%)	317,079 (1.1%)	16,402,533 (58.2%)	810,003 (2.9%)	87,029 (0.3%)	158,014 (0.6%)	28,197,085 (100%)

Source: *National Population Commission,(2006)*

Lagos State and Abuja take the lead among the states in terms of the usage of electricity as the main source of lighting fuel but the percentage acquisition by Lagos State(86.1%) is far higher than that of Abuja (60.5%). Other states use kerosene as their main lighting fuel which contrasts sharply with what is obtainable in both Lagos State and Abuja. The most important issue at this point is that both electricity and kerosene constitute and form the bulk of source of lighting to households in Nigeria. Though, there are differences among the states, to a large extent, they still share the source of lighting, of which electricity and kerosene form the largest part .

The method of disposing solid waste in Nigeria is still far below the internationally approved standard as 28.2% of wastes are being disposed at unapproved dump sites;19.3% are being collected; 20.4% are disposed at public approved dump sites while 19.9% are burnt by individual households, and 9.6% of the wastes are buried by households, as shown in Table 2.13.

Table 2.13 : DISTRIBUTION OF REGULAR HOUSEHOLDS BY METHOD OF SOLID WASTE DISPOSAL IN NIGERIA (METHOD OF SOLID WASTE DISPOSAL)							
	Collected	**Buried by Household**	**Public Approved Dump Site**	**Unapproved Dump Site**	**Burnt by Household**	**Other**	**Total**
LAGOS	1,171,872 (53.4%)	60,633 (2.8%)	484,777 (22.0%)	277,426 (12.6%)	176,239 (8.0%)	24,895 (1.1%)	2,195,842 (100%)
ABUJA	74,523 (24.5%)	10,654 (3.5%)	52,501 (17.3%)	129,171 (42.5%)	35,434 (11.7%)	1,309 (0.4%)	303,592 (100%)
KANO	433,151 (27.0%)	193,333 (12.1%)	346,022 (21.6%)	222,133 (13.9%)	359,746 (22.4%)	48,950 (3.1%)	1,603,335 (100%)
ENUGU	124,113 (17.1%)	78,701 (10.8%)	104,560 (14.4%)	231,276 (31.9%)	155,471 (21.4%)	31,646 (4.4%)	725,767 (100%)
RIVERS	111,219 (9.9%)	101,179 (9.0%)	447,341 (39.8%)	343,072 (30.5%)	99,018 (8.8%)	22,169 (2.0%)	1,123,998 (100%)
NIGERIA	5,439,274 (19.3%)	2,716,037 (9.6%)	5,759,200 (20.4%)	7,965,527 (28.2%)	5,615,273 (19.9%)	701,774 (2.5%)	28,197,085 (100%)

Source: *National Population Commission,(2006).*

From Table 2.13, it is clear that collection of wastes constitutes the main method of disposing wastes in Lagos State as it accounted for about 53.4%, 22.0% constitutes those wastes products being disposed at public approved dump sites and 12.6% are dumped at unapproved sites while those that are buried and burnt by households are 2.8% and 8.0% respectively.

In Abuja, the dumping of refuses at unapproved sites constitutes the most common mean of disposing solid wastes as it accounted for as much as 42.5%, wastes collected accounting for 24.5% while dumping of wastes and refuses at public approved dump sites and burning of wastes by households constituting 17.3% and 11.7% respectively. From the table the situation in Kano presents a different picture in the sense that wastes collected, wastes burnt by households and wastes dumped at public approved dump sites constituting the main waste disposal methods representing 27.0%, 22.4% and 21.6% respectively. The situation is however different in Enugu and Rivers where dumping of wastes at unapproved dump sites with 31.9% and dumping of wastes at public approved sites with 39.8% are the main wastes disposal methods. In Nigeria, wastes dumping at unapproved dump sites remain largely the main mean of disposing wastes as it accounted for 28.2% of the entire wastes disposal method, followed by wastes dumped at public approved dump sites with 20.4% while wastes collected and wastes burnt by household representing 19.3% and 19.9% respectively.

Given the nature and description of the Nigerian housing market, it will be noted from the foregoing that Lagos State housing market has distinctive features that make it different from others. Apart from the fact that it has a relatively developed and organised housing structure, it also has a larger population which accord her the status of the megacities in Africa in general and sub-Saharan Africa (SSA) in particular.

2.3 HOUSING POLICY IN NIGERIA

Introduction

Housing is an important basic human need after food; as such, the method, structure, pattern, strategy and mode of its provision are usually contained in a policy. How well a nation performs in her evolved housing policy and how successful she is in achieving the established housing policy goals and objectives depends to a large extent on how serious the nation takes the issue of housing and how well the intricacies of housing problems are understood (Agboola, 2007).

In this section, attempts will be made to review housing policies and programmes adopted in the past in Nigeria. This will be achieved by reviewing the policies in terms of achievements, mechanisms put in place for the housing goals and objectives to be achieved and their weaknesses.

All these we intend to achieve by undertaking the analysis under different periods, ranging from the colonial period (up to 1960), the post-independence period (1960 to 1979), 1979 to 1983 and May 29, 1999 to date.

Colonial Period (Up to 1960)

During the early colonial period, the housing activities and policies of the Nigerian Government were based mainly on the provision of quarters for expatriates and for selected indigenous staff in some specialised occupations, such as railways, police, armed forces and education. During this period, the population growth could be said to be moderate and manageable; thus housing problems were more of qualitative than quantitative deficiency. Hence, the existence of Government Reservation Area (GRA) for expatriate officials which can aptly be described as the era of "housing reservations". No concrete efforts were made by the then government to build houses either for sale or rent to the general public and little was done to order the growth of settlements outside the reservation areas. At this period, development in public housing was limited to Lagos State and the regional provincial headquarters. The factors which informed this public housing development arising from these critical situations are as outlined below.

(i) The bubonic plague which ravaged Lagos State in the early 1920s brought into existence Lagos Executive Development Board (LEDB) and the approval of the Lagos Central Planning Scheme, the first attempt at solving the problems of public housing in the state.

(ii) The strike action by railway workers in 1945 forced government to build estate for such workers at Surulere and the outskirts of the then capital city of Lagos (Gbaja Randle Avenue and Akerele Extension).

(iii) The slum clearance of central Lagos, which was induced by the preparation for Nigeria's independence resulted in the building of additional houses in Surulere adjoining the workers' estate, this was the first attempt at housing and urban renewal. The Nigerian Building Society (NBS), created in 1956 was among other strategies and measures taken by the government to provide mortgage loans in order to satisfy Nigeria are, housing needs. The mortgage operations of NBS, however, recorded little success because of poor funding and response to the saving schemes of the society. Thus, civil servants were encouraged towards home ownership through the introduction of the African Staff Housing Scheme in 1956. Regional governments created housing corporations to provide housing for its people prior to independence.

The Post-Independence Period (1960 – 1979)

After the attainment of political independence, the need to strengthen, modernise and achieve rapid growth necessitated formulation and emphasis placed on the five-year development plans. In the First National Development Plan of 1962 -68, housing factor was not given particular attention but rather made to suffered complete neglect. Though the importance of housing was appreciated as contained in Town and Country Planning as Egunjobi (1994) rightly observes that the problem of overcrowding in the Federal Territory of Lagos and other urban centres is dwelling recognised by the plan. Hence, a target of 24,000 public housing units to be completed by the NBS with the African Staff Housing Fund was set. Agbola (2007) further submits that few achievements could be said to have been made by way of direct construction. The activities of the housing agencies were limited to the regional capital towns of Ibadan, Enugu, Benin City, Kaduna and Lagos.

Second National Development Plan (1970 – 1974) was formulated against the background of unprecedented growth in urban population and in the physical expansion of the cities of Lagos, Ibadan, Kano, Port Harcourt, Enugu, Benin City and Kaduna. These were brought about by oil boom and a significant rise in revenue from oil exploration during the first military era. These phenomena actually formed the basis for the housing programmes coupled with the outbreak of civil war between 1967 and 1970 in the plan. In 1971, the National Council on Housing comprising state commissioners in charge of housing matters

was established. This marked the first significant and direct attempt by the Federal Government to intervene housing matters. This intervention led to the establishment of a National Housing Programme during the second plan in 1972. Consequently, the Federal Government intended to construct 59,000 dwelling units with 15,000 in Lagos and 4,000 in each of the other 11 state capitals in order to solve the urban housing problem and rehabilitate war-damaged dwellings. This actually led to the creation of Federal Housing Authority (FHA) in 1973 to coordinate a nationwide programme.

The Third Development Plan (1975 – 80) was adjudged the most comprehensive ambition and active intervention by the government in the housing sector in the history of Nigerian development plans. This was likened and attributed to the oil revenue realised by the country. Federal Government directly intervened and participated in the housing provision rather than principally leaving it to the private sector. During the period of the plan, N2.6 billion was earmarked for the implementation of the various projects. This represented about 5.6 % of the planned total expenditure in all sectors. With this allocation, 202,000 housing units were targeted for construction with 50,000 units in Lagos State and 8,000 units in each of the other 19 states. According to the first progress report of the Third Development Plan, performance in the housing sector has been grossly inadequate (Federal Republic of Nigeria, 1976 and Egunjobi 1994). The second progress report emphasises that "progress has been below expectation". Accordingly, less than 15% of the planned dwelling units during the Third Development Plan period were actually completed (Federal Republic of Nigeria, 1991).

During the same period, as part of mechanism for housing provision and delivery, Federal Ministry of Housing, Urban Development and Environment was created in 1975. This was charged with the responsibility of initiating and coordinating policies in housing related area. This ministry existed only for a brief period. Some decisions on housing were reached during this period. First, the setting up of a committee on standardization of house types, and policies, which marked the first attempt of government at recognizing the housing problems encountered by the low-income group who earned less than N3,000 per annum. The recommendations of the committee further led to the acceptance of the Low Income Housing Concepts and Strategies of the World Bank.

Second, was the passing of the Rent Control Law. The Rent Panel of 1976 reviewed the structure and level of rent for the entire country. The recommendations of the panel resulted in the state rent tribunals to be established, which turned out to be ineffective in controlling rent. Third, was the passing of Land Use Act (FGH, 1991; Egunjobi, 1994 and

Agbola, 1998). The Act was promulgated based on the recommendations of the Land Use Panel of 1977.

Another major event which took place during the plan period was the conversion of NBS in 1977 into Federal Mortgage Bank of Nigeria with a capital base of N20m which was later increased to N150m in 1979.

The 1979 to 1983 Period

This period coincided with the second civilian administration. During the period, due to increasing deficit of urban housing as well as its continuous deterioration in the rural areas, high priority was accorded housing provision. This development later induced an elaborate National housing programme, with the housing low-income groups as the target. These groups were those whose annual income did not exceed N5,000 for one bedroom core houses, and also the medium income group with an annual income not exceeding N8,000 for a three bedroom house. A total of N40,000 units were to be constructed annually nationwide with N2,000 units located in each state and the Federal Capital Territory (FCT), Abuja. By June 1983, only 32,000 units had been completed, producing an overall achievement of just 20% (FRN, 1990). The second phase of the programme which commenced with 20,000 units of two bedroom core houses, for low-income group failed to take off in most states. In fact, an estimated sum of N600m (316%) was expended out of N19 billion budgeted for building by the Federal Government in the fourth National Development Plan (1980 – 85). The overall impact of such investment on housing market was negligible. Notably, was during the period that the first housing policy was formulated.

1984 to May 28, 1999

Apart from the Fourth National Development Plan which extended into this period, the 1991 National housing policy was also formulated. This policy was drawn up by a ten-man committee in order to rectify the defects in implementation and inadequacies of past policies, objectives and programmes. The ultimate goal of the 1991 National Housing Policy was to ensure all Nigerians own or have access to decent, safe and sanitary accommodation at affordable prices by 2000 AD.

In fact, the policy was the second housing policy ever embarked upon by the country. It was regarded as the most detailed and most debated housing policy because it addressed many vexed problems of the housing sector. For instance, the policy looked into the problems of availability and accessibility to land, building materials problems such as sourcing, cost and availability and dwelt extensively on the institutional apparatus and strategic modalities for policy implementation.

Also, for the ultimate goal of the 1999 National Housing Policy to be achieved, the following structures, institutions and laws were created:

(a) Employee Housing Scheme (special provision) Act (Cap 107)

(b) Federal Housing Authority Act (Cap. 136)

(c) Mortgage Institutions Act (Cap 231).

(d) National Housing Fund Act (Decree No 3 of 1992).

(e) Urban Development Bank of Nigeria Act (Decree No 51 of 1992).

(f) Urban and Regional Planning Act (Decree No 88 of 1992)

(g) Nigerian Social Insurance Trust Fund Act (Decree No 73 of 1993).

(h) Federal Mortgage Bank of Nigeria Act (Decree No 82 of 1993).

(i) National Construction Policy, 1991; and

(j) National Urban Development Policy, 1997.

The policy strategy was the establishment of the National Housing Fund Scheme to mobilise loanable funds from workers, which would be disbursed through the newly created primary mortgage institutions with the rejuvenated Federal Mortgage Bank of Nigeria (FMBN) playing the role of apex/supervisory body.

Despite the good intentions of the policy, as evident in its contents and various institutional apparatus established to actualise them, the performance of the housing sector remains practically the same at least in terms of inadequacy both in quantity and quality. As observed by Agbola (1995), there is a widening and frightening gap between aspirations, expectations and the capacity of realisation and a yawning chasm between the magnitude of demand and the capacity of supply.

From 1999 to Date

The situation in the housing subsector still remains as it was in the past given that in the beginning of 1999, housing development was grossly neglected. The implication is that successive governments did not place any premium on housing issues as being a priority because on many occasions no annual budgetary provision on housing was made.

National Economic Empowerment Development Strategy (NEEDS), a home-grown document, introduced a paradigm shift in the housing subsector. This paradigm shift lies on the reliance of private sector as medium of achieving economic growth. During this period, the 2002 Third National Housing Policy evolved. The evolvement of such policy was directly informed as a result of lapses of the 1991 housing policy. The main thrust of the policy is the use of the private sector as the fulcrum of the new policy. According to Agbola (2007), this represents a major shift in government's view on how to promote mass housing

for the citizens. The essential ingredients of this policy were aptly described by Mabogunje as follows:

> *The main thrust of the new policy is to seek vigorously to make an increasing majority of Nigerians home-owners on the basis of mortgage finance". This policy entails involving a large number of private sector, real estate developers and State Housing Corporations in the development of estates with houses for sale at affordable prices to low and middle income groups in the country; promoting the growth of many small and medium-sized industrial enterprises to provide local construction materials of all types to keep the cost of producing houses within reasonable limits; mobilising primary mortgage institutions to assist any Nigerian desirous of purchasing a house on how to access mortgage finance, restructuring the Federal Mortgage Bank of Nigeria to be able to provide ample and abundant funds besides the National Housing Trust Fund to meet the secondary mortgage transactions for home-ownership; reviewing and amending all legislations necessary to facilitate the robust development of home-ownership in the country; and setting up a Federal Ministry of Housing and Urban Development to regulate, promote, monitor and supervise all of these changes.* Mabogunje, 2004, p. 1

CHAPTER THREE
LAGOS HOUSING MARKET AND ITS QUALITY

3.1 Introduction

This chapter presents the background information about Lagos State, structure as well as key characteristics of the State's housing market that may influence the choice of residence across different residential density areas. Thus, housing conditions such as type of building, materials used in wall construction, the roof and the floor of the housing unit; safe drinking water, toilet and light were also addressed.

3.2 Background Information

Lagos State is the smallest state in size in Nigeria, with an area of 356,861 hectares of which 75,755 hectares are wetlands, yet it has the highest population which is 5% over the estimated national average. The state has a population of 17,552,942 million representing 12% of national estimate of 150 million with growth rate of between 6% and 8%. The UN estimates that at its present growth rate, it will be third largest mega city in the world by the year, 2015 after Tokyo in Japan and Bombay in India. Over 91% of the total population live in the metropolis with an annual growth of about 600,000 and a density of about 4,193 persons per sq. km. In the built-up areas of metropolitan Lagos, the average density is over 20,000 persons per square km with 72.5% of households occupying one-room apartments and occupancy ratio of 8 to10 persons per room. Notably, while the country's and global's population growth rates are 4.5% and 2% respectively, Lagos state's rate is growing ten times faster than that of New York and Los Angeles with grave implication for urban sustainability and housing delivery.While population growth rate in metropolitan Lagos has assumed geometrical proportions, the provision of urban infrastructure and housing to meet the concommitant increase demand is not at commensurate level. This has resulted in an acute shortage of housing in Lagos State,with the state alone accounting for five million deficit, representing 31% of the estimated national housing deficit of 18 million. The extent of the housing shortage in Lagos is enormous. The inadequacies are far-reaching and the deficit is both quantitative and qualitative; even those households with shelter are often subjected to inhabiting woefully deficient structures as demonstrated in the multiplication of slums from 42 in 1985 to over 100 by January 2010.

Efforts have been made by successive governments in Lagos State to provide accommodation but the emphasis varies from one regime to another. The governments in question have been helpless in providing adequate and low-cost housing since 1955 to date in the face of rapid population growth. For example, according to Adedokun (1982), the defunct Lagos Executive Development Board (LEDB) could only provide a total of 4502 housing units in 17 years between 1955 and 1972 when the Board was dissolved, whereas the population of the state grew from about 1.2 million in 1960 to about 3.0 million in 1972, an increase of 2.8 million persons within just 12years.

The Lagos State Development and Property Corporation (LSDPC) undertakes housing provision in Lagos metropolis in particular and the entire state in general. The corporation was established under edict No.1 of 1972 after the merger of Lagos Executive Development Board (LEDB), Ikeja Area Planning Authority (IAPA) and the Epe Town Planning Authority (ETPA). It has the following responsibilities,to promote: (i) Executive Income Housing Programme; (ii) Medium Income Housing Programme and; (iii) High Rental Housing Programme.

Since its inception, the activities of the corporation have been more pronounced in metropolitan Lagos other than in any part of the state. According to Abiodun (1988), between 1972 and 1975, LSDPC completed the following housing estates: (i) Surulere Medium-Income Houses (Games villages) ;(ii) Isolo Low and Medium-Housing Schemes; (iii) Ogba Housing Project; and (iv) Akerele Extension, Surulere (low-cost housing).

The contributions of the LSDPC to housing in Lagos metropolis between 1980 and 1997 amounted to 21,630 housing units. This is made up of 12,072, which are low- income houses, 1,798 medium-income houses and 760 houses for the upper-income earners (Lagos State Diary, 1997). These figures tend to show that more low-income housing units were provided than the other types (medium and high income). Observably, the prices of these houses are so high that they are not affordable to the low-income earners. Thus, these houses are usually purchased by the wealthy in the society, who in turn let out the buildings to the poor at exorbitant prices.

The first civilian administration in the state, which came to power in 1979, embarked on ambitious public housing project. The goal was to provide 200,000 housing units in the state between 1979 and 1983. However, Abiodun (1993) notes that “at the end of the civilian administration in December 1983, 20685 applicants were given letters of allocation while only 10,428 housing units had been completed. Others were at various stages of construction.

Table 3.1: Completed Housing Units by the Lagos State Government between 1998 and 2005

Housing Type/Year	Economic	Medium	Upper Medium	High	Total
Jubilee Housing Scheme					
1999	120			-	120
2000	1507			-	2515
2001	-	912	96	-	-
Alliance Housing					
2002	454		-	-	454
2003	-		-	-	-
2004	138	270	1560	-	1830
2005	-	68	52	64	321
Total	2219	1250	1708	64	5240

Source: *Ministry of Housing, Alausa Ikeja,Jan, 2005*.

The civilian administration which came to power in 1999 came up with the Millennium Housing Scheme. The goal was to "provide numerous and affordable houses for teeming masses of Lagos state. The main objective was to make available 45,000 housing units within the lifetime of the administration. This number would comprise upper, medium and low income in the following ratios: 10: 20: 70, respectively. However, the Table 3.1 shows a wide difference between the total number of housing units promised by the government and the total number delivered to the populace. The Table shows that for six years (1999 to 2005), the Lagos State Government was able to deliever a total of 5240 housing units with 42% as low-income; 23.85% as medium-income and 1.22% as high-income housing units. Over 21,000 housing units are either under construction or are being proposed.

Another objective of the millennium housing scheme was to ensure that housing schemes were widespread to all local governments in Lagos State. As can be observed in Table 3.2 , this objective has been fairly fulfilled judging by the widespread nature of government's housing projects.

Table 3.2: List of Proposed and Existing Housing Schemes in Lagos State

Schemes	Economics			Medium		Upper Medium		High			Remarks
	Area in hectares	No of block	No of Units	No of block	No of Units	No of block	No of Units	No of block	No of Units	Total Units	
Millennium mixed housing scheme Ikeja I	1.308					8	60			60	Uncompleted
Millennium mixed housing scheme Badagry	12.436	111	222	24	24					246	Proposed
Millennium mixed housing scheme Akanimodo Ajelogo	24.39	63	852	47	376	34	396			1624	Proposed
Millennium mixed housing scheme Ojota	3.372	16	192							192	Proposed
Millennium mixed housing scheme Ojokoro	8.363	16	192							192	Proposed
Millennium mixed housing scheme Ikeja II	1.118							30	30	30	Uncompleted
Millennium mixed housing scheme Igbogbo	0.774	5	48							48	Proposed
Millennium mixed housing scheme Ewu-elepe Ikorodu	7.24	85	170							170	Uncompleted
Millennium mixed housing scheme Ayobo	47.76	308	616	204	408					1024	Proposed

Millennium mixed housing scheme Alaagba	1.217	8	96							96	Uncompleted
Millennium mixed housing scheme (Agege)	6.9	53	768							768	Proposed
Millennium mixed housing scheme Ilupeju	1.0117			6	48					48	Uncompleted
Millennium mixed housing scheme Ajah	19.42	44	704	68	544					1248	Proposed
Ejintin Resettlement Scheme (Ikorodu)	27.73	41	63							631	Proposed
Millennium mixed housing scheme Olokonla	4.21	9	144	16	128					272	Proposed
Millennium mixed housing scheme Egan/Igando	16.307	66		20	160	1044				1204	Proposed
Total			6805		4965		3702			21484	Uncompleted

Source: *Ministry of Housing, Alausa, Ikeja, Jan., 2005*

However, the crises in housing still persist due to exponential rate of growth in population. According to the 1991 census, the population of Lagos State stood at 5.686 million. The projected populations for 2005 and 2010 were 16.095 million and 20.057 million, respectively (Table 3.3). UNCHS (1996) has predicts that Lagos metropolis will be the third largest city in the whole world in 2015 with a population figure of 24.5 million while Bombay in India will have 26.5 million and Tokyo in Japan will have 28.7 million. In addition, the population of Lagos metropolis accounted for about 88% of the state's population in 1978 and has increased to 90.98% in the year 2000. Lagos metropolis, no doubt, is overcrowded with people due to uncontrolled immigration from other parts of the

country and within the state. According to Lagos State Diary (1997), the population growth rate is about 300,000 persons per annum with a population density of about 1308 persons per square kilometer. In the built-up urban areas, the average density is 20,000 persons per square kilometer. These figures show serious overcrowding in several parts of the state, underscoring the fact that Lagos State is the most densely populated part of the country. Housing shortages have resulted in increasing pressures on infrastructural facilities and the rapidly deteriorating environment.

Table 3.3: Analysis of Population Growth of Lagos Metropolis 1978-2010

Year	Metropolitan Lagos(000)	Lagos State (000)	Population of Lagos as percentage of that of the state.
1978	3779	4300	87.88
1980	4518	5092	88.72
1985	6414	7132	89.93
1990	8406	9290	90.92
1995	10406	11471	90.71
2000	12949	14232	90.98
2005*	15754	16903	93.20
2010**	19167	20075	95.47

Source: *Master plan for metropolitan Lagos, Wilbur and Smith and Associates, 1980, 2005*, 2010** population projected assuming same growth rate between 1995 and 2010.*

3.3 Characterisation of Lagos Residential Market

The Lagos housing market and tenurial arrangement is characterised by renting which was estimated at 60.7% in 2000 by Aluko,(2002) whereas National Bureau of Statistics (2005) reports put Lagos renting at 60.5%, normal rent 15.3%, free rent 10.5% and subsidized rent 13.7%. By implication, owner-occupied houses are not the predominant form of residential housing in the Lagos Metropolis.

The distribution of population in Lagos State clearly depicts three categories of residential areas namely: high, medium and low. Each of these residential areas has distinctive features which differentiates it from the others.

High Density Residential Areas

In high population density areas, the occupancy ratio and housing density are high. These areas are inhabited by low-income households. Most of the areas are noted for their prevailing conditions such as high density (average ratio 1:2.4), poverty, poorly built and maintained houses, unemployment, reliance on public services, crimes, vandalism,

delinquency, arson, drug addiction and absolute low standard of living. Nutrition and sanitation are magnified and come to dominate the entire environment (Aluko,2004).

These areas are also referred to as informal, unauthorised or illegal sector. They are akin to slums and are usually occupied by migrants from other regions of the country or from some of the neighbouring countries. The residents are mostly engaged in lowly pay jobs. Houses within the sector are largely illegal or unauthorised because their construction contravenes the city's housing construction codes on materials used and technique employed. The ownership structures within the sector are dominated by the extended family system. These areas also displayed the worst environmental and housing conditions with the city's haphazard distribution of houses which hardly leaves space between the units. In Lagos State, these are mostly found in places like Lagos Island, Mushin, Ajegunle, Oshodi and Okokomaiko.

Medium Density Residential Areas

These are inhabited by upper and middle-income households. The areas are relatively good with minimum density. The average number of rooms is three with average number of persons in the household as 6.2 (ratio 1:2.1). Most of the buildings consist of blocks of flats, 2-3 building floors and some multipurpose/ rooming houses. The buildings are averagely maintained (Aluko, 2004).In Lagos, these areas can be found in places like Yaba/Ebute Metta ,Ikeja,Isolo,Apapa, Gbagada and Awumo-Odofin .

Low Density Residential Areas

This comprises high-quality neighbourhood and community environment. The buildings are usually well-maintained and provided with neighbourhood facilities. In essence it commands high value. The areas are of low density and well-planned. The average number of rooms is 4-6, average number of persons in the household is 6.1 (Aluko, 2004). The ratio is about 1:1.3. This area is characterised by decreasing residential density of single family dwelling, affluent members of the city, essentially the middle-income class of white collar employees and professional people. The area has a proper layout, good infrastructure and sufficient social amenities. The area can be regarded as a high-cost sector because the housing environment is neat and top-class with neighbourhoods that are dominated by modern single-storey family houses. The sector caters predominantly for top civil and public servants and expatriates. During, and in the colonial era, it used to be the preferred place for Europeans and other foreign settlers. Home ownership within the high-cost sector is primarily individual or nuclear family. These are found in places like Victoria Island, Ikoyi, Lekki and Magodo.

3.3.1 Structure and Characteristics of Lagos Housing Market

Housing market in Lagos State is predominantly characterised by rental tenurial arrangement. The real estate market in the State is basically dominated by residential property whose construction was driven primarily by profit motive of the estate managers and housing developers. From Table 3.3, it is observed that rented houses constitute over 80% of the entire housing market. For example, houses where normal rents are paid account for about 50% while that of subsidised and free rents are 32.7% and 3.4% respectively whereas owner-occupier houses are just 13.9%. The proportion of home ownership is small relative to rental houses. The percentage of rented houses is high in all the residential density areas with high residential density area having 90%, medium residential area with 81% and low residential density area with 72.7%. This is further supported by table 3.4 where households renting the dwelling at market rent constitute about 50% of the entire housing market while 32.2% of the households pay nominal/subsidised rent. The prevalence of the rental tenurial arrangement can be attributed to private sector participation in the housing provision as compared to government sector whose contribution to total housing stock is negligible particularly after the federal government introduced structural adjustment programme (SAP) in the late 1980s. the private sector's ultimate goal of maximizing personal profits, explains why attention is accorded rental houses which were believed to produce constant flow of income than to building for owner-occupation. In essence, the production of houses is for investment rather than consumption decision. This explains why buildings for owner-occupation is more prominent in low residential density areas, than in high and medium residential density areas as depicted in Table 3.3. It is, however, interesting to note that most of owner-occupier houses are owned by household heads who constitutes 13.8% in low residential density areas, 5.1% in high and 11.5% in medium residential density areas respectively. Subsidised houses are higher in the high residential density areas than any other residential area while free rents appear to be dominant in low residential density areas.

Table 3.4: Percentage of Households' Tenure Status Cross-classified by Residential Density Areas

VARIABLES	FREQUENCIES (percent)			
	High Residential Density Area	**Medium Residential Density Area**	**Low Residential Density Area**	**Total**
Tenure Status				
Owner-occupier	166(7.5%)	382(15.7%)	288(21.3%)	836(13.9%)
Normal rent	1212(54.7%)	1203(49.4%)	585(43.3%)	3000(50%)
Subsidised rent	793(35.8%)	770(31.6%)	397(29.4%)	1960(32.7%)
Free rent	46(2.1%)	77(3.2%)	80(5.9%)	203(3.4%)
Others	0(0%)	1(0%)	1(0.1%)	2(0%)
Total	**2217(100%)**	**2433(100%)**	**1350(100%)**	**6000(100%)**

Source: *Computed from Lagos Housing Survey, (2006)*

Table 3.5: Percentage of Households' Ownership Status Cross-classified by Residential Density Areas

VARIABLES	FREQUENCIES (percent)			
	High Residential Density Area	**Medium Residential Density Area**	**Low Residential Density Area**	**Total**
Ownership by Tenure Status				
Dwelling s owned by head	113(5.1%)	280(11.5%)	186(13.8%)	579(9.6%)
Dwellings owned by head & spouse	16(0.7%)	32(1.3%)	28(2.1%)	76(1.3%)
Dwellings by owned spouse	6(0.3%)	17(0.7%)	7(0.5%)	30(0.5%)
Dwelling owned by another member of household	37(1.7%)	70(2.9%)	74(5.5%)	181(3.0%)
Household rents: the dwelling at market rent	1212(54.7%)	1203(49.4%)	585(43.3%)	3000(50%)
Household rents: the dwelling and pays nominal/subsidised rent	787(35.3%)	753(30.9%)	390(28.9%)	1930(32.2%)
Uses without paying rent	46(2.1%)	77(3.2%)	80(5.9%)	203(3.4%)
Nomadic or temporary dwelling	0(0%)	1(0%)	1(0.1%)	2(0%)
Total	**2217(100%)**	**2433(100%)**	**1350(100%)**	**6000(100%)**

Source**:** *Computed from Lagos Housing Survey,(2006)*

Table 3.6 and 3.7 present the various types of housing vis-a-vis tenurial status. The tables depicted clearly that rental houses remain the predominant form of tenurial arrangement in all the various housing types but in varying degrees. For instance, single-household houses recorded about 62.8% in this category while multi-household houses, flats, duplexes, rooms in the main dwelling and squatters' settlements recorded as much as 84.7%, 76.3%, 78.5% 86.7% and 85.9% respectively. What is clear from this is that most of the housing types in Lagos are rented houses. The case of subsidising house rents is prominent in multi-household houses than in any other housing type as reflected in the table.

Table 3.6: Percentage of Households' Tenure Status Cross-classified by Residential Housing Choice

Variables	**FREQUENCIES (percent)**							
	Single Household House	**Multi-Household House**	**Flats**	**Duplex**	**Rooms in the main building**	**Squatters' Settlement**	**Others**	**Total**
Tenure status								
Owner-occupier	93 (28.1%)	360 (12.1%)	149 (20.8%)	51 (19.2%)	152 (10.1%)	7 (9.9%)	24 (18.6%)	836 (13.9%)
Normal rent	154 (46.5%)	1473 (49.4%)	304 (42.5%)	138 (52.1%)	818 (54.2%)	39 (54.9%)	74 (57.4%)	3000 (50%)
Subsidised rent	54 (16.3%)	1052 (35.3%)	242 (33.8%)	70 (26.4%)	491 (32.5%)	22 (31.0%)	29 (22.5%)	1960 (32.7%)
Free rent	29 (8.8%)	95 (3.2%)	20 (2.8%)	6 (2.3%)	48 (3.2%)	3 (4.2%)	2 (1.6%)	203 (2.7%)
Others	1 (0.3%)	0 (0%)	0 (0%)	0 (0%)	1 (0.1%)	0 (0%)	0 (0%)	2 (2%)
Total	**330 (100%)**	**2980 (100%)**	**715 (100%)**	**265 (100%)**	**1510 (100%)**	**71 (100%)**	**129 (100%)**	**6000 (100%)**

Source*: Computed from Lagos Housing Survey, (2006)*

Table 3.7: Percentage of Households' Ownership by Tenure Status Cross-classified by Residential Housing Choice

Variables	FREQUENCIES (percent)							
	Single Household House	**Multi-Household House**	**Flats**	**Duplex**	**Room in the main building**	**Squatters' Settlement**	**Others**	**Total**
D.O.Head	62 (18.7%)	249 (8.4%)	106 (14.8%)	44 (16.6%)	100 (6.6%)	3 (4.2%)	15 (11.6%)	579 (9.6%)
D.O. Head & Spouse	15 (4.5%)	26(0.9%)	20 (2.8%)	1 (0.4%)	8 (0.5%)	3 (4.2%)	3 (2.3%)	76(1.3%)
D.O. Spouse	1 (0.3%)	14 (0.5%)	5 (0.7%)	5 (1.9%)	4 (0.3%)	1 (1.4%)	0 (0%)	30 (0.5%)
D.O.Household member	16(4.8%)	85 (2.9%)	23 (3.2%)	6 (2.3%)	44 (2.9%)	1 (1.4%)	6 (4.7%)	181 (3.0%)
HH Market rent	154 (46.5%)	1473 (49.4%)	304 (42.5%)	138 (52.1%)	818 (54.2%)	39 (54.9%)	74 (57.4%)	3000 (50.0%)
HH subsidized rent	53 (16.0%)	1038 (34.8%)	237 (33.1%)	65 (24.5%)	487 (32.3%)	21 (29.6%)	29 (22.5%)	1930 (32.2%)
Uses without paying rent	29 (8.8%)	95 (3.2%)	20 (2.8%)	6 (2.3%)	48 (3.2%)	3 (4.2%)	2 (1.6%)	203 (3.4%)
Nomadic or temporary dwelling	1 (0.3%)	0 (0%)	0 (0%)	0 (0%)	1 (0.1%)	0 (0%)	0 (0%)	2 (0%)
Total	**330 (100%)**	**2980 (100%)**	**715 (100%)**	**265 (100%)**	**1510 (100%)**	**71 (100%)**	**129 (100%)**	**6000(100%)**

Source: *Computed from Lagos Housing Survey,(2006)*
Note: D.O.- Dwelling Owned by; HH-Household

3.4 Background Information about Dwellings in the Local Government Councils in Residential Density Areas in Lagos, Nigeria

This section presents background information about the dwellings in the local government councils within each of the residential density areas namely: high, medium and low. Attempts are, therefore, made to give clearer description about the prevailing tenure status, the ownership status of these tenurial arrangements, the characteristics of the dwellings in terms of walling, roofing and flooring materials used, the availability and source of water supply, methods of solid waste disposal, housing types and the characteristics of the respondents' sampled, such as average monthly income earned, level of educational attainment, occupational status, household size category, tribe and religious affiliation.

3.4.1 Structure and Characteristics of Households and Housing in High Residential Density Areas

One of the prominent features of dwellings in the local government councils in high residential density areas of Lagos State is that a very large and significant number of houses are roofed with corrugated iron sheets irrespective of housing types and architectural designs.

For instance, more than 80% of houses in all the local government councils have corrugated iron roofs except in Lagos Island Local Government where corrugated iron sheets accounted for about 70.3% of the roofs with concrete, and asbestos roofs claiming a substantial proportion of the remaining percentage. In fact, houses in Shomolu Local Government are almost roofed entirely with corrugated iron sheets with about 91.9%, whereas Alimosho and the Mushin Local Government Councils have 83.9% of the buildings with corrugated iron sheets. The usage of mud bricks is negligible as depicted in Table 3.8 in all the local governments except Mushin Local Government where 2.8% of the buildings are roofed with mud bricks. The most commonly used roofing materials are corrugated iron sheets, asbestos and cement.

Table 3.8: Distribution of Households by the Type of Roofing Materials used in the Local Government Councils in High Residential Density Areas

Local Government Councils	Mud/Mud Bricks	Corrugated Iron Sheets	Cement/ Concrete	Roofing Tiles	Asbestos	Other	Total
Agege	7(1.8%)	309(81.5%)	9(2.4%)	8(2.1%)	45(11.9%)	1(0.3%)	379(100%)
Ajeromi	0(0%)	382(83.4%)	35(7.6%)	2(0.4%)	39(8.5%)	0(0%)	458(100%)
Alimosho	3(0.8%)	317(83.9%)	8(2.1%)	1(0.3%)	47(12.4%)	2(0.5%)	378(100%)
Lagos Island	0(0%)	168(70.3%)	44(18.4%)	9(3.8%)	18(7.5%)	0(0%)	239(100%)
Mushin	12(2.8%)	359(83.9%)	3(0.7%)	3(0.7%)	51(11.9%)	0(0%)	428(100%)
Shomolu	1(0.3%)	308(91.9%)	3(0.9%)	1(0.3%)	22(6.6%)	0(0%)	335(100%)
Total	**23(1.0%)**	**1843(83.1%)**	**102(4.6%)**	**24(1.1%)**	**222(10.1%)**	**3(0.1%)**	**2217(100%)**

Source: *Computed from Lagos Household Survey, 2006*

The walling materials used on dwellings in the Local Government Councils (LGCs) within the high residential density areas include cement, which constitutes over 90%. For instance, majority of houses in Agege, Ajeromi, Alimosho, Lagos Island, Mushin and Shomolu have cemented walls with percentages being 94.7%, 98.0%, 98.4%, 99.2%, 97.0% and 99.4% respectively. The use of other alternatives walling material like wood/bamboo, corrugated iron sheets and mud bricks are negligible as can be observed from Table 3.8. Some pockets of usages of ‘’traditional’’ wall materials like mud bricks are still found in Agege and Mushin LGCs with 4.2% and 2.6% respectively while traces of wood/bamboo are also observed in Agege, Ajeromi and Lagos Island LGCs with 0.3%, 1.7% and 0.8% respectively.

Table 3.9: Distribution of Households by the Type of Wall Materials Used in the Local Government Councils in High Residential Density Areas

Local Government Councils	Mud/Mud Bricks	Cement/ Concrete	Wood/Bamboo	Corrugated Iron Sheets	Total
Agege	16(4.2%)	359(94.7%)	1(0.3%)	3(0.8%)	379(100%)
Ajeromi	0(0%%)	449(98.0%)	8(1.7%)	1(0.2%)	458(100%)
Alimosho	5(1.3%)	372(98.4%)	1(0.3%)	0(0%)	378(100%)
Lagos Island	0(0%)	237(99.2%)	2(0.8%)	0(0%)	239(100%)
Mushin	11(2.6%)	415(97.0%)	0(0%)	2(0.5%)	428(100%)
Shomolu	0(0%)	333(99.4%)	0(0%)	2(0.6%)	335(100%)
Total	**32(1.4%)**	**2165(97.7%)**	**12(0.5%)**	**8(0.4%)**	**2217(100%)**

Source: *Computed from Lagos Household Survey, 2006*

Just like walling materials, houses within the LGCs in high residential density areas are floored with cement. Ajeromi and Shomolu LGCs are entirely floored with cement as reflected by 100% percentage figure in Table 3.9. Wooden floors are out-fashioned and almost non-existent in the Lagos residential market. This is further confirmed by the percentages which read zeros for virtually all the LGCs except Agege with an insignificant percentage of 1.1%. The use of earth/mud is still found fashionable in some LGCs like Agege, Alimosho and Mushin but is at negligible rates.

Table 3.10: Distribution of Households by the Type of Floor Materials used in the Local Government Councils in High Residential Density Areas

Local Government Councils	Earth/Mud	Wood/Tile	Concrete	Other	Total
Agege	11(2.9%)	4(1.1%)	364(96.0%)	0(0%)	379(100%)
Ajeromi	0(0%)	0(0%)	458(100%)	0(0%)	458(100%)
Alimosho	11(2.9%)	0(0%)	367(97.1%)	0(0%)	378(100%)
Lagos Island	0(0%)	0(0%)	238(99.6%)	1(0.4%)	239(100%)
Mushin	11(2.6%)	0(0%)	417(97.4%)	0(0%)	428(100%)
Shomolu	0(0%)	0(0%)	335(100%)	0(0%)	335(100%)
Total	**33(1.5%)**	**4(0.2%)**	**2179(98.3%)**	**1(0%)**	**2217(100%)**

Source: *Computed from Lagos Household Survey, 2006*

It can be inferred from the foregoing that Lagos residential market has metamorphosised into modern ones when compared with housing markets in some other states of the federation eg like Kano, Ibadan, Ogun etc as the use of ‘’modern’’ housing materials are common and prevalent.

The common tenure status arrangement which has been identified in Lagos residential market ranges from owner-occupiers, normal rent, subsidised rent and free rent. The most prevalent of them all is that of rental (normal) houses which claims over 50% in all the LGCs except in Alimosho with 49.7% (Table 3.10). This simply depicts that owner-occupier are not many in Lagos State. The local government that has the highest number of owner-occupiers in high residential density area of Lagos State is Alimosho with about 13.0%, closely followed by Agege with 10.8%, and the least is Ajeromi-Ifelodun LGCs with 3.7%. The incidence of subsidised housing rents is also common as the proportion claimed is quite substantial in virtually all the LGCs. The rate of subsidised rents is highest in Alimosho which has about 43.7%, and free rent syndrome is also very prominent in Lagos Island LGC. This is not unexpected given the number of ‘son of Landowners’ in the area. Associated with Table 3.10 is Table.3.11 which presents the distribution of households by type of occupancy. From the table, the occupancy status ranges from household head, spouse, household head and spouse to members of household. In fact, most of the houses are rented and are mostly provided by private sectors like estate agents and housing developers. However, for the owner-occupier houses, they are mainly owned by the household heads with 5.1% but highest came from Alimosho and Agege local governments with 8.7% and 7.4% respectively. Ajeromi still has the smallest number of dwellings owned by household head thus corroborating the earlier assertion of being the LGC with the least owner-occupier houses.

Table 3.11: Distribution of Households by Tenure Status in the Local Government Councils in High Residential Density Areas

Local Government Councils	Owner-Occupier	Normal Rent	Subsidised Rent	Free Rent	Total
Agege	41(10.8%)	207(54.6%)	124(32.7%)	7(1.8%)	379(100%)
Ajeromi	17(3.7%)	257(56.1%)	182(39.7%)	2(0.4%)	458(100%)
Alimosho	49(13.0%)	188(49.7%)	131(43.7%)	10(2.6%)	378(100%)
Lagos Island	16(6.7%)	138(57.7%)	71(29.7%)	14(5.9%)	239(100%)
Mushin	24(5.6%)	240(56.1%)	162(37.9%)	2(0.5%)	428(100%)
Shomolu	19(5.7%)	182(54.3%)	123(36.7%)	11(3.3%)	335(100%)
Total	**166(7.5%)**	**1212(54.7%)**	**793(35.8%)**	**46(2.1%)**	**2217(100%)**

Source*: Computed from Lagos Household Survey, 2006*

Table 3.12: Distribution of Households by Type of Occupancy Status in the Local Government Councils in High Residential Density Areas

Local Government Councils	Dwelling Owned by Head	Dwelling Owned by Head and Spouse	Dwelling Owned by Spouse	Dwelling Owned by another Member of Household	Household rents the dwelling at market rents	Household rent the dwelling and pays nominal or Subsidised Rent.	Uses without paying rent	Total
Agege	28(7.4%)	3(0.8%)	1(0.3%)	10(2.6%)	207(54.7%)	123(32.5%)	7(1.8%)	379(100%)
Ajeromi	12(2.6%)	1(0.2%)	0(0%)	4(0.9%)	257(56.1%)	182(39.7%)	2(0.4%)	458(100%)
Alimosho	33(8.7%)	8(2.1%)	1(0.3%)	8(2.1%)	188(49.7%)	130(34.4%)	10(2.6%)	378(100%)
Lagos Island	11(4.6%)	1(0.4%)	0(0%)	4(1.7%)	138(57.7%)	71(29.7%)	14(5.9%)	239(100%)
Mushin	17(4.0%)	3(0.7%)	2(0.5%)	4(0.9%)	240(56.1%)	160(37.4%)	2(0.5%)	428(100%)
Shomolu	12(3.6%)	0(0%)	2(0.6%)	7(2.1%)	182(54.3%)	121(36.1%)	11(3.3%)	335(100%)
Total	**113(5.1%)**	**16(0.7%)**	**6(0.3%)**	**37(1.7%)**	**1212(54.7%)**	**787(35.5%)**	**46(2.1%)**	**2217(100%)**

Source: *Computed from Lagos Household Survey, 2006*

Apart from tenurial status description, the prevalent housing type in high residential density areas are multi-household houses, and these vary from one local government to another (Table 3.13). For instance, virtually all houses in Shomolu Local Government are multi-

household in nature as suggested by 97.0% of buildings that fall into this category. Next, inorder of percentage scores is Lagos Island Local Government with about 74.9%. Ajeromi and Alimosho present a different picture from other LGCs within the high density area. A room in the main building is prevalent in these two LGCs and perecentage of prevalence of this category varies from 51.7% in Ajeromi to 61.4% in Alimosho LGCs. It is also interesting to note that single-household houses are not so common among the LGCs. However, Agege still has the highest of about 5.0%, Alimosho ,2.4%; Lagos Island and Ajeromi with 0.8% and 0.2% respectively. Of the LGCs, Mushin Local Government has the highest number of flats with 11.9% and the least number of same is found in Shomolu with just a negligible percent of 0.3%. Squatters' settlers are common in both Ajeromi and Alimosho Local Government areas and recorded 4.6% and 6.6% respectively.

Table 3.13: Distribution of Households by Housing Types in the Local Government Councils in High Residential Density Areas

Local Government Councils	**Single-Household House**	**Multi-Household house**	**Flats in a block of flats**	**Duplex**	**Room In the main Dwelling**	**Squatters' Settlement**	**Other**	**Total**
Agege	19(5.0%)	171(45.1%)	26(6.9%)	12(3.2%)	151(39.8%)	0(0%)	0(0%)	379(100%)
Ajeromi	1(0.2%)	177(38.6%)	9(2.0%)	1(0.2%)	237(51.7%)	21(4.6%)	12(2.6%)	458(100%)
Alimosho	9(2.4%)	59(15.6%)	25(6.6%)	9(2.4%)	232(61.4%)	25(6.6%)	19(5.0%)	378(100%)
Lagos Island	2(0.8%)	179(74.9%)	21(8.8%)	4(1.7%)	28(11.7%)	0(0%)	5(2.1%)	239(100%)
Mushin	0(0%)	297(69.4%)	51(11.9%)	2(0.5%)	61(14.3%)	0(0%)	17(4.0%)	428(100%)
Shomolu	0(0%)	325(97.0%)	1(0.3%)	0(0%)	9(2.7%)	0(0%)	0(0%)	335(100%)
Total	**31 (1.4%)**	**1208 (54.5%)**	**133 (6.0%)**	**28 (1.3%)**	**718 (32.4%)**	**46 (2.1%)**	**53 (2.4%)**	**2217 (100%)**

Source**:** *Computed from Lagos Household Survey, 2006*

In terms of available facilities with respect to both water source and method of solid waste disposal, a very interesting picture emanates (Table 3.14). The source of water differs markedly from one LGC to another. For instance, Lagos Island has the cleanest and purest form of drinkable and usable water, comparatively, out of all LGCs in high residential density areas as both pipe borne and public tap water account substantially for over 60% of the water supply. Supply of water through boreholes also accounts for as much as 20%. In Alimosho Local Government, water from borehole contributes largely and remains a large supplier of

water to the residents as it accounts for 75.7% of water supply. The same can be said of Mushin Local Government where borehole contributes roughly 75% of the water supply. The picture which emanates from Ajeromi is quite different, as water from wells is the major water supply source. The activities of small scale vendors of water supply are also prominent across all the LGCs as shown in Table 3.13. The supply of water from tanker trucks in some LGCs is significant as it accounts for as much as 2.4% and 3.8% in both Ajeromi and Lagos Island respectively. The effect of water supply from rain is insignificant as it is almost zero in all the LGCs.

Table 3.14: Distribution of Households by Source of Water in the Local Government Councils in High Residential Density Areas

Local Government Councils	Piped Borne Water	Public Tap	Borehole	Well	Rain Water	Small Scale Vendor	Tanker Truck	Other	Total
Agege	13(3.4%)	19(5.0%)	272(71.8%)	26(6.9%)	0(0%)	47(12.4%)	0(0%)	2(0.5%)	379(100%)
Ajeromi	21(4.6%)	62(13.5%)	122(26.6%)	193(42.1%)	1(0.2%)	39(8.5%)	11(2.4%)	9(2.0%)	458(100%)
Alimosho	13(3.4%)	10(2.6%)	286(75.7%)	14(3.7%)	0(0%)	54(14.3%)	0(0%)	1(0.3%)	378(100%)
Lagos Island	93(38.9%)	61(25.5%)	47(19.7%)	6(2.5%)	0(0%)	20(8.4%)	9(3.8%)	3(1.3%)	239(100%)
Mushin	25(5.8)	18(4.2%)	322(75.2%)	14(3.3%)	0(0%)	48(11.2%)	1(0.2%)	0(0%)	428(100%)
Shomolu	14(4.2%)	55(16.4%)	203(60.6%)	28(8.4%)	0(0%)	31(9.3%)	0(0%)	4(1.2%)	335(100%)
Total	**179 (8.1%)**	**225 (10.1%)**	**1252 (56.5%)**	**281 (12.7%)**	**1 (0%)**	**239 (10.8%)**	**21 (0.9%)**	**19 (0.9%)**	**2217 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

The major method of solid waste disposal across the various LGCs in high residential density areas are private sector participation (hereafter PSP) and private refuse collectors (Table 3.15) but varies from one LGC to another with some using more of PSP and less of private refuse collectors and vice versa. For instance, in Mushin and Shomolu LGCs, PSP remains the main method of solid waste disposal ranging from 87.4% to 90.1% as against all other solid waste disposal methods. Whereas in Alimosho and Agege, truck pushers accounted for as much as 69.0% and 58.6% and PSP took substantial proportion of the remaining percentage. Another illegal and dangerous to health method of disposing wastes is dumping of refuses in unauthorised places, This method is commonly found in Ajeromi LGC with 8.1% while traces of these unhealthy habits are found also in Alimosho and Lagos Island with 2.6% and 2.1% respectively.

Table 3.15: Distribution of Households by Method of Disposal of Solid Waste in the Local Government Councils in High Residential Density Areas

Local Government Councils	Collected by the government house to house (PSP)	Unauthorized Heap-Dumping ground in neighbourhood	Truck pusher/private Refuse Collector	Disposal within compound Neighbourhood Bin/tank	Government Bin	Other	Total
Agege	154(40.6%)	0(0%)	222(58.6%)	0(0%)	3(0.8%)	0(0%)	379(100%)
Ajeromi	202(44.1%)	37(8.1%)	210(45.9%)	3(0.7%)	6(1.3%)	0(0%)	458(100%)
Alimosho	107(28.3%)	10(2.6%)	261(69.0%)	0(0%)	0(0%)	0(0%)	378(100%)
Lagos Island	125(52.3%)	5(2.1%)	104(43.5%)	0(0%)	5(2.1%)	0(0%)	239(100%)
Mushin	374(87.4%)	0(0%)	49(11.4%)	2(0.5%)	2(0.5%)	1(0.2%)	428(100%)
Shomolu	302(90.1%)	0(0%)	33(9.9%)	0(0%)	0(0%)	0(0%)	335(100%)
Total	**1264 (57.0%)**	**52 (2.3%)**	**879 (39.6%)**	**5 (0.2%)**	**16 (0.7%)**	**1 (0%)**	**2217 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

Having discussed the structure and characteristics of housing market in high residential density areas, it will be important to dwell on the characteristics of the individual households' participants in such market. It is clear from Table 3.16 that a large chunk of households in high residential density areas are secondary school certificate holders as percentage figures are quite substantial. For instance, 47% of the respondents are secondary school leavers. Well over one-quarter of households in Lagos Island LGC have one tertiary certificate or another. The distribution of primary school leavers is substantial as well, with over 15% in this category except in Lagos Island LGC where their numbers are few. People with vocational and technical education can be found across the LGCs as depicted in the Table. Agege and Alimosho have the highest number of people without any form of education; this has implication on the choice making of an individual when taking a residential housing decision.

Table 3.16: Distribution of Households by Educational Status in the Local Government Councils in High Residential Density Areas

Local Government Councils	None	Primary	Secondary	Tertiary	Vocational /Technical	Other	Total
Agege	46(12.1%)	71(18.7%)	167(44.1%)	67(17.7%)	27(7.1%)	1(0.3%)	379(100%)
Ajeromi	35(7.6%)	77(16.8%)	236(51.5%)	86(18.8%)	23(5.0%)	1(0.2%)	458(100%)
Alimosho	38(10.1%)	78(20.6%)	179(47.4%)	62(16.4%)	17(4.5%)	4(1.1%)	378(100%)
Lagos Island	10(4.2%)	29(12.1%)	103(43.1%)	80(33.5%)	17(7.1%)	0(0%)	239(100%)
Mushin	32(7.5%)	69(16.1%)	187(43.7%)	119(27.8%)	21(4.9%)	0(0%)	428(100%)
Shomolu	22(6.6%)	51(15.2%)	169(50.4%)	64(19.1%)	27(8.1%)	2(0.6%)	335(100%)
Total	**183 (8.3%)**	**375 (16.9%)**	**1041 (47.0%)**	**478 (21.6%)**	**132 (6.0%)**	**8 (0.4%)**	**2217 (100%)**

Source**:** *Computed from Lagos Household Survey, 2006*

Interestingly, majority of these people are found in self-employed jobs as presented on Table 3.17. The increasing number of households gets preoccupied through self-employment which forms the basis of large informal sector that characterises the country's labour market. Despite this, the proportion of public salaried workers also varies across board in Lagos State. The sampled respondents that are into public-salaried occupation are well over one-third compared to other types of occupation. The private-salaried jobs also made some contributory impact but not as much as what is obtainable in the public sector. This simply goes to show that government is still the largest employer of labour in the country. The number of unemployed people appears substantial in all the LGCs, most especially in Shomolu, Mushin and Agege local government councils.

Table 3.17: Distribution of Households by Occupational Status in the Local Government Councils in High Residential Density Areas

Local Government Councils	Unemployed	Public	Private	Self-employed	Student/ Apprentice	Other	Total
Agege	18(4.7%)	95(25.1%)	29(7.7%)	229(60.4%)	7(1.8%)	1(0.3%)	379(100%)
Ajeromi	17(3.7%)	131(28.6%)	27(5.9%)	273(59.6%)	5(1.1%)	5(1.1%)	458(100%)
Alimosho	15(4.0%)	103(27.2%)	20(5.3%)	225(59.5%)	7(1.9%)	8(2.1%)	378(100%)
Lagos Island	9(3.8%)	89(37.2%)	15(6.3%)	121(50.6%)	4(1.7%)	1(0.4%)	239(100%)
Mushin	21(4.9%)	115(26.9%)	26(6.1%)	257(60.0%)	8(1.9%)	1(0.2%)	428(100%)
Shomolu	18(5.4%)	99(29.6%)	20(6.0%)	185(55.2%)	10(3.0%)	3(0.9%)	335(100%)
Total	**98(4.4%)**	**632(28.5%)**	**137(6.2%)**	**1290(58.2%)**	**41(1.8%)**	**19(0.9%)**	**2217(100%)**

Source: *Computed from Lagos Household Survey, 2006*

The average monthly income earned by the various respondents' household in all the LGCs are in the neighbourhood of N10,001 to N20,000 which is not unexpected as majority are secondary school certificate holders. The highest percentage came from Shomolu with 40.1% of respondents in this category whereas LGCs like Agege, Ajerome, Alimosho and Mushin share similar percentages. Those that earn over N50,000 were from Lagos Island LGCs with about 19.2% while the least earner of monthly income of N10,000 came from Agege and Alimosho with over one-quarter (26.2% and 25.1% respectively) of the respondents in this cadre. It is therefore reasonable and logical to assume and infer that the rationale behind the prevalence of multi-households across the LGCs is attributable most times to poor income earned. The presence of this imposes a constraint on the choice making decision of an individual concerning their housing choices. It is intuitively right to state here that individual is not expected to spend what he/she does not have but if he/she has to, it will be done at a cost.

Table 3.18: Distribution of Households by Monthly Income in the Local Government Councils in High Residential Density Areas

Local Government Councils	Up to N10,000	N10,001-N20,000	N20,001-N30,000	N30,001-N40,000	N40,001-N50,000	N50,000 above	Total
Agege	86(26.2%)	124(37.8%)	58(17.7%)	21(6.4%)	21(6.4%)	18(5.5%)	328(100%)
Ajeromi	86(19.8%)	162(37.3%)	81(18.7%)	47(10.8%)	28(6.5%)	30(6.9%)	434(100%)
Alimosho	71(25.1%)	107(37.8%)	59(20.8%)	23(8.1%)	15(5.3%)	8(2.8%)	283(100%)
Lagos Island	42(19.7%)	34(16.0%)	45(21.1%)	27(12.7%)	24(11.3%)	41(19.2%)	213(100%)
Mushin	81(21.0%)	139(36.1%)	73(19.0%)	37(9.6%)	24(6.2%)	31(8.1%)	385(100%)
Shomolu	51(17.5%)	117(40.1%)	76(26.0%)	23(7.9%)	17(5.8%)	8(2.7%)	292(100%)
Total	**417(21.6%)**	**683(35.3%)**	**392(20.3%)**	**178(9.2%)**	**129(6.7%)**	**136(7.0%)**	**1935(100%)**

Source**:** *Computed from Lagos Household Survey, 2006*

The size and distribution of the households across the LGCs which mainly lies between five and eight people depict the nature of the residential area in question. The category of household size (5-6) constitutes the largest proportion in all the LGCs (Table 3.19).. For instance, in Agege, 36.9%; Ajeromi,46.9%; Alimosho,42.9%; Lagos Island,40.2%; Mushin,40.2% and Shomolu,42.1%. The household size category (7-8) also claims substantial proportion in all the LGCs but is highest in Lagos Island LGC with about 26.8%. This condition of overcrowding poses health hazards to the living habits of the residents in these LGCs. The situation is even worse in Alimosho, Shomolu, Agege and Lagos Island

LGCs having household size category (9-10) which are 3.4%, 2.7%, 2.4% and 2.1% respectively. It is also observed that household size category of over ten ranges from 0.7% to 1.1% are recorded in the following LGCs including Alimosho, Agege and Lagos Island and Ajeromi.

Table 3.19: Distribution of Households by Household Size Category in the Local Government Councils in High Residential Density Areas

Local Government Councils	1-2	3-4	5-6	7-8	9-10	10 and Above	Total
Agege	58(15.3%)	124(32.7%)	140(36.9%)	45(11.9%)	9(2.4%)	3(0.8%)	379(100%)
Ajeromi	59(12.9%)	88(19.2%)	215(46.9%)	86(18.8%)	7(1.5%)	3(0.7%)	458(100%)
Alimosho	38(10.1%)	90(23.8%)	162(42.9%)	71(18.8%)	13(3.4%)	4(1.1%)	378(100%)
Lagos Island	21(8.8%)	51(21.3%)	96(40.2%)	64(26.8%)	5(2.1%)	2(0.8%)	239(100%)
Mushin	60(14.0%)	112(26.2%)	172(40.2%)	78(18.2%)	5(1.2%)	1(0.2%)	428(100%)
Shomolu	44(13.1%)	82(24.5%)	141(42.1%)	58(17.3%)	9(2.7%)	1(0.3%)	335(100%)
Total	**280 (12.6%)**	**547 (24.7%)**	**926 (41.8%)**	**402 (18.1%)**	**48 (2.2%)**	**14 (0.6%)**	**2217 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

The bulk of the sample respondents in the high residential neighbourhoods are Yorubas. The ratio of Yoruba to other tribes is suggestive of the fact that yorubas dominate the residential houses in the area. Table 3.20 shows that Yoruba population skewed more in some local governments than others. From the table, Lagos Island is heavily populated by Yoruba tribe than in any other local government. For instance, they constitute over 90% of the entire population, whereas Hausas and Ibos are just about 1.4% and 5.5% respectively. The population of Ibos was quite substantial in almost all the LGCs than the Hausas as depicted by the Table. The proportion of Ibos in Ajeromi-Ifelodun Local Government is substantially large (46%) compared to other LGCs. The Hausa population is quite insignificant as compared to other tribes but reasonably high in Agege local government with about 10.0%. This implies that the population of Hausas is more in Agege than in any other LGC in high residential density areas.

Table 3.20: Distribution of Households by Type of Tribe in the Local Government Councils in High Residential Density Areas

Local Government Councils	Yoruba	Hausa	Ibo	Total
Agege	219(68.7%)	32(10.0%)	68(21.3%)	319(100%)
Ajeromi	232(54.0%)	0(0%)	198(46.0%)	430(100%)
Alimosho	264(74.2%)	3(0.8%)	89(25.0%)	356(100%)
Lagos Island	204(93.2%)	3(1.4%)	12(5.5%)	219(100%)
Mushin	338(87.6%)	0(0%)	48(12.4%)	386(100%)
Shomolu	260(84.4%)	3(1.0%)	45(14.6%)	308(100%)
Total	**1517(75.2%)**	**41(2.0%)**	**460(22.8%)**	**2018(100%)**

Source: *Computed from Lagos Household Survey, 2006*

Another interesting aspect of examining the characteristics of the households in high residential density areas is to illustrate the type of religious affiliations so as to know if religion is a potent factor that could affect the residential choice decision behaviour. Table 3.21 also depicts the dominating presence of christianity over other religions. As earlier pointed out that the Ibo population were substantial in Ajeromi local government, and so also is the pervasiveness of christianity as Ibos are associated with the christian faith. In fact, they constitute about 71.2% while muslim are just about 24.2% with other religion sects taking the remaining percentage. The proportion of muslims is more in Lagos Island than in any of the local government councils in high residential density areas. The proportion of muslims is as low as 24.2% in Ajeromi local government and as high as 41.0% in Lagos Island local government. People who practice other religions are more pronounced in Agege local government with 11.9%, directly followed by Mushin local government with 8.9%. In sum, it is clear from the Table that though christians are more prominent than other religious sects in all the LGCs their prominence is highest in Ajeromi LGC. Lagos Island LGC recorded highest concentration of muslims in the state unlike Ajeromi local government where they few.. By and large, the religious landscape in Lagos is dominated by both christians and muslim.

Table 3.21: Distribution of Households by Type of Religion in the Local Government Councils in High Residential Density Areas

Local Government Councils	Muslim	Christian	Other Religion	Total
Agege	127(33.5%)	207(54.6%)	45(11.9%)	379(100%)
Ajeromi	111(24.2%)	326(71.2%)	21(4.6%)	458(100%)
Alimosho	119(31.5%)	237(62.7%)	22(5.8%)	378(100%)
Lagos Island	98(41.0%)	127(53.1%)	14(5.9%)	239(100%)
Mushin	145(33.9%)	245(57.2%)	38(8.9%)	428(100%)
Shomolu	92(27.5%)	220(65.7%)	23(6.9%)	335(100%)
Total	**692(31.2%)**	**1362(61.4%)**	**163(7.4%)**	**2217(100%)**

Source*: Computed from Lagos Household Survey, 2006*

3.4.2 Structure and characteristics of Households and Housing in Medium Residential Density Areas

The structure and pattern of housing in the medium residential density areas are similar to that of high residential density areas in certain respects, of which type of materials used on housing, offer examples. Just like corrugated iron sheets serve as dominant roofing materials used on housing in high residential density area, it also serves in medium residential density area. Differences are however observed in the usage of these materials among the LGCs in both high and medium residential density areas. The proportion of usage of corrugated iron sheets is higher among the LGCs in high than in the medium residential density areas. For instance, Kosofe and Oshodi LGCs recorded substantially higher usage of corrugated iron sheets than other LGCs in the density area (Table.3.22). In fact, Oshodi has 81.4% of houses roofed with corrugated iron sheets, Kosofe recorded 85.9% while the usage of same in the remaining LGCs like Eti-osa, Ikeja, Mainland and Surulere hover around 70% and 75% respectively. The least in the distribution in terms of usage of corrugated iron sheets are Amuwo Odofin and Ifako-Ijaiye with 61.8% and 64.8%. The use of cement/concrete roofs also remains a force to be reckoned with following the rate of usage most especially among these four local governments namely: Amuwo-Odofin, Eti-osa, Mainland and Surulere. The 'traditional' roofing materials like mud bricks and wood/bamboo are fast going into extinction as depicted by the lack of usage on the Table. Though, some traces of mud bricks are still conspicuously noticed in some local governments like Ifako-Ijaiye, Mainland, Oshodi and part of Surulere.

Table 3.22: Distribution of Households by Type of Roofing Materials used in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Mud/Mud Bricks	Wood/Bamboo	Corrugated Iron Sheets	Cement/ Concrete	Roofing Tiles	Asbestos	Total
Amuwo Odofin	0(0%)	0(0%)	157(61.8%)	36(14.2%)	10(3.9%)	51(20.1%)	254(100%)
Eti-osa	0(0%)	0(0%)	166(70.9%)	32(13.7%)	20(8.5%)	16(5.9%)	234(100%)
Ifako-Ijaiye	7(2.6%)	1(0.4%)	177(64.8%)	16(5.9%)	7(2.6%)	65(23.8%)	273(100%)
Ikeja	0(0%)	0(0%)	199(78.7%)	1(0.4%)	1(0.4%)	52(20.6%)	253(100%)
Kosofe	0(0%)	0(0%)	316(85.9%)	0(0%)	1(0.3%)	51(13.9%)	368(100%)
Mainland	4(1.4%)	0(0%)	209(72.3%)	39(13.5%)	14(4.8%)	23(8.0%)	289(100%)
Oshodi/Isolo	5(1.3%)	0(0%)	311(81.4%)	15(3.9%)	12(3.1%)	39(10.2%)	382(100%)
Surulere	1(0.3%)	0(0%)	289(76.1%)	50(13.2%)	12(3.2%)	28(7.4%)	380(100%)
Total	**17(0.7%)**	**1(0%)**	**1824(75.0%)**	**189(7.8%)**	**77(3.2%)**	**325(13.4%)**	**2433(100%)**

Source: *Computed from Lagos Household Survey, 2006*

The wall and floor of houses in medium residential density areas are dominated by cement materials as displayed on the Table 3.23. The use of cement, both for walling and flooring of houses, far surpasses all other type of materials used. Most of the houses are virtually cemented both vertically and horizontally as shown in theTable. Thus, the use of mud bricks, burnt bricks, wood, bamboo, corrugated iron sheets and cardboard as walling materials are out-fashioned and outdated. The same arguments can be extended to flooring materials like earth mud, wood/tile, plank, concrete and those in other category. This in effect, suggests lack of demand for these housing materials as modern ones are being preferred and used to by the users (Table 3.24).

Table 3.23: Distribution of Households by Type of Wall Materials in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Mud/Mud Bricks	Burnt Bricks	Cement/ Concrete	Wood/ Bamboo	Corrugated Iron Sheet	Cardboard	Other	Total
Amuwo Odofin	4(1.6%)	2(0.8%)	246(96.9%)	1(0.4%)	1(0.4%)	0(0%)	0(0%)	254(100%)
Eti-osa	0(0%)	0(0%)	234(100%)	0(0%)	0(0%)	0(0%)	0(0%)	234(100%)
Ifako-Ijaiye	7(2.6%)	1(0.4%)	262(96.0%)	2(0.7%)	1(0.4%)	0(0%)	0(0%)	273(100%)
Ikeja	0(0%)	0(0%)	253(100%)	0(0%)	0(0%)	0(0%)	0(0%)	253(100%)
Kosofe	0(0%)	0(0%)	364(98.9%)	2(0.5)	2(0.5%)	0(0%)	0(0%)	368(100%)
Mainland	12(4.2%)	0(0%)	274(94.8%)	0(0%)	0(0%)	1(0.3)	2(0.7%)	289(100%)
Oshodi/Isolo	5(1.3%)	0(0%)	374(97.9%)	0(0%)	3(0.8%)	0(0%)	0(0%)	382(100%)
Surulere	1(0.3%)	0(0%)	376(98.9%)	1(0.3)	2(0.5%)	0(0%)	0(0%)	380(100%)
Total	**29(1.2%)**	**3(0.1%)**	**2383(97.9%)**	**6(0.2%)**	**9(0.4%)**	**1(0%)**	**2(0.1%)**	**2433(100%)**

Source*: Computed from Lagos Household Survey, 2006*

Table 3.24: Distribution of Households by Type of Floor Materials used in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Earth/ Mud	Wood/Tile	Plank	Concrete	Dirt/Straw	Other	Total
Amuwo Odofin	0(0%)	3(1.2%)	5(2.0%)	246(96.9%)	0(0%)	0(0%)	254(100%)
Eti-osa	0(0%)	0(0%)	0(0%)	234(100%)	0(0%)	0(0%)	234(100%)
Ifako-Ijaiye	7(2.6%)	1(0.4%)	0(0%)	265(97.1%)	0(0%)	0(0%)	273(100%)
Ikeja	0(0%)	0(0%)	0(0%)	253(100%)	0(0%)	0(0%)	253(100%)
Kosofe	0(0%)	0(0%)	0(0%)	368(100%)	0(0%)	0(0%)	368(100%)
Mainland	0(0%)	4(1.4%)	0(0%)	284(98.3%)	0(0%)	1(0.3%)	289(100%)
Oshodi/Isolo	5(1.3%)	0(0%)	0(0%)	377(98.7%)	0(0%)	0(0%)	382(100%)
Surulere	0(0%)	6(1.6%)	0(0%)	372(97.9%)	2(0.5%)	0(0%)	380(100%)
Total	**12 (0.5%)**	**14 (0.6%)**	**5 (0.2%)**	**2399 (98.6)**	**2 (0.1%)**	**1 (0%)**	**2433 (100%)**

Source*: Computed from Lagos Household Survey, 2006*

The available facilities could also enhance and help in the residential choice decision behaviour that may likely to be elicited by an individual household either in the choice of

residential neighbourhood or housing type as the case may be. One of the key determinants of making decision out of the feasible and attainable housing choice set is availability, source and type of water supply. From Table 3.25, pipe- borne water serves as a major source of water to some local governments like Eti-osa, Mainland and Surulere as it accounted for 42.3%, 42.2% and 58.9% respectively. The supply of water through public tap also plays a key role in these local governments but at lesser degrees. Just as pipe borne water and water from public tap perform vital roles in the earlier mentioned LGCs, so also is the use of borehole important in some local governments such as Ifako-Ijaiye, Ikeja, Kosofe and Oshodi/Isolo. Infact, boreholes serve as major source of water supply to half of the LGCs in the medium residential density areas. This is similar to the observed trends in high residential density areas. The contribution from boreholes is substantial when compared to other sources of water supply but is more pronounced in high than medium residential density areas. In Amuwo Odofin, water from wells contributed immensely to solving water problems as it accounted for well over 40% of the entire source. The impact of water from the rains, spring, lakes and dams are minimally felt. The activities of small scale water vendors also play contributory role to solving water problems in virtually all LGCs but at varying proportions.

Table 3.25: Distribution of Households by Source of Water in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Piped Borne Water	Public Tap	Borehole	Well	Spring	Rain Water	Small Scale Vendor	Tanker Truck	Dam, Lake	Others	Total
Amuwo Odofin	24 (9.4%)	24(9.4%)	57(22.4%)	116(45.7%)	0(0%)	0(0%)	10(3.9%)	20(7.9%)	1(0.4%)	2(0.8%)	254(100%)
Eti-osa	99(42.3%)	29(12.4%)	43(18.4%)	15(6.4%)	0(0%)	0(0%)	19(8.1%)	29(12.4%)	0(0%)	0(0%)	234(100%)
Ifako-Ijaiye	15(5.5%)	11(4.0%)	212(77.7%)	4(1.5%)	0(0%)	0(0%)	28(10.3%)	0(0%)	1(0.4%)	2(0.7%)	273(100%)
Ikeja	69(27.3%)	23(9.0%)	134(53.0%)	10(4.0%)	0(0%)	0(0%)	11(4.3%)	5(2.0%)	0(0%)	1(0.4%)	253(100%)
Kosofe	66(17.9%)	56(15.2%)	188(51.1%)	34(9.2%)	0(0%)	1(0.3%)	13(3.5%)	4(1.1%)	6(1.6%)	0(0%)	368(100%)
Mainland	122(42.2%)	84(29.1%)	35(12.1%)	34(11.8%)	0(0%)	0(0%)	11(3.8%)	1(0.3%)	0(0%)	2(0.7%)	289(100%)
Oshodi/Isolo	30(7.9%)	11(2.9%)	263(68.8%)	39(10.2%)	0(0%)	0(0%)	37(9.7%)	0(0%)	0(0%)	2(0.5%)	382(100%)
Surulere	224(58.9%)	45(11.8%)	34(8.9%)	61(16.1%)	8(2.1%)	0(0%)	6(1.6%)	1(0.3%)	0(0%)	1(0.3%)	380(100%)
Total	**649(26.7%)**	**283(11.6%)**	**966(39.7%)**	**313(12.9%)**	**8(0.3%)**	**1(0%)**	**135(5.5%)**	**60(2.5%)**	**8(0.3%)**	**10(0.4%)**	**2433 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

Apart from availability of water supply, the ways and manner by which solid wastes are being disposed could also aid in determining, to a large extent, residential choice decision

making of an individual household,. Therefore, it is important to examine its usefulness in such decision-making processes. The picture painted under the LGCs in medium residential density areas is similar to that of high residential density areas in the sense that both PSP and truck pushers remain the two major key methods of disposing solid wastes. From table 3.26, in Oshodi/Isolo local government, PSP alone accounted for over 75% of solid wastes disposal method and this is directly followed by Ikeja with about 62.1%. The contribution from PSP as a means of disposing solid wastes in local governments like Kosofe, and Mainland is also substantial. The presence and prevalence of PSP is not total as private refuse collectors took control of solid wastes collection in some local governments such as Amuwo Odofin, Ifako-Ijaiye and Surulere. We also observed from the Table that Eti-Osa does not possess a distinctive method of disposing wastes as it patronises all the methods of wastes disposal except making use of government bins.

Table 3.26: Distribution of Households by Method of Disposal of Solid Waste in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Collected by the government house to house (PSP)	Unauthorized Heap-Dumping ground in neighbourhood	Truck pusher/private Refuse Collector	Disposal within compound neighbourhood Bin/tank	Government Bin	Other	Total
Amuwo Odofin	58(22.8%)	24(9.4%)	143(56.3%)	12(4.7%)	1(0.4%)	16(6.3%)	254(100%)
Eti-osa	82(35.0%)	46(19.7%)	56(23.9%)	48(20.5%)	0(0%)	2(0.9%)	234(100%)
Ifako-Ijaiye	97(35.5%)	1(0.4%)	171(62.6%)	2(0.7%)	2(0.7%)	0(0%)	273(100%)
Ikeja	157(62.1%)	16(6.3%)	57(22.5%)	10(4.0%)	6(2.4%)	7(2.8%)	253(100%)
Kosofe	202(55.0%)	27(7.4%)	95(25.9%)	6(1.6%)	1(0.3%)	36(9.8%)	367(100%)
Mainland	149(51.6%)	15(5.2%)	105(36.3%)	14(4.8%)	2(0.7%)	4(1.4%)	289(100%)
Oshodi/Isolo	296(77.5%)	0(0%)	82(21.5%)	0(0%)	4(1.0%)	0(0%)	382(100%)
Surulere	91(23.9%)	2(0.5%)	281(73.9%)	3(0.8%)	1(0.3%)	2(0.5%)	380(100%)
Total	**1132(46.5%)**	**131(5.4%)**	**990(40.7%)**	**95(3.9%)**	**17(0.7%)**	**67(2.8%)**	**2432(100%)**

Source: *Computed from Lagos Household Survey, 2006*

Apart from similarity observed in terms of the type of materials used on housing as well as availability of facilities, the proportion of the tenurial arrangement in medium residential density areas slightly differs from that of high residential density areas. The difference in proportion is however observed in the owner-occupancy of houses which has assumed two digit numbers within the LGCs in the medium residential density areas (Table 3.27). For instance, the owner occupancy has two digits for the following local governments namely:

Amuwo-Odofin, Eti-osa, Ifako-Ijaiye, Ikeja, Kosofe, Mainland and Surulere only Oshodi that has a single digit. Of these local governments, Amuwo-Odofin has the highest number of owner-occupier houses which is about 24.8%. What this implies invariably is that the rate of home-ownership is higher in medium than in high residential density areas. However, the dominant tenure status is rental houses which claim substantial proportion of housing production in these residential areas. Of special interest also is Eti-osa local government with high proportion of subsidised rented houses which is over and above owner-occupier and normal rented houses. It can thus be inferred from this that most of the houses in Eti-osa local government are either given to workers of certain corporate organisations at subsidised rates or through other unknown means. The subsidised rents also cover all other LGCs in the density areas in varying degrees. The free rent syndrome is also a prominent tenure status in this residential neighbourhood. Amuwo Odofin has the highest number of 4.7%, closely followed by Eti-osa and Ifako-Ijaiye with 4.3% and 4.0% respectively.

Table 3.27: Distribution of Households by Tenure Status in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Owner-Occupier	Normal Rent	Subsidised Rent	Free Rent	Other	Total
Amuwo Odofin	63(24.8%)	94(37.0%)	84(33.1%)	12(4.7%)	1(0.4%)	254(100%)
Eti-osa	41(17.5%)	86(36.8%)	97(41.5%)	10(4.3%)	0(0%)	234(100%)
Ifako-Ijaiye	41(15.0%)	146(53.5%)	75(27.5%)	11(4.0%)	0(0%)	273(100%)
Ikeja	45(17.8%)	115(45.5%)	85(33.6%)	8(3.2%)	0(0%)	253(100%)
Kosofe	47(12.8%)	184(50.0%)	123(33.4%)	14(3.8%)	0(0%)	368(100%)
Mainland	38(13.1%)	183(63.3%)	61(21.1%)	7(2.4%)	0(0%)	289(100%)
Oshodi/Isolo	34(8.9%)	194(50.8%)	146(38.2%)	8(2.1%)	0(0%)	382(100%)
Surulere	73(19.2%)	201(52.9%)	99(26.1%)	7(1.8%)	0(0%)	380(100%)
Total	**382(15.7%)**	**1203(49.4%)**	**770(31.6%)**	**77(3.2%)**	**1(0%)**	**2433(100%)**

Source: *Computed from Lagos Household Survey, 2006*

The degree of ownership of rental dwellings is not significantly different for houses rented at market rates but some variations are observed in the case of owner-occupier houses. For instance, the ownership structure of owner-occupier houses depicts that the houses are mainly

owned by the household heads across all LGCs whereas houses in the Mainland local government presents co-ownership structure which almost equates that of ownership by household head. The percentage of co-ownership in Mainland local government is 5.9% while that of household heads stand at 5.5% (see Table 3.28). Some owner-occupier dwellings are also observed to have been owned by other members of households ranging from as low as 1.3% in Oshodi/Isolo local government to as high as 5.6% in Eti-osa local government council.

Table.3.28: Distribution of Households by Type of Occupancy Status in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Dwelling Owned by Head	Dwelling Owned by Head and Spouse	Dwelling Owned by Spouse	Dwelling Owned by another Member of Household	Household rents the dwelling at market rents	Household rent the dwelling and pays nominal or Subsidised Rent.	Uses without paying rent	Nomadic/ Temporary Dwelling	Total
Amuwo Odofin	59(23.2%)	0(0%)	0(0%)	4(1.6%)	94(37.0%)	84(33.1%)	12(4.7%)	1(0.4%)	254(100%)
Eti-osa	21(9.0%)	7(3.0%)	2(0.9%)	13(5.6%)	86(36.8%)	95(40.6%)	10(4.3%)	0(0%)	234(100%)
Ifako-Ijaiye	27(9.9%)	2(0.7%)	2(0.7%)	12(4.4%)	146(53.5%)	73(26.7%)	11(4.0%)	0(0%)	273(100%)
Ikeja	34(13.4%)	2(0.8%)	1(0.4%)	9(3.6%)	115(45.5%)	84(33.2%)	8(3.2%)	0(0%)	253(100%)
Kosofe	33(9.0%)	0(0%)	1(0.3%)	14(3.8%)	184(50.0%)	122(33.2%)	14(3.8%)	0(0%)	368(100%)
Mainland	17(5.9%)	16(5.5%)	5(1.7%)	5(1.7%)	183(63.3%)	56(19.4%)	7(2.4%)	0(0%)	289(100%)
Oshodi/Isolo	29(7.6%)	0(0%)	1(0.3%)	5(1.3%)	194(50.8%)	145(38.0%)	8(2.1%)	0(0%)	382(100%)
Surulere	60(15.8%)	5(1.3%)	5(1.3%)	8(2.1%)	201(52.9%)	94(24.7%)	7(1.8%)	0(0%)	380(100%)
Total	**280 (11.5%)**	**32 (1.3%)**	**17 (0.7%)**	**70 (2.9%)**	**1203 (49.4%)**	**753 (30.9%)**	**77 (3.2%)**	**1 (0%)**	**2433 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

Table 3.29 also presents the prevailing housing type in medium residential density areas of the state. The multi-household houses which appear to be the most predominant housing type and stand out prominently in high residential density areas could not find its feet in medium residential density areas as shown on the Table. This, by implication, depicts that there are no particular housing types that stand out markedly. For instance, multi-household houses were only remarkably conspicuous only in three local governments namely: Ifako Ijaiye, (64.8%), Mainland, (44.6%) and Oshodi/Isolo,(51.0%). In fact, some local governments present different and interesting pictures altogether like Eti-osa where flats in a block of flats

dominates with 56.0%, whereas duplex took a lead in Surulere with 49.5% and single household houses apparently predominates Kosofe with 41.8% while Amuwo Odofin and Ikeja dominated with 55.1% and 64.4% respectively under room in the main building. The traces of squatters' settlers are found in Oshodi/Isolo axis as depicted in the Table. From the above description, it is quite obvious that no particular clear-cut pattern has emerged in terms of prevalent housing type unlike what is obtainable in high residential density area.

Table.3.29: Distribution of Households by Housing Types in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Single-Household House	Multi-Household house	Flats in a block of flats	Duplex	Room In the main Dwelling	Squatters' Settlement	Other	Total
Amuwo Odofin	0(0%)	34(13.4%)	79(31.1%)	1(0.4%)	140(55.1%)	0(0%)	0(0%)	254(100%)
Eti-osa	2(0.9%)	89(38.0%)	131(56.0%)	0(0%)	12(5.1%)	0(0%)	0(0%)	234(100%)
Ifako-Ijaiye	1(0.4%)	177(64.8%)	16(5.9%)	14(5.1%)	61(22.3%)	1(0.4%)	3(1.1%)	273(100%)
Ikeja	6(2.4%)	30(11.9%)	34(13.4%)	8(3.2%)	163(64.4%)	0(0%)	12(4.7%)	253(100%)
Kosofe	154(41.8%)	133(36.1%)	61(16.6%)	3(0.8%)	15(4.1%)	0(0%)	2(0.5%)	368(100%)
Mainland	60(20.8%)	129(44.6%)	34(11.8%)	20(6.9%)	41(14.2%)	0(0%)	5(1.7%)	289(100%)
Oshodi/Isolo	0(0%)	195(51.0%)	100(26.2%)	0(0%)	75(19.6%)	1(0.3%)	11(2.9%)	382(100%)
Surulere	3(0.8%)	94(24.7%)	73(19.2%)	188(49.5%)	16(4.2%)	0(0%)	6(1.6%)	380(100%)
Total	**226 (9.3%)**	**881 (36.2%)**	**528 (21.7%)**	**234 (9.6%)**	**523 (21.5%)**	**2 (0.1%)**	**39 (1.6%)**	**2433 (100%)**

Source**:** *Computed from Lagos Household Survey, 2006*

Household characteristics also play prominent roles in the residential choice determination both theoretically and empirically. Thus, it becomes useful to evaluate households' capabilities through critical assessment of the socio-demographic characteristics.

First, just as explained under high residential density areas, [Table 3.30], secondary education appears to dominate the distribution of households by educational status across all the LGCs except for Eti-osa where tertiary education took the lead by constituting about 49.6%. This is not unexpected in this local government since it has become a base for educated elites immediately after the exit of the colonial masters. The proportion of tertiary certificate holders is also substantial in virtually all the LGCs except that it is significantly

higher in Eti-osa local government. The population distribution of those with no formal education is also significant given the percentage values in each of the LGCs.It is highest in Ifako-Ijaiye with about 8.1%, directly followed by Amuwo-Odofin with 7.5% and next to this is Oshodi/Isolo local government. In terms of primary school education, large percentages came virtually from all the LGCs except Eti-osa and Amuwo Odofin local governments with single digits . Those with vocational and technical expertise also accounted for reasonable percentage of the entire distribution, but are highest in Kosofe with 7.6% while Mainland and Ifako-Ijaiye stand at 5.5% and 5.1% respectively.

Table.3.30: Distribution of Households by Educational Status in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	**None**	**Primary**	**Secondary**	**Tertiary**	**Vocational /Technical**	**Other**	**Total**
Amuwo Odofin	19(7.5%)	23(9.1%)	112(44.1%)	91(35.8%)	9(3.5%)	0(0%)	254(100%)
Eti-osa	9(3.8%)	17(7.3%)	84(35.9%)	116(49.6%)	8(3.4%)	0(0%)	234(100%)
Ifako-Ijaiye	22(8.1%)	41(15.0%)	111(40.7%)	82(30.0%)	14(5.1%)	3(1.1%)	273(100%)
Ikeja	17(6.7%)	29(11.5%)	111(43.9%)	90(35.6%)	5(2.0%)	1(0.4%)	253(100%)
Kosofe	29(7.9%)	56(15.2%)	174(47.3%)	75(20.4%)	28(7.6%)	6(1.6%)	368(100%)
Mainland	12(4.2%)	33(11.4%)	126(43.6%)	101(34.9%)	16(5.5%)	1(0.3)	289(100%)
Oshodi/Isolo	27(7.1%)	46(12.0%)	201(52.6%)	96(25.1%)	12(3.1%)	0(0%)	382(100%)
Surulere	25(6.6%)	53(13.9%)	159(41.8%)	127(33.4%)	13(3.4%)	3(0.8%)	380(100%)
Total	**160 (6.6%)**	**298 (12.2%)**	**1078 (44.3%)**	**778 (32.0%)**	**105 (4.3%)**	**14 (0.6)**	**2433 (100%)**

Source*: Computed from Lagos Household Survey, 2006*

The dominant occupation among the sample respondents shown in Table 3.31 is self employment as it accounted for larger percentage of the entire occupational distribution. Self-employment accounted, on the average, for well over 50% of jobs employment to people across the LGCs in medium residential density areas with the highest being Kosofe with 60.1% while the least is Mainland with 42.9%. The availability of public-salaried workers appears to be rampant in Eti-osa and Amuwo-Odofin with 39.3% and 37.0% respectively as compared to other types of occupation. The distribution of private-salaried jobs and that of studentship are not significantly substantial relative to either self employment or public-salaried jobs. In addition, the number of unemployed persons is also substantial among the respondent samples as they are found in the LGCs within the residential density areas.

Table.3.31: Distribution of Households by Occupational Status in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Unemployed	Public	Private	Self-employed	Student/ Apprentice	Other	Total
Amuwo Odofin	8(3.1%)	94(37.0%)	22(8.7%)	121(47.6%)	6(2.4%)	3(1.2%)	254(100%)
Eti-osa	12(5.1%)	92(39.3%)	8(3.4%)	115(49.1%)	6(2.6%)	1(0.4%)	234(100%)
Ifako-Ijaiye	20(7.3%)	68(24.9%)	19(7.0%)	153(56.0%)	11(4.0%)	2(0.7%)	273(100%)
Ikeja	14(5.5%)	93(36.8%)	13(5.1%)	117(46.2%)	12(4.7%)	4(1.6%)	253(100%)
Kosofe	18(4.9%)	97(26.4%)	16(4.3%)	221(60.1%)	11(3.0%)	5(1.4%)	368(100%)
Mainland	18(6.2%)	109(37.7%)	22(7.6%)	124(42.9%)	8(2.8%)	8(2.8%)	289(100%)
Oshodi/Isolo	18(4.7%)	102(26.7%)	19(5.0%)	224(58.6%)	14(3.7%)	5(1.3%)	382(100%)
Surulere	33(8.7%)	100(26.3%)	18(4.7%)	218(57.4%)	8(2.1%)	3(0.8%)	380(100%)
Total	**141 (5.8%)**	**755 (31.0%)**	**137 (5.6%)**	**1293 (53.1%)**	**76 (3.1%)**	**31 (1.3%)**	**2433 (100%)**

Source*: Computed from Lagos Household Survey, 2006*

The bulk of respondents' household average monthly income ranges between N10,001and N20,000 in virtually all the LGCs (Table 3.32). For instance, Amuwo Odofin has 27.9%, Eti-osa, (23.0%), Ifako Ijaiye, (33.6%), Ikeja, (29.1%) ,Kosofe, (47.0%), Mainland, (22.3%), Oshodi/Isolo (35.6%) and Surulere, (22.9%). In Eti-osa local government, the households whose average monthly income peaked at N50,000 and above accounted for as much as 31.1%, close to this is Surulere with 23.7% and the least in this category being Oshodi/Isolo with just 5.0%. The two extreme points clearly brings out the wide disparities observable in the choice relating to the housing types earlier mentioned, with majority with lower income patronising multi-household houses as against higher income earners who patronise flat in a block of flats or duplexes or at best single-household houses. Thus, suggesting that the average income earned still remains a singular factor that is influential in the decisions relating to residential housing choice irrespective of residential areas. Apart from this, households in the LGCs who are within the income bracket of N20,001 to N30,000 were also substantial as depicted by the percentages which range from 16.2% to 21.6%. It is important to mention that the percentage differences among the LGCs were not so significantly wide as to create basis for dichotomous analysis. The same can also be said about those within the income bracket of N30,001 to N40,000 except in Kosofe local government with about 6.0%.

Table.3.32: Distribution of Households by Monthly Income in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Up to N10,000	N10,001-N20,000	N20,001-N30,000	N30,001-N40,000	N40,001-N50,000	N50,000 above	Total
Amuwo Odofin	45(18.8%)	67(27.9%)	42(17.5%)	17(7.1%)	25(10.4%)	44(18.3%)	240(100%)
Eti-osa	25(11.3%)	51(23.0%)	36(16.2%)	25(11.3%)	16(7.2%)	69(31.1%)	222(100%)
Ifako-Ijaiye	43(18.5%)	78(33.6%)	46(19.8%)	31(13.4%)	12(5.2%)	22(9.5%)	232(100%)
Ikeja	39(18.9%)	60(29.1%)	34(16.5%)	21(10.2%)	26(12.6%)	26(12.6%)	206(100%)
Kosofe	65(20.4%)	150(47.0%)	63(19.7%)	19(6.0%)	7(2.2%)	15(4.7%)	319(100%)
Mainland	45(16.5%)	61(22.3%)	59(21.6%)	30(11.0%)	30(11.0%)	48(17.6%)	273(100%)
Oshodi/Isolo	69(21.6%)	114(35.6%)	68(21.3%)	29(9.1%)	24(7.5%)	16(5.0%)	320(100%)
Surulere	47(12.7%)	85(22.9%)	60(16.2%)	45(12.1%)	46(12.4%)	88(23.7%)	371(100%)
Total	**378 (17.3%)**	**666 (30.5%)**	**408 (18.7%)**	**217 (9.9%)**	**186 (8.5%)**	**328 (15.0%)**	**2183 (100%)**

Source*: Computed from Lagos Household Survey, 2006*

The household size category in this residential density area is not too different from what is obtainable in the high residential density areas. For instance, just like in high residential density areas household size category of 5-6 dominates mainly the distribution (table 3.33). All the local government councils in the medium residential density area have household size 5 to 6 which accounts for well over 35% but the distribution of those in category between 7 and 8 is far more than household size 9 to10 as revealed in the Table.

Table.3.33: Distribution of Households by Household Size Category in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	1-2	3-4	5-6	7-8	9-10	10 and Above	Total
Amuwo Odofin	37(14.6%)	64(25.2%)	105(41.3%)	39(15.4%)	7(2.8%)	2(0.8%)	254(100%)
Eti-osa	18(7.7%)	62(26.5%)	113(48.3%)	33(14.1%)	7(3.0%)	1(0.4%)	234(100%)
Ifako-Ijaiye	51(18.7%)	79(28.9%)	109(39.9%)	29(10.6%)	5(1.8%)	0(0%)	273(100%)
Ikeja	37(14.6%)	65(25.7%)	93(36.8%)	45(17.8%)	9(3.6%)	4(1.6%)	253(100%)
Kosofe	62(16.8%)	92(25.0%)	148(40.2%)	52(14.1%)	7(1.9%)	7(1.9%)	368(100%)
Mainland	20(6.9%)	51(17.6%)	160(55.4%)	44(15.2%)	10(3.5%)	4(1.4%)	289(100%)
Oshodi/Isolo	53(13.9%)	101(26.4%)	136(35.6%)	75(19.6%)	15(3.9%)	2(0.5%)	382(100%)
Surulere	16(4.2%)	108(28.4%)	160(42.1%)	73(19.2%)	18(4.7%)	5(1.3%)	380(100%)
Total	**294 (12.1%)**	**622 (25.6%)**	**1024 (42.1%)**	**390 (16.0%)**	**78 (3.2%)**	**25 (1.0%)**	**2433 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

With respect to distribution of respondents by tribe, it is observed from Table 3.34 that the Yorubas form the major tribe dominating the residential dwellings regardless of residential areas. The distribution of people from other tribes are quite insignificant with the exception of some local governments like Amuwo Odofin,Eti osa, Ikeja and oshodi/Isolo where the percentage of Ibo people are relatively large. For instance, Ibos in these local governments are as follows: 48.4%, 31.5%, 37.0% and 36.3% respectively. It is clear from the Table that Hausas are at lower levels of 1.6%,0.4%,1.5% and 0.3% in Eti-osa, Ifako-Ijaiye, Mainland and Surulere respectively.

Table.3.34: Distribution of Households by Type of Tribe in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	**Yoruba**	**Hausa**	**Ibo**	**Total**
Amuwo Odofin	115(51.6%)	0(0%)	108(48.4%)	223(100%)
Eti-osa	123(66.8%)	3(1.6%)	58(31.5%)	184(100%)
Ifako-Ijaiye	198(85.3%)	1(0.4%)	33(14.2%)	232(100%)
Ikeja	133(63.0%)	0(0%)	78(37.0%)	211(100%)
Kosofe	267(82.4%)	0(0%)	57(17.6%)	324(100%)
Mainland	202(77.4%)	4(1.5%)	55(21.1%)	261(100%)
Oshodi/Isolo	218(63.7%)	0(0%)	124(36.3%)	342(100%)
Surulere	258(79.6%)	1(0.3%)	65(20.1%)	324(100%)
Total	**1514(72.1%)**	**9(0.4%)**	**578(27.5%)**	**2101(100%)**

Source: *Computed from Lagos Household Survey, 2006*

The importance of religious issues is also vital in the residential choice decision behaviour and well documented in the literature. From Table 3.35, the proportion of christians to muslims is substantially large and similar to what is obtainable in high residential density areas. The christians dominate the housing units in all the LGCs in the medium residential density areas as reflected on the Table. However, remarkable difference is observed between high and medium residential density areas such that the proportion of people from other religious sects are quite enormous as compared to high residential density areas that are filled with single digit percentage except Agege only with two digits. Thus, people from these other religious sects are higher in Eti-osa and Surulere constituting about19.2% and 20.8% respectively.

Table.3.35: Distribution of Households by Type of Religion in the Local Government Councils in Medium Residential Density Areas

Local Government Councils	Muslim	Christian	Other Religion	Total
Amuwo Odofin	49(19.3%)	173(68.1%)	32(12.6%)	254(100%)
Eti-osa	54(23.1%)	135(57.7%)	45(19.2%)	234(100%)
Ifako-Ijaiye	57(20.9%)	193(70.7%)	23(8.4%)	273(100%)
Ikeja	43(17.0%)	169(66.8%)	41(16.2%)	253(100%)
Kosofe	88(23.9%)	244(66.3%)	36(9.8%)	368(100%)
Mainland	66(22.8%)	189(65.4%)	34(11.8%)	289(100%)
Oshodi/Isolo	72(18.8%)	273(71.5%)	37(9.7%)	382(100%)
Surulere	60(15.8%)	241(63.4%)	79(20.8%)	380(100%)
Total	**489(20.1%)**	**1617(66.5%)**	**327(13.4%)**	**2433(100%)**

Source: *Computed from Lagos Household Survey, 2006*

It is therefore obvious from the above description that the difference between high and medium residential density areas in trems of regious affiliations is marginal.

3.4.3 Structure and characteristics of Households and Housing in Low Residential Density Areas

The housing situation in low residential density areas at least in terms of materials used on housing is not significantly different from that of high and medium residential density areas. The bulk of houses in the LGCs make use of corrugated iron sheets as their major and main roofing material. In Ikorodu local government for instance, almost all the houses there are roofed with corrugated iron sheets, this stands at 91.1% while the remaining are being shared by mud bricks, asbestos and roofing tiles in different proportions (Table 3.36). Similar description can be accorded to all other LGCs except for the fact that there are variations in the proportion of usages among the different type of roofing materials. The use of thatched and wood/bamboo roofs in Ibeju-Lekki also present interesting picture of the nature and structure of housing units in that local government. Both thatched and wood/bamboo accounted for about 7.4% and 5.6% respectively. Also, Apapa LGC used 78.6% corrugated iron sheets, 16.2% cement/concrete and 4.3% asbestos roofs, Badagry and Epe had almost the same pattern of roofing pattern.

Table.3.36: Distribution of Households by Type of Roofing Materials used in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Mud/ Mud Bricks	Thatch	Wood/ Bamboo	Corrugated Iron Sheet	Cement/ Concrete	Roofing Tiles	Asbestos	Other	Total
Apapa	1(0.4%)	0(0%)	1(0.4%)	184(78.6%)	38(16.2%)	0(0%)	10(4.3%)	0(0%)	234(100%)
Badagry	0(0%)	0(0%)	4(1.9%)	168(78.9%)	25(11.75)	1(0.5%)	15(7.0%)	0(0%)	213(100%)
Epe	6(2.9%)	0(0%)	0(0%)	154(74.0%)	25(12.0%)	1(0.5%)	18(8.7%)	4(1.9%)	208(100%)
Ibeju-Lekki	2(1.2%)	12(7.4%)	9(5.6%)	89(54.9%)	15(9.3%)	5(3.1%)	30(18.5%)	0(0%)	162(100%)
Ikorodu	6(2.3%)	0(0%)	0(0%)	236(91.1%)	0(0%)	1(0.4%)	16(6.2%)	0(0%)	259(100%)
Ojo	0(0%)	0(0%)	0(0%)	211(76.7%)	35(12.7%)	0(0%)	29(10.5%)	0(0%)	275(100%)
Total	**15 (1.1%)**	**12 (0.9%)**	**14 (1.0%)**	**1042 (77.1%)**	**138 (10.2%)**	**8 (0.6%)**	**118 (8.7%)**	**4 (0.3%)**	**1351 (100%)**

Source: *Computed from Lagos Household Survey, 2006.*

Similar to other residential areas is the predominant usage of concrete wall materials which took larger percentage over other types. There were also considerable improvements in the usage of concrete walls over other types in Ojo, Apapa and Badagry local governments as depicted by highest percentage of 99.3%, 97.9% and 97.7%respectively as shown in Table 3.37.There are still traces of usage of "traditional" wall materials like mud bricks, burnt bricks and wood/bamboo in some LGC which are Epe,Ikorodu, Ibeju Lekki and negligible proportion in Apapa LGC.

Table.3.37: Distribution of Households by Type of Wall Material in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Mud/Mud Bricks	Burnt Bricks	Cement/Concrete	Wood/Bamboo	Corrugated Iron Sheet	Total
Apapa	4(1.7%)	0(0%)	229(97.9%)	0(0%)	1(0.4%)	234(100%)
Badagry	0(0%)	1(0.5%)	208(97.7%)	4(1.9%)	0(0%)	213(100%)
Epe	33(15.9%)	0(0%)	174(83.7%)	0(0%)	10.5	208(100%)
Ibeju-Lekki	6(3.7%)	0(0%)	134(82.7%)	20(12.3%)	2(1.2%)	162(100%)
Ikorodu	32(12.4%)	0(0%)	227(87.6%)	0(0%)	0(0%)	259(100%)
Ojo	0(0%)	1(0.4%)	273(99.3%)	0(0%)	1(0.4)	275(100%)
Total	**75(5.6%)**	**2(0.1%)**	**1245(92.2%)**	**24(1.8%)**	**5(0.4)**	**1351(100%)**

Source: Computed from Lagos Household Survey, 2006.

Unlike the other two residential density areas [High and medium] where there are no particular flooring materials, buildings in low residential density areas in all the LGCs accorded highest value to concrete floor than any other type. This markedly offers the

difference and demarcating lines among the residential density areas. The use of earth/mud also constitutes a vital component of floor materials in all LGCs except Apapa local government (Table 3.38).

Table.3.38: Distribution of Households by Type of Floor Materials used in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Earth/Mud	Concrete	Other	Total
Apapa	0(0%)	234(100%)	0(0%)	234(100%)
Badagry	4(1.9%)	209(98.1%)	0(0%)	213(100%)
Epe	6(2.9%)	202(97.1%)	0(0%)	208(100%)
Ibeju-Lekki	21(13.0%)	138(85.2%)	3(1.9%)	162(100%)
Ikorodu	9(3.5%)	250(96.5%)	0(0%)	259(100%)
Ojo	1(0.4%)	274(99.6%)	0(0%)	275(100%)
Total	**41(3.0%)**	**1307(96.7%)**	**3(0.2%)**	**1351(100%)**

Source: *Computed from Lagos Household Survey, 2006*

In addition to the type of materials used, the provision and availability of facilities like good drinkable water together with healthy toilet facilities go a long way in influencing the residential choice of housing. In this residential density area, the use of public tap, well and borehole accounted largely as main sources of water supply. For instance, from Table 3.39, in Apapa local government, public tap which serves as the main water supply source provided 40.6% of water used. Similarly in Ikorodu LGC, borehole contributed as much as 73.7% of water used whereas well water has been the main source of water in Badagry, Ibeju-Lekki and Ojo LGCs with of 54.9%, 54.9% and 72.4% respectively. The supply of water by small scale water vendors also complement the main source of water in some local governments like Apapa, Epe and Ikorodo. Water supply by dam, lakes etc also serve important purposes in Epe, Ibeju-Lekki and Ikorodu respectively. What can be inferred in this residential density area is that the source of water supply seems to be common among the LGCs except Ikorodu and Ojo that has borehole and wells as their major souce of water.

Table.3.39: Distribution of Households by Source of Water in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Piped Borne Water	Public Tap	Borehole	Well	Spring	Rain Water	Small Scale Vendor	Tanker Truck	Dam, Lake	Others	Total
Apapa	43(18.4%)	95(40.6%)	11(4.7%)	24(10.3%)	0(0%)	0(0%)	41(17.5%)	1(0.4%)	0(0%)	19(8.1%)	234(100%)
Badagry	19(8.9%)	21(9.9%)	55(25.8%)	117(54.9%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.5%)	213(100%)
Epe	4(1.9%)	45(21.6%)	79(38.0%)	41(19.7%)	17(8.2%)	2(1.0%)	7(3.4%)	0(0%)	9(4.3%)	4(1.9%)	208(100%)
Ibeju-Lekki	5(3.1%)	0(0%)	45(27.8%)	89(54.9%)	1(0.6%)	3(1.9%)	1(0.6%)	2(1.2%)	16(9.9%)	0(0%)	162(100%)
Ikorodu	8(3.1%)	28(10.8%)	191(73.7%)	5(1.9%)	4(1.5%)	0(0%)	14(5.4%)	0(0%)	9(3.5%)	0(0%)	259(100%)
Ojo	2(0.7%)	7(2.5%)	65(23.6%)	199(72.4%)	1(0.4%)	0(0%)	0(0%)	1(0.4%)	0(0%)	0(0%)	275(100%)
Total	**81 (6.0%)**	**196 (14.5%)**	**446 (33.0%)**	**475 (35.2%)**	**23 (1.7%)**	**5 (0.4%)**	**63 (4.7%)**	**4(0.3%)**	**34 (2.5%)**	**24 (1.8%)**	**1351 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

The use of solid wastes disposal system in low residential density area charts a different dimension entirely from what was obtainable in both high and medium residential density areas. For instance, unauthorised methods of dumping refuse remain the key method of disposing wastes since it contributes significantly in virtually all the LGCs. The contributions of this method in the following local governments namely: Badagry, Epe, Ibeju-Lekki, Ikorodu and Ojo are 49.8%, 53.4%, 56.2%, 20.1% and 39.6% respectively [Table 3.40]. The disposal within compound or neighbourhood also has substantial percentage in some local governments like Badagry, Epe and Ibeju-Lekki. Thus, the use and application of PSP and government bin are minimally reduced unlike in the other two residential density areas. Equally important method of disposing solid wastes in low residential density area is the use of the private refuse collectors with Apapa LGC having highest percentage of 75.2%. The contribution of this method of waste disposal system also appears substantial in both Ikorodu(47.9%) and Ojo(27.6%) local governments respectively.

Table.3.40: Distribution of Households by Method of Disposal of Solid Waste in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Collected by the government house to house (PSP)	Unauthorised Heap-Dumping ground in neighbourhood	Truck pusher/private Refuse Collector	Disposal within compound neighbourhood Bin/tank	Government Bin	Other	Total
Apapa	41(17.5%)	15(6.4%)	176(75.2%)	2(0.9%)	0(0%)	0(0%)	234(100%)
Badagry	0(0%)	106(49.8%)	74(34.7%)	30(14.1%)	0(0%)	3(1.4%)	213(100%)
Epe	2(1.0%)	111(53.4%)	20(9.6%)	49(23.6%)	17(8.2%)	9(4.3%)	208(100%)
Ibeju-Lekki	3(1.9%)	91(56.2%)	8(4.9%)	46(28.4%)	0(0%)	14(8.6%)	162(100%)
Ikorodu	50(19.3%)	52(20.1%)	124(47.9%)	11(4.2%)	11(4.2%)	11(4.2%)	259(100%)
Ojo	54(19.6%)	109(39.6%)	76(27.6%)	13(4.7%)	0(0%)	23(8.4%)	275(100%)
Total	**150 (11.1%)**	**484 (35.8%)**	**478 (35.4%)**	**151 (11.2%)**	**28 (2.1%)**	**60 (4.4%)**	**1351 (100%)**

Source*: Computed from Lagos Household Survey, 2006*

The tenure status arrangement in this residential density area presents a totally different setting from what was observed in high and medium residential density areas. A casual observation of Table 3.41 shows increasing proportions in owner-occupier houses and decreasing proportions in rental houses. What this suggests is that home-ownership rates are much higher in low residential density area than in high and medium ones. For instance, owner-occupier houses are almost equal to rental houses in Ibeju-Lekki local government as depicted in the Table. Similarly, in Badagry, Epe and Ikorodu local governments increasing trends is also observed in the percentage of owner-occupation ranging from 26.8%, 28.4% and 22.8% respectively. Another interesting observation is that subsidised housing rent is much higher than owner-occupier and normal rent in Badagry local government. The phenomenon of free rent is also highest in Ibeju-Lekki local government.

Table.3.41: Distribution of Households by Tenure Status in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Owner-Occupier	Normal Rent	Subsidised Rent	Free Rent	Other	Total
Apapa	12(5.1%)	128(54.7%)	90(38.5%)	4(1.7%)	0(0%)	234(100%)
Badagry	57(26.8%)	70(32.9%)	73(34.3%)	13(6.1%)	0(0%)	213(100%)
Epe	59(28.4%)	70(33.7%)	59(28.4%)	19(9.1%)	1(0.5%)	208(100%)
Ibeju-Lekki	60(37.0%)	61(37.7%)	18(11.1%)	23(14.2%)	0(0%)	162(100%)
Ikorodu	59(22.8%)	125(48.3%)	69(26.6%)	6(2.3%)	0(0%)	259(100%)
Ojo	41(14.9%)	131(47.6%)	88(32.0%)	15(5.5%)	0(0%)	275(100%)
Total	**288(21.3%)**	**585(43.3%)**	**397(29.4%)**	**80(5.9%)**	**1(0.1%)**	**1351(100%)**

Source*: Computed from Lagos Household Survey, 2006*

The ownership status of the owner-occupier houses lies mainly with household heads in all the LGCs [Table 3.42] as household heads own 3.0% in Apapa LGC, 13.1%,22.6%, 27.2%,12.4% and 10.2% in Badagry ,Epe, Ibeju-Lekki, Ikorodu and Ojo local governments respectively. It is interesting to note that the dwellings owned by another member of households have also increased tremendously in this residential neighbourhood in relation to other residential density areas. The ownership status of rental houses follow similar pattern as earlier explained under the tenure status discussion.

Table.3.42: Distribution of Households by Type of Occupancy Status in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Dwelling Owned by Head	Dwelling Owned by Head and Spouse	Dwelling Owned by Spouse	Dwelling Owned by another Member of Household	Household rents the dwelling at market rents	Household rent the dwelling and pays nominal or Subsidized Rent.	Uses without paying rent	Nomadic/Temporary Dwelling	Total
Apapa	7(3.0%)	2(0.9%)	0(0%)	3(1.3%)	128(54.7%)	90(38.5%)	4(1.7%)	0(0%)	234(100%)
Badagry	28(13.1%)	9(4.2%)	2(0.9%)	20(9.4%)	70(32.9%)	71(33.3%)	13(6.1%)	0(0%)	213(100%)
Epe	47(22.6%)	2(1.0%)	1(0.5%)	10(4.8%)	70(33.7%)	58(27.9%)	19(9.1%)	1(0.5%)	208(100%)
Ibeju-Lekki	44(27.2%)	13(8.0%)	0(0%)	3(1.9%)	61(37.7%)	18(11.1%)	23(14.2%)	0(0%)	162(100%)
Ikorodu	32(12.4%)	2(0.8%)	2(0.8%)	25(9.7%)	125(48.3%)	67(25.9%)	6(2.3%)	0(0%)	259(100%)
Ojo	28(10.2%)	0(0%)	2(0.7%)	13(4.7%)	131(47.6%)	86(31.3%)	15(5.5%)	0(0%)	275(100%)
Total	**186 (13.8%)**	**28 (2.1%)**	**7 (0.5%)**	**74 (5.5%)**	**585 (43.3%)**	**390 (28.9%)**	**80 (5.9%)**	**1 (0.1%)**	**1351 (100%)**

Source: *Computed from Lagos Household Survey, 2006*.

The housing type in five of the LGCs favour multi-household houses relative to others. In fact, the type of house in four of the local governments namely: Apapa,Badagry,Epe and Ikorodu, are exclusively characterised by multi-household as shown on Table 3.43. For instance, while 90.2% of houses in Apapa are multi-household in nature so is Badagry with 77.0%, Epe, 85.1% and Ikorodu with 95.8% respectively. The prominent and dominant housing type in Ojo LGC is 'room in a main dwelling' which constitutes about 68.4% of the various housing type. Single-household houses were substantial in Ibeju-lekki with 28.4% while the phenomenon of squatters' settlement is highest in the same local government. The duplex as a housing type is comparatively scarce in this residential density area in relation to other residential density areas.

Table.3.43: Distribution of Households by Housing Types in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Single-Household House	Multi-Household house	Flats in a block of flats	Duplex	Room In the main Dwelling	Squatters' Settlement	Other	Total
Apapa	1(0.4%)	211(90.2%)	4(1.7%)	2(0.9%)	16(6.8%)	0(0%)	0(0%)	234(100%)
Badagry	0(0%)	164(77.0%)	16(7.5%)	0(0%)	29(13.6%)	0(0%)	4(1.9%)	213(100%)
Epe	5(2.4%)	177(85.1%)	4(1.9%)	0(0%)	20(9.6%)	0(0%)	2(1.0%)	208(100%)
Ibeju-Lekki	46(28.4%)	57(35.2%)	17(10.5%)	1(0.6%)	16(9.9%)	18(11.1%)	7(4.3%)	162(100%)
Ikorodu	11(4.2%)	248(95.8%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	259(100%)
Ojo	11(4.0%)	34(12.4%)	13(4.7%)	0(0%)	188(68.4%)	5(1.8%)	24(8.7%)	275(100%)
Total	**74 (5.5%)**	**891 (66.0%)**	**54 (4.0%)**	**3 (0.2%)**	**269 (19.9%)**	**23 (1.7%)**	**37 (2.7%)**	**1351 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

The characteristics of the households as earlier mentioned are also very important in explaining peoples' residential housing choice decisions. The importance of socio-demographic variables like education, age, and occupation in explaining residential choice behaviour is documented in residential research literature. From Table 3.44, it is clear that a large number of the respondents' are secondary certificate holders as revealed by the percentage acquisitions. This cut across all the LGCs in low residential density areas. The minimum acquired is 40.7% while the maximum is 52.1%. Surprisingly, the proportion of those with no formal education and primary education are still greater than that of tertiary education. The lowest in the distribution are those in 'other' category and vocational/technical education. For education, Epe and Ikorodu local governments recorded the highest percentages of 16.3% and 16.2 % , while Ibeju-Lekki and Epe have substantial

percentages of 29.6% and 25.5% respectively for primary education. The highest number of tertiary education certificate holders is those from badagry and Apapa local governments with 16.4% and 14.5% respectively. These two local governments still recorded highest number of those in vocational/technical education.

Table.3.44: Distribution of Households by Educational Status in the Local Government Councils in Low Residential Density Areas

Local Government Councils	None	Primary	Secondary	Tertiary	Vocational/Technical	Other	Total
Apapa	24(10.3%)	421(17.9%)	122(52.1%)	34(14.5%)	12(5.1%)	0(0%)	234(100%)
Badagry	16(7.5%)	40(18.8%)	110(51.6%)	35(16.4%)	12(5.6%)	0(0%)	213(100%)
Epe	34(16.3%)	53(25.5%)	94(45.2%)	25(12.0%)	2(1.0%)	0(0%)	208(100%)
Ibeju-Lekki	25(15.4%)	48(29.6%)	66(40.7%)	16(9.9%)	7(4.3%)	0(0%)	162(100%)
Ikorodu	42(16.2%)	52(20.1%)	124(47.9%)	30(11.6%)	10(3.9%)	1(0.4%)	259(100%)
Ojo	33(12.0%)	50(18.2%)	138(50.2%)	40(14.5%)	11(4.0%)	3(1.1%)	275(100%)
Total	**174 (12.9%)**	**285 (21.1%)**	**654 (48.4%)**	**180 (13.3%)**	**54 (4.0%)**	**4 (0.3%)**	**1351 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

From Table 3.45, self-employment still dominates the main occupation in the low residential density areas and the proportion of those in this category is substantial across the LGCs [Table 3.44]. This is directly followed by those in the employment of government that is, public-salaried workers. The percentage of unemployed persons is far higher in Ibeju-Lekki than in any of the other local government councils. What this implies is that the number of self-employed persons are scattered all over Lagos state.

Table.3.45: Distribution of Households by Occupational Status in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Unemployed	Public	Private	Self-employed	Student/ Apprentice	Other	Total
Apapa	7(3.0%)	57(24.4%)	16(6.8%)	151(64.5%)	2(0.9%)	1(0.4%)	234(100%)
Badagry	10(4.7%)	55(25.8%)	20(9.4%)	123(57.7%)	1(0.5%)	4(1.9%)	213(100%)
Epe	11(5.3%)	32(15.4%)	19(9.1%)	138(66.3%)	4(1.9%)	4(1.9%)	208(100%)
Ibeju-Lekki	14(8.6%)	32(19.8%)	18(11.1%)	81(50.0%)	5(3.1%)	12(7.4%)	162(100%)
Ikorodu	12(4.6%)	55(21.2%)	10(3.9%)	174(67.2%)	3(1.2%)	5(1.9%)	259(100%)
Ojo	15(5.5%)	52(18.9%)	27(9.8%)	163(59.3%)	15(5.5%)	3(1.1%)	275(100%)
Total	**69 (5.1%)**	**283 (20.9%)**	**110 (8.1%)**	**830 (61.4%)**	**30 (2.2%)**	**29 (2.1%)**	**1351 (100%)**

Source: *Computed from Lagos Household Survey, 2006*.

The bulk of the respondents (42.3%) comprise people with average family size of between 5 and 6 persons. Next to this are those in the category of between 3 tand 4. This runs through the entire local governments. Of all the local governments, Ibeju-Lekki has the highest household size of between 9 and 10 and this stands at 5.6%, and followed by Apapa with

2.1%. The least in this category however is Badagry local government with 0.9%. This situation simply suggests that irrespective of residential density areas, Lagos State is generally overcrowded.

Table. 3.46: Distribution of Households by Household Size Category in the Local Government Councils in Low Residential Density Areas

Local Government Councils	1-2	3-4	5-6	7-8	9-10	10 and Above	Total
Apapa	20(8.5%)	68(29.1%)	105(44.9%)	35(15.0%)	5(2.1%)	1(0.4%)	234(100%)
Badagry	36(16.9%)	68(31.9%)	88(41.3%)	19(8.9%)	2(0.9%)	0(0%)	213(100%)
Epe	28(13.5%)	56(26.9%)	99(47.6%)	18(8.7%)	4(1.9%)	3(1.4%)	208(100%)
Ibeju-Lekki	11(6.8%)	34(21.0%)	75(46.3%)	32(19.8%)	9(5.6%)	1(0.6%)	162(100%)
Ikorodu	40(15.4%)	78(30.1%)	104(40.2%)	31(12.0%)	4(1.5%)	2(0.8%)	259(100%)
Ojo	62(22.5%)	76(27.6%)	101(36.7%)	31(11.3%)	4(1.5%)	1(0.4%)	275(100%)
Total	**197 (14.6%)**	**380 (28.1%)**	**572 (42.3%)**	**166 (12.3%)**	**28 (2.1%)**	**8 (0.6%)**	**1351 (100%)**

Source*: Computed from Lagos Household Survey, 2006*

The distribution of households by income across the local governments depicts that majority of representative samples (36.9%) earn monthly income of up to N10,000 (Table 3.47). This is more pronounced in Epe local government with highest percentage of 61.6%, followed by Ibeju-lekki with 46.1% and the lowest in the income category came from Apapa local government with 17.1%. A substantial number of people's monthly income lies between N10,001 and N20,000 as depicted in the Table. Ikorodu and Badagry had highest percentage of 48.5% and 41.0% respectively within this income bracket. Apapa LGC took a lead in the income of N20,000 and above over other LGCs as it has 18.4%,15.8% and 13.6% relative to percentages acquired by other local governments. The Ibeju-Lekki LGC (6.4%) took the within the income of above N50,000 and this was directly followed by Apapa with about 4.4%.

Table.3.47: Distribution of Households by Monthly Income in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Up to N10,000	N10,001-N20,000	N20,001-N30,000	N30,001-N40,000	N40,001-N50,000	N50,000 above	Total
Apapa	39(17.1%)	70(30.7%)	42(18.4%)	36(15.8%)	31(13.6%)	10(4.4%)	228(100%)
Badagry	82(40.0%)	84(41.0%)	24(11.7%)	8(3.9%)	5(2.4%)	2(1.0%)	205(100%)
Epe	122(61.6%)	52(26.3%)	10(5.1%)	9(4.5%)	4(2.0%)	1(0.5%)	198(100%)
Ibeju-Lekki	65(46.1%)	33(23.4%)	15(10.6%)	13(9.2%)	6(4.3%)	9(6.4%)	141(100%)
Ikorodu	72(29.6%)	117(48.1%)	39(16.0%)	6(2.5%)	5(2.1%)	4(1.6%)	243(100%)
Ojo	89(34.9%)	88(34.5%)	48(18.8%)	17(6.7%)	6(2.4%)	7(2.7%)	255(100%)
Total	**469 (36.9%)**	**444 (35.0%)**	**178 (14.0%)**	**89 (7.0%)**	**57 (4.5%)**	**33 (2.6%)**	**1270 (100%)**

Source: *Computed from Lagos Household Survey, 2006*

Just like stated under high and medium residential density areas, Yoruba is the dominant tribe even in low residential density areas directly followed by Ibo people. Notably, the proportion of Hausa people is quite small in relation to other tribes. Thus, from Table 3.48, the residential houses in Epe and Ibeju-Lekki are mainly Yoruba dominated as they account for well over 90%. This is also true of Badagry and Ikorodu LGCs. However, the population of Ibos is on the increase in Apapa and Ojo and also some Hausas are found in the same LGCs.

Table.3.48: Distribution of Households by Type of Tribe in the Local Government Councils in Low Residential Density Areas

Local Government Councils	Yoruba	Hausa	Ibo	Total
Apapa	166(77.9%)	3(1.4%)	44(20.7%)	213(100%)
Badagry	159(83.2%)	0(0%)	32(16.8%)	191(100%)
Epe	198(98.5%)	0(0%)	3(1.5%)	201(100%)
Ibeju-Lekki	144(92.3%)	1(0.6%)	11(7.1%)	156(100%)
Ikorodu	208(88.5%)	0(0%)	27(11.5%)	235(100%)
Ojo	160(64.0%)	3(1.2%)	87(34.8%)	250(100%)
Total	**1035(83.1%)**	**7(0.6%)**	**204(16.4%)**	**1246(100%)**

Source*: Computed from Lagos Household Survey, 2006*

In terms of religion, christianity also dominates the residential density areas just as we have in high and medium residential density areas. However, the proportion of muslims appear to be more in Ibeju-Lekki with about 59.3% and 40% in Epe LGC.

Table.3.49: Distribution of Households by Type of Religion in the Local Government Councils in Low Residential Density Areas

Local Government Councils	**Muslim**	**Christian**	**Other Religion**	**Total**
Apapa	86(36.8%)	130(55.6%)	18(7.7%)	234(100%)
Badagry	37(17.4%)	157(73.7%)	19(8.9%)	213(100%)
Epe	84(40.4%)	118(56.7%)	6(2.9%)	208(100%)
Ibeju-Lekki	96(59.3%)	65(40.1%)	1(0.6%)	162(100%)
Ikorodu	94(36.3%)	149(57.5%)	16(6.2%)	259(100%)
Ojo	70(25.5%)	183(66.5%)	22(8.0%)	275(100%)
Total	**467(34.6%)**	**802(59.4%)**	**82(6.1%)**	**1351(100%)**

Source*: Computed from Lagos Household Survey, 2006.*

The implication of the description of Lagos housing market is to lend credence to the fact that in renting an apartment or buying a house, people ultimately places different premiums on each of these housing characteristics. This varies from one individual to another. Thus, the choice of an individual when renting a house could easily be influenced if presence any of these qualities mentioned.

CHAPTER FOUR
LITERATURE REVIEW

4.1 Introduction

A review of the literature is undertaken in this section. In addition, the theoretical and conceptual basis for the study is provided. The study of residential preferences and choice behaviour has received considerable attention for many years in various disciplines of humanities such as environmental psychology, geography, urban and regional planning, urban sociology, civil and building engineering, estate management and environmental economics. The two major approaches which have received attention in studying the housing choice in the housing literature are: revealed and stated modelling approaches. Revealed models are based on observational data of households' actual housing choices in real markets. In contrast, stated preference and choice models are based on people's reactions to hypothetical houses.

The problem of housing choice is, therefore, strongly related to the identification of the factors associated with the dwelling and environmental context that may determine the attractiveness of a place. Numerous studies have been carried out in the international literature on housing choice models (see, e.g., Cooper, Ryley and Smith, 2001; Earnhart, 2002; Gayda, 1998; Ortuzar, Martinez and Varela,2000; Perez,Martinez and Ortuzar, 2003; Walker, Marsh,Wardman and Niner,2002), and a wide variety of explanatory variables has been considered: price, rent, dwelling size, accessibility, natural features, etc.

In addition, empirical and methodological reviews of residential housing choice are undertaken in this section. Lastly, a review of hedonic pricing methodology which is central to the study of housing choice decistion is also dwelt upon.

4.2 THEORETICAL UNDERPINNINGS

In the housing economics literature, various theories have been put forward to explain people's residential choice behaviour with each of the theories specifically explaining the probable factors that determine why an individual household prefers or chooses a particular residential type/area to another. Among these are: residential location theory, theory of consumer behaviour and revealed preference theory, maximum housing expenditure theory, tiebout model, cultural agglomeration model, trade-off model and life cycle model.

Ecological Residential Theory

Studies on residential choice stem originally from the ecological tradition of Burgess (1926), Hoyt (1939) and others in the 1920s and 1930s, collectively known as the ‘’Chicago School’’ (UN-HABITAT, 2003). The Chicago school saw residential choice as an outcome of ‘’ecological’’ competition for niches among social classes who behaved like different species in terms of endowments and want, and who would compete for different house types, with the strongest groups taking the most desirable houses and the weaker groups occupying residual ones. Park, Burgess and Mckenzie (1925) note the concentration of low-income houses within particular sections of the city. These zones are those designated as ‘working men’s housing and zones in transition’. Earlier generations of working men’s housing were slowly taken over by warehouses, immigrants and the urban poor, as better households moved to the suburbs. The zones in transitions were the ghettos, slums and ‘bright light areas’ (UN-HABITAT,2003). Slums do not occur in a vacuum. They result from a combination of poverty or low incomes with inadequacies in the housing provision system (UN-HABITAT,2003).

Residential Location Theory

This is one of the urban microeconomic models which explains household location behaviour and also offers valuable insight into the city structure. The earliest contributors to this model include: Wingo(1961); Kain(1962); Alonso(1964); Muth(1969); and Beckmann(1969). The core of this theory is that a major determinant of people’s residential choice behaviour is the accessibility to their residential locations or place of residence. In essence, the model emphasises journey-to-work phenomenon as a basic factor in people’s residential choice behaviour. Simple models of residential location theory are essentially based on the concepts of cost minimisation. For instance, a worker surveys the housing market from his/her workplace and he/she typically observes that housing prices, P declines with distance, d, from the Central Business District (CBD) in at least one direction. The theory, however, assumes that travel costs, t, increase with distance from his/her workplace. For any given amount of housing, H, he faces a total expenditure on housing, Z, composed of a housing expenditure plus transport expenditure.

$$Z_j = R_j(d).H + t_j(d) \quad \text{.....(1)}$$

For quantity H_0, the worker can solve for the least cost distance by taking derivatives.

$$Z_j^{'} = R_j^{'}(d).H_0 + t_j^{'}(d) = 0 \quad \text{.....(2)}$$

and solving the expression for d_j^*, the optimal distance or location for quantity H_0 and workplace j. This least cost distance can be substituted back into equation (1) to calculate the minimum total expenditure for quantity H_0, as

$$Z_j^* = R_j(d_j^*).H_0 + t_j(d_j) \quad \ldots\ldots(3)$$

The decline of housing prices with distance $R_j(d)$, will differ systematically across workplace, very likely showing steep rates of decline with distance for centrally located workplaces and gradual rates of decline for peripheral workplaces. The major drawbacks that beset the theory has to do with the assumptions of monocentricity, which implies that the locations of all employment and residential housing are located around central business districts, each household has only one worker and that workplace choice is predetermined and exogenous to residential location choice.

Social Area Analysis and Factorial Ecology Theory

Ecological and classical micro-economic studies on urban housing choice were later 'brought together, in the form of social area analysis and through the methodology of factorial ecology, to provide a more comprehensive view of urban residential choice. In every city that was studied in widely different parts of the developed world, residential choice was due, in part, to three factors, usually known as socio-economic status, familism and ethnicity (Shevky and Bell, 1955; Berry and Kassada, 1975). As perceived by these authors, socio-economic status was an 'index of advantage' that combined factors such as income, education and occupation. Familism according to them, is concerned with the effect of family type: households with children and non-working wives in the 1970s tended to seek suburban bungalows, while single persons were more inclined to live in apartments in the central city. Ethnicity usually measured the proportion of those born outside the country, but could also represent the separation of particular ethnic or religious groups. The three factors were of different strengths in different cities and cultures and had different weightings on the variables; but they were invariably, the three major factors determining urban residential choice.

Maximum Housing Expenditure Theory

This theory states that income and the availability and conditions of mortgage finance determine residential location behaviour. Their choice is fairly restricted and the point on the housing cost curve will be determined largely by mortgage availability. This theory is based on the assumption that the house-buyers will attempt to acquire a house as expensive as they can afford with the maximum mortgage which they can raise in the area of their choice,

although house-buyers may seek a property over a wide area, transport costs may be a relatively minor consideration and may vary in relation to the distribution of houses within a specific price range. Environmental and social factors are likely to be a much greater influence over choice. This hypothesis evolved by Ellis (1967) and Stegman (1969), implies there is no overall relationship between income, travel cost/time and place of work, and that there is no effective trade off.

The Tiebout Model

The Tiebout Model specifically dwells on the relationship between local government programmes, taxes and housing prices. This theory relies on the existence of four postulates. These are:

- A house purchased or rented in a particular area embodies a bundle of services that vary depending on government activity;
- Individuals form preferences for an area based on the public services and other features of the external environment together with the private services of the house;
- Different levels of service provisions will often result in different tax burdens among municipalities; and
- Individuals differ in their preference and willingness to pay for private housing services and also for the goods associated with housing in a particular neighbourhood (Blair, 1995: 251).

Thus, the theory places strong emphasis on differences in preferences resulting from government policies and programmes. The theory recognises that individuals in the same position might not make the same decisions. If they are not satisfied with the way things are, they will not necessarily bear it, individuals "vote with their feet" for the combination of amenities and disamenities they prefer.

The early work of Tiebout (1956) continues to prompt research based on his market model for explaining the behaviour of both individuals and local government units operating within spatially defined political jurisdictions located in urban areas. Since Tiebout's article, many economists have viewed the decision of families to reside in a particular community as a conscious choice of one particular package of local public services over others (Friedman, 1981). Tiebout suggests that under certain conditions, consumers might reveal their preferences for locally provided public goods. Tiebout proposes that a market-like mechanism might exist for local public goods because the taxes used to finance those goods are specific to each jurisdiction. He further suggests that households would sort themselves

such that all families in a given jurisdiction would derive the same marginal benefit from the local public goods, and marginal benefit would be equal to marginal cost.

The Cultural Agglomeration Model

This model states that cultural factors are important in taking residential choice decisions. According to this theory, people often believe they will find congenial friends (or friends for their children) if they live near people like themselves. Thus, neighbourhood where individuals with similar social characteristics are found, will form based on social desires and agglomeration economies. Balchin and Kieve (1982) based this on households with similar incomes and presume they will, in the long run, be willing to incur the same price for travelling and housing. If travelling costs increase, certain groups will migrate to areas where the cost of housing is relatively cheaper, while people will tend to move to more expensive housing if travelling costs decrease. The actual direction of change, if any, will depend upon the relative strength of these two opposing forces. It should, however, be noted that even if there was an inverse correlation between house prices and travel costs, it is unlikely that all households would trade off. Harvey (1996: 206) also posits that environmental characteristics are important in the location decisions of a household.

Trade-Off Model

Trade off model, according to Muth (1969), explains the predominance of high-quality housing on the city perimeters in terms of the trade-off between access to central locations and household demand for space. The model is based on the assumption that as incomes rise the rate at which household are willing to substitute access for cheaper land changes. The model deals with two categories of changes namely: space versus access within a central city and trade offs in a multiple nuclear city.

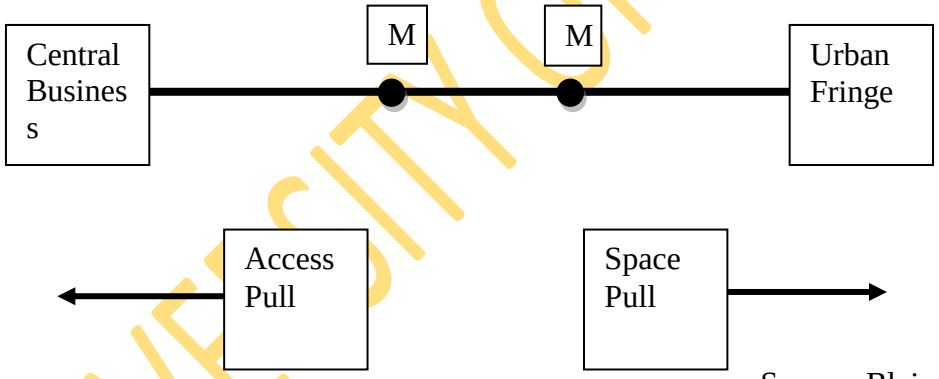
(i) Space Versus Access/Travel Cost Minimisation Theory

According to Balchin, Bull and Kieve (1995: 84), if travel costs to work are nil or very low, households will be prepared to pay the highest rents or prices for accommodation. Through the working of the price mechanism, this would imply that the rich live very close to the central business district and the poor live in less expensive outer area. The opposite is however generally true, low income earners live close to their work places (usually within the inner area of cities) to minimise their cost of travelling, rents are mainly regulated, and housing densities are high. As incomes rise, there is the tendency for people to live farther

away from their work in areas of lower density and more expensive housing. Balchin, Bull and Kieve (1995) also argue that the outward spread of cities would only be compatible with travel cost minimisation if employment was simultaneously decentralised, but that this decentralisation of employment opportunities usually do not take place which implies that travelling cost remains important.

According to Blair (1995: 249), the increased distance from the Central Business District (CBD) also increases the opportunity cost of commuting. The increased opportunity cost of commuting tends to orient the optimal location toward the city's centre where access is best. Which pull will dominate cannot be determined theoretically and may be illustrated with the help of a simple diagram. Initially, the household is in equilibrium at point M, as income increases, the household will relocate because the desire for more space between the cheaper land near the fringe is for better access. A relocation to M' would reflect the stronger space pull caused by the income increase. The contrast suggests that the trade off is affected by attitude regarding the value of non-work time and preferred living accommodation.

Fig 4.1: Space versus Access as Income Increases



Source: Blair, 1995

Critics point out that a trade off model of the above sort is least satisfactory in explaining residential location choice behaviour within a conurbation where there may be several CBDs and a complex pattern of commuting. Patterns and relationships will also be distorted by the decentralisation of employment. A further step was taken by Blair to expand the theory by making provision for the Multiple Nuclear City.

(ii) Trade offs in the Multiple Nuclear City

The structure of cities has however changed in recent years and locations other than the CBD have become very popular for commercial use. There are increasingly multiple points within a metropolitan area that represent points of substantial access in most major metropolitan

areas. During the past few years, jobs have shifted from the central city to suburban locations, so the assumption of minimum transportation costs at the CBD are unrealistic for most families. The CBD remains the site of the plurality of jobs, but many large business agglomerations exist throughout most metropolitan areas. Within limited areas, land costs may actually decline, moving towards the central city.

Evans (1985) also expands the trade off hypothesis by suggesting that a household might move further out from the city centre if their demand for space increases, but if their income increases and their demand for space remain constant, they will probably move closer to the city centre. Evans further suggests that following a general increase in pay, higher income household out-bid income groups both in the periphery of urban areas and in the inner cities, in the latter case often by means of gentrification. High income groups can bid for land or residential houses in any location because they can afford high transportation cost and expensive housing, which implies that increases/decreases in transportation cost will not have an impact on their residential location behaviour. High income commuters do not have to trade off travel and housing cost, they can afford both.

Life Cycle Model

This model states that different age groups with different household characteristics have different desires for their residences, and that these preferences change over the life course (Wenning,1995).So, even if one demographic group focuses on distance to work, others might not and the group's preferences might change with time (Masnick,2003). By implication, household changes in the sense that an individual and/or every family evolves through a life-cycle sequence have an important impact on the housing market. Changes in household life-cycle generate mobility either by altering specific housing needs or by creating or eliminating a demand for an independent housing unit. Gayle (2001), identifies six stages in the family life cycle as follows: Stage (i) Pre-family or unattached young adult (ii) Coupling (iii) Child bearing (iv) Child rearing (v) Post family and (vi) Later life. He further grouped these stages into three: (1) Pre-family –stage (i) (2) Active Stage-Stage(ii), (iii) and (iv) i.e coupling, child bearing and child rearing (3) Post-family-Stages (v) and (vi) i.e post family and later life. According to this model there are at least three separate types of housing needed to be satisfied at each stage of the family life cycle. The first type: rental apartment is common in coupling stage. In the second type, the family can write the programme for its castle and make a commitment during the child bearing stage, when the job, geography and gestation must have stabilised. In the third type, the family decides whether to build during

child rearing stage. This will depend on the family size, composition, aspiration and availability of finance. The Table 4.1 provides the summary of the Life-Cycle Model.

Table 4.1 Summary of the Life Cycle Model.

Stages in Life-Cycle	**Space requirements/Aspiration**
Creation of new household (pre-child stage) 1 or 2 persons	Relatively cheap flat or small house.
Child bearing 2-3 persons	House with at least 2 bedrooms
Child rearing 3-4or more persons	Large house with at least 3 or 4 bedrooms.
Post-child (2 persons).	Institution/flat, live with relatives.
Later life (1 person)	Relatively cheap flat or small house

Source**:** *Adopted from Short* (1982).

What is however clear from this brief theoretical review is that most of these studies merely emphasised and focused on the determinants of residential location behaviour without necessarily examining the determinants of residential housing choice which is the main thrust of this study. In addition, majority of these studies have geographers', urban planners', civil engineers', quantity surveyors' and estate managers' orientations in their approach to the issue of residential location behaviour. Our study, therefore, attempts looking at the problem of residential housing choice from the perspectives of economics based on microeconomic theory of consumer behaviour. Attempt is made therefore to review two basic economics theories relating to the choice namely: Theory of consumer behavior and reveal preference theory.

Theory of Consumer Behaviour

This theory states that consumers' purchasing decisions are largely determined by "rational" and conscious economic calculations. Rationality in this context is conceptualised in terms of the consumer seeking to spend his/her income on those commodity bundles that will give him/her the highest level of satisfaction according to his/her tastes and the relative prices. The underlying assumptions implicit in this theory are:

(i) the consumer is fully informed as to the alternatives in the market from which he/she can choose;

(ii) the consideration of price; the lower the price, the higher the quantity consumed and vice versa; and

(iii) consumer always desires more to less.

Central to this theory is the concept of utility, which according to the neoclassical school of thought was developed around a rational consumer who is faced with a given budget and has a basket of wants to satisfy. This theory holds that the consumer will allocate his/her budget in such a way as to maximise the utility derived from consuming the various commodity bundles. This is mathematically expressed as :

$$U = U(q_1, q_2, ..., q_n) \quad \text{.....(1)}$$

$$M = p_1q_1 + p_2q_2 + ...p_nq_n$$

$$\sum_{i=1}^{N} P_nQ_n \quad \text{.....(2)}$$

Where:

$q = (q_{1,} q_2, ..., q_n)$ is a vector of quantities of goods

$p = (p_1, p_2, ...p_n)$ is a vector of prices of goods

M = the budget constraint

n = the number of commodities consumed

i = number of individual households

$\sum$ = summation sign

If the function is continuous and at least twice differentiable, that is, well behaved, we can then derive the condition under which the consumer will maximise utility. An augmented utility function L can then be defined such that:

$$L = U(q_1, q_2, ...q_n) + \lambda(M - p_1q_1 - p_2q_2 -, ...p_nq_n) \quad \text{.....(3)}$$

where L and λ are langrange coefficient and multiplier respectively.

Sufficient conditions for a maximum are satisfied by first order condition which requires that the partial derivatives of equation (3) with respect to q's and λ be equal to

$$\frac{\partial u}{\partial q_i} - \lambda p_1 = 0 \quad \text{.....(4)}$$

and that

$$M - \sum_i p_iq_i = 0 \quad \text{.....(5)}$$

The condition in the first order condition in the equation (4) and (5) can be put as :

$$\frac{\frac{\partial u}{\partial q_1}}{P_1} = \frac{\frac{\partial u}{\partial q_2}}{P_2} =, ... \frac{\frac{\partial u}{\partial q_n}}{P_n} = \lambda \quad \text{.....(6)}$$

In other words, the ratio of the marginal utility of a commodity to price is equal for all commodities. Equation (5) implies that the consumer allocates his/her budget amongst the goods in such a way that per unit of money utility of one good is the same with other goods and also the same with the marginal utility of holding a unit of money.

Substituting for equation (4) and solving the (n+1) equations of (4) and (5) will give the demand curves for the n commodities, each appearing as:

$$q_i = f(P_1, P_2, ...P_n, M) \quad \text{.....(7)}$$

Where i=1,2,3,……n.

Thus, the demand for a commodity is a function of all prices of the commodities in the basket of goods and services as well as the consumer income.

The second-order condition for a maximum requires that the bordered Hessian determinants must alternate in sign.

$$\begin{bmatrix} U_{11} & -P_1 \\ -P_1 & 0 \end{bmatrix} < 0, \begin{bmatrix} U_{11} & U_{12} & -P_1 \\ U_{21} & U_{22} & -P_2 \\ -P_1 & -P_2 & 0 \end{bmatrix} > 0, .., (-1)^k \begin{bmatrix} U_{11} & U_{12}..... & U_{1k} & -P_1 \\ ; & ; & ; & ; \\ U_{k1} & U_{k2,}..... & U_{kk} & -P_k \\ -P_1 & -P_2 & -P_k & 0 \end{bmatrix} > 0 \quad \text{.....(8)}$$

Where k =1,2,……,n

U_{ij} is the principal minor of order K ×K with the characteristic elements

$$\frac{\partial^2 U}{\partial_{q_i} \partial_{q_j}} \quad \text{.....(9)}$$

Revealed Preference Theory

Revealed preference theory was first expounded by Samuelson (1938) as a consequence of dissatisfactions with the then existing theory of choice, based on ordinal utility and indifference curve analysis. Samuelson's initial reasons for propounding an alternative to the Hicks-Allen synthesis included two important objectives (Wong, 1978). First, Samuelson desires to relate choice theory to behaviour in order to avoid the psychological assumptions that preference and utility were meaningful concepts. That is, Samuelson was striving for the then fashionable objective of attempting to devise a theory of choice which was not based upon particular psychological assumptions. Second, Samuelson stresses the observable nature of choices—that is, behaviour was reflected in terms of observed choices— and it is this aspect of Samuelson's work which has received most attention. Thus, revealed-preference theory represented a marked break with past theories of choice and demand.

This theory was later extended by others like Houthaker (1950), Hicks (1956) and later by Charas and Cost (1993). It is one of the micro-economic theories of consumer choice; it permits the nature of the consumer's preference to be derived from the observed choices of the consumer when confronted with alternative commodity bundles. A commodity combination is said to be revealed to be preferred to another if the consumer chooses it in preference to another combination which is not more expensive and hence, which to him/her is also affordable. However, if one option or commodity combination is chosen instead of another, then the chosen option is revealed to be preferred to the one not chosen except if the monetary cost of the option is the lowest.

First, the theory assumes choice is the purposive outcome of the interaction of a consumer's utility function and budget constraints and that these are independent of each other. Further, choices are assumed to be revealed for a simple commodity, in a perfectly competitive economy where consumers do not affect prices and there is an infinite range of supply or production possibilities. Then a series of assumptions are made to allow behaviour to be interpreted as a mirror of the underlying preference structure, and to predetermine the existence of a single- valued, continuous, downward-sloping demand curve. The usual assumptions are as follows.

I. The individual makes a rational preference ranking of all potential combinations of goods, whether or not they are available and whether or not the individual has previously consumed the goods. This is the axiom of completeness.
II. The axiom of transitivity states that if A > B and B > C, then A > C.
III. The axiom of greed or satiation, suggests that consumers will always prefer a bundle A to a bundle B, if bundle A contains more of at least one good and less of none of the others. Taken together, assumptions (b) and (c) imply a definition of rational choice.
IV. The axiom of convexity asserts that not only are indifference curves downward-sloping, from left to right (axiom of greed), but also that the curves are convex to the origin.
V. The axiom of continuity implies that consumption points in the choice set are very close to each other (and this is reflected in the continuity of the demand curve).

This is a standard piece of economic analysis, devised to estimate well- behaved demand curves from market data. Further, it is also well established in the literature that violation of the axioms, or pathological cases (see Simmons, 1974), result in peculiar but non unique

demand curves. This theory has gained widespread acceptability in housing studies on the grounds of its observational superiority over experimental identification of preference rankings or ordinal indifference curves.

4.3 REVIEW OF RELATED EMPIRICAL STUDIES

The empirical issues on individual household residential choice behaviour are varied and multidimensional in nature ranging from socio-economic, cultural, administrative and psychological, with each addressing a particular issue at a time. Thus, there are several factors influencing and determining the residential choice behaviour: accessibility, physical characteristics of the neighbourhood, services and facilities, social environment, individual site and dwelling characteristics. Researchers hold different views about what factors actually determining residential behaviour of people over time.

One of the highly researched areas of interest revealed in residential research literature is that of the influence of workplace factor on residential choice behaviour. The assumption of workplace location at the city centre (Central Business Districts) substantially pioneered the conceptualisation of most urban residential location behaviour models. One of the basic assumptions of the economic equilibrium model of Alonso (1964), Kain (1968) and Muth (1969) is that the city centre provided all job opportunities (workplaces) and that households tend to locate in circular form around the CBD. By implication, the concentric nature of jobs-residential balance arrangement has a tendency of influencing households' residential choice decisions behaviour. Early researches using this model focussed on density, residential rent gradients and commuting distances. A large number of empirical studies have actually trailed this theoretical underpinning to either validating or refuting the claims. Most of these studies employed discrete choice model in their analysis. Evidence from studies conducted so far show some conflicting results. Quite a reasonable number of studies supported empirically the inter-relationship between residence and workplace. (Examples are Guest and Cluett,1976; Curran etal, 1982; Broughton and Tanner,1983; Quigley,1985;Blackley and Follain,1987; Olatubara and Salami,2000 and Aluko,2002).

Guest and Cluett's (1976) study suggested the clear inter-relationship of residence and workplace among the Los Angeles suburbs particularly for non-black workers. Broughton and Tanner (1983) were concerned with equilibrium condition in which patterns of work travel are associated with fixed home workplace location. Effects of changing travel costs were simulated and the result showed that distance costs rose. This implies that it is always

better for households to be located near their workplaces especially when the result showed that consumer surplus rises when homes are accessible to workplaces. Quigley (1985) discovered that housing choice may be non-sensitive to variation in workplace accessibility than is indicated by more restricted models of household choice. Some studies produced contrary results such as Steinnes, (1977, 1983), Cooke (1978); and Desalvo (1985). The basic assumption underlying their studies is that 'Jobs follow people'. For instance, Cooke (1978) and Steinnes (1977, 1983), in their studies of changes in the intra-urban location of employment (manufacturing) and residences have results which is diametrically opposed to the prevailing view of causality implicit in the traditional equilibrium models of residential location which attempt to explain residential location choices on the basis of journey-to-work. Desalvo (1985) found that housing consumption and location to workplace are negatively related to commuting time. White (1977) brought a gender-related issue into the argument, where he predicted that under certain restrictive conditions, a two-worker family will locate close to the woman's job. It is apparently clear from the foregoing that opinions are divided on the impact of workplace on residential choice.

The work of Waddel (1996), Abraham and Hunt (1997), Levinson (1998), Shen (1998), Bhat and Guo(2004), Srour, et al (2002), Zondag and Pieters (2005) and Blijie,(2005) constituted conceptual fulcrum for other studies on the residential choice behaviour in the housing literature. These studies actually examined the impact of accessibility on residential choice behaviour. For instance, Waddel (1996), in his work stated that accessibility is a major factor that influences attractiveness of a certain location aside from the area's physical characteristics. It is argued that the reason why most people prefer to live in city centres and built-up areas is because of accessibility-potential for a variety of activities aside from journey to work. Using data from Calgary (Canada), Abraham and Hunt (1997) found that distance-related variables (journey-to-work, out-of-pocket costs and trip time) are the most important factors influencing residential choices. Levinson (1998) also pointed out the relative importance of accessibility; showing that accessibility to jobs and housing are more effective variables than demographic and socio-demographic, socio-economic variables such as age, gender, home ownership, number of children and household size. Shen (1998) and Bhat and Guo (2004) also confirmed that accessibility to the workplace is a critical determinant of residential choice behaviour. The work by Srour, etal, (2002), further corroborated the significance of transportation on residential choice. Zondag and Pieters (2005) showed that people in the Netherlands are less likely to move to locations with less accessibility for all purposes. The work by Blijie (2005) supported the important role of

transportation on people's residential choice behaviour. Several studies done on residential location choice show that accessibility has influence but not very significant. Belonging to these class of studies are Weisbrod et al (1980) , Hunt et al (1994),Timmermans and Borgers (1993),Molin et al (2003).

The studies done by Weisbrod et al (1980) and Hunt et al (1994) provided good insight on how households assess the benefits inherent in a potential residential location choice behaviour. In Hunt's study, respondents were asked to rank hypothetical residential location options which include monthly house rent, travel time to work and proximity to rail. They hypothesised that aside from house characteristics, the relative travel times and ease of access provided by roads and public transport systems present in a particular area contributes to the location's degree of attractiveness. The study concluded that there exists two types of households when choosing a residential location: first, those households that use public transport and believe that public transport influences the quality of the residential location and the second type are households who do not intend to use public transport and consider the degree of attractiveness of public transport insignificant to the location. Meanwhile, households belonging to the second category prevailed in the study conducted by Weisbrod et al for the city of St. Paul in Minnesota.

Timmermans and Borgers, (1993) indicated that the preference for a particular residential area is highly dependent on the characteristics of the dwelling and its environment and to a lesser extent on the travel time to the workplace. Moreover, characteristics pertaining to transportation facilities seem to be less important. Molin et al (2003) summarised the various case studies about residential location choice in Brussels and found that the results of those studies suggested that regardless of the study area and the model specification, accessibility considerations are significantly less important than housing attributes and attributes related to the neighbourhood. They explained that as long as people have the opportunity to afford flexible means of transport, the impact of accessibility on their residential choice behaviour is relatively limited, but might be different on households who rely on public transport. Waddel (1996) also found a negative, or in other cases insignificant relation between residential location choice and accessibility of jobs and inhabitants.

Households also value their neighbourhood or immediate environment in taking residential housing decisions. Wilson (1960) found that people consistently chose "good neighbourhoods" over accessibility to jobs. On a study done by Gayda (1998), she discovered that residents in Brussels are attracted to urban residential neighbourhoods which are quiet, safe and have very low traffic volume. Children being able to play in the street were also

considered important by the residents. In other studies, the characteristics of the neighbourhood are incorporated. This can be done as a dummy-variable for a certain area. Socio-economic aspects of the neighbourhood like average income, local expenditures for education, racial equivalence with inhabitants and crime rates seem to be good explanatory variables (Boehm,1982; Quigley, 1985; Columbino and Locatelli, 2001). Shillcox (2003) affirmed that neighbourhood characteristics such as low density, beauty, recreational opportunities and healthy environments for raising children were far more important determinants than proximity to work.

Farley, et al. (1997), using descriptive analysis specifically examined the issue of racism in the residential choice behaviour. They observed that race continues to be a significant factor in the residential decision-making process. Whites' willingness to move into a neighbourhood has been established empirically to be inversely related to the density of blacks living in that neighbourhood. Blacks, on the other hand, prefer integrated neighbourhood but with substantial blacks representation. Preferences differ significantly from one metropolis to another. According to them, if residential patterns were based solely on social or economic factors such as income, educational attainment, or occupational prestige, racial segregation would be much lower than currently observed. The study by Gabriel and Rosenthal (1989) developed and estimated a multinomial logit model of household location among mutually exclusive counties in the Washington, D.C. metropolitan area. The findings indicate that race is a major choice determinant for that area and that further application of MNL models to the analysis of urban housing racial segregation is warranted. Further, the effects of household socio-demographic characteristics on residential location are found to differ significantly by race. Other studies that empirically support the importance of racism in the residential choice decisions are Taeuber, 1965; Erbe, 1975; Simkus, 1978; Massey, 1979; Denton and Massey, 1988; Fielding and Taeuber, 1992; Farley, 1997).

Schafer (1999), also employed multinomial logit model to study the determinants of the living arrangements of the elderly in the US, classifies the housing choices of the elderly into five types: assisted communities, unassisted 60 plus communities, shared housing, supported housing and conventional housing. The selection of each of the first four is studied relative to the selection of conventional housing. He submitted that income, net worth and sex have little to do with the selection of one of these living arrangements; rather, choice of each type varies with other characteristics of the household. From the foregoing, it can be inferred that several factors come into play whenever residential decision is to be taken. These are

additional to such conventional factors like income, housing price, occupation, and life-cycle variables.

Earlier literature on residential choice behaviour and residential mobility has also emphasised life-cycle factors as critical determinants of the residential choice behaviour and decision to move. From this perspective, life-cycle changes in the size, age composition and socioeconomic position of households create dissatisfaction with the current residence, which influences the demand for a different type of housing or geographic location and ultimately leads to decision to move. Age has been found to be one of the most important of these life-cycle variables. The presence of children living in the household has been found to deter relocation whereas household crowding, in contrast, has been found to encourage relocation. Socioeconomic characteristics have also been linked to local residential mobility, although the evidence is less conclusive, e.g. education-level has only moderately been related to local residential mobility.

Studies on residential choice behaviour are voluminous particularly in the developed nations but such studies are sparse in case of the Africa continent in general and sub-Saharan Africa in particular. In Nigeria, however, they are few thus suggesting that a lot still needs to be done in order to bring it close if not at par with foreign counterparts. The few ones that had been conducted in Nigeria to the best of our knowledge include among others Olatubara,(1996 and 2003); Gbakeji and Magnus,(2007), Aluko, (2003) and Sanni and Akinyemi,(2009).

Olatubara (1996), using a stepwise multiple regression analysis studied the significance of workplace locations in the residential location choice of residents of Ibadan, Nigeria. He found a high correlation between workplace distance and number of households commuting such distance. A discriminant analysis result showed that residential location choice is very sensitive to workplace locations as sub-optimal location in relation to workplaces made workplace locations inconvenient and induced a willingness to change residences. The multiple regression analysis further confirmed that, generally, the nearer the location of workplaces of households to their residences, the more convenient such workplace locations would be.

Aluko, (2003), estimated the relationship between house renters and socio-economic attributes of an individual household. He observed that 60.7 percent of the renters choose to live in their present houses because they are very close to their working place. Other factors like income, house value, occupation, education, type of building, quality of properties, basic

amenities provided and the neighbourhood were found to play prominent roles in influencing renters decision making process.

Olatubara (2003) showed the decision-makers in respect of the residential district choice an individual household makes and the choice of housing in that residential district. Two groups of decision-makers (husband and wife) stand out clearly. The results showed there excessive dominance by husbands in the decision-making on the choice of residential district. He further submitted that less than half of all households have mutual discussions and agreement on this very important household residential location choice. The study also showed that in decision making, the largest proportion came from a choice jointly made by husband and wife. The dominant influence of the wife was established when the issue of decision making on some selected household materials was considered.

Sanni and Akinyemi (2009), investigated the determinants of households' residential district preferences within the metropolitan city of Ibadan. The variables considered include: quality of the environment in terms of good layout, infrastructural facilities availability like good roads network, good water supply, quietness, peace and adequate security,socio-cultural activities, accessibility to place of work, 'chance' factors like occupying of vacant plot/place, security of land ownershipaffinity to place of birth and need to live close to relatives. The analysis was done essentially for three residential density zones purposefully selected namely: Bodija (low density), Mokola (medium) and Mapo (high). Using descriptive approach, they observed that for low residential density zone, environmental quality accounted largely (86.8%) as the most important determinant, followed by security of land ownership with about 10.6% and socio-cultural factor of 2.6%. For the high residential density zone, socio-cultural factors appear to be most important determinantof households' residential district preference which accounts for as high as 60.2%, directly followed by chance factor with 17% while factors like closeness to workplace, environmental quality and cheap accommodation had 13%, 9% and 1.3% respectively. Lastly, in the medium residential district preferences lies in between the two extreme polarisations. In this case, environmental quality maintains a lead (35.6%) over chance factors of 31.1%, other important factors are cultural factors and nearness to workplace with 17.8% and 15.5% respectively. In the final analysis, their results indicate that different categories of residential density districts of the city have distinct set of household's residential districts preferences peculiar to each, hence broad generalisation for the entire city could be erroneous.

Gbakeji and Magnus (2007) also examined the residential and neighbourhood preferences of residents in the Warri metropolis in Nigeria. The study selected 25

neighbourhoods in which both primary and secondary data were used in analysing them. To determine the level of preference for each neighbourhood, seven criteria were used which include among others: neighbourhood environment quality, quality of immediate surroundings, neighbourhood social setting, proximity toand availability of neighbourhood facilities, housing aesthetics, housing facilities and housing structure. A further disaggregation of these criteria into component parts depict from the results that residents generally place more emphasis on environmental quality, proximity to and availability of neighbourhood facilities and the quality of the immediate surroundings when taking decision relating to where to relocate to within the urban space.

However, relatively little light has been shed on the residential housing choice through analysis of these three issues: structure and characteristics of housing market, housing price determining variables as well as determinants of residential housing choice. In this study, the effect of these issues will be discussed against the background of a fast growing third world megacity of Lagos, Nigeria.

While many of the previous studies provide useful insights into the important factors in individual's household housing choices, they reveal several limitations.

• All studies contend that there are important drivers in housing choice. For example, price, location and property size tend to be dominant factors. However, little is said about factors like demographic variables like age, sex, ethnicity and marital status as being important in making residential choice behaviour.

•Very little is known about the relative importance of housing structure and characteristics in a typical Third World megacity.

• Similarly, little is known about the way in which individual households' trade off some of these factors to make a final housing choice. A summary of some of the selected empirical studies is also provided in the appendix.

4.4 Methodological Issues and Approaches in Previous Studies

This section will review methodological issues that have been identified from the previous studies mainly from these following perspectives namely: data sources and unit of study and research techniques used.

A preponderance of studies that have been conducted on housing choice and housing preferences is usually micro-based in nature with the individual household being the unit of analysis. As regards the source of information, some theories used workable data obtained from specifically designed survey, (Wang and Li,2004), majority of which are mostly dominated by America studies which used large housing censuses (Tremblay and

Dillman,1983; Morris and Winter,1978; Michealson,1977). The large repository of data base enabled housing experts and researchers to conduct detailed time series analysis in order to obtain more accurate results.

The studies on housing choices and preferences thus far conducted in developing countries mainly utilised surveys, primary dataset with varied levels of details depending on the willingness of the respondents to answer. However, exceptional cases can be cited of a study on housing choices among immigrant women in Indonesia where life-story research method was used in information gathering (Arifina and Daleb, 2003). With respect to research techniques used, we presently observed two different kinds of research techniques being used in the literature on the studies of housing choice. First, while most studies used discrete choice-based housing studies, some used revealed preference data i.e housing data from the real market. For example, a large number of studies into residential location, dwelling, and tenure choice used discrete choice model via application like multinomial logit choice models estimated on cross-sectional data. Examples include: Tu and Goldfinch (1996) in Lothian, U.K; Cho (1997) in Chongju, South Korea; Ben-Akiva and Bowman (1998) in Boston, U.S.A; Bayer et al. (2003) in San Francisco, U.S.A; Yates and Mackay (2006) in Sydney, Australia; Garci´a and Hern´andez (2007) in Spain; and de Palma et al. (2007) in Paris, France. Residential choice models are also part of larger land-use and transport models, such as UrbanSim (Waddell, 2000) and Anas' RELU-TRAN (Anas, 2007).

An increasing number of applications also adopted experimental data (Wang and Li,2004a; 2004b).The stated preference method was proved to be partially useful where there is an absence of actual market information from which preference can be revealed (Walker, Marsh, Wardman and Niner,2002). Housing choice is a multi-dimensional product involving the choice of tenure, housing type, neighbourhood location etc. Most studies examine only one or maximally two choice dimensions. In particular, the stated preference method almost as a rule, is applied to model a single choice dimension.

Second, many studies on housing choice and preferences have adopted the hedonic approach to analyse how the marginal value of housing attributes is priced (Ogwang and Wang; 2003, Yang,2001). In this research, the hedonic price approach will be adopted for calculating the implicit price of certain housing attributes of housing in order to explore functional formula with which housing price can be predicted.

Having reviewed theoretical, empirical and methodological issues on residential choice behaviour, there is a need to review hedonic pricing methodolody which is very

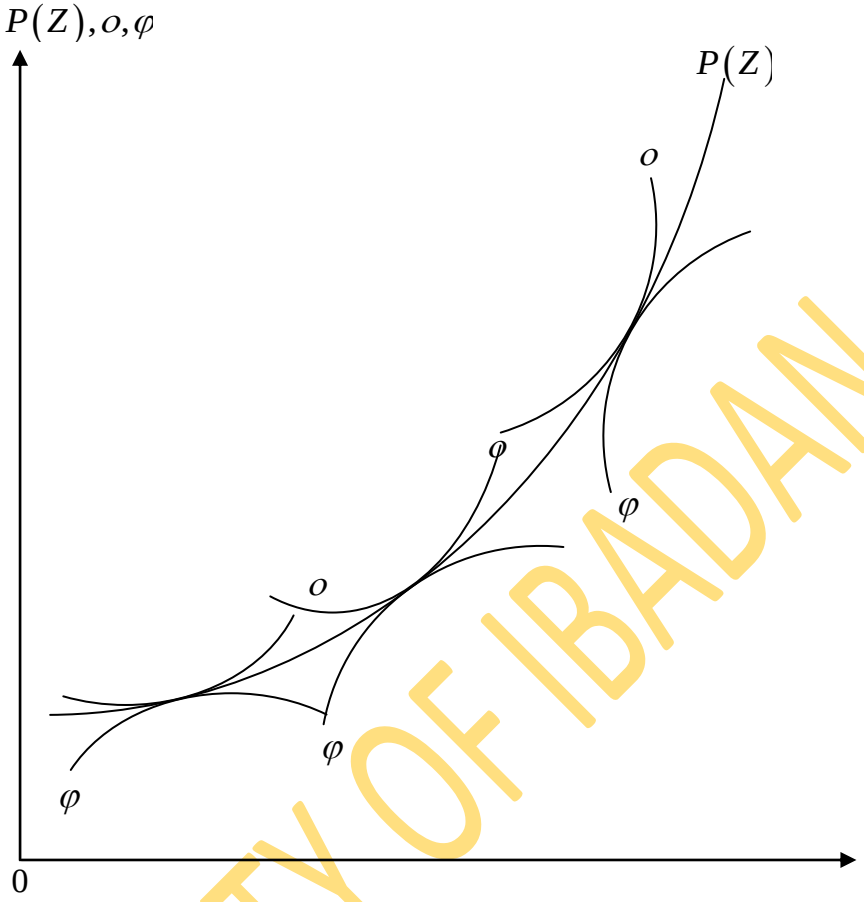
central to the study. This is important given the role of housing price in residential choice determination.

4.5 HEDONIC PRICING METHODOLOGY

The term hedonic is used to describe "the weighting of the relative importance of various components among others in constructing an index of usefulness and desirability" (Goodman, 1998: 292). Rosen (1974: 34) defines hedonic prices as "the implicit prices of attributes and are revealed to economic agents from observed prices of differentiated products and the specific amounts of characteristics associated with them" (Ustaoğlu, 2003). Rosen (1974), comprehensively laid down a theoretical foundation for determining the bid price or implicit value of the attributes of a commodity for different consumers. The bid price (φ) is defined as the maximum amount of money which a consumer is willing to pay for a good under the condition that he or she retains a specific level of happiness or utility. He proposed to utilise the information from the tangent of the market price curve with which the consumers or producers share the same value of the equilibrium conditions. The methods used to identify the consumer's bid price function and the producer's offer function (o) was fully discussed by him. The offer function is defined as a function to determine the minimum value of price which a producer should accept to sell a good for a certain profit. The relationship among market price, bid price and offer functions are shown in Figure 4.2 (Hidano, 2002: 10). Diagram.

Hedonic Pricing Function

Fig.4.2:



Hedonic methodology is mainly used for market valuation of goods for their utility bearing characteristics. The Hedonic Housing Price Model is a powerful econometric tool for capturing important determinants of housing values. The lack of theoretical foundations in hedonic price theory was overcome by Lancaster (1966) who states that a commodity can be decomposed into a bundle of attributes. The correct interpretation of these hedonic functions was widely misunderstood until the work of Rosen (1974) . The goods under consideration embody varying amounts of attributes and are differentiated by the particular attribute composition they possess. In most cases, the attributes themselves are not explicitly traded, so that one cannot observe the prices of these attributes directly. In such a case, hedonic pricing models are very essential in order to determine how the price of a unit of commodity varies with the set of attributes it possesses. If the prices of these attributes are known, or can be estimated and the attribute composition of a particular differentiated good is also known, hedonic methodology will provide a framework for value estimation (Ustaoğlu, 2003).

As stated above, the theory of hedonic price functions provides a framework for the analysis of differentiated goods like housing units, whose individual features do not have

observable market prices. The traditional use of hedonic estimation in housing studies has been for the purpose of making inferences about non-observable values of different attributes like air quality, airport noise, commuter access (railway, subway or highway) and neighbourhood amenities (Janssen,VanVliet,Aart,Harssema and Brunekreef,2001). Over the past three decades, the hedonic-based regression approach has been utilised extensively in the housing market literature to investigate the relationship between house prices and housing characteristics. The primary reasons for such extensive application are for analysing household demand for these characteristics as well as constructing housing price indices (see, for example, Can, 1992; Sheppard, 1999).

Residential housing is an important aspect of quality of life in any community. Therefore, appropriate valuation of specific characteristics of a residential house is in order. To achieve this objective, empirical researchers often specify hedonic price functions or hedonic models (Ogwang and Wang, 2003).

4.5.1 Empirical Studies on Hedonic Pricing Model[6]

Hedonic price theory has found useful applications in the housing market right from time of Ridker and Henning (1976) who analysed the effect of air pollution on housing prices. Following this study, a number of empirical studies appeared in the hedonic price literature regarding the housing market. A brief list of some selected findings is presented in the appendix after giving consideration to the review of certain empirical studies.

Follain and Jimenez (1985) used data from a household survey similar to PNAD for five cities of Colombia, Korea and Philippines. They have used rent as a proxy for property value. From the estimates of the household willingness to pay for the property attributes, the authors estimated the optimum size and characteristics of the properties addressed to low income population that would maximise the producers' profit and the consumers' utility. In this way, it could be possible to estimate which housing programme would be most suitable for the low income population, at the minimum cost to the government and still respecting the consumers' preferences for the various attributes of the property. Hence, such methodology could be permitted researchers to answer the following question: given a certain cost and a target group previously defined for an urban policy, what would be the best project, in the sense of maximising the social welfare derived from that policy?

[6] Summaries of some earlier studies were provided in the Appendix

Figueroa (1993) has estimated a hedonic prices function for Paraguay, by Iterative Least Squares. The advantage of this method is that it avoids the use of ML to estimate an optimum functional form, so that the Box-Cox transformation could be derived by OLS. To find the optimum λ, several values were imputed and equations were estimated by OLS for each specification, choosing those with the smallest Sum of Squared Errors (SSE). Such methodology permits obtaining the optimum functional form, without the need of using non-linear methods like ML. The data comes from a survey carried out especially for this study in housing programmes implemented by the Paraguayan government. After estimating the equations, the author analysed the social impact of housing programmes for low-income populations. The property price was obtained by questioning the owner directly, in order to evaluate his house. According to the author, this would allow the capturing the number of people who are willing to pay for their properties. Figueroa has demonstrated how urban infrastructure policies affect the property selling price, and consequently, the families' patrimony. He has also shown how hedonic models can be used to estimate some of the positive externalities of urban infrastructure policies, such as the increase in families' wealth and living conditions.

Santos et. al. (1999), have applied the hedonic prices model to the RMs of Recife, Curitiba and Brasília, using data from PNAD/97. They have used a log-linear model and the OLS technique for the estimation of the regressions for each RM, separating families per income levels. The great contribution of this study was trying to explain the families willingness to pay for housing services, taking into account their income level, with an emphasis on governmental housing programmes (families with monthly income below Brazilian minimum wages). However, their results can be biased, once the data was censured a priori, because of the partition of the sample by income strata.

Aguirre and Macedo (1996), have estimated a hedonic function for Belo Horizonte (Minas Gerais), using Box-Cox transformation and data from the Institute of Economic, Administrative and Accounting Researches of Minas Gerais (IPEAd). The results were obtained by Ordinary Least Square (OLS), Maximum Likelihood (ML) and non transformed data. The sample is limited to information on flats, with an average size of 120 m^2. However, some of their findings indicate a possible bias in the sample because the presence of a garage was not significant to increase the property price. This is probably due to the fact that flats with 120 m^2 are targeted at higher income groups, who require a priori the existence of a garage in the property. Perhaps the inclusion of an extra parking space would be more important to explain the variation in flat prices than the existence of a garage in the building.

Selim (2008) used Hedonic model to examine the effect of characteristics of goods on their prices. Factors that determine the house prices in Turkey are analysed in this paper using 2004 Household Budget Survey Data. The most important variables that affect house rents are type of house, type of building, number of rooms, size and other structural characteristics such as water system, pool, natural gas.

Some studies measure the benefits of air-based amenities (Harrison and Rubinfeld, 1978; Nelson, 1978; Graves et. al., 1988); others measure the benefits of water-based amenities (Brown and Pollakowski, 1977; Lansford and Jones, 1995; Epp and Al-Ani, 1979; Young, 1984; Milon, Gressel, and Mulkey, 1984; Wilman, 1981). All these studies apply the hedonic price model, which assumes that a continuous function relates the price of a house to its attributes — the hedonic price function — and that people select a house by equating the marginal utility of each house attribute to its marginal price (Rosen, 1974).

CHAPTER FIVE

Theoretical Framework and Methodology

5.1 Introduction:

This chapter presents the study's theoretical framework, model specification and methodology under which the estimation technique and the source of data used were also discussed.

5.2 Theoretical Framework

The neoclassical consumption theory is the basic theoretical framework on which this study of residential housing choice is anchored. This theory is predicated on several assumptions which include : (i) household decision making is assumed to parallel consumer decision-making;, that is, consumers optimise their utility in the light of the income and price constraints they face in the market place; (ii) a perfect competitive market is also assumed; and (iii) the object of consumer decision-making is considered not to be the observable heterogeneous commodity of housing but rather an unobservable homogeneous commodity called housing services. The neoclassical economic theory of the consumer was applied to housing within the framework of the aforementioned assumptions.

Choice is a multivariate relationship: in the sense that it is determined by many factors simultaneously. Residential choice is affected by its housing price, household's income, tastes and preferences. The implicit assumption underlying this theory is that of rationality. A consumer is said to be rational given the level of his/her income and market prices of goods and services. The framework adopted follows the work of Goodman (1988), Zabel (2004) and Fontela and Gonzalez (2008). Thus a consumer utility function depends on the amount of the housing consumption (Q^h) and other goods consumed (Z).

Households are assumed to have the same utility function represented as:

$$U_{ij} = U(Q_{ij}^h, Z_{ij},) \quad \text{.....(1)}$$

Where i and j represent household and residential housing market in different residential areas. Assuming the household's problem is to maximise utility subject to their income (M) and the price of housing and other goods.

$$\underset{Q_{ij}Z_{ij}}{Max} U(Q_{ij}^h, Z_{ij},)$$

Subject to the budget constraints specified as follows:

$$Z_{ij} + p_j Q_{ij}^h = M_{ij} \quad \text{.....(2)}$$

Where M_{ij} is households i income across the residential housing market and the price of Z is the numeraire and set equal to one. We allow housing prices to be different across markets. Forming the lagrangian,. Ψ

$$\Psi = U(Q_{ij}^h, Z_{ij}) + \lambda(M_{ij} - Z_{ij} - p_j Q_{ij}^h) \quad \text{.....(3)}$$

We obtain the first-order conditions for a constrained maximum:

$$\frac{\partial \Psi}{\partial Q_{ij}^h} = U'(Q_{ij}^h, Z_{ij})Q_{ij}^h + \lambda(-p_j) = 0 \quad \text{.....(4)}$$

$$\frac{\partial \Psi}{\partial Z_{ij}} = U'(Q_{ij}^h, Z_{ij})Z_{ij} + \lambda(-1) = 0 \quad \text{.....(5)}$$

$$\frac{\partial \Psi}{\partial \lambda} = M_{ij} - Z_{ij} - p_j Q_{ij}^h = 0 \quad \text{.....(6)}$$

From equation (4)

$$U'(Q_{ij}^h, Z_{ij})Q_{ij}^h - \lambda(p_j) = 0$$

$$U'(Q_{ij}^h, Z_{ij})Q_{ij}^h = \lambda p_j \quad \text{.....(7)}$$

$$\lambda = \frac{U'(Q_{ij}^h, Z_{ij})Q_{ij}^h}{p_j}$$

From equation (5)

$$U'(Q_{ij}^h, Z_{ij})Z_{ij} - \lambda = 0$$

$$U'(Q_{ij}^h, Z_{ij})Z_{ij} = \lambda \quad \text{.....(8)}$$

Equating both equation (7) and (8)

$$\frac{U'(Q_{ij}^h, Z_{ij})Q_{ij}^h}{p_j} = \frac{U'(Q_{ij}^h, Z_{ij})Z_{ij}}{1} \quad \text{.....(9)}$$

Canceling of like terms give

$$\frac{Q_{ij}^h}{p_j} = \frac{Z_{ij}}{1} \quad \text{.....(10)}$$

Substituting equation (10) into equation (6)

$$M_{ij} - Z_{ij} - p_j Q_{ij}^h = 0$$

$$M_{ij} - \frac{Q_{ij}^h}{p_j} - p_j Q_{ij}^h = 0$$

$$M_{ij} p_j - Q_{ij}^h - p_j^2 Q_{ij}^h = 0$$

$$M_{ij} p_j = Q_{ij}^h (1 + p_j^2)$$

$$Q_{ij}^h = \frac{M_{ij} p_j}{1 + p_j^2} \text{----------(11)}$$

In general, the consumer's ordinary demand functions for Q_{ij}^h is written as:

$$Q_{ij}^h = Q(M_{ij}, p_j) \text{.....(12)}$$

This equation 12 shows that quantity demanded of housing of an individual i given alternative j depends on his/her households' income and housing price.

The strategy this study adopts in obtaining a more realistic theory of housing market is to place the analysis within the context of hedonic price theory as formulated by Rosen (1974) and Mas-colell (1975).[7] Housing is not a homogeneous commodity, but rather a label for a collection that are all distinct to some degree. It exhibits substantial variations in structural features, lot size, characteristics of surrounding neighbourhood, and the quality of public services.[8] It was based on this, that Ellickson (1977) submitted that housing markets are complex phenomena, not at all well suited to application of the standard tools of price theory. Housing violates two of the most basic requirements for the application of standard price theory, the homogeneity and divisibility of commodities in a given market. The Rosen estimation of hedonic price functions therefore, is not very informative, since it says nothing about the effect of the housing markets on residential choice. To surmount this problem, we use hedonic theory to derive a set of empirically estimable functions giving the probability that a house with a certain set of characteristics will be occupied by a household of a specified type.

From the above, we now equate housing price to hedonic prices since p_j is not just a price but a composite price. Hence,

$$p_j \equiv H^p \text{----------(13)}$$

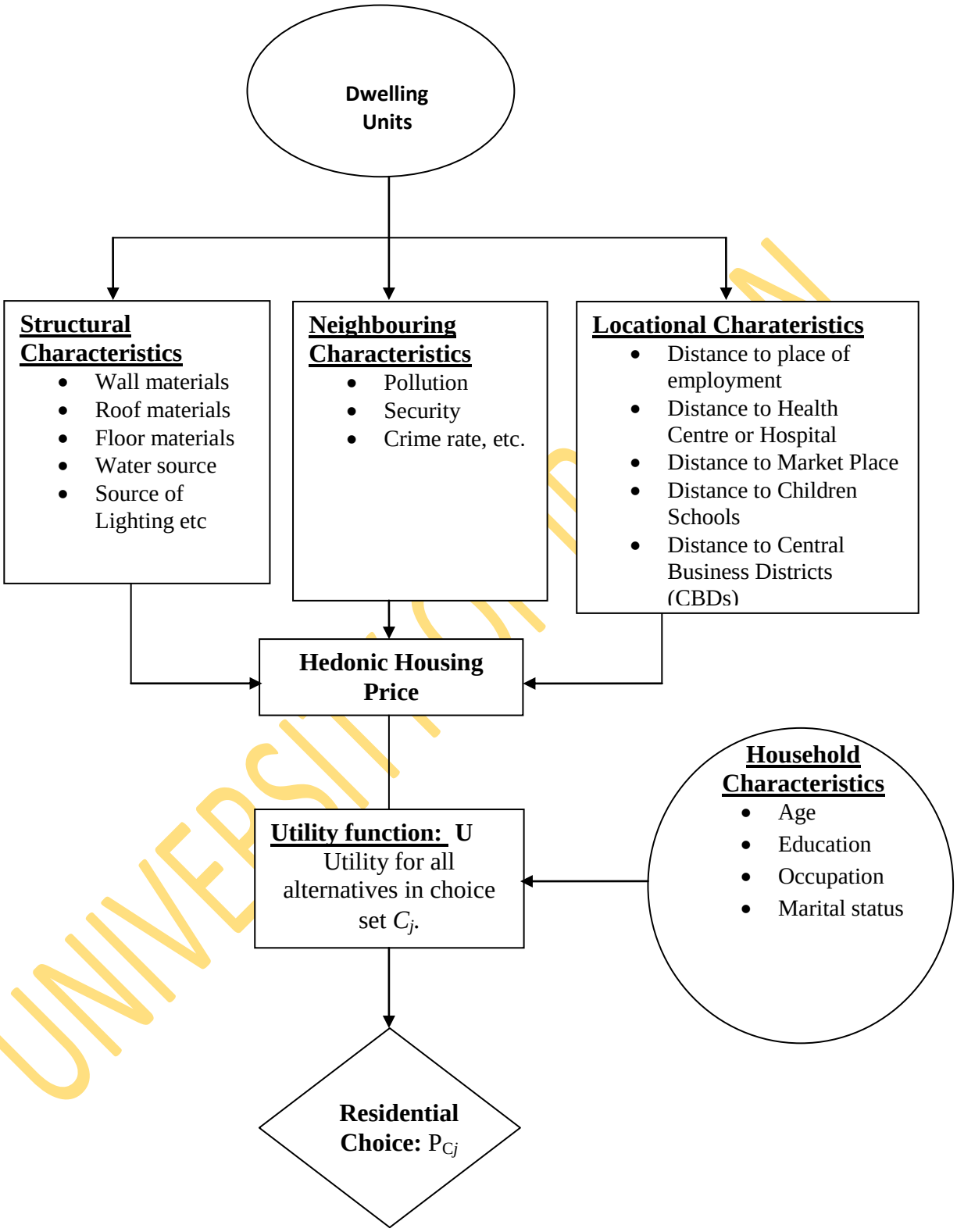
[7] Following Rosen (1974) and Mas-colell (1975), hedonic price theory is viewed as simply the extension of competitive equilibrium analysis to markets with heterogeneous indivisible commodities where the price of an indivisible commodity is a function of its characteristics.

[8] Consumer choice is assume d to depend solely on these qualities.

5.3 CONCEPTUAL FRAMEWORK

The conceptual framework employed by this study is closely related and drawn from the hedonic pricing approach which assumes that what people pay for when renting an apartment or buying a house are the characteristics embodied in it. These include structural, neighbourhood and locational characteristics. Therefore, housing is synonymously refers to as a dwelling unit constitutes a product which consists of a bundle of services. Among the bundle of services rolled into a product called a residential dwelling unit are : structural characteristics (such as roof condition and frequency of replacement, wall and floor types, availability of water as well as their source types, lighting source, among others); neighbourhood facilities and environmental quality (such as level of pollution, rate and level of crime prevalence, adequacy of security etc) and locational features (such as access to different facilities like distance to place of employment, hospital and health centers, market places, children schools, central business districts etc). Looking at the figure 5.1, it is clear why the arrow which emanates from the dwelling units with three different housing components denoting structural , neighbourhood and locational characteristics, with each of them having an arrow pointing towards hedonic housing price loop. Thus, in offering a price for a dwelling unit, all the above and more are usually given due consideration. The hedonic approach is based on the notion that a dwelling is composed of a bundle of individual components, each of which has an implied price and the price of any typical dwelling unit therefore, is the summation of the prices of the various components. Essentially, all these components of a house are what a purchaser or renter will be willing to pay for. Thus, in a consumer or an household's utility function that is characterized by quantity of housing services and that of other commodities to be consumed. If this utility is subjected to household's constraints in form of housing price (hedonic housing price) and household income. It is clear from the above explanation that housing price in this case is not just an ordinary price but a composite price thus, plays a useful role in the residential behavior determination.The resulting outcome is the quantity of housing to be demanded. The choice to be made of any of these housing types depend not only on the hedonic housing price (a critical determining factor influencing the choice of residential dwelling units) but also important are the intervening variables of household characteristics like age, sex, education, occupation and marital status. All these factors are what a potential house renter or house buyer considers in revealing preferences for his/her choice of residence. This is well depicted by the diagram overleaf.

Fig. 5.1 **CONCEPTUAL FRAMEWORK**



Source: Author's conceptualization

5.4 MODEL SPECIFICATION

Housing choice can be derived within the context of a theory of consumer behaviour in which standard household utility maximization framework is set up as explicitly stated in equations 1 to 3. In estimating residential choice, we specify residential choice equation based on equation 12 as proposed by Bajari and Benkard (2002) and Salvi (2007). The equation is augmented with demographic variables as suggested by Zabel (2004), Halicioglu (2005) and Kim (2007). The incorporation of demographic variables helps in reducing the effect of unexplained factors in residential choice behaviour. Our empirical model is specified with some modifications to reflect the influence of peculiarities of each of the residential density areas. In addition, the study is different from all other studies and those earlier stated in the sense that it includes all relevant variables simultaneously, and also specifically take cognizance of housing price and households' income through the incorporation of their predicted values.

Following from equation 12, we re-specify the equation by including demographic variables as thus:

$$Q_{ij}^{h} = f(M, H^{p}, D) \quad \text{.....(14)}$$

Where Q^h,and M remain as earlier defined and ε is the error term, H^p and D represent hedonic price and demographic variables. Equation (6) can be rewritten as:

$$Q_{ij}^{h} = \Omega_0 + \Omega_1 \log M + \Omega_2 \log H^{p} + \Omega_3 D + \varepsilon \quad \text{.....(15)}$$

We re-specify equation (15) after decomposing the demographic variables into gender, age, religion and ethnicity as follows:

$$Q_{ij}^{h} = \Omega_0 + \Omega_1 \log M + \Omega_2 \log H^{p} + \Omega_3 Age + \Omega_4 Hsize + \Omega_5 Gender + \Omega_6 Ethn + \Omega_7 \mathrm{Re}l + \varepsilon \text{ -(16)}$$

Q_{ij}^{h} is the categorical variable which is the choice variable that shows a household preference for one particular residential housing type across different residential areas (that is, high, medium and low) whereas socio-demographic variables like age, household size, gender, ethnic and religion are dummy variables. Each of these variables is further decomposed into different levels with each of the levels having zero and one value as a dummy variable. The details of the variable descriptions are shown on Table 5.4.1. Also, Ω_1 to Ω_7 stand for coefficients of the parameters to be estimated.

Table 5.1: DESCRIPTION OF HOUSING CHOICE VARIABLES

Variables	Definitions and Measurements
Thedprice	Transformed hedonic price
Hhincome	Household income(naira value)
Hhsize	Household size (in numbers)
Age	
15-65	1 if household head age falls within 15-65 and 0 if otherwise
65 and above	1 if household head age falls within 65 and above and 0 if otherwise
Gender Dummy	
Male	1 if household head is male and 0 if otherwise
Female	1 if household head is female and 0 if otherwise
Educational Qualification Dummy	
Edunone	1 If household head has no formal education and 0 if otherwise
Edupry	1 If household head has primary education and 0 if otherwise
Edusec	1 If household head has secondary education and 0 if otherwise
Edutert	1 If household head has tertiary education and 0 if otherwise
Eduvotec	1 If household head has either vocational or technical education and 0 if otherwise
Occupational Status Dummy	
Occu_unemply	1 if household head is unemployed and 0 if otherwise
Occu_pub	1 If household head is a public servant and 0 if otherwise
Occu_priv	1 if household head is a private-salaried worker and 0 if otherwise
Occu_selfemply	1 if household head is self-employed and 0 if otherwise
Occu_stua	1 if household head is a student or apprentice
Ethnicity Dummy	
Ethn_yoruba	1 if household head is a Yoruba and 0 if otherwise
Ethn_hausa	1 if household head is a Hausa and 0 if otherwise
Ethn_Ibo	1 if household head is a Ibo and 0 if otherwise

Prior to estimation of the equation 16, both H^p and M will first of all, be estimated. The rationale behind this is that in the literature, housing price and quantity in equation (16) are not directly observable but, observed jointly either as rent paid or as the owners' estimates of housing value. It has also been observed that for developing countries, the information is scarce and studies either omit the price term from the demand equation (Jimenez and Keare, 1984) or derive price estimates in indirect ways . The production function approach was applied to Korean data by Follain et al. (1982) and the hedonic approach by Ingram (1981) to Colombian data and by Grootaert and Dubois (1988) to Ivory Coast cities. Various solutions have been suggested in the literature because of this problem. The most appealing and often used approach is to estimate housing price either as actual or imputed rent or owner's value of the house (see Mayo, 1981; Malpezzi, Mayo and Gross 1981, Arimah, 1992 and Phillip,

2006). Housing price is a variable which poses a serious challenge to all housing researchers. Hence, different methods have been adopted to proxy it, in the literature. The most favoured approach in the literature has been that of Hedonic pricing.

The basic premise of the hedonic pricing method is that the price of a marketed good is related to its characteristics or the services it provides. The characteristic of a given dwelling unit or housing structure includes among others the property characteristics that affect selling prices, such as lot size, number and size of rooms and number of bathrooms; locations of residential properties; accessibility characteristics that affect prices, such as distance to work and shopping centres, availability of public transportation and the neighborhood characteristics that affect selling prices, such as property taxes, crime rates and quality of schools**.** In capturing the housing price (P) in equation (16), we specify hedonic price function of the general form as follows.

$LogH^{p} = \alpha_0 + \alpha_i(X_{ij}) + \varepsilon_i$ ..... (17) Where H^{p} is hedonic prices, X_i is a vector of characteristics of the house traits (characteristics) like structural, neighbourhood and locational traits. This classical hedonic price model reflects a relationship between housing prices and traits. The housing traits can be classified into three categories: structural traits denoted by S; neighbourhood traits denoted by N; and locational traits denoted by L. Above equation (17) can be explicitly rewritten as:

$H^{p} = H(S, N, L)$ ---------- (18)

The structural traits consist of roofing materials, walling materials, flooring materials, lighting types and water sources while the neighbourhood traits as identified in the survey are waste disposal methods, security services and pollution and locational traits also are distance to workplace, children schools, public transports, hospitals and water supply. In the light of the above, the empirical model of hedonic pricing was specified as follows:

$$Log(H^{p}) = \Phi_0 + \Phi_1 Roofing\_Mat_{ij} + \Phi_2 Walling\_Mat_{ij} + \Phi_3 Flooring\_Mat_{ij} + \Phi_4 Lighting\_Typ_{ij} +$$
$$\Phi_5 Toilet\_fac_{ij} + \Phi_6 Water\_soc_{ij} + \Phi_7 Waste\_disp_{ij} + \Phi_8 Security_{ij} + \Phi_9 Pollution_{ij} +$$
$$\Phi_{10} Distance\_emply_{ij} + \Phi_{11} Distance\_chdsch_{ij} + \Phi_{12} Distance\_pubtran_{ij} +$$
$$\Phi_{13} Distance\_pubtran_{ij} + \Phi_{14} Distance\_hosp_{ij} + \Phi_{15} Distance\_watssp_{ij} + \varepsilon_{ij} \quad (19)$$

Each of the explanatory variables is further sub-divided into different levels with each carrying zero and one value as dummy variables. The Φ_1 - Φ_{15}, are the coefficients of the parameters to be estimated. The details of the variable description are shown on Table 5.2. below.

Table 5.2: DESCRIPTION OF HEDONIC PRICING METHODOLOGY VARIABLES

Variables	Definitions and Measurements
Structural Characteristics	
Roofing materials types	
Corrugated_roof	1 if the house is roofed with corrugated roofing sheet and 0 if otherwise
Cement_roof	1 if the house is roofed with cement and 0 if otherwise
Tile_roof	1 if the house is roofed with tiles and 0 if otherwise
Asbestos	1 if the house is roofed with asbestos and 0 if otherwise
Wooden_roof	1 if the house is roofed with wooden roof and 0 if otherwise
Thatched_roof	1 if the house is roofed with thatched roof and 0 if otherwise
Mud_bricks	1 if the house is roofed with mud bricks and 0 if otherwise
Walling materials types	
Mud_wall	1 if the house is walled with mud wall and 0 if otherwise
Burnt_wall	1 if the house is walled with burnt bricks wall and 0 if otherwise
Cement_wall	1 if the house is walled with cement wall and 0 if otherwise
Wooden_wall	1 if the house is walled with wooden wall and 0 if otherwise
Corrugated_wall	1 if the house is walled with corrugated wall and 0 if otherwise
Cardboard_wall	1 if the house is walled with cardboard wall and 0 if otherwise
Flooring materials types	
Earth_mud_floor	1 if the house is floored with earth mud and 0 if otherwise
Wood_tile_floor	1 if the house is floored with wood/tile and 0 if otherwise
Plank_floor	1 if the house is floored with plank and 0 if otherwise
Concrete_floor	1 if the house is floored with concrete and 0 if otherwise
Dirt_straw_floor	1 if the house is floored with dirt/straw and 0 if otherwise
Lighting Source types	
PHCN	1 if Power Holding Company of Nigeria supplies the light and 0 if otherwise
Generator	1 if the lighting comes from generator and 0 if otherwise
Candle	1 if the lighting comes from candle and 0 if otherwise
Battery	1 if the lighting comes from battery and 0 if otherwise
Gas	1 if the lighting comes from gas and 0 if otherwise
Kerosene	1 if the lighting comes from kerosene /paraffin and 0 if otherwise
Wood_coal	1 if the lighting comes from wood/coal and 0 if otherwise
Toileting facilities	
Flushpipe	1 if the toilet facility is flush to piped sewer and 0 if otherwise
Flush_septic	1 if the toilet facility is flush to septic tank and 0 if otherwise
Flush_pit	1 if the toilet facility is flush to pit and 0 if otherwise
Composting	1 if the toilet facility is composting and 0 if otherwise
VIP_pit	1 if the toilet facility is pit latrine with slab and 0 if otherwise
Covered_pit	1 if the toilet facility is covered pit and 0 if otherwise
Uncovered_pit	1 if the toilet facility is uncovered pit and 0 if otherwise
Hanging	1 if the toilet facility is hanging type and 0 if otherwise
Pail/bucket	1 if the toilet facility is by pail/bucket and 0 if otherwise
No_toilet	1 if there is no toilet facility and 0 if otherwise

Water source types	
Pipebor_water	1 if water source is from pipe borne water and 0 if otherwise
Public_water	1 if water source is from public tap and 0 if otherwise
Borehole	1 if water source is from borehole and 0 if otherwise
Well_water	1 if water source is from thewell and 0 if otherwise
SSvendor_water	1 if water source is from small scale vendor and 0 if otherwise
Tanker_truck	1 if water source is from tanker truck and 0 if otherwise
Other_water	1 if water source is from other water sources other than those earlier mentioned and 0 if otherwise
NEIGHBOURHOOD CHARACTERISTICS	
Waste Disposal Methods	
PSP	1 if wastes are being collected by the government through private sector participation and 0 if otherwise
Dump_ground	1 if wastes are dumped in unauthorised places and 0 if otherwise
Truck_push	1 if wastes are being collected by the truck pushers and 0 if otherwise
Comp_dump	1 if wastes are dumped within the house compound and 0 if otherwise
Other_dump	1 if wastes are dumped through other methods and 0 if otherwise
Security services	
Com_pol	1 if security services are provided by the community police e.g like vigilante group, maid-guards etc and 0 if otherwise
Govt_pol	1 if security services are provided by the government police and 0 if otherwise.
Pollution	
Littering	1 if pollution is mainly in form of littering and 0 if otherwise
Public_urine	1 if pollution is mainly in form of urinating in the public places and 0 if otherwise
Poor_traffic	1 if pollution is in form of poor traffic and 0 if otherwise
Illegal_trad	1 if pollution is in form of illegal trading and 0 if otherwise.
LOCATIONAL CHARACTERISTICS	
Distance to employment	
Distemployd0_14	1 if distance to household head place of employment takes between 0-14 minutes
Distemployd15_29	1 if distance to household head place of employment takes between 15-29 minutes
Distemployd30_44	1 if distance to household head place of employment takes between 30-44 minutes
Distemployd45_59	1 if distance to household head place of employment takes between 45-60 minutes
Distemployd60_abv	1 if distance to household head place of employment takes between 60-above minutes
Distance to children school	
Distschdsch0_14	1 if distance of household head to children schools takes between 0-14 minutes
Distschdsch15_29	1 if distance of household head to children schools takes between

	15-29 minutes
Distschdsch30_44	1 if distance of household head to children school takes between 30-44 minutes
Distschdsch45_59	1 if distance of household head to children schools takes between 45-59 minutes
Distschdsch60_abv	1 if distance of household head to children schools takes between 60-above minutes
Distance to public transport	
Distpubtrans0_14	1 if distance of household head to public transport takes 0_14 minutes
Distpubtrans15_29	1 if distance of household head to public transport takes 15_29 minutes
Distpubtrans30_44	1 if distance of household head to public transport takes 30_44 minutes
Distpubtrans45_59	1 if distance of household head to public transport takes 45_59 minutes
Distpubtrans60_abv	1 if distance of household head to public transport takes 60_above minutes
Distance to hospital	
Disthosp0_14	1 if distance of household head to the hospital takes 0_14minutes
Disthosp15_29	1 if distance of household head to the hospital takes 15_29minutes
Disthosp30_44	1 if distance of household head to the hospital takes 30_44minutes
Disthosp45_59	1 if distance of household head to the hospital takes 45_59minutes
Disthosp60_abv	1 if distance of household head to the hospital takes 60_above minutes
Distance to market	
Distmkt0_14	1 if distance of household head to marketplace takes 0_14minutes
Distmkt15_29	1 if distance of household head to marketplace takes 15_29minutes
Distmkt30_44	1 if distance of household head to marketplace takes 30_44minutes
Distmkt45_59	1 if distance of household head to marketplace takes 45_59minutes
Distmkt60_abv	1 if distance of household head to marketplace takes 60_above minutes
Distance to water supply	
Distwat0_14	1 if distance from household head house to water supply takes between 0_14 minutes
Distwat15_29	1 if distance from household head house to water supply takes between 15_29 minutes
Distwat30_44	1 if distance from household head house to water supply takes between 30_44 minutes
Distwat45_59	1 if distance from household head house to water supply takes between 45_59 minutes
Distwat60_abv	1 if distance from household head house to water supply takes between 60_above minutes

However, the estimation of the implicit prices of the hedonic prices can be done by regressing market values of house prices H^p, measured as rents, as a function of various

housing attributes such as what we have in equation (19). The next stage in the implementation of this model is the choice of the functional form for the hedonic prices. The issue that has generated debates in the housing literature borders on the choice of functional form specification. In fact, quite a large number of studies on residential choice impose *a prior restriction* on their model before estimation. This may lead to model misspecification, erroneous and inconsistent estimates. In specifying a model, it is pertinent to derive information from the data itself (data-based model specification) instead of imposing an untested restriction in advance. Hence, we employ Box-Cox transformation which is a flexible form of obtaining an accurate functional form. In addition, since we do not have any prior notions about the shape of the hedonic functions, we estimate alternative forms of Box-Cox transformations. We estimate the general Box-Cox functional forms given below:

$$H^p(Z)^{(\tau)} = \delta_0 + \sum_{i=1}^{k} \delta_1 X_i^{\lambda_i} + 0.5 \sum_i \sum_j \theta_{ij} X_i^{\lambda_i} X_j^{\lambda_j} \quad \text{----------(20)}$$

where

$$H^p(X)^{(\tau)} = [(H^p(X))^{(\tau)} - 1)]/\tau \quad \text{----------(21)}$$

and

$$X^{(\lambda_i)} = (X^{(\lambda_i)} - 1)/\lambda_i \quad \text{----------(22)}$$

Where λ is a parameter used to transform housing characteristics to do Box-Cox transformation and τ is transformation parameter for rent (H^p). Nonlinear methods are used to find optimal values of transformation parameters. The thesis employs a Box-Cox transformation to transform the specification in equation (19) and the Box-Cox transformation generated the maximum likelihood estimates of the parameters according to

$$\frac{H^{(p)\theta} - 1}{\theta} = \alpha + \sum \beta_k \frac{X_k^{\lambda} - 1}{\lambda} + \varepsilon \quad \text{----------(23)}$$

Where $\varepsilon \sim N(0, \sigma^2)$ and $\theta, \lambda \in (-\infty, +\infty)$. The dependent variable H^p is transformed by the parameter θ, and each of the independent variables X_k is transformed by the same parameter λ. The transformed variables must be strictly positive to be defined for all values of θ and λ. Thus, variables that have negative values or contain zeros such as dummy variables are not transformed.

Since Box-Cox transformation embeds several standard functional forms, estimating θ and λ allows us to test these functional forms without imposing them a priori on the data.

In particular, when $\theta=\lambda=1$, then equation (19) becomes linear. When $\theta=\lambda\rightarrow 0$, the transformed elements of equation (19) become log-linear. Finally, when $\theta=\lambda=-1$, the transformed elements of the regression become the multiplicative inverse specification. Another benefit to be derived from using the Box-Cox transformation is that it makes the residuals more closely normal and less heteroskedastic.

In addition, M can further be calculated since researchers are divided on which measure to be used in capturing appropriate household income. Different measures have been applied in the literature but the most favoured measure is to regress current income on life cycle variables. This is achieved by running a household income regression using household demographic characteristics. The fitted value of the regression provides permanent income while the temporary income is calculated as the residual. The main justification for using income equation specified in equation 24 is whether there exists multicollinearity between income and human capital variables. The study adapted the version of Mincerian human capital equation. This is expressed as follows:

$$LnM_{ij} = \vartheta_0 + \vartheta_k H_{ij} + \varepsilon_{ij} \quad \text{---------- (24)}$$

Where LnM_{ij} is natural logarithms of monthly household income of an individual in residential density area j, H_{ij} are human capital and other background characteristics of household i in residential density area j, ε_{ij} is the error term of zero mean and constant variance. ϑ_0, and ϑ_k, are parameters to be estimated. If the variables are highly collinear, then human capital variables like education and occupational status will not enter into estimable models but if otherwise, all the variables will enter into the final estimable equation.

A Priori Expectation of Model Parameters

Among the explanatory variables considered in the equation 16 as factors influencing the residential housing choice are housing prices, household income, household size, age, gender and ethnicity.

The important role of housing price (housing rents in the case of rented houses or house value in the case of owner-occupier houses) in the determination of residential housing choice is well established in the housing literature. Apart from the fact that the strong surge in housing prices can place affordable housing beyond the reach of many demographic groups, it is also possible for such increase in housing price to influence the choice of residence type

and location. For instance, one may prefer a duplex to multi-household houses but if house rents were to increase substantially, such preference may change from renting a duplex to multi-household houses. Housing price (hedonic price) is a composite price in the sense that it represents a schedule of prices that a household faces. Thus, what one values in houses vary from one individual to another. While some place higher premiums on accessibility to workplace, others may value proximity to market place or central business districts (CBDs) and some place recognition on the presence of housing physical fittings than anything else. Since all these cannot be explicitly traded in the market place, it must have been captured into prices, but at higher prices individual preferences may be distorted. Hence, the impact of housing price on residential housing choice is negative.

Household income is another vital explanatory factor in the residential housing determination. Housing literature clearly distinguishes permanent and temporary or current income but in studies of durable consumer purchases, permanent income has been shown to be the relevant variable in consumers' housing decision (Friedman,1957; Mayo,1981 and ; Malpezzi and Mayo,1987). This hinges primarily on the permanent-income hypothesis which states that in well-functioning capital markets, a household's consumption of durable goods is determined by the permanent income, which takes cognisance of the flow of income over a long time. This is because current income usually contains transitory components which bring about fluctuations in the flow of income over a given period. This in part resulted to a downward bias in estimates obtained via current income. (Follain etal,1980; Jimenez and Keare,1984 and ; Shefer,1990). The income data collected through the survey was based on average total income of the household per month. Thus we could not differentiate between permanent and current income for our analysis. More importantly, income usually impacts on the choice of residence positively, that is income is predicted to be positively related to residential housing choice.

The size of household could also determine greatly the residential housing choice behaviour of an individual household. The higher the size of the household, the greater would be the need to demand for spacious houses and hence influence the choice of residential housing . A family of two that hitherto had been staying in a room apartment may want to demand for two or three bedroom apartment once the family size increase to three or four. Thus, the size of the family has a positive relationship with choice of residence. Households with children and relatively high incomes tend to live in suburbs because of the need for larger houses, larger lots and good schools (Filion et al.1999).

Age has been found in many studies to have a strong influence on residential tenure choice decisions. Age captures the experience as well as the stage in the life cycle of the household. Life-course model of residential mobility suggests that different age groups with different household characteristics have different desires for their residences and that these preferences change over the life course (Wenning,1995 and Morrow-Jones,2005). Rowles (1993) noted that older people want to live close to their children and still be independent in their residential location decisions. What this suggests is that age as a factor determining choice of residence could either exert a positive or negative impact depending on the stages in the life-cycle of the individual household. Empirical evidence from Tiwari (2000) also showed that if age of household head increases by 1%, the market share of single family and multi-family ownership houses increases.

Gender is also an important factor in determining residential housing choice in the literature. It has been observed that females usually prefer and cherish their privacy than their male counterparts. Hence they prefer houses like flats, single-household houses to multi-household houses and squatters' settlement. Also, women or females are seen to prefer renting houses close to their workplaces and markets than their male counterparts. The issues relating to proximity to workplaces and markets are believed to have been captured under hedonic prices. What this suggests is that irrespective of the amount charged on house rents, females will always prefer all these features prior to their choice of houses whereas male counterparts hardly pay attention to these features in relation to the female counterparts.

The relationship between the level of education and residential housing choice is positive in many studies. The direction of the relationship tends to vary across different residential types and location. For example, it is expected that somebody with tertiary education tends to prefer flat, duplex and single-household houses to multi-household houses, room in the main building and squatters' settlements relative to someone with primary or no education. Thus, demand for different residential housing types tend to vary significantly across different level of educational attainments. The higher the level of education one attains, the higher the level of sophistication. Generally speaking, education tends to exert positive influence on both the demand for housing and choice of residence. Thus, the level of schooling determines greatly the type and choice of residential location of an individual household.

Another variable that was included in the estimated model is the occupational status of the household head. Occupation often measures the social status of the head of the household thereby indicating that household in which the head is employed in a white-collar

job are more likely to consume greater quantities of housing attributes. The results are consistent with those obtained by Blomquist and Worley (1981, 1982), and Witte, Sumka and Erekson (1979). The effect of occupation on housing consumption is generally positive but this tends to vary depending on the type and nature of occupation. For instance, public salaried workers tend to live in rented apartments than both self-employed and private-salaried workers. The choice made of residential housing also varies from one occupation to another.

Religion may be a factor in the emergence of residential concentrations as people who share cultural backgrounds including religion seek to live near each other or are attracted by services provided by religious organisations. In addition, religion may be used as a dimension in the identification of residential concentrations of people.

People of the same ethnic group are more alike, while people of different ethnic groups within the same racial group may be quite different. This suggests that individuals are drawn more to people of their own ethnic group rather than to people of other ethnic groups in the same racial group. In other words, people choose residences based on proximity to co-ethnics rather than other co-racial, but since all co-ethnics are of the same race, both ethnicity- and race-based concentration results. For instance, social capital theories suggest that ethnicity and race form important social and economic networks, leading people to gravitate towards others in the same group and ultimately resulting in geographic concentration by race and ethnicity. Thus, people will move to a neighbourhood or a place where there is a large population of coethnics.

5.4 SOURCE OF DATA

The study used household survey data collected by the Lagos State Government. The baseline data on the target sampled households were generated by the survey fieldwork conducted by the Lagos State Government through Central Office of Statistics and Ministry of Economic Planning and Budget in collaboration with the World Bank in 2006. The Household survey was a state-wide survey which collected detailed information on a variety of topics including demographic characteristics of the household, education, health, infrastructure, income and expenditure, economic activity, housing conditions, access to social amenities, asset ownership, violence, crime and safety and other subjective issues among others.[9]

[9] The details of the methodology employed for the collection of the data can be seen at the appendix.

The raw data used was worked upon to suit the purpose of the study. For instance, data of over 826 variables were collected covering a variety of topics just like earlier mentioned above but those eventually used for the study were about 126 having undergone the data cleaning process . Importantly, the classification of the residential density areas was done in collaboration with the Lagos State staff of the department of budget and planning section of the secretariat. The Table for the classification is shown below:

Classification of the Local Governments in Residential Density Areas

Density is referred to as the number of persons, objects per unit of space, such as the number of persons or houses per acre or hectare. In housing literature, residential densities can be expressed in any of the following ways namely: (a) population density: the number of persons per acre or hectare; (b) Occupancy rate: the number of persons resident per habitable room; (c) Housing density: the number of houses per acre or hectare; (iv) Accommodation density: the number of habitable rooms per acre or hectare; (v) Bedspace density: the number of bedspaces per acre or hectare and (vi) Floor space rate: the amount of floor space (in square metres or square feet) per person.

Table 5.3: LAGOS STATE RESIDENTIAL DENSITY CLASSIFICATION

S/N	Local Government Area	2006	High Residential Area	Medium Residential Area	Low Residential Area
1.	AGEGE	1,033,064	✓		
2.	AJEROMI/IFELODUN	1,435,295	✓		
3.	ALIMOSHO	2,047,026	✓		
4.	AMUWO/ODOFIN	524,971		✓	
5.	APAPA	522,384			✓
6.	BADAGRY	380,420			✓
7.	EPE	323,634			✓
8.	ETI-OSA	983,515		✓	
9.	IBEJU-LEKKI	99,540			✓
10.	IFAKO-IJAIYE	744,323		✓	
11.	IKEJA	648,720		✓	
12.	IKORODU	689,045			✓
13.	KOSOFE	934,614		✓	
14.	LAGOS ISLAND	859,849	✓		
15.	LAGOS MAINDLAND	629,469		✓	
16.	MUSHIN	1,321,517	✓		
17.	OJO	941,523			✓
18.	OSHODI/ISOLO	1,134,548		✓	
19.	SHOMOLU	1,025,123	✓		
20	SURULERE	1,274,362		✓	
	TOTAL	17,552,942	6	8	6

Note: population density per LG (population divided by landmass) was actually used to classify the residential areas into high, medium and low residential areas respectively.

5.6 ESTIMATION TECHNIQUES

The thesis employs choice-based model to estimate residential housing choice. It has been found appropriate to capture the central focus of this study which is: to determine empirically the factors determining the residential choice decision, because it is based on the analysis of both qualitative and quantitative data which is derived from a discrete choice specification of the demand for residential housing from a utility theoretical model. Discrete choice decisions[10] in the context of random utility theory are usually modelled and estimated with the multinomial logit model (MNL) (Guadagni and Little, 1983). The multinomial logistic regression model used is generally effective where the dependent variable is composed of a polychotomous[11] category having multiple choices. The basic concept was generalised from binary logistic regression (Aldrich & Nelson 1984, Hosmer & Lemeshow, 2000).

The MLM appeals to this study for three reasons. First, data for the study consist of individual specific characteristics, and the MLM is well-suitable to analyse the characteristics of the individual. If the data is composed of alternative specific attributes, then the conditional logit model (CLM) is appropriate. Second, while the MLM is most popular as discrete choice model, it has a strict restriction in use. An assumption of both MLM and CLM is that the alternatives are distinct and independent of one another. That is, introducing a new alternative leaves the relative odds of choosing among the existing alternatives unchanged. This property is called the independence of irrelevant alternatives (IIA) assumption. The IIA assumption follows from the assumption that the stochastic disturbances are independent and identically distributed. However, if alternatives are close substitutes for one another, then the IIA assumption is violated. The MLM has suffered from the IIA assumption in many areas by restricting the correlation patterns among choice alternatives. The IIA assumption, however, can only be empirically tested when some respondents have different choice sets. That is, when everyone in the sample is presented with the same choice set, the IIA assumption is not a serious problem (Allison, 1999). For the study, six alternatives are presented to all individuals. Thus, this study is free from IIA assumption. In addition, the MLM is easy to estimate even for a large number of alternatives (Borsch-Supan, 1990). Third, one of the alternatives to the MLM is the nested logit model (NLM) developed by McFadden (1978),

[10] Utility-based choice or choice based on the relative attractiveness of competing alternatives from a set of mutually exclusive alternatives is called a *discrete choice* situation.

[11] Polychotomous logistic regression is frequently the method of choice when outcome is categorical (2 or more mutually exclusive, unordered response categories) and interest is in relationship between the outcome and covariates. The covariates may be binary, categorical, ordinal, or continuous.

which relaxes the IIA restriction of the MNL by allowing alternatives to be correlated across, but not within, groups (Greene, 2003). However, if a larger number of independent variables are included, the NLM is difficult to employ.

The basic framework for analysis is provided by the random utility model where consumers are assumed to choose among a range of discrete number of alternatives to maximise their utility.

Let an individual household i choose from a set of mutually exclusive alternatives $j = 1, ----------, J$. He/she obtains a certain level of utility U_{ij} from each alternative. The discrete choice model is based on the principle that the individual household chooses the outcome that maximizes the utility. We do not observe his/her utility, but observe some attributes of the alternatives as faced by the household. This utility according to random utility theory can be decomposed into systematic and random components of utility. That is, total utility is the sum of observable and unobservable components, Hence, the utility is decomposed into deterministic V_{ij} and random part ε_{ij}:

$$U_{ij} = V_{ij} + \varepsilon_{ij,} \quad \forall j. \text{----------(25)}$$

Since ε_{ij} is not observed, the household's choice cannot be predicted exactly. Instead, the probability of any particular outcome is derived. The unobserved term is treated as random with density $f(\varepsilon_{ij})$. The joint density of the random vector $\varepsilon_i = \varepsilon_{i1,-----,\varepsilon_{iJ}}$ is denoted $f(\varepsilon_i)$. Probability that household i chooses alternative *j* among *J* alternatives is

$$\begin{aligned} P_{ij} &= \Pr(U_{ij} \succ U_{ik} \forall j \neq i) \\ &= \Pr(V_{ij} + \varepsilon_{ij} \succ V_{ik} + \varepsilon_{ik} \forall j \neq i) \\ &= \int I(V_{ij} + \varepsilon_{ij} \succ V_{ik} + \varepsilon_{ik} \forall j \neq i) f(\varepsilon_i) d\varepsilon_i \text{ ---------- (26)} \end{aligned}$$

where *I*(.) is the indicator function, equaling 1 when the term in parenthesis is true and 0 otherwise. This is a multidimensional integral over the density of the unobserved portion of utility $f(\varepsilon_i)$. Different discrete choice models are obtained from different specifications of the density. The deterministic part V_{ij} of utility is usually treated as a linear function of explanatory variables *x* and an unknown vector of underlying parameters θ. In random utility models the expectation of the random component $E(\varepsilon_{ij})$ is assumed to equal 0, that in turn

implies $E(U_{ij}) = V_{ij}$. A vector of utilities $U_{ij}, \forall_j$ is assumed to be continuously distributed with an existing covariance matrix (see Tutz, 2000).

The absolute level of utility in Equation 26 is irrelevant to the individual household behavior. For example, if a constant is added to the utility of all alternatives, the alternative with the highest utility does not change. The choice probability is $P_{ij} = P(U_{ij} \succ U_{ik}) = P(U_{ij} - U_{ik} \succ 0),$, which depends only on the difference in utility, not its absolute level. The fact that only differences in utility matter has several implications for the identification and specification of discrete choice models. In general it means that the only parameters that can be estimated (that is, are identified) are those that capture differences across alternatives. In order to investigate the way and how observed factors influence the individual household to make a choice, unknown parameters θ of the model are estimated. The log-likelihood estimator can be used to estimate the parameters. The log-likelihood function to be maximized over parameters θ is given as :

$$\ln L(\theta) = \sum_{i=1}^{N} \sum_{j=1}^{J} y_{ij} \ln P_{ij} \text{ ----------(27)}$$

Where y_{ij} equals 1 if alternative *j* is chosen and equals 0 for all other non-chosen alternatives.

The multinomial logit (MNL) model, invented by McFadden (1974), is obtained by the assumption that each random components ε_{ij} in the utilities (25) is distributed independently, identically type I extreme value, where the variance of the error term is equal to $\pi^2/6$. The density for each unobserved component of utility and the cumulative distribution are given, respectively, by

$$\lambda(\varepsilon_{ij}) = e^{-\varepsilon_{ij}} e^{-e^{-\varepsilon_{ij}}} \text{ and } \lambda(\varepsilon_{ij}) = e^{-e^{-\varepsilon_{ij}}} \text{ ----------(28)}$$

The random utility (25) is combined with the probability distribution for the random components ε_{ij} in equation (28) and assumes independence among the random components of the different alternatives. The probability that an individual household i choose alternative *j* among the *J* alternatives is given by

$$P_{ij} = \Pr(\varepsilon_{ij} \prec V_{ij} - V_{ik} + \varepsilon_{ik} \forall j \neq i)$$

$$= \int \prod_{j \neq k} \Lambda \Pr(\varepsilon_{ij} \prec V_{ij} - V_{ik} + \varepsilon_{ik} \forall j \neq i) d\varepsilon_{ij} \text{ ----------(29)}$$

Thus, the choice probability is the integral over all values of ε_{ij} weighted by its density $\lambda(.)$ as defined in (28). This integral has a closed form solution and after some manipulation the logit probabilities, with $V_{ij} = x_i' \beta_{j,}$ become:

$$P_{ij} = \frac{e^{x_i' \beta_j}}{\sum_j e^{x_i' \beta_k}} \text{ ----------(30)}$$

Since MNL is a model where regressors do not vary over choices, coefficients are estimated for any choice. MNL requires identification: one of the choices, say *j*, is treated as the base category (correspondent β_j is constrained to equal 0). Substitution of equation (30) into (27) yields the log-likelihood function to be maximized over parameters β

$$\ln L(\beta) = \sum_{i=1}^{N} \sum_{j=1}^{J} y_{ij} \ln \frac{e^{x_i' \beta_j}}{\sum_j e^{x_i' \beta_k}} \quad \text{----------(31)}$$

where y_{ij} equals 1 if alternative j is chosen and equals 0 for all other non-chosen alternatives (Greene, 2003).

Thus the study uses MLM to discern the determinants of the residential housing choice across different segments of population namely High, Medium and Low. The multinomial logistic regression model used in this study estimates the effect of the individual variables on the probability of choosing an alternative residential housing type. This is informed by the fact that an individual household in Nigeria may be found occupying or renting houses in any one of the six residential housing choice as obtainable in the Lagos State housing surveys. These residential choices are single household houses, multi-household houses, flats in a block of flats, duplex, room in the main building and squatters' settlements. The model can be expressed as follows:

$$\Pr[Q^h = P_{ij}] = \frac{\exp(X_{i,}\beta_j)}{1 + \sum_{k=1}^{j} \exp(X_i, \beta_j)} \quad \text{----------(32)}$$

where $Q^h = P_{ij}$ is the dependent variable and the number of alternatives in the choice set. The model is estimated with six alternatives: j=1 if the respondents indicate they prefer single-household houses as their choice of residence; j=2 if the respondents indicate they prefer multi-household houses as their residential housing choice; j=3 if the respondents indicate flats in a block of flats as their residential housing choice; j=4 if the respondents indicate they prefer duplex as their choice of residence; j=5 if the respondents indicate they prefer room in the main building as their residential housing choice; j=6 if the respondents indicate they make choice of squatters' settlement as their residential choice[12] . The second alternative, j=2,

[12] (i) **Single household house** – a whole building (bungalow) occupied by one household.
(ii) **Multi-household house** - a whole building (bungalow) occupied by more than one households.
(iii) **Duplex** - a storey building with inbuilt stair case occupied by a single household.
(iv) **Room in the main building** is defined as space occupied by a household in a building containing more than one room with shared toilets and kitchens.
(v) **Flat in a block of flats**- refer to flats in an estate and flats in more than one building with same designs and separate conveniences but share same address. The number of bedrooms is usually used to denote them e.g. 2 bedroom, 3 bedroom etc.

show the respondents that indicated that they prefer multi-household houses as their residential housing choice, is used as the reference choice. The independent variables, Xi, hypothesised to influence the alternatives are summarised as follows: (1) transformed hedonic housing prices; (2) household incomes; and (3) socioeconomic and demographic factors. ßj is a vector of the estimated parameters, and $Pr[Q^h=P_{ij}]$ is the probability of individual i choosing j alternative among six alternatives in the choice set.

Coefficients of the MLM are difficult to interpret because of the proliferation of parameters, which results in increased complexity in interpreting the estimates (Greene, 2003). The, marginal effects of the MLM are also difficult to derive.

The derivatives of the probabilities of the alternatives with respect to each of the explanatory variables are obtained at the sample means of the explanatory variables.

However, calculating marginal probabilities are not very useful to evaluate the magnitude of ß in MLM. First of all, discrete change represents the change for a particular set of values of the independent variables. Thus, the changes will not be the same at different levels of the variables. Another problem with marginal probability is that the dynamics among the dependent outcomes cannot be captured from measures of discrete change (Long, 1997). Therefore, for the study, results are interpreted using the odds ratio, which is the exponentiated coefficient. The odds ratio is calculated by contrasting each category with the reference category. The odds ratio shows a multiplicative change in the odds for a unit change in an independent variable. The logistic coefficient is interpreted as the change in the logit associated with a one unit change in the independent variable, holding all other variables constant. The exponential of the logistic coefficient is the effects on the odds rather than probability. In interpretation, a one unit change in the independent variable, tis expected to change the odds by a factor of exp(ß) when other things are equal.

The exponential of a positive number is greater than one, and the exponential of a negative number is less than one. Thus, the threshold between positive and negative effect is one in interpreting odds ratio. If exponentiated coefficient is greater than one, that implies increased odds. On the other hand, if exponentiated coefficient is between zero and one, odds decrease. The distance of exponentiated coefficient from one in either direction explains the size of the effect on the odds for unit change in the independent variable (Pampel, 2000).

(vi) **Squatter' Settlement-** can be defined as a residential area which has developed without legal claims to the land and/or permission from the concerned authorities to build; as a result of their illegal or semi-legal status, infrastructure and services are usually inadequate

CHAPTER SIX
ANALYSIS AND INTERPRETATION OF RESULTS

6.1 Introduction

This chapter presents the analysis of housing characteristics and socio-demographic characteristics of the representative samples across the three residential density areas in Lagos State. Apart from the socio-demographic variables description, analyses of hedonic results are also presented for full sample and high, medium and low residential density areas. The essence of the hedonic pricing approach is to show the qualities of housing structure that are implicitly embedded in the house rents people normally pay for. A section of the chapter also presents results of the multinomial logit models approach employed.

6.2 Analysis of Housing Characteristics of Lagos State

Table 6.2 presents the summary data on the type of materials used in the construction of roof, wall and floor, cross-classified by type of housing. Type of construction materials of housing units is of statistical importance. Together with the type of building, it will help to assess the durability and permanency of construction and demand for construction materials. It will also serve as an indicator of the quality of housing units.

Roofing Materials

As can be observed, the overwhelming majority (mean average of 0.785) of the housing units in Lagos State are roofed with corrugated iron. This is particularly predominated in multi-household, duplex, room in the main building and single-household houses. Asbestos follows at a wider gap (0.111). The mean of mud roof constituted 0.009 and that of wood roof 0.003 and thatched roof with a very negligible mean of 0.002. Average mean of corrugated iron increases substantially for all the housing types with the least of 0.747 for squatters' settlement to the highest of 0.828 for multi-household houses. Also patronage is accorded to asbestos after corrugated iron with the least mean value from squatters' settlement of 0.090 to the highest patronage from flat in the main building with 0.176 and single-household houses with mean of 0.136. Tile roof is another highly patronised roofing material in Lagos apart from corrugated and asbestos roofs. This is clearly depicted on Table 6.1. This finding is consistent with expectation given the level of development that is taking place in Lagos state. The use of thatched and wood roofing materials is almost non-existent in Lagos state as reflected by the mean values of 0.002 and 0.003 respectively. What is obvious from this is that there is a relatively increasing trend in the number of housing units that are roofed with corrugated iron sheet.

Walling Materials

The cross-tabulation between various types of housing and major materials for the construction of wall revealed that there is an increasing trend in the usage of cement walls in Lagos state. This varies from one housing type to another with not so much difference except for squatters' settlement with a least mean value of 0.648. Mud wall is also a prevalent form of walling materials used in the construction of houses after cement as shown in each of housing types. The mean value of each of them is as follows: single-household house (0.018),multi-household house(0.032),flat in a block of flats (0.004),duplex (0.011),room in main building(0.157), and those in 'other category' (0.031) but this appears more prominent in multi-household houses. Houses made of stone wall, burnt bricks and card wall are not popular forms of walling materials used for houses most especially in Lagos as depicted on Table 6.1. A marked decline in the use of these walling materials which could be regarded as ' traditional materials' show the level of sophistication that has been attained in the housing construction. In spite of this sophistication in housing, we still observed some pockets of wood and bamboo across the various type of housing but more pronounced where squatters' settlements are found. This is not unexpected given the nature of the settlement of the land occupiers that are acquired illegally and in an unauthorised manner. What is clear from the above is that associating the number of housing units constructed with 'modern materials (like cement)', with type of housing, we observe a marked increasing trend in Lagos metropolis.

Flooring Materials

With regard to type of housing and flooring materials, the use of cement floor appears to be the most common and is the bulk of flooring materials housing builders normally use. This is directly followed by earth/mud but at a much wider gap. The mean value of cement floor in Lagos State is 0.981 while that of earth/mud, wood/tiles, plank are 0.014, 0.003 and 0.001 respectively. The rate of usage of cement floor in each of the identified housing types is substantial given their mean values of 0.985 for single-household houses and 0.985, 0.983, 0.974, 0.985 and 0.789 for multi-household houses, flats, room in main building and squatters' settlement. The use of earth/mud is more fashionable among the squatters' settlements as can be observed from the Table where the mean value is 0.211 with least usage of it being observed in flats with the mean value of 0.004. Just like the case of walling materials, cement remains important housing material used in house flooring in Lagos state.

Table 6.1a: Housing Quality Cross-Classified by Residential Housing Choice

	Single Household House	Multi-Household House	Flats in a Block of flats	Duplex	Room in Main Dwelling	Squatter Settlements	Others	Total
Roofing Materials								
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Mud_roof	0.006 (0.078)	0.012 (0.109)	0.004 (0.065)	0.000 (0.000)	0.007 (0.085)	0.000 (0.000)	0.023 (0.151)	0.009 (0.095)
Thatch_roof	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.155 (0.364)	0.008 (0.089)	0.002 (0.045)
Wood_roof	0.009 (0.095)	0.001 (0.037)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.028 (0.167)	0.047 (0.211)	0.003 (0.050)
Corrugated_roof	0.758 (0.429)	0.828 (0.377)	0.636 (0.481)	0.789 (0.409)	0.777 (0.417)	0.747 (0.438)	0.775 (0.419)	0.785 (0.411)
Cement_roof	0.051 (0.221)	0.053 (0.225)	0.139 (0.346)	0.079 (0.271)	0.085 (0.280)	0.042 (0.203)	0.008 (0.088)	0.072 (0.258)
Tile_roof	0.039 (0.951)	0.013 (0.115)	0.043 (0.204)	0.026 (0.161)	0.009 (0.092)	0.000 (0.000)	0.039 (0.194)	0.018 (0.134)
Asbestos	0.136 (0.343)	0.090 (0.287)	0.178 (0.382)	0.106 (0.308)	0.120 (0.325)	0.028 (0.167)	0.101 (0.302)	0.111 (0.314)
Walling Materials								
Mud wall	0.018 (0.134)	0.032 (0.176)	0.004 (0.065)	0.011 (0.106)	0.015 (0.123)	0.028 (0.167)	0.031 (0.174)	0.023 (0.149)
Stone wall	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Burnt bricks	0.000 (0.000)	0.001 (0.026)	0.000 (0.000)	0.000 (0.000)	0.002 (0.045)	0.000 (0.000)	0.000 (0.000)	0.001 (0.029)
Cement	0.967 (0.180)	0.962 (0.191)	0.996 (0.065)	0.977 (0.149)	0.974 (0.159)	0.648 (0.481)	0.915 (0.280)	0.965 (0.183)
Wood & Bamboo	0.006 (0.078)	0.003 (0.052)	0.000 (0.000)	0.004 (0.061)	0.002 (0.045)	0.296 (0.460)	0.054 (0.227)	0.007 (0.083)
Corrugated	0.009 (0.095)	0.002 (0.045)	0.000 (0.000)	0.008 (0.087)	0.006 (0.077)	0.028 (0.167)	0.000 (0.000)	0.004 (0.060)
Card wall	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.026)	0.000 (0.000)	0.000 (0.000)	0.000 (0.013)
Flooring Materials								
Earth/Mud	0.012 (0.109)	0.012 (0.111)	0.004 (0.065)	0.000 (0.000)	0.012 (0.109)	0.211 (0.411)	0.070 (0.256)	0.014 (0.119)
Wood/Tiles	0.003 (0.055)	0.001 (0.032)	0.010 (0.099)	0.026 (0.161)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.003 (0.055)
Plank	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.003 (0.057)	0.000 (0.000)	0.000 (0.000)	0.001 (0.029)
Cement	0.985 (0.122)	0.985 (0.122)	0.983 (0.129)	0.974 (0.161)	0.985 (0.123)	0.789 (0.411)	0.930 (0.256)	0.981 (0.138)
Dirt/Straw	0.000 (0.000)	0.000 (0.000)	0.003 (0.053)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.018)

Source**:** *Computed from Lagos State Government Household Survey (2006)*
Note: *Standard deviations are in parenthesis*

Source of Lighting

This gives important information about quality of houses that may influence the choice of residential housing. Table 6.1b also presents source of lighting types in which electricity appears to be the major source of lighting in Lagos state. For example, lighting from PHCN is

the major source of lighting in all the housing types and this is depicted by the mean averages of 0.93, 0.99, 0.99, 1.00, 0.97,0.75 and 0.96 for single-household house, multi-household house, flats, duplex, room in the main building, squatters' settlements and those in 'other category'. Lighting from Kerosene lamp is another important source of lighting in Lagos as the mean value follows that of PHCN for all the various residential housing choice. Candle lighting is another crucial medium of getting lighting as the proportion of housing units using it appear significant just like that of kerosene lamp. The usage of which, are more pronounced in a single household house and squatters' settlements. The least source of lighting are those coming from gas, wood/coal and other lighting sources as can be observed from the Table 6.1 results.

Toilet Facilities

This presents another important housing quality that characterises housing market in Lagos state. A standard toilet is that which the United Nations Principles and Recommendations for housing census defines as an installation for the disposal of human excreta and a flush toilet as an installation connected with pipe water arranged for humans to discharge their wastes and from which the wastes are flushed with water (UN, 1969). Generally speaking, flush to septic tank toilet is the most commonly found type of toilet facilities in the housing units in Lagos with mean value of 0.31, and this is directly followed by covered pit latrine toilet with a mean of 0.21. Flush to pipe and pits have the mean values of 0.16 and 0.15 respectively. Composting type of toilet and toilet by pail are no longer reigning in the Lagos housing market unlike what was obtainable about three decades ago. Majority of flats in Lagos are using either flush to pipe or flush to septic tank toilets as indicated by the mean values of 0.37 and 0.50 whereas in a duplex flush to pipe is the type of toilet facility that is reigning as compared to flush to septic tanks. No toilet condition is found more in squatters' settlements as shown by the mean value of 0.27 but this situation is non- existent in either a flat or duplex as their means are zeros.

Table 6.1b: Housing Quality Cross-Classified by Residential Housing Choice

	Single Household House	Multi-Household House	Flats in a Block of flats	Duplex	Room in Main Dwelling	Squatter Settlements	Others	Total
Source of Lighting								
PHCN	0.93 (0.260)	0.99 (0.108)	0.99 (0.075)	1.00 (0.000)	0.97 (0.179)	0.75 (0.438)	0.96 (0.194)	0.98 (0.149)
Generator	0.03 (0.172)	0.03 (0.166)	0.10 (0.299)	0.04 (0.192)	0.03 (0.175)	0.01 (0.119)	0.07 (0.256)	0.04 (0.193)
illegal	0.00 (0.000)	0.00 (0.026)	0.00 (0.000)	0.00 (0.000)	0.00 (0.036)	0.00 (0.000)	0.00 (0.000)	0.00 (0.026)
Candle	0.23 (0.422)	0.14 (0.349)	0.10 (0.229)	0.06 (0.239)	0.15 (0.356)	0.18 (0.390)	0.15 (0.356)	0.14 (0.348)
Battery	0.06 (0.239)	0.03 (0.182)	0.02 (0.134)	0.04 (0.200)	0.03 (0.177)	0.00 (0.000)	0.01 (0.088)	0.03 (0.178)
Gas	0.02 (0.122)	0.01 (0.082)	0.01 (0.099)	0.00 (0.000)	0.00 (0.057)	0.00 (0.000)	0.00 (0.000)	0.01 (0.078)
Kerosene	0.30 (0.457)	0.17 (0.307)	0.10 (0.307)	0.11 (0.313)	0.21 (0.406)	0.34 (0.476)	0.12 (0.322)	0.18 (0.383)
Wood/Coal	0.02 (0.154)	0.01 (0.078)	0.00 (0.037)	0.00 (0.000)	0.01 (0.077)	0.06 (0.232)	0.02 (0.151)	0.01 (0.084)
Otherligting	0.01 (0.095)	0.00 (0.037)	0.00 (0.000)	0.00 (0.000)	0.02 (0.133)	0.01 (0.119)	0.00 (0.000)	0.01 (0.076)
Toilet Facilities								
Flushpipe	0.12 (0.326)	0.13 (0.334)	0.37 (0.484)	0.47 (0.500)	0.08 (0.274)	0.14 (0.350)	0.16 (0.363)	0.16 (0.368)
Flushseptic	0.31 (0.462)	0.32 (0.466)	0.50 (0.500)	0.30 (0.461)	0.23 (0.420)	0.07 (0.258)	0.33 (0.473)	0.31 (0.464)
Flushpit	0.12 (0.323)	0.19 (0.393)	0.07 (0.255)	0.13 (0.331)	0.14 (0.343)	0.01 (0.119)	0.09 (0.292)	0.15 (0.358)
Flushanywh	0.00 (0.000)	0.00 (0.048)	0.00 (0.037)	0.00 (0.000)	0.01 (0.092)	0.00 (0.000)	0.01 (0.088)	0.00 (0.060)
Composting	0.00 (0.000)	0.00 (0.026)	0.00 (0.000)	0.00 (0.000)	0.00 (0.000)	0.00 (0.000)	0.00 (0.000)	0.00 (0.018)
Vip_pit	0.04 (0.195)	0.08 (0.278)	0.01 (0.075)	0.06 (0.246)	0.08 (0274)	0.03 (0.167)	0.05 (0.211)	0.07 (0.254)
Cover_pit	0.15 (0.353)	0.20 (0.402)	0.04 (0.194)	0.03 (0.172)	0.35 (0.476)	0.44 (0.499)	0.25 (0.434)	0.21 (0.409)
Uncovered_pit	0.07 (0.260)	0.05 (0.212)	0.01 (0.083)	0.01 (0.087)	0.06 (0.234)	0.04 (0.203)	0.05 (0.211)	0.04 (0.207)
Pail	0.00 (0.000)	0.00 (0.026)	0.00 (0.000)	0.01 (0.106)	0.00 (0.051)	0.00 (0.000)	0.00 (0.000)	0.00 (0.039)
Hanging	0.08 (0.279)	0.00 (0.000)	0.00 (0.065)	0.00 (0.000)	0.01 (0.114)	0.00 (0.000)	0.00 (0.000)	0.01 (0.092)
Notoilet	0.13 (0.337)	0.03 (0.173)	0.00 (0.000)	0.00 (0.000)	0.05 (0.216)	0.27 (0.446)	0.07 (0.256)	0.04 (0.195)
Othertoilet	0.01 (0.078)	0.00 (0.048)	0.00 (0.000)	0.00 (0.000)	0.00 (0.026)	0.00 (0.000)	0.00 (0.000)	0.00 (0.041)

Source**:** *Computed from Lagos State Government Household Survey (2006)*
Note: *Standard deviations are in parenthesis*

Type of Water Source

This also counts so much in the choice of residential housing as various types of which could determine how much is to be paid of an accommodation. Protected water supply for the total

population is of great importance for sanitary purpose, for the protection of communicable diseases and for the general safety of the population. The most effective means of protecting water from pollution and to ensure its purity is supplying it through pipes. This may hold true provided the water supply system is effectively administered (UN 1969). Moreover, the availability of organoleptic standard tap piped water is an essential indicator of the hygienic-sanitary level, and of access to utilities which are now considered an indispensable part of urban life. The Table 6.1c depicts that water from borehole and well are the most commonly found water source in Lagos as their overall mean values 0.444 and 0.178 are higher than any other source of water. This is true for all housing types except for flats and duplexes where pipe borne water had the higher mean values of 0.366 and 0.442 over that of water from the boreholes. The provision of which could attract more value to the house, most especially, in terms of increased house rents. Water from pipe borne and public tap provide important sources of water supply after borehole and well water as revealed from their mean values of 0.152 and 0.117 on the same Table. In some parts of Lagos, water is being supplied by water vendors and this is mostly found among rooms in the main building and squatters' settlements. Flats and duplexes could also procure their water by water tankers as shown by average mean of 0.062 and 0.015. What can be deduced from this is that water supply by borehole, well, pipe borne water and public tap serve as major sources of water supply in the Lagos housing market.

Waste Disposal

The means and methods of disposing wastes and refuse determine largely the quality that may likely be attached to the house one is willing to rent or purchase as the case may be. PSP which is a government collection of wastes has the highest mean value 0.424, followed by wastes collected by truck pushers with mean value of 0.391. These methods of waste collection are seen everywhere in Lagos at strategic places unlike what are found in other states of the federation. PSP has highest proportion in terms of waste collection in almost half of the housing units as compared to other forms of waste collection methods while truck pushers dominate the remaining housing units' most especially for duplex, room in main building and squatters' settlement. It has an average mean ranging from the least of 0.272 for single-household to as high as 0.642 for duplex. There are certain areas of the state where refuse is dumped on the ground mostly at unauthorised places. This is more common in market places, thus suggesting the level of significance of this method of disposing waste in the state. This is clearer from the results on Table 6.1c where the mean value has a lowest of

0.011 and highest of 0.296. These ranges of value are more than that of dumping wastes in one's compound, government bins and other dumping methods. In sum, PSP and truck pushers are the most popular methods of disposing wastes in Lagos state as suggested by the Table results.

Table 6.1c: Housing Quality Cross-Classified by Residential Housing Choice

	Single Household House	**Multi-Household House**	**Flats in a Block of flats**	**Duplex**	**Room in Main Dwelling**	**Squatter Settlements**	**Others**	**Total**
Water source								
Waterpipe	0.184 (0.388)	0.101 (0.301)	0.366 (0.482)	0.442 (0.498)	0.097 (0.297)	0.056 (0.232)	0.132 (0.340)	0.152 (0.359)
Waterpub	0.091 (0.288)	0.149 (0.356)	0.066 (0.248)	0.196 (0.398)	0.083 (0.276)	0.000 (0.000)	0.039 (0.194)	0.117 (0.322)
Waterbore	0.417 (0.494)	0.514 (0.500)	0.329 (0.470)	0.170 (0.376)	0.412 (0.492)	0.634 (0.485)	0.357 (0.481)	0.444 (0.497)
Waterwell	0.196 (0.398)	0.130 (0.336)	0.116 (0.321)	0.151 (0.359)	0.286 (0.452)	0.183 (0.390)	0.388 (0.489)	0.178 (0.383)
Waterspring	0.003 (0.055)	0.004 (0.066)	0.008 (0.091)	0.008 (0.087)	0.005 (0.068)	0.000 (0.000)	0.016 (0.124)	0.005 (0.072)
Water_rain	0.006 (0.078)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.002 (0.045)	0.000 (0.000)	0.016 (0.124)	0.001 (0.034)
Water_vendor	0.039 (0.195)	0.074 (0.262)	0.048 (0.213)	0.019 (0.136)	0.101 (0.301)	0.085 (0.280)	0.054 (0.227)	0.073 (0.260)
Water_tanker	0.009 (0.095)	0.009 (0.093)	0.062 (0.240)	0.015 (0.122)	0.005 (0.073)	0.000 (0.000)	0.000 (0.000)	0.014 (0.118)
Water_lake	0.054 (0.227)	0.007 (0.082)	0.001 (0.037)	0.000 (0.000)	0.000 (0.000)	0.042 (0.203)	0.000 (0.000)	0.007 (0.083)
Water_others	0.000 (0.000)	0.012 (0.109)	0.004 (0.065)	0.000 (0.000)	0.009 (0.096)	0.000 (0.000)	0.000 (0.000)	0.009 (0.094)
Waste Disposal								
PSP	0.396 (0.490)	0.460 (0.498)	0.462 (0.499)	0.309 (0.463)	0.378 (0.485)	0.254 (0.438)	0.333 (0.473)	0.424 (0.494)
Dump_ground	0.127 (0.333)	0.117 (0.322)	0.043 (0.204)	0.011 (0.106)	0.138 (0.345)	0.296 (0.460)	0.101 (0.302)	0.111 (0.314)
Truck_push	0.272 (0.446)	0.359 (0.480)	0.385 (0.487)	0.642 (0.480)	0.431 (0.495)	0.394 (0.492)	0.481 (0.502)	0.391 (0.488)
Compd_dump	0.085 (0.279)	0.041 (0.197)	0.084 (0.277)	0.030 (0.171)	0.017 (0.130)	0.028 (0.167)	0.047 (0.211)	0.042 (0.200)
Govt_bin	0.003 (0.055)	0.012 (0.111)	0.008 (0.091)	0.008 (0.091)	0.010 (0.099)	0.000 (0.000)	0.000 (0.000)	0.010 (0.100)
Others_dump	0.118 (0.323)	0.010 (0.101)	0.017 (0.129)	0.000 (0.000)	0.026 (0.159)	0.028 (0.167)	0.039 (0.194)	0.021 (0.144)

Source**:** *Computed from Lagos State Government Household Survey (2006)*
Note: *Standard deviations are in parenthesis*

Over 75% of the housing units in Lagos have corrugated roofs regardless of the residential density areas under consideration. From Table 6.2 it was observed that houses in high residential density areas have the highest corrugated roofing sheets of 83.1 % while low and medium residential density areas have 77.1% and 75% respectively.

Table.6.2: Housing Quality Cross-Classified by Residential Density Areas

Variables	Low Residential Density Area		Medium Residential Density Area		High Residential Density Area		Total Sample	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Roofing Materials								
Mud roof	0.111	0.105	0.007	0.833	0.010	0.101	0.009	0.953
Thatched roof	0.009	0.939	0.000	0.000	0.000	0.000	0.002	0.045
Wood & bamboo	0.010	0.101	0.001	0.203	0.000	0.000	0.002	0.499
Corrugated	0.771	0.420	0.750	0.433	0.831	0.375	0.785	0.411
Cement	0.102	0.303	0.078	0.268	0.046	0.210	0.072	0.258
Tiles	0.006	0.768	0.032	0.175	0.011	0.104	0.018	0.133
Asbestos	0.087	0.282	0.134	0.340	0.100	0.300	0.111	0.314
Walling Materials								
Mud wall	0.056	0.229	0.012	0.109	0.014	0.119	0.022	0.148
Stone wall	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Burnt bricks	0.002	0.038	0.001	0.035	0.000	0.000	0.001	0.029
Cement	0.922	0.269	0.980	0.142	0.977	0.151	0.965	0.183
Wood & Bamboo	0.018	0.132	0.003	0.050	0.005	0.073	0.007	0.083
Corrugated	0.004	0.061	0.004	0.061	0.004	0.060	0.004	0.060
Card wall	0.000	0.000	0.000	0.203	0.000	0.000	0.000	0.013
Flooring Materials								
Earth/Mud	0.030	0.172	0.005	0.070	0.015	0.121	0.014	0.119
Wood/Tiles	0.000	0.000	0.006	0.076	0.002	0.042	0.003	0.055
Plank	0.000	0.000	0.002	0.045	0.000	0.000	0.000	0.029
Cement	0.967	0.178	0.986	0.117	0.983	0.130	0.981	0.138
Dirt/Straw	0.000	0.000	0.000	0.029	0.000	0.000	0.000	0.018

Source**:** *Computed from Lagos State Government Household Survey (2006)*

The percentage of those using cement roofs are more in low residential density areas than in the medium and high residential density areas as depicted by mean of 0.102 for low as against that of medium, 0.078 and high, 0.046. Asbestos followed that of corrugated roof in both medium and high, mud roof followed that of low residential density area. In respect of walling and flooring materials, cement remains the highly utilised housing material across the three residential density areas. In fact, over 90% of the housing units constructed made use of these materials. Mud wall is prominently used among low residential density dwellers than both medium and high residential density areas whereas earth mud appears second in terms of flooring materials being used by households after cement . Stone wall, wood and bamboo and mud roofs are becoming out of fashion as shown by their insignificant mean values. The same argument is true for wood/tiles, plank and dirt/straw in the case of flooring materials used on the houses constructed in Lagos state.

Table.6.3: Source of Lighting and Toilet Facilities Cross-Classified by Residential Density Areas

Variables	Low Residential Density Area		Medium Residential Density Area		High Residential Density Area		Total Sample	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Source of Lighting								
PHCN	0.92	0.268	0.99	0.103	1.00	0.047	0.98	0.149
Generator	0.01	0.105	0.05	0.224	0.04	0.196	0.04	0.193
illegal	0.00	0.027	0.00	0.029	0.00	0.021	0.00	0.026
Candle	0.13	0.332	0.14	0.343	0.15	0.361	0.14	0.348
Battery	0.02	0.140	0.04	0.188	0.04	0.187	0.03	0.178
Gas	0.00	0.061	0.00	0.067	0.01	0.097	0.01	0.078
Kerosene	0.17	0.373	0.17	0.372	0.20	0.400	0.18	0.383
Wood/Coal	0.02	0.140	0.00	0.064	0.00	0.052	0.01	0.084
Otherligting	0.01	0.076	0.00	0.070	0.00	0.042	0.01	0.076
Toilet Facilities								
Flushpipe	0.06	0.240	0.23	0.418	0.15	0.358	0.16	0.368
Flushseptic	0.20	0.398	0.38	0.486	0.31	0.462	0.31	0.464
Flushpit	0.17	0.380	0.14	0.349	0.15	0.354	0.15	0.358
Flushanywh	0.01	0.086	0.00	0.064	0.00	0.030	0.00	0.060
Composting	0.00	0.038	0.00	0.00	0.00	0.00	0.00	0.018
Vip_pit	0.11	0.319	0.05	0.219	0.06	0.242	0.07	0.254
Cover_pit	0.25	0.432	0.13	0.339	0.28	0.449	0.21	0.409
Uncovered_pit	0.05	0.219	0.04	0.184	0.05	0.222	0.04	0.207
Pail	0.00	0.027	0.00	0.035	0.00	0.047	0.00	0.039
Hanging	0.00	0.027	0.02	0.142	0.00	0.00	0.01	0.092
Notoilet	0.15	0.355	0.02	0.124	0.00	0.00	0.04	0.195
Othertoilet	0.01	0.072	0.00	0.035	0.00	0.00	0.00	0.041

Source**:** *Computed from Lagos State Government Household Survey (2006)*

From Table 6.3, Light from PHCN is the most commonly used source of lighting in all the residential density areas. It still remains the main source of lighting despite the erratic nature of its supply for both residential and industrial uses. According to Lagos State Survey Reports, about 99% of the households in the state used conventional PHCN (Formerly called NEPA) meter. The usage of other energy such as solar/generator, candles, battery, gas, paraffin/ kerosene and wood is not common in the state. For instance, 4% of the entire sample used generator,14% used candle, 3% used battery, 1% each for gas, wood/coal and other lighting and 18% for kerosene. Kerosene lamp and candle are good substitutes for lighting as reflected by the mean value for each of the residential density area.

The Table 6.3 also depicts clearly that the usage of piped sewer toilets were not as popular among the households in the state as septic tank toilet facilities. 46.4% of the housing units are using flush septic tank toilets, directly followed by covered pit toilet with 40.9% and 36.8% and 35.8% are meant for piped sewer toilets and flush to pit toilets. Usage of pail/bucket, hanging bucket and composting has been totally eradicated as they constituted

3.9%, 9.2% and 6% respectively. The Table further reveals that no toilet situation are found in the both low and medium residential density areas as they accounted for 15% and 2% respectively. Covered pit toilets dominated toilet facilities in low residential density area unlike medium and high residential density area where septic tank toilets constitute the highest proportion of toilet facilities.

Table.6.4: Source of Water Cross-Classified by Residential Density Areas

Variables	**Low Residential Density Area**		**Medium Residential Density Area**		**High Residential Density Area**		**Total Sample**	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Water source								
Waterpipe	0.060	0.237	0.267	0.442	0.081	0.273	0.152	0.359
Waterpub	0.145	0.352	0.116	0.321	0.102	0.302	0.117	0.322
Waterbore	0.330	0.470	0.397	0.489	0.565	0.496	0.444	0.497
Waterwell	0.352	0.478	0.129	0.335	0.127	0.333	0.178	0.383
Waterspring	0.017	0.129	0.003	0.057	0.000	0.00	0.005	0.072
Water_rain	0.004	0.061	0.00	0.020	0.00	0.021	0.001	0.034
Water_vendor	0.047	0.211	0.056	0.229	0.108	0.310	0.073	0.260
Water_tanker	0.003	0.054	0.025	0.155	0.010	0.097	0.014	0.118
Water_lake	0.025	0.157	0.003	0.057	0.00	0.00	0.007	0.083
Water_others	0.018	0.132	0.004	0.064	0.009	0.092	0.009	0.094

Source: *Computed from Lagos State Government Household Survey (2006)*

Water source is also a very important feature that characterises housing market in Lagos State. Water from borehole and well are the main sources of water supply that people rely on in Lagos as this is clearly reflected on Table,6.4 Precisely 68.2% depended on well and borehole in low residential density areas, 52.6% and 69.2% for medium and high residential density areas. A noticeable difference was observed in source of water supply in the medium residential density area where piped water into dwelling accounted for as much as 26.7% unlike 6% and 8.1% respectively for low and high residential density areas. Spring water is non-existent in high residential density area whereas it accounted for 1.7% and 0.3% respectively in low and medium residential density areas. About 26% patronised water vendors, a complementary water production and services outfit usually established by private individual and corporate organisations. Further disaggregation reveals that 90% of the households actually patronised both mobile/street vendors and private neighbourhood (Lagos State Survey Reports, 2006). Households rely less on water from rain, spring and lake as their source of water supply.

Table.6.5: Method of Waste Disposal Cross-Classified by Residential Density Areas

Variables	Low Residential Density Area		Medium Residential Density Area		High Residential Density Area		Total Sample	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Waste Disposal								
PSP	0.111	0.314	0.465	0.499	0.570	0.495	0.424	0.494
Dump_ground	0.358	0.480	0.054	0.226	0.024	0.151	0.111	0.314
Truck_push	0.354	0.478	0.407	0.491	0.397	0.489	0.391	0.488
Compd_dump	0.112	0.315	0.039	0.194	0.002	0.047	0.042	0.200
Govt_bin	0.021	0.143	0.007	0.083	0.007	0.085	0.010	0.100
Others_dump	0.444	0.206	0.028	0.164	0.001	0.021	0.021	0.144

Source**:** *Computed from Lagos State Government Household Survey (2006)*

In terms of waste disposal method, PSP remains the major means of disposing wastes and refuse in Lagos as a whole; this is particularly noticeable in both medium and high residential density areas with 46.5%and 57% respectively. Whereas in the low residential density area other forms of dump site appear to be much more important, with PSP accounting for only 11.1%. Also dumping refuses on the ground and using of truck pushers accounted for as large percentage as 71.2% in the low residential density area. By and large, PSP accounted for highest percentage (42.4%) mean of collecting refuses in Lagos State, directly followed by truck pushers with 39.1%.

Table.6.6: Distances to Activity Nodes Cross-Classified by Residential Density Areas

Variables	Low Residential Density Area		Medium Residential Density Area		High Residential Density Area		Total Sample	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Distance to Employment (mins)								
0-14	0.315	0.461	0.327	0.469	0.309	0.462	0.316	0.465
15-29	0.358	0.479	0.239	0.427	0.243	0.429	0.267	0.442
30-44	0.181	0.385	0.222	0.416	0.229	0.420	0.215	0.411
45-59	0.054	0.226	0.081	0.273	0.096	0.295	0.081	0.272
60 and above	0.103	0.304	0.130	0.337	0.122	0.328	0.121	0.326
Distance to Children's School (mins)								
0-14	0.255	0.436	0.278	0.448	0.286	0.452	0.276	0.447
15-29	0.272	0.445	0.255	0.436	0.258	0.437	0.260	0.438
30-44	0.104	0.305	0.107	0.310	0.107	0.308	0.106	0.308
45-59	0.036	0.185	0.043	0.202	0.042	0.202	0.041	0.198
60 and above	0.020	0.140	0.022	0.147	0.023	0.150	0.022	0.147
Distance to Public Transport (mins)								
0-14	0.721	0.449	0.826	0.379	0.829	0.377	0.803	0.398
15-29	0.178	0.382	0.130	0.336	0.140	0.347	0.144	0.351
30-44	0.057	0.232	0.034	0.181	0.021	0.144	0.034	0.182
45-59	0.022	0.145	0.006	0.078	0.004	0.060	0.009	0.093
60 and above	0.023	0.150	0.005	0.067	0.006	0.079	0.009	0.096
Distance to Hospital (mins)								
0-14	0.328	0.470	0.400	0.490	0.371	0.483	0.373	0.484
15-29	0.331	0.471	0.289	0.454	0.310	0.463	0.306	0.461
30-44	0.127	0.333	0.169	0.375	0.162	0.369	0.157	0.364
45-59	0.083	0.276	0.048	0.214	0.065	0.246	0.062	0.241
60 and above	0.131	0.338	0.093	0.291	0.092	0.288	0.101	0.302
Distance to Market (mins)								
0-14	0.491	0.500	0.529	0.499	0.548	0.498	0.528	0.499
15-29	0.333	0.471	0.303	0.459	0.329	0.470	0.319	0.466
30-44	0.102	0.303	0.108	0.311	0.079	0.269	0.096	0.294
45-59	0.019	0.137	0.023	0.150	0.013	0.112	0.018	0.134
60 and above	0.055	0.228	0.037	0.189	0.032	0.176	0.039	0.194
Distance to Water Supply (mins)								
0-14	0.894	0.308	0.911	0.284	0.901	0.298	0.904	0.295
15-29	0.071	0.257	0.063	0.243	0.068	0.252	0.067	0.249
30-44	0.028	0.165	0.016	0.127	0.013	0.114	0.018	0.132
45-59	0.002	0.047	0.004	0.061	0.002	0.047	0.003	0.053
60 and above	0.004	0.067	0.005	0.070	0.015	0.121	0.009	0.092

Source**:** *Computed from Lagos State Government Household Survey (2006)*

The distance to employment, children's school, public transport, hospital (health centres), market and water supply, to a greater extent also influence the choice of residential housing choice. From Table 6.6 we observe that the distance ranging from 15 to 29 minutes accounted for about 35.8% and 24.3% for low and high residential density areas while the distance range of 0 to 14minutes is what it took those in medium residential density area to get to their place of employment. Taking a total sample, it is clearly discernable that the distance range of 0 to14minutes accounted for about for 31.6% while that of 15 to 29minutes accounted for 26.7%. Those results are not unexpected given the type of occupation that predominates the residential area. From earlier discussion of results, it was noticed that self-employment is the type of occupation that predominates all the residential density areas. The nature of this job does not require having to travel a long distance but rather situated close to one's residential house. They are mostly trekking distances from one's house. From Table 6.6 while 27.6% accounted for distance range of 0 to 14minutes, 43.8% accounted for 26% only took about 15 to 24minutes to cover. It is interesting however to observe that the distance coverage of 30 to 44minutes account as much as 10% in each of the residential housing area as depicted by the mean averages of 10.4. 10.7 and 10.7 for low, medium and high residential density areas.

Proximity to children school is another important reason why people would prefer one residential house to another. The distance coverage which takes about 30minutes accounted for over 50% in each of the residential housing choice. This simply reflects the fact that household head usually consider nearness to their children school as being important reason why they would make preference in favour of one residential house to another.

Apart from low residential density area where distance to public transport normally takes between 0 to14minutes to cover and only accounted for about 72.1%, that of medium and high residential density areas are over 80% within the same range of distance. This suggests by implication, that majority of people in these residential area reside close to where there is availability and accessibility to public transports. The choice is likely to be affected as the distance to be covered increases. This is clearly depicted on the Table where the distance reduces for each of the residential density area.

The proportion of those whose residential house distance to hospital lies within the distance range of 0 to14minutes are 32.8%, 0.40% and 37.1% for low, medium and high residential density areas respectively. For the full sample, 48.4% accounted for the said distance range. Between 15 to 29minutes are 33.1%, 28.9% and 31.0% for these same residential density areas respectively. The distance coverage of 60 and above, we observed

that those in low residential density areas have the highest mean of 13.1%. Whereas for both distance to market and water supply, the Table depicts quite a large percentage. The household head considered proximity to water supply as being very important. This is reflected in the mean averages of 89.4%, 91.1% and 90.1% for distance which took between 0 to 14minutes. This simply reflects the extent of value placed on water supply. For market, the same distance 0-14minutes only accounted for 49.1%, 52.9% and 54.85 in all these three residential density areas.

Thus, in terms of the distance coverage of 0 to14minutes, we discovered that proximity to public transport and water supply accounted substantially to determine the choice of residential houses in low, medium and high residential density areas.

6.3 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE REPRESENTATIVE SAMPLE

The section shows the demographic features of the representative samples surveyed which include gender, age, educational qualification, occupational status, house monthly income, religion and tribe.

Table 6.7: Descriptive Statistics

VARIABLES	FREQUENCIES (PERCENT)			
	High Residential Density Areas	Medium Residential Density Areas	Low Residential Density Areas	Total
Gender				
Male	1800 (81.2)	1975 (81.2)	1106(81.9)	4880(81.3)
Female	417 (18.8)	458 (18.8)	245 (18.1)	1120 (18.7)
Total	2217 (100)	2433 (100)	1350 (100)	6000(100)
Age				
15-65	2163 (97.6)	2345 (96.4)	1308 (96.8)	5815 (96.9)
Above 65	54 (2.4)	88 (3.6)	43 (3.2)	185 (3.1)
Total	2217 (100)	2433 (100)	1350 (100)	6000 (100)
Marital Status				
Single	512(23.1)	459(18.9)	123(9.1)	1094(18.2)
Married	1312(59.2)	1705(70.1)	1072(79.4)	4089(68.2)
Others	393(17.7)	269(11.0)	155(11.5)	817(13.6)
Total	2217(100)	2433(100)	1350(100)	6000(100)
Educational Qualification				
None	183 (8.3)	160 (6.6)	174 (12.9)	517 (8.6)
Primary	375 (16.9)	298 (12.2)	285 (21.1)	958 (16.0)
Secondary	1041 (47.0)	1078 (44.3)	654 (48.4)	2773 (46.2)
Tertiary	478 (21.6)	778 (32.0)	180 (13.3)	1436 (23.9)
Vocational / Technical	132 (6.0)	105 (4.3)	54 (4.0)	291 (4.8)
Others	8 (0.4)	14 (0.6)	4 (0.3)	26 (0.4)
Total	2217 (100)	2433 (100)	1350 (100)	6000 (100)
Occupational Status				
Unemployed	98(4.4)	141(5.8)	69(5.1)	308(5.1)
Public	632(28.5)	755(31.0)	283(20.9)	1670(27.8)
Private	137(6.2)	137(5.6)	110(8.1)	384(6.4)
Self-employed	1290(58.2)	1293(53.1)	830(61.4)	3413(56.9)
Student/apprenticement	41(1.8)	76(3.1)	30(2.2)	147(2.4)
Others	19(0.9)	31(1.3)	29(2.1)	79(1.3)
Total	2217(100)	2433(100)	1350(100)	6000(100)
Household Monthly Income				
Up to N10,000	417(21.6)	378(17.3)	469(36.9)	1264(23.5)
N10,001-N20,000	683(35.3)	666(30.5)	444(35.0)	1793(33.3)
N20,001-N30,000	392(20.3)	408(18.7)	178(14.0)	978(18.2)
N30,001-N40,000	178(9.2)	217(9.9)	89(7.0)	484(9.0)

N40,001-N50,000	129(6.7)	186(8.5)	57(4.5)	372(6.9)
Above N50,000	136(7.0)	328(15.0)	33(2.6)	497(9.2)
Total	1935(100)	2183(100)	1270(100)	5388(100)
Tribe				
Yoruba	1517(75.2)	1514(72.1)	1035(83.1)	4066(75.8)
Hausa	41(2.0)	9(0.4)	7(0.6)	57(1.0)
Ibo	460(22.8)	578 (27.5)	204(16.4)	1242(23.2)
Total	2018 (100)	2101(100)	1246(100)	5365(100)
Household size category				
1-2	280(12.6)	294(12.1)	197(14.6)	771(12.8)
3-4	547(24.7)	622(25.6)	380(28.1)	1549(25.8)
5-6	926(41.8)	1024(42.1)	572(42.3)	2522(42.0)
7-8	402(18.1)	390 (16.0)	166(12.3)	958(16.0)
9-10	48(2.2)	78(3.2)	128(2.1)	154(2.6)
10 +	14(0.6)	25(1.0)	8(0.6)	47(0.8)
Total	2217(100)	2433(100)	1350(100)	6000(100)

Source: *Computed*

From Table 6.7, it is observed that males dominate our representatives sample size and this cut across all the residential density areas. That is, over 80 percent of each of the residential density areas is male dominated. For example, 1800(81.2%) of the respondents of high residential density area are males which means by implication, the household sampled are headed by males. The same arguments are true for medium and low residential density areas. It can therefore be inferred that most of the houses in Lagos are headed by males. Majority of these male headed households are within the age bracket 15 to 65 which are those that are still in the category of economically productive segment of the population. This is common to all residential density areas as can be observed on Table 6.7. The implication of this on the economy of Lagos state is that more actively productive segment of the population has more to contribute to economic growth than if the population were to be dominated by elderly or aging households.

The proportion of married persons is highest in the distribution. For instance, 68.2% of the sample respondents are married while the single accounts for just only 18.2%. Those who fall under 'other category' were just about 13.6%. At a residential area level, the proportion of married people in low have the highest percentage, followed by medium with 70.1%, and the least goes to the high density. High residential density area has the highest number of single persons, directly followed by medium with 18.9%. On the row three of the Table where educational qualifications of the respondents are presented, it is observed that secondary school certificate holders of 1041 (47%) constituted majority of the respondents,

followed by those with tertiary education of about 21.6%. in fact over 65% of the sample are well educated. Less than 10% of the respondents had neither formal nor informal education. The percentage of the secondary school leavers in the medium residential density area are more than any other form of education attainment except that the percentage of the tertiary education is more than that of high residential density area. The situation in the case of low residential density area is also similar to those of high and medium residential density areas except for the fact that those with primary school education are much more than those with tertiary education. Even percentage of those with non education in low residential density area is more than that of high and medium residential density areas respectively. Taking the full sample, it is clearly evident that the bulk of the respondents are constituted by secondary school certificate holders. Next to it, are those with tertiary education which are 1436, while those with primary and non education are 958 and 517 respectively.

It is interesting to note that majority of the respondents are self-employed and public servants as can be observed from the Table. The percentage of self-employed people is more in low residential density areas than any other residential area. They are 1290(58.2%), 1293(53.1) and 830(61.4%) in high, medium and low residential density areas respectively. The number and percentage of public servants are more in the medium residential density area than any of the residential areas. The results of having more self-employed people dominate all the residential density areas could be justified considering the predominance of secondary school leavers among the representative samples. This is even more so in our environment where secondary school certificates have turned to mere paper with little or no value attached. Thus, getting white-collar jobs with such certificates is difficult. The number of private salaried workers is more in low residential density areas with 8.1% whereas those in high and medium are 6.2% and 5.6% respectively. The percentage of those that are students/ apprentice is highest in medium residential area. The unemployment situation is one of the problems compounding housing matter in Lagos State but the problem of unemployed persons seems to be more prevalent in the medium residential density area with 5.8% while that of high and low residential areas are 4.4% and 5.1% respectively.

An important socio-demographic variable in the analysis of household choice decision-making has to do with monthly income earned. From Table 6.7, we observed that majority of the representative sample average monthly income fall within the neighbourhood of N10,000 and N20,000. This mean income cuts across the residential density areas. Those that earn above N50,000 are in majority in the medium residential density area. For example, 328(15%) are in medium, 136(7.0%) and 33 (2.6%) are in high and low residential density

areas respectively. Those people that are earning up to N10,000 are mainly in low residential density areas as can be seen on the Table where they constitute about 36.9%, in fact their percentage is over 70% if added to those within the income bracket of between N10,001 to N20,000. The same arguments held for those in high and medium except that the percentages are 56.9% and 47.8% respectively. This outcome is not unconnected to the predominance of self-employed and public servants among the representative samples. This is because salary scale of public workers are nothing to be compared to that of private salaried workers e.g like those in the banking sector, petroleum and other well-paid private salaried jobs. The same is also true of self-employed workers whose earnings are irregular depending on the nature and type of employment engaged in and frequencies of sales recorded per transaction.

Another prominent feature of the respondents in this residential area is their tribal-ethnic attachments. The major tribe which dominates the residential areas is Yoruba. Well over 70% of the representative samples are Yorubas while the remaining percentage is shared by both Hausas and Ibos. Out of this remaining 30%, a larger percentage is taken by Ibos as can be observed from the Table. For instance, Ibos are 22.8%, 27.5% and 16.4% in high, medium and low residential density areas of Lagos state. Hausas are more in high residential density area with 2.0% whereas their percentages are 0.4% and 0.6% in medium and low residential density areas. Ibos also are more prevalent in the medium residential density area than other residential areas. This is not unexpected considering the fact that Lagos is one of the Yoruba speaking states in Nigeria inspite of its status as being a former state capital and having outlook that is cosmopolitan in nature.

The distribution of the household size category appears not to be different from one residential density area to another because we observed that household size of between 5 to 6 has the highest percentage in all the residential density areas. This is directly followed by household size of 3 to 4. The household size of 1 to 2 appears to be highest in terms of percentage in low residential density area with 14.6% whereas that of high and medium are 12.6% and 12.1% respectively. The household size of 7 to 8 are in majority in high residential density area at least in terms of percentage of about 18.1% while that of medium and low are 16.0% and 12.3% respectively. The household size of 10 and above appears to be prominent in the medium residential neighbourhood with 1.05% while that of high and low have the percentage of 0.6% each.

By and large, what can be deduced from the result is that there seems to be no significant difference in the category of household size from one residential density area to

another. By implication, the results shed more light to the fact that Lagos state is overpopulated in respect of the residential density areas under consideration.

Table 6.8: Income of the respondents (Descriptive Statistics)

Density Areas	Mean	Standard Deviation
Low	20,681.91	21,815.89
Medium	36,063.86	55,041.39
High	26,235.80	35,335.03
Total	28,979.71	42,795.32

Source: Computed

Table 6.8 shows that the average monthly income for low residential density area dwellers was N20,681.91 while that of high and medium were N26,235.80 and N36,063.86 respectively. Both medium and high residential density areas are accompanied with high levels of dispersion as indicated by the value of N55,041.39 and N35,335.03. These results corroborate our earlier results when the household incomes were disaggregated in table. above. This in effect means monthly income of those in the medium residential area is highest when compared with other residential areas.

Table. 6.9: Rent paid by the respondents (Descriptive Statistics)

Density Areas	Mean	Standard Deviation
Low	1209.31	1582.76
Medium	3786.44	7025.11
High	2201.48	4280.61
Total	2632.12	5334.34

Source: *Computed*

Similar results were also observed in terms of the payment of house rents. The average rent payment in low, medium and high residential density areas are N1209.31, N3786.44 and N2201.48 respectively. By implication, what people paid for house rents are highest in medium than any other residential density area.

6.4 ANALYSIS OF HEDONIC RESULT

Analysis of Hedonic Result for the Full Sample

Table 6.10 shows the results of Box-Cox transformation. The estimate for lambda(λ) equals -0.4818 for the full sample specification while the estimates for high, medium and low residential density areas specifications are -0.3545, -0.6574 and -0.4434 respectively. The likelihood tests show that the linear, log-linear and multiplicative inverse specifications are strongly rejected across all the specifications. This simply provides compelling support for using the box-cox model rather imposing a particular specification from the outset.

The initial model covered all the variables of interest as identified in the housing literature and of which the selection of the variables are based and then the most insignificant ones were removed from the model until parsimonious model is achieved. This simply suggests that all the variables found to be problematic have been excluded from the analysis.

Table 6.10: RESULTS OF BOX-COX TRANFORMATION VALUES FOR FULL SAMPLE

MRENT	Coefficient	Standard Error	Z	P>[Z]
Lambda(λ)	-0.4818027	0.0560678	-8.59	0.000

Test H0:	Restricted Log Likelihood	LR Statistic Chi Squared	P-value Prob>Chi Squared
Λ= -1	-1933.813	86.12	0.000
Λ= 0	-1929.7174	77.93	0.000
Λ = 1	-2345.2825	909.06	0.000

Source: *Computed*

The Table 6.11 provides estimate of hedonic price model for the entire sample size. From the result, it is clear that most of the housing characteristics variables are highly significant given their t-statistic and probability values. Apart from this, it is also observed that the sign of the coefficients are consistent with the expectations.

Table.6.11: RESULTS OF BOX-COX HEDONIC ESTIMATION FOR FULL SAMPLE–DEPENDENT VARIABLE: MONTHLY HOUSE RENT

STRUCTURAL CHARACTERISTICS			
	Coefficient	**T-Statistics**	**Probability value**
Roofing materials type			
Corrugated_roof	0.089(0.0090)	3.62***	0.002
Cement_roof	0.062(0.0081)	2.72**	0.008
Tile_roof	0.013(0.0053)	2.15**	0.020
Asbestos	0.026(0.0060)	2.33**	0.004
Walling materials type			
Mud_wall	0.0073(0.0066)	2.15**	0.040
Cement_wall	0.0109(0.0049)	3.22***	0.007
Corrugated_wall	0.0130(0.0064)	5.03***	0.000
Flooring materials type			
Earth_mud _floor	0.0132(0.0080)	1.66*	0.098
Lighting type			
PHCN	0.0003(0.0050)	0.05	0.959
Generator	0.0110(0.0017)	6.45***	0.000
Candle	0.0018(0.0010)	1.80*	0.072
Battery	0.0025(0.0016)	1.56	0.119
Gas	0.0090(0.0026)	3.42**	0.001
Kerosene	0.0001(0.0009)	0.07	0.940
Toilet Facilities			
Flushpipe	0.0177(0.0028)	6.25***	0.000
Flush_septic	0.0150(0.0028)	5.40***	0.000
Flush_pit	0.0066(0.0027)	2.39**	0.017
Composting	0.0041(0.0021)	2.45**	0.014
Vip_pit	0.0096(0.0030)	3.24***	0.001
Covered_pit	0.0053(0.0027)	1.93*	0.054
Uncovered_pit	0.0038(0.0029)	1.30	0.195
Pail	0.0121(0.0057)	2.11**	0.035
No_toilet	-0.0103(0.0051)	-2.00**	0.046
Water source			
Pipebor_water	0.0561(0.0258)	2.17**	0.008
Public_water	0.0451(0.0255)	1.77*	0.077
Borehole	0.0462(0.0254)	1.82*	0.069
Well_water	0.0455(0.0254)	1.80*	0.071
SSvendor_water	0.0450(0.0254)	1.77*	0.076
Tanker_truck	0.0425(0.0254)	1.72*	0.090
Other_water	0.0440(0.0254)	1.73*	0.083
NEIGHBOURHOOD CHARACTERISTICS			
Waste disposal source			
PSP	0.0022(0.0028)	0.78	0.437
Dump_ground	-0.0102(0.0032)	-3.16***	0.002
Truck_push	0.0017(0.0028)	0.59	0.557
Comp_dump	-0.0017(0.0037)	-0.46	0.646
Others_dump	-0.0029(0.0041)	-0.71	0.480

Security services			
Com_Pol	0.0009(0.0010)	0.83	0.404
Gvt_Pol	0.0027(0.0014)	1.93*	0.054
Pollution			
Littering	-0.0003(0.0008)	-0.42	0.672
Public_urine	-0.0000(0.0007)	-0.03	0.979
Illegal _trad	-0.0002(0.0008)	-0.28	0.776
Poor_traffic	-0.0030(0.0008)	-3.90***	0.000
LOCATIONAL CHARACTERISTICS			
Distance to employment(mins)			
Distemployd 0_14	0.0008(0.0012)	0.64	0.519
Distemployd15_29	0.0015(0.0012)	1.24	0.213
Distemployd30_44	0.0003(0.0013)	0.24	0.808
Distemployd60_abv	-0.0023(0.0013)	-1.74*	0.082
Distance to Children school(mins)			
Dischdsch0_14	0.0009(0.0008)	1.09	0.276
Dischdsch15_29	0.0009(0.0009)	0.92	0.357
Dischdsch30_44	-0.0047(0.0012)	-3.79***	0.000
Dischdsch45_59	-0.0058(0.0017)	-5.67***	0.000
Dischdsch60_abv	-0.0101(0.0024)	-6.87***	0.000
Distance to public transport(mins)			
Dispubtrans0_14	0.0048(0.0025)	1.94*	0.052
Dispubtrans15_29	-0.0078(0.0025)	-2.50**	0.002
Dispubtrans30_44	-0.0091(0.0044)	-3.24***	0.000
Distance to hospital(mins)			
Dishosp0_14	0.0146(0.0120)	1.22	0.223
Dishosp15_29	0.0146(0.0120)	1.22	0.222
Dishosp30_44	0.0158(0.0120)	1.32	0.188
Dishosp45_59	-0.0144(0.0120)	-1.19	0.233
Dishosp60_abv	-0.0196(0.0120)	-1.64	0.102
Distance to market(mins)			
Distmkt0_14	0.0022(0.0027)	0.81	0.420
Dismkt15_29	0.0030(0.0027)	1.11	0.268
Dismkt30_44	-0.0001(0.0029)	-0.03	0.979
Dismkt60_abv	-0.0002(0.0031)	-0.06	0.952
Distance to water supply (mins)			
Diswat0_14	0.0064(0.0049)	-1.31	0.189
Diswat15_29	-0.0062(0.0051)	-1.22	0.224
Diswat30_44	-0.0121(0.0056)	-2.17**	0.030
Diswat60_abv	-0.0235(0.0061)	-4.57***	0.000
Constant	1.9851(0.0302)	65.74	0.000
Lambda(λ)	-0.4818		
S.E	0.5601		
Log likelihood	-1890.75		
LR chi-squared	175.80		

Source: *Computed*

Notes: Standard errors are in parentheses

(*) the coefficient is statistically significant at 10%

(**) the coefficient is statistically at 5%
(***) the coefficient is statistically significant at 1%

The structural characteristics of which roofing material types are a component are seen to contribute greatly to hedonic price of the house. For example, corrugated roof increases house rent by 0.089 units rather than cement roof, tile roof and asbestos which increase the rent by 0.062, 0.013 and 0.026 respectively. What this suggests is that houses roofed with corrugated roofing sheets attract more house rent than houses roofed either by tiles or asbestos as the case may be.

In terms of the walling material types, corrugated wall still increases house rent by 0.0130 than either mud or cement wall. The importance of corrugated wall type is further supported by 1% level of significance as depicted on the Table.

For the flooring material types, it is only earth-mud that appears significant at 10% level of significance. Due to the problem of multicollinearity that characterised the use of hedonic price model, all other important variables have been dropped from the model in order to avoid dummy trap problem since most of the variables are dummies with either one or zero value.

For the lighting types, generator, candle and gas appear significant at 1%, 10% and 5% respectively. This result is not however surprising given the problem encountered through infrequent and erratic power supply by PHCN, though the coefficient of PHCN is positive but insignificant. All the same, all other lighting types are correctly signed but are insignificant.

The availability of toilet facilities also contribute to increased house rent depending on the degree of sophistication. From the result, it is observed flush to piped sewer system increases house rent more than any other type of toilet facilities available, flush to pipe sewer increases house rent by 0.0177, flush to septic tank by 0.0150, flush to pit by 0.0541, composting by 0.0041, VIP/pit latrine with slab by 0.0096, covered pit by 0.0053, uncovered pit by 0.0038 and pail by 0.0121. House rent tends to reduce if there are no toilet facilities by -0.0103. What can be said at this point is that irrespective of the toilet facilities that are made available or constructed by house owners, that will not deter increase in the housing rent. A possible explanation for this can be likened to the problem of overpopulation that is associated with Lagos metropolis which accommodates immigrants from other parts of the country.

The source of water is another contributory factor to the price of rented houses. Water from pipe borne is mostly preferred and highly sought source of water hence it implicitly accords higher worth to the value of a house through increased rents. What can be inferred from the result is that regardless of source of water, increase in house rent still occurs at

different rates depending on the type and location of the house. It is interesting to note that all these water source type have the expected signs and they are all statistically significant.

Neighbourhood characteristics constitute another important component of hedonic housing price of which waste disposal source is an important element of these characteristics. PSP which represents wastes collected by the government bears the expected sign with housing rent. Availability of this waste disposal method adds to house rent by 0.0022 though it is insignificant. Unlike dumping refuses in unauthorised places which has a negative sign but significant at 5% level of significance. This means that having refuses dumped on the ground tend to reduce house rent. The same arguments go for dumping refuse within a compound and other dump sites this might likely reduce the rent charged on house.

Provision of either government or community security also has direct relationship with house rent. That is, there is one–to-one relationship between provision of security services and house rent. Though both have expected signs but only that of government security is significant at 10% level of significance. Pollution of any sort tends to reduce the value charged on houses but the reduction may not be too conspicuous as reflected from non-significance in all the polluting variables except for poor traffic and congestion which has the expected sign and it is significant at 10% level of significance.

Locational characteristic is another important element in an hedonic pricing model. It is obvious from the results that distances from household head employment/workplace, to children school, public transportation system , health centres (hospitals), market place and supply of water exert positive impact on housing rents particularly if such distances lies within 0 to 44minutes. House rents might get reduced if the distance is more than 45 minutes as can be observed from the results.

For instance, the house rent decreases by 0.0023 for houses whose distance coverage to household head workplace is above 60 minutes; even at that point it is only significant at about 10% level of significance. This is made possible because there are places in Lagos that are very remote to the main city yet this will not reduce such places being labelled as rural area. At such people can live and secure an apartment in any part of the city since they are linked up with well road network and other social amenities. Due to this, rent of accommodations still go for the same price with that in main city but with slight differences.

It is possible to get rebates on house rents for any distance over 30 minutes to children's school. This possibility is high given the level of significance which stood at I% for distance coverage of between 30 to44, 45 to 59 and 60 and above minutes respectively. A different picture emerges in the case of distance to public transportation. A distance of 0 to

14minutes increases house rent by 0.0048 but this rent declines immediately the distance covered extends beyond 15 minutes. This is confirmed by the value of t-statistics of -2.50 and -3.24 as can be observed from the Table.

The distance from health centres (hospital) is not statistically significant given their probability values with least value of 0.102 to the highest value of 0.223. Though, the distance ranging between 0 to 44minutes convey positive signs which simply depict direct relationship existing between distance to hospital and the house rent. However, declining trends are observed at distances between 45 to 59 and 60 and above minutes respectively. This suggests that once distance to be covered exceeds 45 minutes, declining house rents might likely be experienced.

Market is another important factor people normally accord consideration when taking a decision involving renting an apartment in a particular residential location. Thus distances involving to and from remain critical in such decisions. From the results presented above, it is clearly discernable that distances from 0 to 30minutes from one's house could impact positively on the rent payment but this might translate into rent reduction once it exceeds 30 minutes. The interesting observation from the results stem from non-significance of the distance as depicted on Table 6.11. This suggests in effect that distance to market is not an important factor when renting an accommodation in Lagos, even if considered, its effect on the housing rent is only marginal. Two possible explanations may be offered in this regards: one is that Lagos state is endowed with good tarred roads which makes it easier to access afar away markets with little or no stress. The second reason may be attributed to excess demand for the available housing units and this thereby make other important factors that could have been considered less attractive when renting an apartment or buying a house.

Locating or renting a house in a particular area for the reason that has to do with proximity to water supply is another important criterion that is often considered before such decision is eventually taken. Proximity to water source is equally as important as it increases house rent for the distance that ranges from 0 to14 minutes. Beyond this range, a declining house rent may ensue.

HIGH

Table 6.12 shows the results of box-cox transformation. The estimate for lambda(λ) equals -- 0.3545 for residential density areas specifications . The likelihood tests show that the linear, log-linear and multiplicative inverse specifications are strongly rejected across all the

specifications. This simply provides compelling support for using the box-cox model rather imposing a particular specification from the outset.

Table.6.12: RESULTS OF BOX-COX TRANFORMATION VALUES FOR HIGH RESIDENTIAL DENSITY AREAS

MRENT	Coefficient	Standard Error	Z	P>[Z]
Lambda(λ)	-0.3545	0.1316215	-2.69	0.007

Test H0:	Restricted Log Likelihood	LR Statistic Chi Squared	P-value Prob>Chi Squared
Λ= -1	-659.67	24.04	0.000
Λ= 0	-651.22	7.14	0.008
Λ = 1	-696.02	96.74	0.000

Source: *Computed*

Unlike general results that were obtained under full sample model, here corrugated roofing sheets though conform with expected sign but it is insignificant (see Table 6.13). This simply implies that having houses roofed with corrugated sheets could only increase house rent by 0.0004 which is too marginal for such impact to be felt on the rent paid. Asbestos, on the other hand, contradicts the theoretical expectation by having a negative sign which means that using it on housing has a declining effect on house rent by -0.0013. The implication is that houses in this residential neighbourhood are predominantly roofed with corrugated iron as shown by the mean value of 82.1 in table 6.13. This therefore suggests that if there are houses roofed with asbestos, the rent on such houses are likely to reduce as compared to that of houses roofed with corrugated iron sheets. The walling material consists of mud, this also conform with expected sign but not significant as depicted by the various statistics.

Table 6.13: RESULTS OF BOX-COX HEDONIC ESTIMATION FOR HIGH RESIDENTIAL DENSITY AREAS–DEPENDENT VARIABLE: MONTHLY HOUSE RENT

	Coefficient	T-Statistics	Probability value
STRUCTURAL CHARACTERISTICS			
Roofing materials type			
Corrugated_roof	0.0004(0.004)	0.09	0.932
Asbestos	-0.0013(0.0057)	-0.23	0.821
Walling materials type			
Mud_wall	0.0092(0.0121)	0.76	0.449
Lighting type			
Generator	0.0307(0.0064)	4.80***	0.000
Candle	-0.0028(0.0034)	-0.81	0.417
Battery	0.0100(0.0055)	1.82*	0.069
Gas	0.0263(0.0089)	2.96**	0.003
Kerosene	-0.0079(0.0030)	-2.63**	0.009
Toilet Facilities			
Flushpipe	0.0237(0.0050)	4.96***	0.000
Flush_septic	0.0216(0.0043)	5.08***	0.000
Flush_pit	0.0052(0.0044)	1.18	0.239
Vip_pit	0.0146(0.0055)	2.64**	0.008
Covered_pit	0.0028(0.0042)	0.66	0.508
Pail	0.0153(0.0073)	2.11**	0.035
Water source			
Pipebor_water	0.0315(0.0043)	7.29***	0.000
Public_water	0.0163(0.0037)	4.40***	0.000
Borehole	0.0183(0.0029)	6.39***	0.000
SSvendor_water	0.0200(0.0041)	4.87***	0.000
NEIGHBOURHOOD CHARACTERISTICS			
Waste disposal source			
PSP	0.0077(0.0058)	1.31	0.189
Truck_push	-0.0035(0.0059)	-0.60	0.547
Security services			
Com_Pol	0.0004(0.0036)	0.11	0.916
Gvt_Pol	0.0146(0.0043)	3.39***	0.001
Pollution			
Littering	-5.10e-06(0.0024)	-0.00	0.998
Public_urine	-0.0020(0.0024)	-0.84	0.402
Illegal _trad	-0.0048(0.0026)	-1.87*	0.062
Poor_traffic	-0.0016(0.0023)	-0.71	0.479
LOCATIONAL CHARACTERISTICS			
Distance to employment(mins)			
Distemployd 0_14	-0.0046(0.0038)	-1.22	0.222
Distemployd15_29	-0.0050(0.0037)	-1.35	0.178
Distemployd30_44	-0.0016(0.0036)	-0.45	0.655
Distemployd60_abv	-0.0026(0.0042)	-0.62	0.533
Distance to Children school(mins)			

Dischdsch0_14	0.0062(0.0027)	2.34**	0.019
Dischdsch15_29	0.0026(0.0027)	0.93	0.352
Dischdsch30_44	0.0246(0.0040)	6.13***	0.000
Dischdsch45_59	0.0023(0.0048)	0.49	0.627
Dischdsch60_abv	-0.0050(0.0077)	-0.66	0.512
Distance to public transport(mins)			
Dispubtrans0_14	0.0001(0.0076)	0.02	0.986
Dispubtrans15_29	0.0017(0.0077)	0.22	0.826
Dispubtrans30_44	-0.0043(0.0091)	-0.48	0.635
Distance to hospital(mins)			
Dishosp0_14	0.0069(0.0045)	1.54	0.124
Dishosp15_29	0.0060(0.0041)	1.47	0.141
Dishosp30_44	0.0060(0.0042)	1.45	0.148
Dishosp45_59	0.0104(0.0057)	1.83*	0.067
Distance to market(mins)			
Distmkt0_14	0.0109(0.0075)	1.45	0.147
Dismkt15_29	0.0096(0.0073)	1.32	0.187
Dismkt30_44	0.0085(0.0078)	1.09	0.275
Dismkt60_abv	-0.0030(0.0084)	-0.35	0.723
Distance to water supply (mins)			
Diswat0_14	-0.0615(0.0122)	-5.02***	0.000
Diswat15_29	-0.0606(0.0126)	-4.80***	0.000
Diswat30_44	-0.0570(0.0124)	-4.61***	0.000
Diswat45_59	-0.0495(0.0197)	-2.51**	0.012
Diswat60_abv	-0.0356(0.0170)	-2.09**	0.037
Constant	2.6269(0.0061)	429.67	0.000
Lambda(λ)	-0.3545		
S.E	0.1316		
Log likelihood	-647.65		
LR chi-squared	139.61		

Source: *Computed*
Notes: Standard errors are in parentheses
(*) the coefficient is statistically significant at 10%
(**) the coefficient is statistically at 5%
(***) the coefficient is statistically significant at 1%

For the lighting source types, we observed that generator has a correct hypothesized signed and also has a high statistical value owing to 1% level of significance. Battery and gas are statistically significant at 10% and 5% level of significance respectively. Kerosene as a lighting source type carries a negative sign but significant at 5% level of significance. A simple interpretation to this is that in houses where kerosene serves as the main source of lighting, such houses have tendency to reduce their house rent by -0.0079.

Interestingly, there are various toilet facilities that are prevalent in high residential density areas in Lagos as can seen on Table 6.13 and they all conform to theoretical

expectations of having positive signs but at different levels of significance except toilets where faeces are flush to pit and covered pit latrine. Both are insignificant statistically. Water source as part of structural characteristics is also very important in explaining hedonic housing price in this residential neighbourhood as revealed by 1% level of significance across various water sources. In these residential density areas, house rents will increase for houses with pipe borne water by 0.0315 while that of houses with public water, boreholes and small water vendor by 0.0163, 0.0183 and 0.0200 respecively. This simply shows that house will attract more rent if pipe water serves as the main source of water as in the order it is arranged on the Table. Thus, there are positive relationships between these water sources and house rent. By implication the type of water source that is available has implication on what is paid as rent in high residential neighbourhood.

Neighbourhood characteristics variables do not provide convincing evidence in the explanation of hedonic housing price in high residential density areas as depicted on the Table through waste disposal source, security services and pollution variables. None of the variables of waste disposal source are significant at any level. For example while PSP has a positive coefficient value, that of truck-pusher (truck_push) carries a negative coefficient value. The former tends to increase house rent by 0.0077 and the latter reduces it by -0.0035. Both comply with theoretically expected signs. In terms of security services, government policing appears significant at 1% level of significance when compared with community policing which only conforms with expected sign but remains insignificant. The possible explanation for this is that house rent tends to increase substantially in any area that enjoys the security patronage of the Nigerian police force. This mostly occurs through contributions made by landlords' association to nearby police station for protection.

Pollution is a vital aspect of neighbourhood characteristics that also offer explanation to hedonic housing price in the context of an emerging city like Lagos. This is viewed from the angle of littering, public urination, illegal trading, poor traffic and congestion. In the result displayed on table 6.13, it becomes clear that they all bear negative relationship on the house rent. Interesting from this result is the significance level of only illegal trading. This in effect suggests that house rent is more likely to reduce in any area where illegal trading is prevalent because not too many people would prefer it as a choice of residence in spite of shortage in the supply of houses.

The locational characteristics present surprising outcome in the sense that it is only in a situation where distance to water supply is considered that actually record highest number of significant variables. For example, distance to household head's workplace depicts

negative coefficient for all the range of distances considered. The likely impact of this on house rent is negligible if at all it would reduce it. This result is not impossible considering the number of self-employed people that occupy the area. Majority of them would prefer a place close to their homes than having to travel long distance. The situation however differs in the case of distance to children's school. Proximity to children's school commands extra increase on house rent as shown by 5% level of significance for distance of between 0 to14minutes. The trend is not consistent and stable as can be observed on distance between 15 to29 minutes. At a distance range of 30 to44minutes, the increase in house rent occurs at 1% level of significance. This zig-zag pattern of behaviour can be best explained by indiscriminate charges on house rent by the house-owners. The distance to public transportation is not significant at all considering any range of distance level. This could be explained in terms of good road network that are put in place by the government which makes travelling a lot easier. The distance to hospital is also significant only at 10% level of significance as depicted by the probability value of 0.067. This means that increase in house rent only becomes noticeable at a distance range of 45 to59 minutes. At lower level of distance, the impacts are just negligible. Similar argument holds for distance to marketplace except that none of them are significant at any significance level. It is also important to add that at a distance range above 60 minutes house rent reduces by -0.0030 which as well marginal.

The result on the distance to water supply portrays an interesting picture in the sense that all the distance ranges are significant both at 1% and 5% respectively. This suggests that people residing in high residential neighbourhood place high premium on proximity to water supply than any other thing. The tendency is high for landlords to reduce their rents once the distance from water supply is far from their place of abode.

MEDIUM

Table 6.14 shows the results of box-cox transformation. The estimate for lambda(λ) equals ---0.6574 for medium residential density areas specifications. The likelihood tests show that the linear, log-linear and multiplicative inverse specifications are strongly rejected across all the specifications. This simply provides compelling support for using the box-cox model rather imposing a particular specification from the outset.

Table 6.14: RESULTS OF BOX-COX TRANFORMATION VALUES FOR MEDIUM RESIDENTIAL DENSITY AREA

MRENT	Coefficient	Standard Error	Z	P>[Z]
Lambda(λ)	-0.6573668	0.0953682	-6.89	0.000

Test H0:	Restricted Log Likelihood	LR Statistic Chi Squared	P-value Prob>Chi Squared
Λ= -1	-914.14	11.10	0.001
Λ= 0	-941.81	66.45	0.008
Λ = 1	-1173.62	530.07	0.000

Source: *Computed*

The structural characteristics of medium density neighbourhood constitute important variables which provide explanation mainly to hedonic housing price model of the area. For example, none of the roofing material types is significant given the T-statistics and probability values though their coefficients had the expected signs but are insignificant. These contrast sharply with what was obtainable in the case of full sample and high residential density area. The provision of these will not impact significantly on the house rents as depicted on Table 6.15. The mud type of wall also is not statistically significant. By implication, all these housing characteristics do not simply influence the rents that are paid on houses.

Table 6.15: RESULTS OF BOX-COX HEDONIC ESTIMATION FOR MEDIUM RESIDENTIAL DENSITY AREAS –DEPENDENT VARIABLE: MONTHLY HOUSE RENT

STRUCTURAL CHARACTERISTICS			
	Coefficient	**T-Statistics**	**Probability value**
Roofing materials type			
Corrugated_roof	0.0009(0.0026)	0.33	0.740
Cement_roof	0.0019(0.0027)	0.70	0.484
Tile_roof	0.0014(0.0029)	0.48	0.629
Asbestos	0.0021(0.0027)	0.80	0.423
Walling materials type			
Mud_wall	0.0013(0.0015)	0.82	0.414
Lighting type			
Generator	0.0017(0.0009)	2.02**	0.044
Candle	0.0042(0.0017)	1.74*	0.082
Battery	0.0008(0.0010)	0.80	0.426
Gas	0.0042(0.0017)	2.46**	0.014
Kerosene	0.0003(0.0005)	0.62	0.535
Toilet Facilities			
Flushpipe	0.0084(0.0010)	8.13***	0.000
Flush_septic	0.0081(0.0010)	7.86***	0.000
Flush_pit	0.0053(0.0010)	5.30***	0.000
Vip_pit	0.0068(0.0012)	5.64***	0.000
Covered_pit	0.0035(0.0010)	3.47***	0.001
Uncovered_pit	0.0046(0.0012)	3.94***	0.000
Water source			
Pipebor_water	0.0001(0.0010)	0.10	0.923
Public_water	0.0034(0.0011)	3.20***	0.001
Borehole	0.0028(0.0011)	2.62**	0.009
Well_water	0.0025(0.0010)	2.50**	0.013
Spring_water	0.0485(0.0430)	1.13	0.259
SSvendor_water	0.0031(0.0012)	2.71**	0.007
NEIGHBOURHOOD CHARACTERISTICS			
Waste disposal source			
PSP	0.0031(0.0007)	4.30***	0.000
Dump_ground	0.0038(0.0009)	4.20***	0.000
Truck_push	0.0036(0.0008)	4.39***	0.000
Others_dump	0.0042(0.0013)	3.15***	0.002
Security services			
Com_Pol	0.0009(0.0005)	1.72*	0.086
Gvt_Pol	0.0003(0.0011)	0.25	0.804
Pollution			
Littering	0.0001(0.0004)	0.36	0.719
Public_urine	0.0008(0.0004)	2.18**	0.029
Illegal _trad	0.0001(0.0005)	0.17	0.862
Poor_traffic	0.0004(0.0004)	1.04	0.301
LOCATIONAL CHARACTERISTICS			

Distance to employment(mins)			
Distemployd 0_14	-0.0013(0.0006)	-2.33**	0.020
Distemployd15_29	-0.0006(0.0006)	-1.14	0.256
Distemployd30_44	-0.0013(0.0007)	-1.74*	0.081
Distemployd60_abv	-0.0006(0.0007)	-0.85	0.397
Distance to Children school(mins)			
Dischdsch0_14	-0.0003(0.0005)	-0.63	0.531
Dischdsch15_29	-0.0001(0.0006)	-0.13	0.898
Dischdsch30_44	-0.0010(0.0007)	-1.42	0.155
Dischdsch45_59	-0.0000(0.0009)	-0.03	0.973
Dischdsch60_abv	-0.0018(0.0012)	-1.58	0.115
Distance to public transport(mins)			
Dispubtrans0_14	-0.0001(0.0008)	-0.13	0.900
Dispubtrans30_44	-0.0039(0.0048)	-0.81	0.416
Distance to hospital(mins)			
Dishosp0_14	-0.0010(0.0008)	-1.16	0.245
Dishosp15_29	-0.0003(0.0008)	-0.33	0.745
Dishosp30_44	-0.0017(0.0011)	-1.55	0.122
Dishosp60_abv	-0.0018(0.0013)	-1.43	0.152
Distance to market(mins)			
Distmkt0_14	-0.0013(0.0011)	-1.17	0.243
Dismkt15_29	-0.0023(0.0012)	-1.95*	0.051
Dismkt30_44	-0.0008(0.0012)	-0.64	0.520
Dismkt60_abv	-0.0012(0.0014)	-0.82	0.411
Distance to water supply (mins)			
Diswat0_14	0.0002(0.0006)	0.32	0.752
Diswat30_44	-0.0008(0.0013)	-0.56	0.575
Constant	1.5086(0.0033)	455.73	0.000
Lambda(λ)	-0.6574		
S.E	0.0954		
Log likelihood	-908.58		
LR chi-squared	123.74		

Source: *Computed*
Notes: Standard errors are in parentheses
(*) the coefficient is statistically significant at 10%
(**) the coefficient is statistically at 5%
(***) the coefficient is statistically significant at 1%

In terms of lighting type, we observed that generator, candle and gas are significant at different levels of significance which include 5% and 10% respectively. Though they all had the expected signs but are statistically insignificant. The availability of any of these lighting types will not significantly alter the house rent charged by the landlords.

The availability of alternative toilet facilities shows that the provision of any of which could actually increase the rent paid on house since they are all significant at 1% level of significance. The increase in house rents by their provision are dictated by the degree of

comfort they offer to the users. According to the result, the comforts that are derivable from flush into sewer system far outweighs that of flush into septic tanks and also this goes for flush into septic tanks and all other type of toilet facilities considered.

The use of water also plays a very critical role in determining what indirectly enters into house rent eventually. From the result, it is obvious that pipe-water is scarce in the medium residential neighbourhood as suggested by non-significance of the variable in the model. Others like borehole, well water and small scale vendor are significant except for spring water that is insignificant as suggested by its t-statistics and probability value.

The component of waste disposal methods in the neighbourhood characteristics appear as the most important variable which impact on house rent. This is self-revealing from the result appearing on Table 6.15. The significance level is astoundingly high at 1%. The provision of any of this has the tendency of causing a rise in the price of house. Out of security services, it is only community policing services that is significant at 10% level of significance while that of government policing is not. This shows that most often than not the services of community police like maid guards, vigilante groups are mostly employed and hence use less of government police.

Contrary to expectations, none of the pollution variables coefficients has the expected signs. What can be inferred from this is that the presence of any of these pollutions could still increase house rents in this area. The presence of public urine is also significant at 5% level of significance. This simply shows that people are mindless about the polluted environment but only care about their place of residence.

Another influential factor in hedonic pricing is the locational characteristics of housing. This factor has tended to impact on price of housing by way of increasing house rent based on the proximity ground. The distance to household head's workplace reduces the amount of house rent depending on the magnitude of the variable coefficient. From the results, all the distances are correctly signed but two out of four are significant at 5% and 10% level of significance. Apart from this, the distance involving children's schools are not significant but correctly signed. Similar outcomes are found in distance to public transportation, hospital and water supply except for distance to market where the range of distance of 15 to29 appears significant only at 10% level of significance.

LOW

Table 6.16 shows the results of box-cox transformation. The estimate for lambda(λ) equals - -0.4434 for low residential density areas. The likelihood tests show that the linear, log-linear

and multiplicative inverse specifications are strongly rejected across all the specifications. This simply provides compelling support for using the box-cox model rather imposing a particular specification from the outset.

Table 6.16: RESULTS OF BOX-COX TRANFORMATION VALUES FOR LOW RESIDENTIAL DENSITY AREAS

MRENT	Coefficient	Standard Error	Z	P>[Z]
Lambda(λ)	-0.4433733	0.2129736	-2.08	0.037

Test H0:	Restricted Log Likelihood	LR Statistic Chi Squared	P-value Prob>Chi Squared
Λ= -1	-211.454	5.83	0.016
Λ= 0	-210.811	4.55	0.033
Λ = 1	--229.438	41.80	0.000

Source: *Computed*
Notes: Standard errors are in parentheses
(*) the coefficient is statistically significant at 10%
(**) the coefficient is statistically at 5%
(***) the coefficient is statistically significant at 1%

Due to multicollinearity problem, some variables have been dropped and few retained. The roof of a house that is made up of cement tends to reduce hedonic housing price by -0.0096 but it is significant at 1% level of significance. This in effect means landlords have the tendency to reduce their house rent for any house whose roof is made up of cement as revealed by the results. The same explanation can be offered for mud wall under walling material type that is significant at 1% level of significance. Candle light is another structural characteristic variable which affects house rent negatively though its impact is insignificant as shown by probability value.

Table 6.17: RESULTS OF BOX-COX HEDONIC ESTIMATION FOR LOW RESIDENTIAL DENSITY AREAS SAMPLE–DEPENDENT VARIABLE: MONTHLY HOUSE RENT

STRUCTURAL CHARACTERISTICS			
	Coefficient	**T-Statistics**	**Probability value**
Roofing materials type			
Cement_roof	-0.0096(0.0031)	-3.09***	0.002
Walling materials type			
Mud_wall	-0.0345(0.0099)	-3.47***	0.001
Lighting type			
Candle	-0.0018(0.0038)	-0.48	0.633
Toilet Facilities			
Flushpipe	0.0096(0.0037)	2.62**	0.009
Vip_pit	0.0060(0.0036)	1.66*	0.096
Covered_pit	-0.0087(0.0024)	-3.59***	0.000
Water source			
Borehole	0.0015(0.0025)	0.63	0.532
NEIGHBOURHOOD CHARACTERISTICS			
Waste disposal source			
Dump_ground	-0.0272(0.0034)	-7.92***	0.000
Truck_push	-0.0058(0.0027)	-2.15**	0.032
Comp_dump	-0.0148(0.0042)	-3.55***	0.000
Others_dump	-0.0131(0.0063)	-2.09**	0.037
Security services			
Com_Pol	-0.0053(0.0032)	-1.67*	0.096
Pollution			
Littering	-0.0026(0.0024)	-1.07	0.286
Public_urine	-0.0036(0.0022)	-1.59	0.112
Illegal _trad	-0.0069(0.0027)	-2.58**	0.010
Poor_traffic	-0.0090(0.0022)	-4.03***	0.000
LOCATIONAL CHARACTERISTICS			
Distance to employment(mins)			
Distemployd 0_14	-0.0023(0.0030)	-0.76	0.449
Distemployd15_29	-0.0060(0.0027)	-1.66*	0.074
Distemployd45_59	-0.0111(0.0058)	-1.90*	0.057
Distemployd60_abv	-0.0133(0.0033)	-1.97*	0.051
Distance to Children school(mins)			
Dischdsch0_14	0.0008(0.0027)	0.31	0.760
Dischdsch15_29	-0.0002(0.0031)	-0.07	0.941
Dischdsch30_44	-0.0114(0.0035)	-3.26***	0.001
Distance to public transport(mins)			
Dispubtrans15_29	0.0050(0.0029)	1.71*	0.088
Distance to hospital(mins)			
Dishosp15_29	0.0067(0.0027)	2.51**	0.012
Dishosp30_44	0.0059(0.0028)	2.09**	0.037
Distance to market(mins)			
Distmkt0_14	-0.0033(0.0025)	-1.29	0.197

Distance to water supply (mins)			
Diswat15_29	-0.0001(0.0062)	-0.01	0.988
Constant	2.1539(0.0039)	557.69	0.000
Lambda(λ)	-0.4434		
S.E	0.2130		
Log likelihood	-208.536		
LR chi-squared	138.28		

Source: *Computed*

The availability of toilet facilities also represents an influential factor that could impact on the price of houses in the low residential density neighbourhood. Flush to sewer system and VIP/ pit latrine could cause house rent to be increased by 0.0096 and 0.0060 though at different levels of significance whereas covered pit latrine affects it by causing reduction in its value by -0.0087 at 1% level of significance. The implicit assumption is that before any house rent is paid these salient features must have been taken proper account of. The presence of borehole is also important though the coefficient is rightly signed but it is not statistically significant.

Unlike what were obtained under waste disposal source in other residential density areas earlier considered, we noticed negative coefficients in all different methods of disposing refuses in the residential neighbourhood thus suggesting their reducing impacts on house rents. It is interesting however to note that they are all statistically significant at 1% and 5% respectively.

The security services component of the neighbourhood characteristics depicts that community policing tends to cause a fall in house rent but at 10% level of significance. This is counter intuitive as it is expected that employing the services of community police like maid guard and vigilante group may further raise rent paid on a house. The possible reason for this may be that the house rent paid on a house or areas where community policing services are employed tend to be relatively cheaper as compared to employing the service of government police.

Pollution in whatever forms are negative externality and are expected to lead to a fall in the price to be paid for a house whether rented or owner-occupied where it is found to be prevalent. The results from Table 6.17 clearly show that all the polluting features like littering, public urine, illegal trading and poor traffic and congestion led credence to the above statement. This is particularly so for both illegal trading activities and poor traffic. Apart from the fact that their coefficients are rightly signed, they are also significant at 1% and 5% levels of significance.

Locational characteristics play very vital role in implicit determination of hedonic housing price in the medium density areas. It is discernable from the results of distance to household head's employment, children's school, public transport and hospital have at least a range of distance that is significant. For example, distance to household employment have negative coefficients and shows that any distance range above 15 minutes has a likely reducing impact on the rent paid on a house which occurs only at 10% level of significance. The same can be said of distance to children's school, public transport and hospital as shown on the Table. This simply suggests that people count and place high premiums on proximity to these various places when taking residential choice decisions. This trends trickle down on distance to market and source of water supply though they are not statistically significant as depicted by the probability values of 0.197 and 0.988 respectively.

6.5 ANALYSIS OF INCOME EQUATION

The Tables 6.18. to 6.21 present the results of the estimated equation (24) for all the residential density areas in Lagos. This is important given the problem of collinearity which may exist between income and human capital variables like education and occupation. From the results it was revealed that virtually all the human capital variables are highly correlated thus suggesting their exclusion from the multinomial logit models together with household income. Failure to observe these may lead to erroneous policy recommendations.

Table. 6.18: Estimated Log-Monthly Income Equation for the full sample

Independent variables	Single-Household House	Multiple-Household House	Flat in a Block of Flats	Duplex	A room in the Main Building	Squatter Settlements
Constant	2.2322*** (3.312)	1.432** (1.932)	2.298*** (2.897)	1.156* (1.861)	4.076*** (5.897)	6.003*** (6.911)
Age15_64	3.876*** (4.462)	2.956.*** (3.261)	2.353*** (3.262)	2.673*** (3.021)	2.967*** (3.362)	3.983*** (4.561)
65 and Above	-2.829*** (-3.671)	-2.003** (-1.911)	-4.111*** (-3.727)	-2.998*** (-3.771)	-2.229** (-1.971)	-4.299*** (-6.671)
Edupry	-0.369 (-0.897)	-0.306 (-0.877)	-0.061 (-0.757)	-1.006 (-0.927)	-0.906 (-0.697)	-0.766 (-0.607)
Edusec	2.891*** (4.176)	2.491*** (3.106)	4.891*** (5.576)	1.897** (1.971)	10.891*** (12.176)	8.322*** (9.776)
Edutert	3.113*** (3.872)	2.691*** (2.963)	3.922*** (4.166)	2.627*** (3.559)	1.609* (1.893)	1.826* (1.868)
Eduvocte	-0.200 (-0.901)	-0.423 (-0.654)	-0.112 (-0.432)	-0.273 (-0.443)	2.661*** (3.154)	10.273*** (9.054)
Occu_pub	2.661*** (3.011)	2.221*** (2.911)	2.002*** (2.733)	2.611*** (2.808)	1.966* (1.811)	2.011*** (2.271)
Occu-pvt	1.775** (1.982)	2.375*** (2.982)	1.887** (1.992)	1.275 (1.182)	2.007*** (2.282)	3.112*** (3.382)
Occu_selfemp	3.288*** (5.220)	7.218*** (9.220)	3.982*** (5.773)	2.166*** (2.554)	8.288*** (11.220)	7.288*** (8.122)
Occu_stuap	-0.112 (-0.019)	-0.309 (-0.045)	-0.323 (-0.113)	-0.546 (-0.323)	2.039** (1.913)	-0.127 (-0.003)
Sample Size	232	1765	754	345	1120	217
F- Statistics	8.211	7.327	8.991	4.767	3.897	5.873
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000
Adjusted R^2	0.223	0.342	0.231	0.198	0.201	0.199

Note that the figures in brackets are t-statistics of the corresponding coefficients.
Where *** implies 1 percent level of significance
** implies 5 percent level of significance
* implies 10 percent level of significance
Source: *Estimations based on Lagos State Housing Survey data, 2006.*

The result of the estimated income equation is presented in Table 6.18. The explanatory variables considered are age, various educational levels as well as different levels of the respondents' occupational status. The dependent variable is natural logarithm of monthly income. The explanatory powers of the estimated equations in terms of adjusted R^2 range from the lowest of 19.8 to the highest percent of 34.2. The entire slope coefficients of each of the equations are highly significant as indicated by the F-statistics and its significance levels. The results show that variables have the right signs except the primary education dummy, age bracket above 65 and dummy for students and apprentices. Most of the variables are statistically significant at 1 percent except some that are significant at both 5 and 10 percent

respectively. The negative signs carried by primary education dummy simply suggest that return to having primary education leads to decrease in income earned. The returns however increase with the higher levels of educational attainments as indicated by secondary and tertiary education dummies. The choice of residential housing is likely to increase with increased income. The self-employed dummy accounts largely as a main source of income followed directly by those in the employment of the government. Thus, income earned either through private establishment or as students/apprentices is likely to constrain one's choice of going for quality residential housing options. What can be inferred from this analysis is that the type of education attainment and occupational status seem to be correlated with the household monthly income.

Table 6.19: Estimated Log-Monthly Income Equation for the High Residential Density Areas

Independent variables	Single-Household House	Multiple-Household House	Flat in a Block of Flats	Duplex	A room in the Main Building	Squatter Settlements
Constant	2.002*** (2.212)	1.332** (1.832)	2.558*** (2.897)	1.656** (1.961)	3.176*** (4.097)	7.003*** (8.911)
Age15_64	5.176*** (5.862)	7.656*** (5.966)	3.953*** (4.562)	3.673*** (3.927)	3.967*** (4.262)	3.083*** (3.461)
65 and Above	-1.829** (-2.071)	-2.003** (-1.911)	-4.111*** (-3.727)	-3.228*** (-2.679)	-2.100** (-1.932)	-3.599*** (-3.671)
Edupry	-0.310 (-0.077)	-0.298 (-0.377)	-0.261 (-0.359)	-1.666 (-1.527)	-0.855 (-0.932)	-0.549 (-0.597)
Edusec	2.441*** (2.976)	5.491*** (4.106)	2.881*** (2.976)	0.898 (0.911)	6.801*** (7.676)	5.357*** (6.986)
Edutert	2.433*** (3.072)	2.690*** (2.632)	6.922*** (5.066)	2.677*** (3.539)	1.999** (2.183)	2.226*** (2.458)
Eduvocte	-0.765 (-0.812)	-0.401 (-0.553)	-0.822 (-0.939)	-0.583 (-0.603)	4.111*** (4.854)	8.973*** (9.224)
Occu_pub	3.061*** (3.841)	3.281*** (3.911)	2.982*** (3.283)	2.211*** (2.448)	2.166*** (2.551)	2.919*** (3.177)
Occu-pvt	3.075*** (3.382)	3.875*** (3.982)	3.177*** (3.332)	3.225*** (3.337)	1.107 (1.332)	1.112 (1.382)
Occu_selfemp	4.888*** (5.020)	5.288*** (6.220)	2.992*** (3.777)	2.666*** (2.754)	7.222*** (8.002)	5.228*** (5.522)
Occu_stuap	-0.182 (-0.219)	-0.679 (-0.715)	-0.473 (-0.488)	-1.544 (-1.423)	2.919*** (3.113)	-0.626 (-0.063)
Sample Size	265	546	329	279	293	41
F- Statistics	6.271	5.397	8.998	4.197	5.297	7.373
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000
Adjusted R^2	0.178	0.235	0.172	0.169	0.205	0.188

Note that the figures in brackets are t-statistics of the corresponding coefficients.
Where *** implies 1 percent level of significance
** implies 5 percent level of significance
* implies 10 percent level of significance
Source: *Estimations based on Lagos State Housing Survey data, 2006.*

The result is similar to that of the full sample in the sense that most of the variables (age, educational and occupational status dummies) bear the expected signs expect for few variables like primary education and students and apprentice dummies whose signs contradict the aprior expectations (Table 6.19). Just like the case of full sample, the range of adjusted R^2 lies between 0.169 and 0.235 percent. Also, a large number of the variables are statistically significant at 1% but with a few being statistically significant at 5% and 10 % respectively. In effect, the outcome of the results suggest that in making a choice of residential housing, the age bracket of 15 to64, having secondary and tertiary education, being self-employed and

getting employed in the public services tend to enhance increased income which could aid effective decision concerning residential housing choice.

Table 6.20: Estimated Log-Monthly Income Equation for the Medium Residential Density Areas

Independent variables	Single-Household House	Multiple-Household House	Flat in a Block of Flats	Duplex	A room in the Main Building	Squatter Settlements
Constant	7.442*** (6.982)	5.311*** (6.986)	2.931*** (3.977)	2.766*** (3.233)	8.449*** (8.881)	10.661*** (9.911)
Age15_64	9.9122*** (10.011)	8.883*** (9.166)	5.675*** (5.897)	2.1223*** (2.511)	11.117*** (12.132)	7.882*** (8.811)
65 and Above	-1.029 (-1.071)	-1.033 (-1.071)	-6.161*** (-6.776)	-5.668*** (-6.979)	-9.199*** (-11.902)	-7.099*** (-8.611)
Edupry	-0.315 (-0.177)	-0.408 (-0.627)	-0.661 (-0.334)	-0.124 (-0.707)	-0.911 (-0.862)	-0.773 (-0.557)
Edusec	5.941*** (6.576)	7.491*** (9.106)	12.821*** (10.976)	2.888*** (3.981)	16.891*** (20.976)	5.777*** (7.966)
Edutert	12.499*** (13.772)	22.120*** (17.932)	9.922*** (11.866)	8.907*** (10.559)	6.699*** (5.293)	7.776*** (6.958)
Eduvocte	-1.165 (-1.212)	-1.101 (-1.553)	-1.922 (-1.339)	-1.383 (-1.673)	4.441*** (4.954)	7.373*** (6.924)
Occu_pub	13.021*** (9.841)	10.281*** (13.011)	7.182*** (8.281)	12.271*** (10.948)	19.166*** (23.151)	12.912*** (10.777)
Occu-pvt	2.275** (1.982)	1.875* (1.782)	3.974*** (4.332)	3.005*** (2.837)	11.107*** (11.332)	5.012*** (4.382)
Occu_selfemp	4.111*** (5.122)	9.788*** (10.620)	3.192*** (2.707)	2.266*** (2.154)	11.422*** (11.992)	7.728*** (7.922)
Occu_stuap	-0.338 (-0.419)	-0.128 (-0.215)	-1.453 (-1.698)	-0.449 (-0.323)	0.632 (0.713)	-1.126 (-1.063)
Sample Size	312	473	276	212	392	88
F- Statistics	5.876	9.654	4.221	4.490	7.781	9.876
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000
Adjusted R^2	0.188	0.229	0.179	0.169	0.216	0.199

Note that the figures in brackets are t-statistics of the corresponding coefficients.
Where *** implies 1 percent level of significance
** implies 5 percent level of significance
* implies 10 percent level of significance
Source: *Estimations based on Lagos State Housing Survey data, 2006.*

The case of medium residential density area is also similar to that of both full sample and high but with much difference in the level of significance of the variables. For instance, there were strong levels of significance in secondary and tertiary education dummies as compared to other levels of educational attainment variables (Table 6.20). This is also noticeable in the public and self-employed occupational status dummies. By implication, this depicts that there

seems to be strong correlation between income earned and these variables (education and occupational status). This result goes to show that robustness of income earned is explained by these variables. That is, having either secondary or tertiary education and being self-employed or public servants as the case may be, could make an household income to be increased.

Table 6.21: Estimated Log-Monthly Income Equation for the Low Residential Density Area

Independent variables	Single-Household House	Multiple-Household House	Flat in a Block of Flats	Duplex	A room in the Main Building	Squatter Settlements
Constant	7.342*** (6.181)	10.911*** (8.936)	3.931*** (2.927)	2.061** (1.933)	11.149*** (9.971)	13.061*** (11.011)
Age15_64	6.522*** (7.111)	8.088*** (7.966)	3.665*** (2.899)	3.923*** (4.251)	10.107*** (11.332)	5.888*** (6.801)
65 and Above	3.009*** (4.071)	5.033*** (5.971)	6.969*** (6.376)	2.668** (1.979)	8.199*** (10.102)	6.999*** (7.119)
Edupry	0.225 (0.337)	0.428 (0.667)	1.661 (1.634)	0.144 (0.117)	0.414 (0.552)	0.373 (0.457)
Edusec	15.041*** (11.673)	19.491*** (20.106)	5.621*** (5.976)	1.898** (1.981)	20.898*** (23.906)	9.977*** (9.066)
Edutert	8.199*** (7.972)	13.121*** (11.332)	2.922* (1.866)	3.987*** (2.559)	11.700*** (9.993)	5.766*** (5.008)
Eduvocte	1.665 (1.582)	1.761 (1.653)	1.882 (1.539)	1.089 (1.173)	7.941*** (6.954)	6.673*** (5.764)
Occu_pub	8.441*** (8.240)	7.881*** (6.611)	4.082*** (3.881)	2.971*** (2.748)	5.666*** (4.951)	6.212*** (6.077)
Occu-pvt	4.275** (3.932)	6.971*** (6.712)	1.974* (1.832)	3.175*** (3.137)	9.907*** (10.132)	7.712*** (6.682)
Occu_selfemp	14.141*** (11.222)	13.788*** (10.726)	7.892*** (6.777)	5.661*** (5.757)	21.412*** (18.192)	8.028*** (7.992)
Occu_stuap	-0.088 (-0.019)	-0.222 (-0.295)	-0.493 (-0.628)	-0.549 (-0.923)	-0.111 (-0.013)	-1.326 (-1.668)
Sample Size	89	293	112	149	234	56
F- Statistics	8.324	5.213	6.341	3.425	8.911	6.774
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000
Adjusted R^2	0.132	0.224	0.148	0.127	0.206	0.212

Note that the figures in brackets are t-statistics of the corresponding coefficients.
Where *** implies 1 percent level of significance
** implies 5 percent level of significance
* implies 10 percent level of significance
Source: *Estimations based on Lagos State Housing Survey data, 2006.*

Unlike other residential density areas that have been discussed above, the adjusted R^2 lies between 0.132 and 0.212 and the entire slope coefficients of each of the equations are highly

significant as indicated by the F-statistics and its significance levels. Similar to medium residential density area, most of the variables are highly significant statistically.

What can be inferred from the results thus far is that most of the human capital variables are highly correlated with income variable. This therefore justified their exclusion from multinomial logit model estimations because using them together may lead to spurious results and consequently generate wrong policy diagnosis and recommendations.

6.6 ANALYSIS OF MULTINOMIAL LOGIT MODEL RESULTS

Table 6.22 presents insightful results on the determinants of residential housing choice among sampled representative household heads in Lagos State. From Table 6.22, hedonic housing price remains an important determinant that influences the likelihood of choosing a flat in a block of flats and duplex relative to multi-household houses. This simply suggests that once there is an increase in the housing price, people are more likely to make a choice of renting a flat in a block of flats and duplex rather than choosing to rent a multi-household houses. The odd of a household head choosing flats and duplex increase by 4.581 and 3.501 times relative to choosing multi-household houses whereas the odd of choosing a room in the main building and squatters' settlement decrease by 0.476 and 0.332 times as against that of multi-household houses. That is, households' preferences would increase for flat and duplex by 4.58 and 3.50 times relative to multi-household houses when there is an increase in housing price. The probabilities for squatters' settlements and a room in the main building are likely to fall by 0.33 and 0.47 times respectively relative to the base category.. By implication, base reference group is preferred to room in a main building and squatters' settlement. It is also notable that housing price is not statistically significant in the case of single household given their z-statistic values. The outcome of the results in the case of single-household houses may be explained by the prohibitive nature of the housing rents. The intuition behind the outcome is straight word in the sense that people would always prefer more to less. A better condition of living will always be preferred to staying in an uncomfortable situation of overcrowded and filthy environment that characterises multi-household houses should there be an upward review of house rents.

Income is another important predictor of residential housing choice. Thus, it is statistically significant for both a flat in a block of flats and duplexes. The higher the income earned by household head, the higher the likelihood of choosing a flat in a block of flats and duplexes relative to multi-household houses. The odd of choosing a single-household house, flats and duplexes increase by 3.233, 7.242 and 4.873 times for a single-household house, flats and duplex relative to multi-household houses. Simply put, household income would

increase preferences and probabilities for flats, duplexes and single household houses by 7.24, 4.87 and 3.23 times respectively over multi-household houses. The probabilities, however, decreased by 0.02 and 0.85 times for squatters' settlements and a room in the main building relative to multi-household houses. These results are more sensible given the fact that a condition of higher and better living is always preferred to lesser one. Single household houses are not statistically different from multi-household houses should there be an increase in the housing price. This situation can be explained by the fact that the take-home pay of the household head may not be enough to secure single-household houses in Lagos State even if income increases. The odds of a household head choosing a room in the main building and squatters' settlement decrease by 0.85 and 0.002times relative to multi-household houses where there are increases in the household income.

Household size variable also appears significant only for a flat in a block of flats relative to the base category. As the size of household increases, the odds of choosing to live or rent a flat relative to multi-household houses increases by 1.082 times. This can be interpreted to mean that as the size of household increases, a spacious and conducive house is more likely to be preferred. The condition of choosing to live in single household houses, room in a main building and squatters' settlements may not actually be better alternatives. The reasons for this may be likened to prohibitive nature of house rents for single household houses and non-conduciveness of squatters' settlements. Also choosing to rent a duplex may not be an option because the cost of renting a duplex is mostly out of reach because of excessive rent that is associated with it.

Gender criterion as depicted on the Table is not an important determinant of residential housing choice as suggested by the level of non significance of z-statistics. Thus, being a female-headed household is not statistically different from that of men on issues relating to making residential housing choice. Though, being a female would increase the probabilities or preferences for single-household house, flats, duplexes while decreasing the likelihood for choosing squatters' settlement and a room in the main building but they are insignificant.

Age is another important demographic variable influencing residential housing choice in the housing literature. As revealed from the Table, household head whose age is above 65 years is more likely to choose a flat in a block of flats and duplex as his residential homes than the household head whose age falls within 15 to 65years relative to multi-household houses. This result can simply be attributed to the decision the elderly are likely to take since they are no longer economically productive. Thus, they may simply require a quiet, healthy

and conducive environment to live. It is also interesting to note that household head whose age is over 65 years is more likely than those within the age bracket, 15 to 65 years to choose a squatters' settlement to multi-household houses though at different level of significance to that of living or renting a flat. The odd of a household head (the elderly) increases more for flats (4.233times) than for both duplex (3.157times) and squatters' settlement (3.776times) but all compare to bench-mark category. This may be applicable to the elderly who could not afford to rent either a flat or a duplex in Lagos. They may simply prefer to provide their own informal and illegal housing structures devoid of hustling and bustling which characterises city life. This is more prevalent in Lagos metropolis where all sort of illegal structures are erected all over available spaces. Also, household head within age bracket 15-65 and above 60 years are not significantly different in their likelihood of choosing to live in either single household houses or room in a main building as against multi-household houses.

Religion is also an important factor when making residential housing choice as noted in the housing literature. This is in fact supported by several empirical studies eg Farley et al (1997). Our result also provides additional evidence to this. For example, household head whose religion is islam are less likely than the christians to choose a flat in a block of flats relative to multi-household houses. The odd of a muslim household head making a choice of a flat relative to multi-household houses decreases by 0.754 times than christian household. Also household heads with other religious faith are more likely to choose a duplex than the christian in relation to multi-household houses. Similar argument is also hold for a muslim in the choice of duplex as a residence. In addition, household heads which are from other religious sects are more likely than the christians to make a choice of a room in a main building relative to multi-household houses. The odd of a head of household from other religious sects choosing a room in the main building increases by 1.654times relative to multi-household houses than household head that is a christian. A simple inference that can be drawn from this is that religious doctrines and ideology may affect people's ways and styles of life greatly.

Ethnicity also plays an important role in determining the choice of residence in the housing literature. This factor shows no significant effect on the choice of single household house. Household heads who are Ibo by tribe are more likely than Yoruba household head to choose flats relative to multi-household as depicted by the z-statistics value on the Table. Whereas household heads from other tribes other than Hausa and Ibo are less likely than the Yorubas to choose a duplex as their residence relative to multi-household houses. Ibo people also are more likely to make a choice of residence in favour of a room in the main building

than Yoruba as against multi-household houses. This is quite common in the Lagos metropolis for the reason that has to do with the fact that majority of the people actually migrated to Lagos metropolis for business purposes. They mostly prefer to build expensive houses in their home towns than Lagos which they view as business centres where they come to make money back home. Ibos also, are more likely than the Yoruba to choose squatters' settlement relative to multi-household houses whereas household headed by Hausa are more likely than Yoruba to demand for squatters' settlements relative to multi-household houses.

Table. 6.22: ESTIMATED MULTINOMIAL LOGIT MODEL RESULTS FOR THE FULL SAMPLE SIZE

Independent variables	Dependent variable : Residential Housing Choice[a]				
	Single Household House	Flats in a block of flats	Duplex	Room in the main Building	Squatters' settlement
Hedprice	0.004 (-0.79)	4.581*** (9.48)	3.501*** (8.04)	0.476*** (-8.12)	0.332*** (-3.90)
Logincm	3.233*** (3.77)	7.242*** (6.55)	4.873*** (4.26)	0.85*** (-3.05)	0.02*** (-4.32)
Hsize	1.062 (1.27)	1.082** (2.35)	0.984 (-0.32)	1.019 (0.86)	0.964 (-0.71)
Gender[b]	0.986 (-0.07)	1.094 (0.57)	1.208 (0.95)	0.881 (-1.24)	0.867 (-0.55)
Age_abv65[c]	0.467 (-0.73)	4.233*** (3.37)	3.157** (2.22)	1.284 (0.78)	3.776** (2.20)
Rel_mus[f]	0.866 (-0.72)	0.754* (-1.69)	0.510** (-2.92)	1.090 (0.93)	1.121 (0.45)
Rel_oth	1.219 (0.48)	2.200** (2.97)	3.714*** (4.16)	1.654** (2.50)	0.865 (-0.27)
Ethn_Hau[g]	0.629 (-0.45)	1.026 (0.04)	0.550 (-0.57)	1.099 (0.25)	3.920** (2.51)
Ethn_Ibo	1.209 (0.89)	0.641** (2.23)	0.846 (-0.74)	1.094** (2.20)	1.402** (2.13)
Ethn_oth	1.052 (0.13)	0.980 (-0.08)	0.324*** (-3.25)	0.951 (-0.26)	1.282 (0.52)

Sample Size=4433, LR chi2(90)=1070.87, Prob>chi2=0.0000, Pseudo R^2=0.0933, Log Likelihood=-5203.6228
Note: The variables' coefficients are odd ratios, which are referred to as relative risk ratios(rrr) in Stata program
The figures in brackets are z-statistics, with (***) representing 1 percent level of significance (**);5 percent level of significance; and (*) 10 percent level of significance.
The following are the base categories for each of the power alphabets: a=Multi-household houses=Male c=Age bracket 15_65 d=Christianity and e=Yoruba.
Source***:*** *Estimations based on Lagos State Housing Survey data, 2006*.

Housing price which is a composite price of housing characteristics plays a very critical role in determining the choice of residential housing in high residential density areas of Lagos state as depicted on Table 6.22. The hedonic housing price is statistically significant at a 1%

level of significance for both the flats and a room in a main building while that of squatters' settlement is significant at 5% level of significance. Household heads are2.629 times more likely to choose flats relative to multi-household houses while household heads are 0.709 and 0.810 times less likely to choose room in the main building and squatters' settlements relative to multi-household houses. For flats however, an increase in the housing price will likely increase the probability of choosing flats relative to multi-household houses. Contrary arguments hold for a room in a main building in the sense that an increase in price of houses will likely reduce the choice of demanding for a room in a main building relative to the reference group category. This same argument goes for squatters' settlement. It is therefore logically plausible to argue that it would be desirable for any rational person to have taken this kind of decisions since quality that is attached to flats is much more than that of multi-household houses. This may at the same time mean demanding less for a room in a main building and squatters' settlement because of the low and poor housing quality that may be associated with them.

Household income is significant for a flat in a block of flats, duplex and squatters settlements at both 5% and 10 % respectively. This simply suggests that at higher levels of income, household heads in high residential density areas will likely choose to live in a flat or duplex than living in a multi-household house. This variable is also significant for squatters' settlements. By implication, this means they are statistically different from that of multi-household houses because households will likely demand less for squatters' settlements at higher house rents relative to multi-household houses. For the duplex as a choice of residence, inadequate household income level within the density areas may be enough reason coupled with prohibitive housing rents to reduce the likelihood of choosing it. This outcome goes to show that with increasing income level, the probability is high for the household heads to demand for less and low housing quality but rather demand for an improved housing condition.

The size of household also plays a prominent role in determining a person's choice of residence out of a feasible affordable alternative choice sets . From the table, it is discernable that an increase in the size of the household may likely limit the choice of duplex relative to multi-household houses. This may be explained by the fact that majority of people with a large number of family are commonly found living in multi-household houses in high residential density areas in Lagos. In actual fact this is more prevalent in this residential neighbourhood. Thus it is not a surprising to find a family of seven or eight living in a small-sized multi-household house in the Lagos, metropolis. It is equally not surprising to observe

that the odd of a household decreases by 0.572 times relative to multi-household houses. This is not unexpected given the nature of the people residing in such area.

The issue of gender in the determination of residential housing choice is also very critical as can be observed from the Table. A female-headed household have a higher likelihood than male in choosing a single household house as against the choice of multi-household houses. This contrast sharply with what will occur if it involves a room in a main building. What is observed from the Table is that a female-headed household is less likely than a male counterpart in choosing a room in a main building relative to multi-household houses. Thus from the Table ,it is evidently clear that while the odd of female-headed household increases by 2.676 times for a single-household house and decreases by 0.676 times for a room in the main building. This outcome simply suggests that a female-headed household has a very strong preference for better and qualitative houses than male counterpart in relation to occupying or choosing multi-household houses.

Age remains a significant factor in making a residential housing choice concerning duplex and squatters' settlement in high residential density areas. A household head whose age is 65 years and above will more likely than those within the age bracket 15 to 65years to choose duplex and squatters' settlement as their residential housing choice. What this implies is that at the age above 65 years, there is high likelihood that household head will choose to live in either a duplex or squatters' settlement depending on the financial status of the individual involved. If it were to be a wealthy or high net-worth individual, a duplex may be a preferred option most especially at retirement age. Squatters' settlement may provide an option if the person is not financially buoyant. The reasons for this are not far-fetched given the fact that the odd of a household head whose age is above 65 years increases by 4.623 times for a duplex and 3.272 times for squatters' settlement relative to multi-household houses than a household head within the age bracket 15 to 65years. At age 65 and above, the assumption is that people may no longer be economically productive therefore, would require a more lonely and spacious housing environment to live than those that are still within their economically productive years.

As for the religion, people with different faiths are more likely than christians choose to demand for single household house, flats and a room in the main building. This corroborates some beliefs that muslims and christians care less about material things. The odd of a household head choosing flats (3.851 times) increases more than that of both single-household houses (5.125 times) and a room in the main building(1.451 times) for household head with other religion than christian household heads in relation to multi-household houses.

Interesting results also emerged from ethnic variable as one of the determinants of residential housing choice. Here, an Ibo will more likely than the Yoruba choose and live in a single-household house, flats, a room in the main building and squatters' settlements relative to multi-household houses. This is significant at both 1% and 10% level of significance respectively. The odd of an Ibo person choosing a squatters' settlement is highest by 3.384 times than Yoruba person relative to multi-household houses while the odd for the same Ibo person increases by 2.870 and 2.331 times for both flats and a room in the main building.

Table 6.23: ESTIMATED MULTINOMIAL LOGIT MODEL RESULTS FOR HIGH RESIDENTIAL DENSITY AREAS

Independent variables	Dependent variable : Residential Housing Choice[a]				
	Single Household House	Flats in a block of flats	Duplex	Room in the main Building	Squatters' settlement
Hedprice	0.008 (-0.32)	2.629*** (3.63)	1.344 (0.02)	0.709*** (-6.00)	0.810** (-2.60)
Logincm	3.251 (1.37)	2.682** (2.49)	5.709** (2.96)	1.207 (1.03)	0.392** (-2.91)
Hsize	1.022 (0.13)	1.096 (1.27)	0.572** (-2.80)	1.015 (0.46)	1.012 (0.16)
Gender[b]	2.676* (1.65)	0.902 (-0.29)	2.615 (1.55)	0.676** (-2.53)	2.816 (-0.57)
Age_abv65[c]	1.96e-16 (-0.00)	2.994 (0.98)	4.623*** (3.48)	1.609 (0.97)	3.272** (2.57)
Rel_mus[f]	2.641 (1.38)	0.860 (-0.45)	0.795 (-0.31)	1.171 (1.17)	0.768 (-0.73)
Rel_oth	5.125* (1.75)	3.851*** (3.34)	1.131 (0.14)	1.451* (1.65)	1.325 (0.53)
Ethn_Hau[g]	4.335 (1.28)	3.595 (1.54)	2.168 (0.57)	0.907 (-0.21)	3.22e-15 (-0.00)
Ethn_Ibo	3.565* (1.73)	2.870*** (3.66)	1.520 (0.57)	2.331*** (5.98)	3.384*** (4.11)

Sample Size=1753, LR chi2(85)=1070.87, Prob>chi2=0.0000, Pseudo R^2=0.0879, Log Likelihood=-1675.6973
Note: The variables' coefficients are odd ratios, which are referred to as relative risk ratios(rrr) in Stata program
The figures in brackets are z-statistics, with (***) representing 1 percent level of significance (**);5 percent level of significance; and (*) 10 percent level of significance.
The following are the base categories for each of the power alphabets: a=Multi-household houses,b=Male c=Age bracket 15_65 d=Christianity and e=Yoruba.
Source: *Estimations based on Lagos State Housing Survey data, 2006.*

MEDIUM

Similar to earlier results, hedonic housing price was still found to be significant for a single household house, flats, duplex, a room and squatters' settlement respectively. Hence, housing price is found to be significant across all the residential housing choice. What is obvious from this result is that at a higher housing price, preferences are more likely to be shifted in favour

of flats, duplex and squatters' settlement relative to multi-household houses. This result appears reasonable in the sense that a rational thinking household head would prefer living in a flat and duplex should there be increases in the housing price than staying in a multi-household house which is devoid of privacy that are inherent in a qualitative house. This result contrasts sharply with what is obtainable in the case of a single household house and a room in a block of flats. Given these residential housing choice, increasing house rents are less likely to make a household demand for them relative to multi-household houses. This by implication suggests that preferences are likely to be shifted in favour of multi-household houses than demanding for a single household house and a room in a main building. It is surprising however to note that household head places more and a higher premium on squatter settlement over multi-household houses. Table 6.6.3 depicts that the odds of a household choosing flats, duplex and squatters' settlement increase by 5.334, 5.151 and 6.553 times relative to multi-household houses while the odd of a household choosing a single-household house and a room in the main building decrease by 0.535 and 0.421 times relative to multi-household houses. All these occur at different levels of significance.

Household income in the medium residential density areas is only significant for flats and duplex at the highest level of significance. A simple inference that can be drawn from this result is that household head with increased income will likely demand for flats or duplex as their choice of residence relative to multi-household houses as their z-statistics values are significant at 1% level of significance. But for other residential housing choice, household head position is not significantly different from that of multi-household houses. Thus, for the increased household income, the odds of a household choosing either flats or duplex increase significantly by 3.261 and 2.419 times relative to multi-household houses.

Household size appears significant for both flats and duplex at 5% and 10% level of significance respectively. What this suggests is that the higher the size of the household family, the more likely the preference for flats and duplex would be relative to multi-household houses. This result goes contrary to what was obtained in the case of high residential density areas where the odd of a household head choosing a duplex decreases by 0.572 times relative to multi-household houses.

In the case of gender dummies, it is observed that there was no significant difference between being a male or female in the choice of residence as clearly depicted on the Table. For age dummies, it is only those within the age bracket of 65years and above that are likely to demand for flats as their choice of residential homes as against multi-household houses. The assumption here is that at that age, a lonelier and private place of residence will be

preferable by the elderly. Also the odd of a household head of 65 years and above choosing squatters' settlements decreases by 0.577 times relative to multi-household houses than those household head within the age bracket of 15 to 65years.

Religion is also a very critical factor in the determination of residential choice in the medium residential density areas but to a lesser degree. Other religions relative to being a christian appears significant in choosing either a flat or duplex. Comparatively, muslims are less likely than christians to choose a duplex relative to multi-household houses.

Tribal sentiments also appear significant over half of the residential housing alternatives which include flats, a room in a main building and squatters' settlement respectively. What this suggests is that Ibos are likely than Yorubas to live in these type of residential houses as against staying in a multi-household houses.

Table 6.24: ESTIMATED MULTINOMIAL LOGIT MODEL RESULTS FOR MEDIUM RESIDENTIAL DENSITY AREAS

Independent variables	Dependent variable : Residential Housing Choice[a]				
	Single Household House	Flats in a block of flats	Duplex	Room in the main Building	Squatters' settlement
Hedprice	0.535** (-2.06)	5.334*** (3.49)	5.151*** (3.92)	0.421* (-1.75)	6.553** (2.40)
Logincm	0.671 (-1.23)	3.261*** (5.14)	2.419*** (3.15)	1.046 (0.21)	0.427 (-1.33)
Hsize	1.068 (1.21)	1.122** (2.76)	1.108* (1.96)	1.050 (1.30)	0.920 (-0.79)
Gender[b]	0.840 (-0.65)	1.147 (0.70)	1.298 (1.16)	1.068 (0.38)	0.395 (-1.19)
Age_abv65[c]	0.680 (-0.35)	5.362** (2.84)	2.336 (1.21)	1.983 (1.18)	0.577*** (-5.03)
Rel_mus[f]	0.831 (-0.74)	0.875 (-0.62)	0.553** (-2.20)	0.943 (-0.33)	1.357 (0.53)
Rel_oth	0.778 (-0.74)	1.756** (2.50)	1.542* (1.67)	1.205 (0.86)	0.940 (-0.10)
Ethn_Ibo	2.267 (-0.08)	2.267*** (4.73)	0.669 (-1.57)	3.898*** (4.02)	2.738** (2.13)

Sample Size=1745, LR chi2(80)=406.60, Prob>chi2=0.0000, Pseudo R^2=0.0772, Log Likelihood=-2428.8723

Note: The variables' coefficients are odd ratios, which are referred to as relative risk ratios(rrr) in Stata program The figures in brackets are z-statistics, with (***) representing 1 percent level of significance (**);5 percent level of significance; and (*) 10 percent level of significance.

The following are the base categories for each of the power alphabets: a=Multi-household houses=Male c=Age bracket 15_65 d=No education; e= Unemployed person; f=Christianity and g=Yoruba.

Source: *Estimations based on Lagos State Housing Survey data, 2006.*

LOW

Hedonic housing price is also an important variable that determines the choice of residence in the low residential density areas but as much as it influences the choice of residential housing in high and medium residential density areas. This is because it only affects the choice of a duplex and a room in the main building in this residential area. This is particularly so for the choice of duplex because an increase in housing rent in this neighbourhood may likely make people demand for duplex relative to multi-household houses, this may be true for a wealthy household head. Also, such a rise in housing rent could reduce the likelihood of demanding for a room in the main building relative to multi-household houses. People will normally prefer a better and comfortable accommodation than an uncomfortable one wherever there are increases in housing price. This is what is clearly depicted by 10% and 1% level of significances in the Table 6.6.4 for both duplex and room in the main building respectively. These results are shown on the table by the odds of a household head which increases by 2.852 times for duplex and decreases by 0.023 times for a room in the main building relative to multi-household houses.

Household income, being a critical variable in the determination of residential choice in the literature, does not apparently depict such in the case of low residential density areas as it is only significant at the levels of a room in the main building and squatters' settlement. The reason for this is due to the fact that, the level of significance of this variable occurs at 1% for a room in the main building and 5% for squatters' settlements. According to the results on the Table, at a higher level of income, there is high likelihood that the residential choice preference may likely increase for a room in the main building and decline for that of squatters' settlement relative to multi-household houses. The Table depicts that the odds of a household head is more likely to increase for a room in the main building by 2.500 times and decreases by 0.184 times for squatters' settlement relative to multi-household houses should there be an increase in the household income.

Household size also has an impact on the residential preference for a flat in a block of flats as against multi-household houses while its effect on other residential housing choice does not appear to be significant as shown by the results on the Table.

None of the gender dummies is significant at any level of significance for the residential choice. This means that an issue relating to gender is meaningless in the household residential choice decision in this residential area. Succinctly put, such a residential housing choice decision is gender insensitive as far as low residential density areas are concern.

Other variables like age, religion and tribe are also critical in determining residential choice decision in the housing literature. For instance, household head whose age is 65 years and above is more likely than the household head within the age bracket 15 to 65years to show preference for single-household house, flats and squatters' settlements relative to multi-household houses. The inference that can be drawn from this is that, on the one hand, those that are still economically productive would show preference for a single household house and flats than choosing multi-household houses in a low residential density area. On the other hand, the elderly who are already weak and inactive prefer a duplex and squatters' settlement than staying in multi-household houses. This decision will, to a large extent, depend on the financial standing of the individual household concerns. All the results relating to this argument are statistically significant at 1% level of significance.

The impact of religion dummies is negligible as far as residential housing choice is concerned in the low residential density area. The import of this is well appreciated on account of the level of insignificance of the dummies across the various residential choices. In the case of tribal dummies, we can see evidently from the Table that an Ibo household head will more likely than the Yoruba demand for either flat, room in the main building and squatters, settlements in relation to multi-household houses. The odds of household heads who are Ibo are more likely than Yorubas' and Hausas' and people from other ethnic groups to choose flats, a room in the main building and squatters' settlement. The preference would likely increase by 2.485, 2.409 and 10.949 times relative to multi-household houses. This odd increases more for squatters' settlement than other residential housing choice.

Table 6.25: ESTIMATED MULTINOMIAL LOGIT MODEL RESULTS FOR LOW RESIDENTIAL DENSITY AREAS

Independent variables	Dependent variable : Residential Housing Choice[a]				
	Single Household House	Flats in a block of flats	Duplex	Room in the main Building	Squatters' settlement
Hedprice	5.381 (0.26)	1.897 (1.10)	2.852* (1.68)	0.023*** (-5.35)	0.512 (-0.05)
Logincm	2.357 (1.06)	2.640 (1.54)	4.873 (0.56)	2.500*** (3.04)	0.184** (-2.61)
Hsize	1.192 (1.21)	1.355** (2.64)	1.099 (0.19)	0.923 (-1.43)	0.896 (-0.96)
Gender[b]	0.930 (-0.11)	2.221 (1.45)	1.215 (-1.03)	0.819 (0.410)	1.343 (0.58)
Age_abv65[c]	4.116*** (5.23)	3.015*** (3.07)	1.184 (-1.36)	0.404 (-1.18)	1.810* (1.73)
Rel_mus[f]	1.084 (0.15)	0.429 (-1.46)	7.308 (1.11)	1.098 (0.46)	1.694 (1.07)
Rel_oth	1.402 (0.31)	3.089 (1.56)	1.607 (-0.90)	1.621 (1.29)	1.315 (-1.25)
Ethn_Ibo	1.067 (0.09)	2.485** (2.14)	1.309 (1.10)	2.409*** (3.79)	10.949*** (5.25)

Sample Size=933, LR chi2(80)=235.20, Prob>chi2=0.0000, Pseudo R^2=0.1321, Log Likelihood=-772.84312

Note: The variables' coefficients are odd ratios, which are referred to as relative risk ratios(rrr) in Stata program The figures in brackets are z-statistics, with (***) representing 1 percent level of significance (**);5 percent level of significance; and (*) 10 percent level of significance.

The following are the base categories for each of the power alphabets: a=Multi-household houses=Male c=Age bracket 15_65 d=Christianity and e=Yoruba.

Source***:*** *Estimations based on Lagos State Housing Survey data, 2006*.

CHAPTER SEVEN

SUMMARY OF FINDINGS, POLICY RECOMMENDATIONS AND CONCLUSION

7.1 Introduction

The importance of housing in human existence cannot be overemphasised; as such every individual strives to get accommodated. The scarce financial resources usually impose restrictions on the structure, type and nature of housing production and consumption, which each economic decision-making unit can avail him/herself. This technically calls for choice making out of a bundle of feasible attainable choice sets. It is against this background that a plethora of literature exists on residential location choice behaviour explaining the factors which influence such residential choice decisions, ranging from socio-psychological to rigorous economic approaches. Most residential location studies employ an approach which largely uses socio-economic criteria to explain residential location decision. For example, economic equilibrium theory, in which household's residential location behaviour is seen to be influenced by income, space preference, transport cost to workplaces, provides the starting point for the preferred choice of residential locations.

In spite of the rich literature on the studies of the residential location behaviour, what stands out markedly is that majority of these studies have urban-geographical and sociological orientations but with a fewer studies examining the economic dimensions of the issue. It is on this note that some more profound explanations are found necessary for the reasons behind the observed residential choice differentials across different residential density areas in a Third World mega city like Lagos, Nigeria. The selection and consideration accorded Lagos housing market by the thesis is a product of several factors which include among others: it has a relatively well-organised and structured housing market; it also presents strong idiosyncrasies in terms of real estate market, coupled with her large population in the federation caused by rural-urban migration processes. Lastly, it was a former capital city and seat of power before the eventual relocation to the Federal Capital City, Abuja. A summary of the main findings, beginning from the structure and characteristics of the Lagos housing market to the econometric validation are done. Some policy recommendations are then subsequently provided.

7.2 Findings from Descriptive Statistics

The first objective of the study is achieved using descriptive approach. Arising from it are the following striking outcomes.

The descriptive statistical Tables reveal that well over 80% of the housing units in Lagos State are predominantly rental in nature, suggesting that the proportion of owner occupied houses to the total housing stock is negligible. The involvement of private sectors in its provision is more pronounced after the structural adjustment programme (SAP) in the late eighties. The rental tenurial arrangement was common and prevalent in all the residential density areas. In terms of residential choices, multi-household houses are the most prevalent form of residential type. This is directly followed by a room in the main building, while flat and single household houses are also prominent in the Lagos residential landscape. It can be said, therefore, that there seems to be no significant difference among the residential density areas both in terms of structure, tenure status and type of residential units. The percentage acquisition by each of the residential density areas differs from one to another as they occurred in varying degrees.

The analysis also shows that over 70% of the housing units are roofed with corrugated iron sheets, predominantly common in multi-household houses, duplexes, rooms in the main building and single-household houses. In fact, this cuts across all the residential density areas, though the high residential density area has the highest number of corrugated roofing houses. This is directly followed by asbestos with a much wider gap. The use of thatched and wood roofing materials is almost non-existent in Lagos residential markets. The use of cement for residential walling and flooring is commonly found in all the constructed houses, such that out of every ten houses, at least seven possess these housing features.

An improvement in the quality of housing is also observed in the analysis in terms of source of lighting, water sources, waste disposal methods and availability of toilet facilities. In virtually all residential housing units, the main source of light is electricity and power supply by Power Holding Company of Nigeria (PHCN). This is common in all the residential density areas. The major sources of water are boreholes and wells, while water from pipe borne is in short supply. A striking difference is observed in the medium residential density areas where pipe borne water installed in the dwellings accounted for as much as 26.7%, while low and high density areas only accounted for 6% and 8.1% respectively. In terms of waste disposal methods, PSP constituted the highest method of waste collector in Lagos State. This is more noticeable in both medium and high residential density areas. With regard

to toilet facilities, flush to septic tank is the most commonly found. This is followed by covered pit latrine. The condition of no toilet situation is found in low and medium residential density areas and they accounted for 15% and 2% respectively.

7.3 Main findings from Hedonic Model Results

The second and third objectives of the study are achieved mainly through multinomial logit models. For the results to be meaningful, we first estimated an hedonic price model. The major findings arising from the hedonic regression model analysis is presented in what follows.

First, the estimation results presented in Table 6.10 suggest that the linearity, log-linearity and double log specifications of the dependent variable are rejected.[13] Parameter λ in the estimated Box-Cox model ranges from -0.3545 to -0.6574. With the estimation of the full sample size having -0.4818, while -0.3545, -0.6574 and -0.4434 are for high, medium and low residential density areas, respectively. They are all strongly significant at the 1% level. This may suggest that, in terms of the goodness-of-fit (likelihood values), the flexible functional form is preferred..

Second, housing price was estimated for all the different residential density areas using Box-Cox hedonic model. The results reveal the magnitude of the importance of each of the housing attributes in the price of houses. It is observed from the results of the full sample size estimation that the structural characteristics (like, roofing materials, walling materials, flooring materials, toilet, lighting and water sources) of the residential houses have strong statistical significance for the amount of house rents charged by house owners. The proportion of the attribute variables that is significant in the model occurred at a 1% level. Thus, an increase in any of the structural attributes is likely to increase the house rents. Among the structural attributes, availability of toilet facilities contributed more significantly to the rising house rents than any other attribute. Neighbourhood and locational characteristics do not seem to be statistically significant in explaining any change that may be observed in the housing price.

In terms of the different residential density areas, we observed that in the high residential density area, structural traits had more significant positive impact on the house rents than other housing attributes. There seems to be significant differences even among the

[13] STATA conducted automatic hypothesis testing for $\theta = -1; \theta = 0; \theta = 1$. All tests conducted are rejected at the conventional levels.

structural traits in terms of the magnitude in their level of significance. Unlike full sample size estimation where availability of toilet facilities has the highest contribution to the value of house rents, the availability of water source type impacted more on the rent charged on houses in the high residential density areas. This is clearly depicted at a 1% level of significance among the different water source types. This is further corroborated by the declining effect of distance to water supply on house rents as shown in table 6.13.

For the medium residential density area, structural and neighbourhood traits have significant impact on the house rents but the presence of structural attributes had dominating impact relative to that of neighbourhood attributes. Under the structural characteristics, toilet facilities source are more significant at a 1% level of significance. The impact of water source type also had a contributory impact most especially from the availability of water from the public tap. For the neighbourhood attributes, waste disposal methods remain critical structural traits that contributed to the rising house rents as all waste disposing methods appear significant at a 1% level of significance.

Lastly, the results in the low residential density areas present a different picture as compared to what is obtained under high and medium residential density areas though similar to other residential areas. Structural characteristics still stand out markedly as being critical attributes that contributed significantly to the pricing of houses. For example, unlike other residential neighbourhoods, the results reveal a declining impact of houses roofed with cement and with mud walls on the house rents at 1% conventional level of significance. The same can still be said of waste disposal methods with negative signs.

The inference that can be drawn from this is that, of all the housing attributes, structural components of housing added more positive impacts on the housing price than any of the attributes that characterised residential houses in Lagos housing market. By implication, house renters place more premiums on structural characteristics of houses than any other feature since they are willing to pay more for their inclusion in the house.

7.4 Main Findings from Multinomial Logit Model Results

One of the cardinal objectives of the thesis is to explain factors affecting the residential housing choice across different residential areas in Lagos State, Nigeria. This objective is well captured using multinomial logit model. The following results emanated from the estimated model:

First, most of the hypothesised signs are mixed for the housing price across different residential housing types and areas. It is normally expected theoretically that the signs would

be negative; suggesting that at higher prices, quantity demanded of any product should be reduced. This is also expected to extend to an act of choice-making since it is an element of demand theory.

Given the value of odd ratios and z-statistics, housing price constitutes an important factor influencing residential housing choice in all the residential density areas. On the one hand, it has positive impact on the choice of flats and duplex and on the other hand, negative impact on the choice of a room in the main building and squatters' settlements relative to multi-household houses. For instance, in the high residential density area, the odds of a household head choosing flats increase by 2.629 times and decreases for a room in the main building and squatters' settlements by 0.709 and 0.810 times respectively, relative to multi-household houses. Similar arguments are true for low and medium residential density areas except for the fact that odds of a household head is not significant for choosing single-household house, flats and squatters' settlements in the low residential density area, while the odd ratios are significant for all the residential choices in the case of medium residential density areas though at different levels of significance. What can be inferred from the results is that household heads tend to react more to changes in the house prices in the medium residential density areas than in any other residential density area in Lagos State.

The impact of household income on the residential housing choice is also well-documented in the literature. The results depict that household head preferences for duplex, flats and a room in the main building increases relative to multi-household houses should there be an increase in household income and decreases for squatters' settlements. This outcome implies that higher condition of living is preferable to lower one as preferences often shifted in favour of flats and duplex relative to multi-household houses. This situation is particularly common among the affluent individual households in high and medium residential density areas. Preference for a room in the main building relative to multi-household houses is prevalent among the poor household heads in the low residential density areas. Again, the signs are mixed thereby contradicting the positive expectation between household income and residential choice as indicated in the literature.

The size of household also determines, to a large extent the residential choice determination in our estimated results. Theoretically, the impact of a large family size on the housing demand is positive and it could also be positive for residential housing choice. From our results, the impact is mixed. For example, from the full sample size results, we observed that the odd of a household head choosing a flat in a block of flats increases by 1.082 times in relation to multi-household houses whereas it deceases for duplex by 0.572times in high

residential density areas, whereas it increases by 1.355 times for duplex in low residential density area and increases for flats and duplex by 1.122 and 1.108 times respectively, in the medium residential density areas relative to multi-household houses. It should be mentioned here that this situation could be made possible if the head of household concerned has a good financial standing.

The gender dimension to the issue relating to residential housing choice determination suggests that it does not significantly matter as far as Lagos housing market is concerned. The gender-related dummy variables only appear significant in the case of a single-household house and a room in the main building for high residential density areas. The odds of a female headed household choosing a single-household house increase relative to male counterparts by 2.676 times and decreases for a room in the main building more than male by 0.676 times relative to multi-household houses. This, in effect, implies that female-headed household chooses to prefer a single-household house than the male counterpart relative to multi-household houses whereas they are less likely to choose a room in the main building than their male counterpart relative to the baseline category.

Age factor is another important determinant of residential housing choice with the degree of its impact varying from one age group to another. It was clearly depicted from the estimated results that the odds of a household head whose age bracket is 65 years and above choosing flats, duplex and squatters' settlements is more likely to increase than those within the age bracket 15 to 65 years by 4.233, 3.157 and 3.776 times, respectively relative to the reference group. This appears to be true for high residential density areas whereas in the case of the medium residential density areas different pictures emerged. For instance, the odds of an elderly (65years and above) choosing flats increase more than those within the age bracket 15-65 years by 5.362 times relative to multi-household houses, but decrease for squatters' settlements by 0.577 times more than age bracket 15-65 years in relation to the base category. The odds only increase for squatters' settlements by 1.810 times in favour of 65years and above as against 15-65years relative to the baseline category in low density residential areas.

The importance of religion in residential choice determination is also recognised in the literature as people of the same faith prefer to stay and live together. Thus, our results offer additional evidence on this claim in the sense that people who practise other religions other than islam and christianity are more likely to choose a single-household house, flats and a room in the main building relative to multi-household houses. This is confirmed through the odd ratios which increase by 5.125, 3.851 and 1.451 times for the three residential housing choices in relation to the base category in the case of high residential density areas. None of

the religious dummy variables appears to be significant for low residential housing choice. In the medium residential density areas, the odd of a muslim is less likely than a christian to choose duplex, by 0.553 times relative to multi-household house whereas, that of other religious groups are more likely to increase by 1.756 and 1.542 times for duplex and flats respectively. Taking a full sample size estimation results depict that the odd of muslims to choose flats and duplex decreases by 0.754 and 0.510 times than the christians relative to the baseline group, while the odds of other religious groups choosing flats, duplex and room increases by 2.200,3.714 and 1.654 times relative to multi-household houses.

Tribal-ethnic sentiments have been observed to also play a key role in determining the residential housing choice in the literature, but to what degree and extent is what the thesis tries to shed light on. The results from the estimated models show that the odds of an Ibo household choosing among the alternatives of residential houses like flats, a room in the main building and squatters' settlements are likely to increase across the residential areas as against the Yoruba's relative to multi-household houses. For example, in high residential density areas, the odds of an Ibo household increases more than the Yoruba's by 3.565, 2.870, 2.331 and 3.384 times relative to multi-household houses for a single-household house, flats, a room in the main building and squatters' settlements, respectively. Also, for low residential density areas, the odds for the Ibos to choose flats, a room in the main building and squatters'settlement increase by 2.485, 2.409 and 10.949, whereas for medium residential density areas, the odds increase by 2.267, 3.898 and 2.738 times respectively than the Yoruba relative to the baseline category for same residential choices. In the case of low residential density areas, the odds ratio increases more substantially for squatters' settlements than any other residential choice. This simply shows that the Ibos are more likely to be found in squatters' settlements than people from other ethnic groups in relation to multi-household houses. This is quite common in the Lagos metropolis for the reason that has to do with the fact that majority of the people actually migrated to Lagos metropolis for business purposes. They mostly prefer to build expensive houses in their home towns than Lagos, which they view as business centres where they come to make money and send back home.

7.5 Implications of Findings for Policy Application

From the implications of the major findings of the study, the following recommendations can be made:

i. Improved incomes and affordable prices are likely to induce a shift in people's preferences from living in multi-household houses, which largely characterised the

Lagos residential market to choosing flats and duplexes. Appropriate income and pricing policy, therefore, can be used to reduce the concentration of people living in slums and squatters' settlements.

ii. The results of the hedonic pricing models show that when renting or buying a house, people are willing to pay more for desirable structural, locational and neighbourhood traits provided in a house in consideration of the opportunity cost of staying away from these facilities. Therefore, if proliferation of urban slums, shanties and squatters' settlements is to be drastically minimised if not completely eliminated, it would pay government and housing suppliers[14] to provide such basic social amenities and important housing accessories. In doing so, however, there is need to consider the peculiarities of each of the residential density areas since willingness to pay for all these housing traits differ in varying degrees from one location to another. For instance, in high residential areas, premium is placed more on structural traits like materials used for housing and water availability than other traits whereas in the medium residential density areas, neighbourhood traits appear to be accorded more consideration.

iii. Rented houses predominantly constituted the bulk of the total housing stock in Lagos. The very low rate of home ownership is attributable partly to the cost of building, especially the high cost of land acquisition. The resultant outcome is insensitivity of housing supply to its demand. It is, therefore, necessary for government to embark on land reforms in the state so that people in the middle and lower income classes can have unhindered access to land for building houses. It is equally important for government to regulate the allocation, sales and purchase of land rationally, so that interested buyers can buy at affordable prices. Concessionary housing loans can also be extended to medium and low income earners to mitigate associated problems of housing poverty. In this way, attainment of ''housing for all'' policy can be enhanced.

iv. Lastly, in formulating housing policies, either at the central, state and local government levels, it is necessary to find out why people live in certain areas, what types of houses should be constructed and in which locations? It is also important to

[14] These include various kinds of people that are engaged in the housing supply and production like estate managers, estate agents and landlords.

recognise the significance of journey-to-work considerations, enhancement of residential environment, and how desirable it is to decentralise employment.

7.6 Conclusion

The thesis examines the determinants of residential housing choice across different residential areas in Lagos state, Nigeria. The findings reveal the importance of housing price, household income, household size, age, education, religion and tribe as being important factors that can influence households in determining residential housing choice. Notably, the importance of housing price, household income, age, education and ethnicity are more pronounced when compared to occupational status, gender and household size that are of less significance. The households' residential choice is important both in the planning and management of urban cities because of its capability in assisting efforts to sort and stratify households into various socio-economic classes. The absence of regular city-wide analysis of the prevailing housing circumstances and the general area of tendency largely precludes policymakers, urban planners, urban managers and other stakeholders to be innovative in their methods and approaches at solving emerging urban problems.

7.7 Limitations of the study

One of the major limitations of the study is the limited scope both in terms of coverage and the number of sample size. No two houses of housing market are the same, even within the same town and locality. Each housing market, therefore, is assumed to have certain peculiarities connoting that data extracted from Lagos housing market may not be used for extrapolation. For example, there are six geographical zones in Nigeria and each presents strong residential idiosyncrasies. Even within the south-western states in which Lagos housing market falls, we observe that owner-occupier houses are much more prevalent though with different housing structure and types. In most of the south-western states, there are conspicuous rural-urban dichotomy which draws a demarcating line between Lagos and other states. Also, the number of sample size is not large enough thereby making generalisable conclusion on the topic to be interpreted with some caution.

There are other important variables that may be responsible for the residential housing choice of people which are not considered in this study.

7.8 Suggestions for Further Studies

Quite a large number of studies have been done on residential location behaviour, but with preponderance of these studies having sociological and urban-geographical orientations. To the best of our knowledge, fewer studies have taken the same issue from economic perspectives and the available few are mostly from developed countries. A more thorough economic analysis is required in this area so that robust econometric technique can be applied.

Relevant important variables affecting residential housing choice decisions should be included by subsequent studies in this area. Also, a further disaggregated data should be used such that both regional and locational effects should be accounted for in the analysis.

Further, state by state and local government by local government analysis can be done to enable comparative analysis to be conducted on the determination of residential housing choice behaviour and also the analysis of different tenurial arrangements. For instance, owner-occupier housing could be included in future studies for Nigeria in this area.

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APPENDIX

Methodology Employed for the Data Used

This section depicts how the baseline data on the target sampled households were generated by the survey fieldwork conducted by the Lagos State Government through Central Office of Statistics and Ministry of Economic Planning and Budget in collaboration with the World Bank in 2006. The Household survey was a state-wide survey which collected detailed information on a variety of topics including demographic characteristics of the household, education, health, infrastructure, income and expenditure, economic activity, housing conditions, access to social amenities, asset ownership, violence, crime and safety and other subjective issues among others. This section therefore covers some survey-related issues which include among others: sample design, survey methodology and survey instruments and equipment.

Sample Design

A sample in any household survey is desired to be representative of the various social and economic strata that exist in the society, as defined by basic demographic variables. In Nigeria, an urban settlement like Lagos exhibits some visible social strata and these must be of keen interest, in addition to geographic spread, in order to minimise bias. The sampling design adopted in this survey was essentially Stratified Multi-stage Sampling.[15]

The 6,000 samples were divided into equal parts .The first half of the sample size was scientifically selected using probability proportional to size (PPS) of the populace and the other half was divided equally (ES) among the entire local government areas. The two values were added to arrive at the actual sample size.

In summary, PPS + ES = ACTUAL SAMPLE SIZE.

[15] **Multistage sampling** is a complex form of cluster sampling. Using all the sample elements in all the selected clusters may be prohibitively expensive or not necessary. Under these circumstances, multistage cluster sampling becomes useful. Instead of using all the elements contained in the selected clusters, the researcher randomly selects elements from each cluster. Constructing the clusters is the first stage. Deciding what elements within the cluster to use is the second stage. The technique is used frequently when a complete list of all members of the population does not exist and is inappropriate. In some cases, several levels of cluster selection may be applied before the final sample elements are reached.

DISTRIBUTION OF SAMPLE SIZE BY LOCAL GOVERNMENT AREAS ZONE 1 - SOUTH

S/N	LGA	POPULATION	FINAL SAMPLE	% OF SAMPLE SIZE(6,000)
1	Ajeromi Ifelodun	1,588,361	458	8
2	Amuwo Odofin	560,814	259	4
3	Badagry	332,685	215	4
4	Surulere	1,183,886	380	6
5	Mainland(Yaba)	721,733	290	5
6	Ojo	635,366	273	5
7	Apapa	432,686	234	4
8	Epe	292,049	207	3
9	Eti –Osa	424,434	232	4
10	Ibeju-Lekki	62,998	162	3
11	Lagos Island	454,714	238	4
Total		6,689,716	2,948	49

Source: Lagos State Government Household Survey (2006)

DISTRIBUTION OF SAMPLE SIZE BY LOCAL GOVERNMENT AREAS (LGAs)

ZONE 2- NORTH

S/N	LGA	POPULATION	FINAL SAMPLE	% OF SAMPLE SIZE(6,000)
1	Agege(Agege-Ogba, Orile Agege)	1,180,358	379	6
2	Alimosho	1,175,622	378	6
3	Ifako – Ijaiye	645,471	275	5
4	Ikeja	533,237	253	4
5	Mushin	1,439,556	429	7
6	Oshodi/Isolo	1,192,652	381	6
7	Kosofe	1,102,661	364	6
8	Shomolu(Bariga)	949,730	334	6
9	Ikorodu	558,422	258	4
Total		8,777,709	3,052	51

Source: Lagos State Government Household Survey (2006)

The first level of stratification comprised the Local Government Areas(LGAs), with each of them divided into Political Wards (between 10 and 25). These wards formed the second level of stratification. All the streets in each ward were listed and all the housing units in selected streets were also listed, together with all the households living in them as indicated in Table below.

DISTRIBUTION OF SELECTED HOUSEHOLDS BY LOCAL GOVERNMENT AREAS (LGAs)

Local Government Area	Population	No of political wards	No of Households listed	No of Households Sampled
Agege	1,180,358	10	1134	379
Ajeromi/Ifelodun	1,588,361	17	980	458
Alimosho	1,175,622	11	947	378
Amuwo/Odofin	560,814	12	833	259
Apapa	432,686	9	750	234
Badagry	332,685	11	614	215
Epe	292,049	18	1401	207
Eti Osa	424,434	9	809	232
Ibeju-Lekki	62,988	16	1054	162
Ifako Ijaiye	645,471	14	924	275
Ikeja	533,237	10	929	253
Ikorodu	558,422	18	1066	258
Kosofe	1,102,661	12	1275	364
Lagos Island	454,714	18	1328	238
Mainland	721,733	10	1005	290
Mushin	1,439,556	15	981	429
Ojo	635,366	13	767	273
Oshodi/Isolo	1,192,652	11	928	381
Shomolu	949,730	8	967	334
Surulere	1,183,886	12	975	380
TOTAL	**15,467,425**	**254**	**19667**	**6000**

Source: Lagos State Government Household Survey (2006)

After having determined the sample size per local government by mixed design (PPS & ES) the ultimate samples were selected using Simple Random Sampling without Replacement. It is to be noted, however, that the number of households selected from each political ward was allocated proportionally to the LGAs and political wards based on the projected population figure of year 2005. The Stratified Multi-stage Sampling procedure ensured that the sample eventually taken was representative of the study population along geographic spread, and the household social and economic strata. However, some institutionalised establishments were excluded from the sample. It is worthy to be noted that in a household survey in which the

living standard and social amenities of households are investigated, decisions may be taken in advance to exclude certain segments of the society whose activities are predetermined.

These include institutionalised establishments like hospitals, schools, prisons, police barracks, military settlements, hostels, hotels, and charity homes. Such establishments were not listed and therefore did not fall into the sample; hence, they were not surveyed.

Classification of the Local Governments in Residential Density Areas

Density is referred to as the number of persons, objects per unit of space, such as the number of persons or houses per acre or hectare. In housing literature, residential densities can be expressed in any of the following ways namely: (a) population density: the number of persons per acre or hectare; (b) Occupancy rate: the number of persons resident per habitable room; (c) Housing density: the number of houses per acre or hectare; (iv) Accommodation density: the number of habitable rooms per acre or hectare; (v) Bedspace density: the number of bedspaces per acre or hectare and (vi) Floor space rate: the amount of floor space (in square metres or square feet) per person.

Lagos State Residential Density Classification

S/N	LOCAL GOVERNMENT AREA	2006	HIGH RESIDENTIAL AREA	MEDIUM RESIDENTIAL AREA	LOW RESIDENTIAL AREA
1.	AGEGE	1,033,064	✓		
2.	AJEROMI/IFELODUN	1,435,295	✓		
3.	ALIMOSHO	2,047,026	✓		
4.	AMUWO/ODOFIN	524,971		✓	
5.	APAPA	522,384			✓
6.	BADAGRY	380,420			✓
7.	EPE	323,634			✓
8.	ETI-OSA	983,515		✓	
9.	IBEJU-LEKKI	99,540			✓
10.	IFAKO-IJAIYE	744,323		✓	
11.	IKEJA	648,720		✓	
12.	IKORODU	689,045			✓
13.	KOSOFE	934,614		✓	
14.	LAGOS ISLAND	859,849	✓		
15.	LAGOS MAINDLAND	629,469		✓	
16.	MUSHIN	1,321,517	✓		
17.	OJO	941,523			✓
18.	OSHODI/ISOLO	1,134,548		✓	
19.	SHOMOLU	1,025,123	✓		
20	SURULERE	1,274,362		✓	
	TOTAL	17,552,942	6	8	6

Note: population density per LG (population divided by landmass) was actually used to classify the residential areas into high, medium and low residential areas respectively.

Survey Methodology

The technology adopted for the exercise is deemed to be the first of its kind in West Africa in the sense that data was captured through hand-held pocket PC. The survey instrument was uploaded into Dell Pocket PCs using Perseus Solutions Mobile Survey Software. To ensure spatial distribution was carried out on LGAs, Global Positioning System (GPS) instruments were used to record the latitude, longitude and altitude of each surveyed household housing/dwelling unit. Everyday of each survey week, the captured data are synced into the laptop specifically meant for the purpose in the Central Office of Statistics. To ensure back-ups exist for the data, they were saved in a Compact Disk and also e-mailed to the World Bank in Washington at regular intervals.

Survey Instrument and Equipment

Questionnaire was finalised after the pilot survey was carried out, following the discussions with the World Bank; numerous suggestions were made to further tailor the questionnaire to be effective to the state and the Nigerian environment. However, as the survey questionnaire was initially programmed by the mobile survey vendor, Perseus Development Corporation, changes to questions were conducted very carefully. The household survey adopted a household-based questionnaire which consisted of 80 pages. To ensure concise responses for the interviews, pre-coded multiple-choice response questions were used. The questionnaire was designed based on 15 distinct modules consisting of: household information, type of housing ,land and tenure, access to infrastructure-storm water drainage, sanitation, water supply, solid waste removal, energy and electricity, communication (telephone),transportation and local roads , education, health, emergency and policing services, community preference , household income and expenditure

Modelled after the work undertaken by the bank in Johannesburg, South Africa, the household survey was a technologically advanced approach to capturing information. This was the first time in West and Central Africa that household information was recorded in Pocket PC and spatial coordinates of households included using GPS instruments. This allowed immediate information availability and greatly reduced chances of error in data capture and entry. There was in-built validation that ensured questions were not skipped or accidentally missed. Other advanced features like branching enable enumerators ask only the relevant questions, making the process more efficient (for example, if a person says he owns a piece of land, he gets questions specific to land ownership, whereas someone renting the person's house, gets rent specific questions). Possible responses have been keyed in ahead of time, to standardise the way responses were recorded while allowing the flexibility

to record unique responses (e.g. list of consumable assets). This standardisation of data entry allows for more accurate data analysis. The GPS technology was utilised in recording the exact coordinates of each location which made it beneficial not just for mapping, but also for drainage, solid waste and other infrastructure projects. This overall process of electronic data capture compacted the number of steps required in a paper survey and therefore also reduced the opportunities for data error. The enumerators entered the data into the Pocket PC as they interviewed the head of household. Data was then uploaded directly into the database where analysis could take place. Data quality checks were put in place to ensure data accuracy. A schedule for regular data backup was also put in place.

Field Organisation

Two teams were formed for the main fieldwork, with each team comprising five supervisors and 20 interviewers. The interviewers were mainly recruited from the State. Each team was assigned to one zone each as the State was divided into two zones namely North which consisted 3,052 selected households (Agege, Alimosho, Ifako-Ijaiye, Ikeja, Ikorodu, Kosofe, Mushin, Oshodi/Isolo and Shomolu Local Government Areas) and South with 2,948 selected households (Ajeromi/Ifelodun, Amuwo Odofin, Apapa, Badagry, Epe, Eti-Osa, Ibeju Lekki, Lagos Island, Lagos Mainland, Ojo and Surulere Local Government Areas). Each interviewer was expected to cover three households per day, thus each team could complete 75 households (i.e. one zone) per day. An interviewer could therefore cover a maximum of 18 households per week, assuming six effective working days per week. Hence the sample size of 6000 households could be covered within four weeks.

Training of Field Staff

Experienced field staff of two consulting firms-University of Ibadan Consultancy Services and University of Lagos Consult were to assume supervisory role for all the data collection teams participating in the main fieldwork and staff of Central Office of Statistics attended the training on field management and of enumerators and supervisors – The training programme which spanned through 14th to 16th June 2005, at Centre for Management Development (CMD), Shangisa, Lagos had World Bank officials as facilitators, which comprised Sudeshna Ghosh Banerjee (Economist Consultant, AFTU2 in Washington), Kim Pimenta and Virginie Bocard (Africa IT in Washington) and Paul Kalu (Economist Consultant, AFTU2 in Lagos). The training started with a presentation on field management that included all the different components of the household survey implementation. This was followed by the training for the enumerators selected to work on this survey, which focussed on the use of Pocket PCs. There were many suggestions by the enumerators on interview

process or content of questions but very little on use of technology. The supervisors proved to be equally adept with the technology and monitoring the work of the enumerators and also the Central Office of Statistics staff have the IT capacity to handle the advanced technology associated with this survey. In addition, Central Office of Statistics staff went through the entire process of creating a new survey in the Perseus software, uploading to the Pocket PCs, synchronising the responses into the laptop and sending data files to the World Bank.

Fieldwork

The data collection exercise for the main survey commenced on 6th July 2005 and ended on September 2nd, 2005. Sixty fieldworkers and supervisors were involved in the fieldwork which comprised a team of five supervisors and 25 fieldworkers per zone. As a quality control measure and also to boost the morale of the fieldworkers, both scheduled and unannounced extended/extensive field trips were made by the senior project management personnel of Central Office of Statistics to check on the logistics, quality and progress of work.

Data Capture and Processing

The survey methodology used a technique of hand-held pocket computer where interviewers entered responses of the heads of households while on the field. Before the commencement of the fieldwork, the pockets PCs were loaded with the copy of the final questionnaire using the Perseus Survey Solutions 6 software which was used to design the questionnaire. The software was used to automate the entire process of data capture, evaluation, validating and storage of the data. It permitted fast processing of data and timely release of results. Data were synchronised from Pocket PC to laptop everyday of the survey week. As part of data quality control, editing was carried out to ensure the household name, address and questionnaire number was correct. Also, automatic correction was done for some selected fields by the Perseus Survey Solutions application based on some validation rules within the system.

SUMMARY OF EMPIRICAL STUDIES ON RESIDENTIAL CHOICE

Author/Year/Country	Nature of Data	Methodology and Estimation Techniques	Studies' Objectives	Empirical Findings
Sanni and Akinyemi (2009), Ibadan,Nigeria	Cross sectional data	Chi-square	Determinants of households' residential district preferences in Ibadan, Nigeria	Their results show that different category of residential density district of the city has distinct set of households' residential districts preferences peculiar to it.
Habib and Kockelman, (2008). Texas, United States.	Cross sectional data	Nested Multinomial Logit Model (NMLM)	Investigate recent mover preferences for location choice and home type.	Empirical results reveal a strong interrelationship between home type and residential location selections.
Blijie (2005),Netherlands	Cross sectional data	Multinomial Logit Model (MLM)	To reveal the influence of accessibility on residential choice behaviour.	The results show that individual accessibility measures, like migration, distance, commuting distance and access to public transport for households without a car, have a significant influence on the residential choice behaviour.
Borgers and Timmermans (1993), Netherland.	Cross sectional data	Decompostional preference and Choice models	(i)To gain insight into the influence of the characteristics of residential locations on residential location choice behaviour (ii) To test a model of joint(Multi-person) decision making behaviour.	The results conclude that the preference for a particular residential location is highly dependent on the characteristics of the dwelling and its environment, and to a lesser extent on the travel time to the workplace.
Schafer (1999), United States	Cross sectional data	Multinomial Logit Model	Study the determinants of the living arrangements of the elderly in US, classifies the housing choices of the elderly into five types: assisted communities, unassisted 60plus communities, shared housing, supported housing and conventional housing.	His results show that income, net worth and sex have little to do with the selection of one of these living arrangements, rather, choice of each type varies with other characteristics of the household.
Farley, et al. (1997),	Cross sectional data	Descriptive Statistics	Specifically examine the issue of racism in the residential choice behaviour.	They observe that race continues to be a significant factor in the residential decision-making process.

Source: Compiled by Author

Summary of previous empirical studies on Hedonic Pricing Models in House Markets

Authors and Data	Functional form	Variables used	Conclusions and Evaluation
Ridker and Henning (1967), 167 Observation	Linear	***Dependent Variable:*** Mean value of owner-occupied single family housing units. ***Independent Variables:*** (1) An index of annual geometric mean sulfation levels, (2) Mean number of rooms per housing unit, (3) Percentage recently built, (4) Total houses per square mile of tracts, (5) Time zone for central business district, (6) Parentage non-housing units, (7) School quality, (8) Occupation ratio (9) Highway accessibility, (10) Illionis/Missouri dummy variable, (11) Person per unit, (12) Median family income (13) Index of annual geometric mean concentrations of suspended particulates gathered by high-volume air samplers (14) Percentage substandard (15) Crime rate (16) Shopping area accessibility (17) Industrial area accessibility (18) Social area analysis indexes.	The most important variable of the study are statistically significant and all are fairly reasonable within the context of the area. I. Sulfation levels to which any single-family dwelling unit is exposed were to drop by 0.25mg,/100cm2/day, the value of that property could be expected to rise by at least $83 and more likely closer to $245.23 II. The variables (2), (3) and (4) which are characteristics that are specific to the property turned out to be important explanatory variables. The signs and magnitudes of the variable coefficients are rightly signed as expected. iii. Both variables (5) and (9) are statistically significant. The coefficients attached to variables (5), however, are not quite as expected. (iv) Variable (8) proved to be best estimated among neighbourhood characteristics. The coefficients of variable (7) are positive.
Kain and Quigley, (1970),1184 Observation	Semi-log and Linear	***Dependent Variable:*** Dwelling unit price ***Independent Variables:*** (1) Basic residential quality (2) Dwelling unit quality (3) Quality of proximate properties (4) Non residential usage (5) Average structure quality (6) Proportion of whites in census tract (7) Median schooling of adults in census tract (8) Public school achievement (9) Number of major crimes (10) Age of structure (11) Number of rooms (natural log) (12) Number of bathrooms (13) Parcel area (hundreds of sq.ft) (14) First floor area (hundreds of sq.ft) (15) Single detached (16) Duplex (17) Row (18) Apartment (19) Rooming house (20) Flat (21) No heat included in rent (22) No water included in rent (23) No major appliances included in rent (24) No furniture included in rent (25) Hot water (26) Central heat (27) Duration of occupancy (years) (28) Owner in building	The interesting results which emanate show that: I. For renters' equations used 25 variables and for owners equations used 15 variables in the study. For renters among the first 5 quality variables, variable (1),(2) and (5) are statistically significant in the model which has restricted observation. For owners, among the first 5 quality variables, (3) and (5) are not statistically significant in the model which has restricted observation. For renters' equations only 16 variables and for owners' equations only 5 variables are statistically significant at 5% significance level. II. The most striking difference when the model is re-estimated for the entire observations is the increase in the significance of the coefficients.
Straszheim (1973)	Linear	***Dependent Variable:***	Different equations were estimated for

Household interview data (100-200) observation		Price of standardized dwelling unit ***Independent Variables:*** (1) Probability of ownership (2) Number of rooms in dwelling units (3) Structure age dummies (4) Lot size dummies (5) Structure condition dummies (6) Unsound condition dummies (7) Sample size	both rental and owner units, and for each geographic submarket. I. Strong relationship was established between house price and (3), (4) and (7). II. Variables (3) and (4) were statistically significant III. Analysis of covariance tests reveals statistically significant differences in the equations across zones. IV. There is substantial spatial variation in the price of most attributes of housing services.
Goodman (1978), 1835 observation	Box-Cox	***Dependent Variable:*** House selling price ***Independent Variables*** (1) Lot size in sq.ft. (2) 1 if house is all brick; 0 otherwise (3) 1 if hardwood floors; 0 otherwise (4) Number of covered garage spaces (5) Age of house in years (6) Number of rooms excluding bathrooms, lavatories (7) Number of full bathrooms (8) Number of lavatories (9) Indoor living space in sq.ft (10) Number of fireplaces (11) Percentage of black population (12) Percentage of families with income less than $5000 (13) Percentage of population over age 25 with 13 or more years of education (14) 1 if black is greater than 5% and less than 15% (15) Principal components measure of neighbourhood attitudes.	The model results showed that, variables affect the house price differently in urban and suburb areas and for both structure and neighbourhood characteristics the price are up to 20% higher than the suburbs. (1) Intrametropolitan examination of structural and neighbourhood quality reveals that the relative valuation of physical improvements in housing is smaller in the central city than in the suburbs, while the relative valuation of improved neighbourhoods is relatively constants. (2) Aggregation of hedonic price coefficients into standardized units yields significantly higher housing prices in the central city than in its suburbs, as well as differential effects of structural and neighbourhood improvements among submarkets.
Palmquist (1984), 20297 observation	Linear, Semi-logarithmic, Log-Linear and Inverse Semi-Logarithmic	***Dependent Variable*** House Selling Price ***Independent Variables*** (1) Area of lot in Sq.ft, (2) Finished interior area squared in Sq.ft., (3) Finished interior area squared, (4) Number of bathrooms, (5) Year of Construction, (6) Number of stalls in garage, (7) Number of stalls in carport, (8) 1 if garage is detached from house, (9) 1 if there is underground wiring, (10) 1 if there is a dishwasher, (11) 1 if there is a garbage disposal, (12) 1 if there is central air conditioning, (13) 1 if there is wall air conditioning units, (14) 1 if there is a ceiling fan, (15) 1 if the date of sale was 1976, (16) Excellent condition, (17) Fair condition, (18) Poor condition (19) Brick or stone exterior finish, (20) 1 if there is a full basement, (21) 1 if there is a partial basement (22) 1 if there are one or more fireplaces, (23) 1 if there is a swimming pool, (24) The annual arithmetic mean of the particulate air pollution level, (25) The median age of the residents of the census tract, (26) The median family income of residents of the census tract, (27) The percentage of workers in the census tract that has a blue collar job, (28) The percentage of houses in the census tract that has changed ownership within	Of the 200 estimated coefficients the one with incorrect signs were just 17 and none of them are for the most important variables. Hedonic regression results showed that variables (3),(8),(18),(24),(28), and (29) affects house prices negatively. (1) First 32 variables which were positively affects prices have expected signs and magnitudes, also they were statistically significant. (2) In the second stage, variables (33), (34),(42) and (43) were more effective on the house prices and these variables which were statistically significant have positive coefficients.

		the last five years, (29) The percentage of the population of the census tract that is classified as non-white, (30) The percentage of the population of the census tract over 24 years old that has graduated from high school, (31) The percentage of the structure in the census tract with 1.00 or less persons per room, (32) The number of work destinations within the census tract divided by the area of the census tract, (33) Adjusted monthly housing expenditure, (34) Hedonic price of sq.ft of living space, (35) Hedonic price of bathrooms (36) Hedonic price of the percentage of the census tract with high school degrees, (37) Hedonic price of racial homogeneity, (38) Hedonic price of lot area, (39) Hedonic price of reduction in age of house, (40) Age of the purchaser, (41) 1 if the purchaser is single, (42) Number of dependents in the family making the purchase, (43) 1 if the purchaser is black.	
Meese & Wallace (1991), time series data for two different city between 1970-1988.	Translog and Log-Linear	***Dependent Variables*** House selling price ***Independent Variables*** (1) Number of Bathrooms, (2) Sq.ft of Floor Space (m^2), (3) Number of total rooms, (4) Index of housing condition, (5) Federal Mortgage, (6) Multiple sales dummy variable, (7) Mortgage assumability dummy, (8) Residential zoning dummy, (9) Swimming pool dummy, (10) Fireplace dummy, (11) Age of dwelling (years).	(1) Non-parametric regression techniques were used to construct housing price indices. (2) The analysis includes an examination of the variation in the implicit price of house attributes over time, diagnostic checks of the adequacy of the fitted hedonics, and simulated confidence intervals for the Fischer Ideal Price index. Thus for the two states, Diedmont city variables (1), (2), (3), (4),(7), (9) and (10) have positive effects on the house selling prices. For San Francisco city only variable (5), (7) and (8) have negative signs.
Yang (2000), 226 observation	Linear, Log-Linear and Box-Cox	***Dependent Variable*** Asking Price of per square metre of gross construction area **Independent Variables** (1) Gross construction area of living room, (2) Number of bedrooms, (3) Number of bathrooms (4) 1 if the public facilities provided for the household; 0 otherwise, (5) Distance from Central Business District (CBD), (6) 1 if apartment located in the west; 0 otherwise, (7) 1 if apartment located in the north; 0 otherwise, (8) 1 if apartment located in the south; 0 otherwise, (9) Perceived construction risk.	(1) The results of linear specification showed that 64.4% of the variation observed in housing prices. Most of the coefficients are significant at the 99 percent level, with the exception of variable (3) is significant at 90 percent and variable (2) has no significance.The results of another two hedonic equations for sub-samples showed that the influence of most variables on housing prices remains stable, except that the value of variable (3) is significantly different for the two locations. The marginal price of public facilities was fairly low in the results. (2) The high tolerance value for each variable suggests a

			limited amount of multicollinearity among the independent variables. For chow-test (F-0.625) is not larger than the critical value (=2.54), which shows that the null hypothesis of statistically stable estimated parameters cannot be rejected at the 95% significance level. House quality affects the house prices very significantly. The most important preference suggests households are willing to pay additional expenditures to protect themselves from low construction quality.
Leishman (2001), 1155 observation	Linear	***Dependent Variable*** House selling price ***Independent Variable*** (1) Second bedroom, (2) Third bedroom, (3) Fourth bedroom, (4) Floor area (square metres), (5) Bungalow, (6) Detached, (7) Mid terrace, (8) Garage, (9) Dining room, (10) Second bathroom, (11) En-suite, (12) Box room, (13) Utility room, (14) Year dummies.	(1) Hedonic regression models are constructed and chow tests are performed in order to test the null hypothesis of product homogeneity between house builders, (2) In the study two regression model is intended to explain and predict variation in house prices within a given local area with reference only to the attributes or physical characteristics of house sold and time. The second regression model includes the factor scores derived from the principal component analysis as explanatory variables. (3) the results show that the hedonic regression model explains more than 83% of the total variation in house prices. Most of the variables entered into the equation are significant at the 99% level and the majority of the estimated parameters have the 'correct' sign, that is, they are positive or negative in keeping with a prior expectations. (4) In the second regression model, 12 of the factor scores are statistically significant at the 1% level. The statistically insignificant factors are those associated only with the quarterly dummies. The collinearity statistics now indicate that there is no multicollinearity problem.
Üçdoğruk, (2001), 2718 0bservation from face to face interview with real estate agencies.	Log-Linear	***Dependent Variable*** House selling price ***Independent Variables*** (1) Number of balcony, (2) Number of elevator, (3) Number of flats in apartment, (4) Dwelling size, (5) Number of rooms, (6) Floor number of dwelling, (7) Age of dwelling, (8) Heating system, (9) Furnishing status of room and saloon,	(1) Hedonic Pricing Model estimated by using the simple ordinary least square method, for the best model choice used Wald-F statistics and "from the general to the particular" approach which was suggested by Hendry. (2) In this study, it is established both general and

		(10) Bathroom floor, (11) Window carpentry, (12) Roof proofing, (13) Wallboard, (14) Location of dwelling, (15) Building of kitchen, (16) Satellite system, (17) Cable, (18) Pressure tank, (19) Parking place, (20) Venetian, (21) Solar energy, (22) Caretaker, (23) Whether house is located at the garden or site.	restricted model and study with restricted model is more available. Furthermore, it is mentioned that the percentage changes of each variables affects the house prices. (3) When it is examined, conclusions of restricted model, variable (5) was statistically significant. (4) Except variable (5), all of the coefficients estimation belong to the other variables conform to theoretical expectations and is statistically significant. (5) Taking place the housing in site, in the garden and with solar energy resulted as economically insignificant. (6) Improvements that occurs in housing characteristics have been raising housing prices at different degrees; both housing features and external factors (floor space of housing, whether it is the site) significantly affects the price.
Ogwang & Wang (2002), 832 observation	Linear	***Dependent Variable*** House selling price ***Independent Variable*** (1) Lot size (acres), (2) Number of bedrooms, (3) Number of bathrooms, (4) Number of other rooms, (5) Number of Garage spaces, (6) Number of carports, (7) Number of fireplaces, (8) 1 if city central, 0 otherwise, (9) 1 if city west, 0 otherwise, (10) 1 if city north, 0 otherwise, (11) 1 if city south, 0 otherwise, (12) 1 if city South-east, 0 otherwise, (13) 1 if rural, 0 otherwise, (14) 1 if basement, 0 otherwise, (15) 1 if gas/electricity,0 otherwise, (16) 1 if forced air/hot water, 0 otherwise, (17) 1 if aluminium, 0 otherwise, (18) 1 if wood, 0 otherwise, (19) 1 if stucco, 0 otherwise, (20) 1 if vinyl, 0 otherwise, (21) 1 if osid, 0 otherwise, (22) 1 if outside basement entry, 0 otherwise.	(1) The coefficients of all the independent variables (12), (15), (18), and (20) are significant at the 10 percent level of significance. (2) Variables (1), (2),(3), (5), (6), and (7) are statistically significant determinants of residential housing prices. (3) Observations remain valid when heteroscadasticity-adjusted standard errors are used instead of OLS standard errors. (4) The coefficients variable (18) and (20) are all negatives and statistically significant. The coefficients of variables (8), (9), (10),(11), (12), (19) and (21) are all statistically significant. Neither variable (15) and nor variable (16) is a significant determinant of residential housing prices. The coefficients of variables (14) and (22) are all positive.
Wilhemsson (2002),Cross sectional data which include only 318 transactions	Log-Linear and Box-Cox	***Dependent Variable*** House selling price ***Independent Variable*** (1) Living area (price), (2) Lot size (Price), (3) Quality (price), (4) Quietness (Price), (5) Changes in real economics, (6) Permanent income, (7) Mortgage, (8) Family size, (9) Household age.	(1) The main objective of the study is to demonstrate how the linear expenditure system approach can be used in the estimation of housing attribute elasticities. (2) Estimation of the hedonic price equation is conducted using a Box-Cox transformation. The Study has chosen to use four specifications of the hedonic price equation that together will provide four estimates of the implicit price. Model 1, the

			base specification, is a log-linear specification using the whole sample period; Model 2 is a Box-Cox specification using the whole sample; Model 3 and 4 are based on a different transformation of the hedonic price equation in each time period. (3) The implicit prices were estimated by a Box-Cox transformed hedonic price equation. However, the robustness or sensitivity of the estimates in the linear expenditure system was tested for different choices of specifications; the conclusion was reached that they are relatively insensitive to functional form. (4) All the estimated parameters differ statistically significantly from zero and have the expected sign. Furthermore, each is of reasonable magnitude. An increase by 1% of the living –area attribute will increase the price of the price of the house by 0.5%. the five variables can explain around 60% of the deflated price variation.
Toda & Nozdrina(2004), 5282 observation	Linear	***Dependent Variable*** *House selling price* ***Independent Variables*** (1) Size of an apartment including a bathroom and hallway, (2) The size of a kitchen, (3) The distance from a nearby metro station is measured in meters, (4) The distance from the city center, (5) Location, (6) Wage arrears, (7) Two room, (8) Three room, (9) Four and more rooms, (10) A room can be accessed directly from a hallway or not, (11) The material for the exterior wall, (12) The number of balcony, (13) Elevator, (14) The materials for floor, (15) Apartment repaired or not, (16) Location condition, (17) East, (18) Northeast (19) Northeast, (20) Northwest, (21) Southwest, (22) South, (23) Southeast with North as the base, (24) The number of workers the enterprises want to employ, (25) Apartment new, (26) Apartment under construction.	(1) The data used in these estimations are the various attributes of individual apartments and the prices proposed by the agents who were selling them in February and April 2002. All regression equations for two periods were estimated by ordinary least square method and obtained the same results for each one.(2) (2) The result of the estimation of regression equation on the data in February 2002 is in following. Number of observations is 5,282. The F-ratio with the degrees of freedom 22 and 5259 is equal to 256.58. The R-squared and the adjusted R-squared are equal to 0.5177 and 0.5157 respectively. (3) The result of the estimation equation on the data in April 2002 is in following. Number of observations is 6551. The F-ratio with the degrees of freedom 21 and 6529 is equal to 0.5120 and 0.5105 respectively. (4) Among the attributes of an apartment, the total

			size, the size of kitchen, the number of room, the degree of certainty with which a buyer can move into an apartment in a short period play a significant role. The building materials for wall and for floor, whether an apartment has been repaired. Whether the building has an elevator are also relevant in the determination of apartment price.
Maurer & Pitzer& Sebastian (2004), 223,705 total and 84,686 restricted observation	Box-Cox	***Dependent Variable*** House selling price ***Independent Variables*** (1) Dwelling area, (2) Elevator, (3) Bathroom, (4) The number of kitchen, (5) Number of garage, (6) Garden, (7) Terrace, (8) New dwelling, (9) Occupied by buyer, (10) Partly Occupied, (11) Occupied by tenant, (12) Basement, (13) Second floor, (14) Third floor, (15) Fourth floor, (16) Fifth floor, (17) Sixth floor, (18) Seventh floor, (19) Construction period dummies	(1) In the study, for monthly and quarterly period 2 different regression equations constructed. In the model which was constructed for quarterly period, R^2 value was found % 89.1. (2) Sign and size of the regression coefficient are economically intuitively plausible with except for the variable (12). The coefficients for all other floors are positive and increase up to the fifth floor. This means, that as the floor location of the building increases, so does the price of the property. Similar results were obtained for the construction year. The negative coefficients show that in the case of occupancy of the property, significant price reductions can be expected. (3) Almost all parameters are significant at the 1% level. (4) The White Heteroskedasticity Test statistic is significant with W=4984.274. Furthermore, was finding significant autocorrelation in the residuals. The first (second, third) order autocorrelation of the residuals: 0.213 (0.150,0.113). Therefore, following Newey and West's (1987) suggestion, t-values have been calculated using heteroskedasticity and autocorrelation consistent covariances even if only small changes occur due to the large sample.
Filho & Bin (2005) 1000 observation	Linear	***Dependent Variable*** House selling price ***Independent Variable*** (1) Number of bathrooms, (2) Number of bedrooms, (3) Dwelling area, (4) Land area, (5) Dwelling age in 1994, (6) Distance to nearest lake, (7) Distance to nearest wetland, (8) Distance to improved park, (9) Dwelling elevation, (10) Distance to nearest industrial zone, (11) Distance to the nearest commercial zone, (12) Distance to the nearest central business district, (13) Dwelling age.	(1) Variable (3),(4) and (13) affects house prices more than the other variables in the parametric model. Location variables (7), (9), (11) and (12) have significant effects on house selling prices in the parametric model. Variables (1), (2), (3), (4), (6), (9) and (11) affect house prices negatively, variable (12) affects house price stronger than the other variables, variable (13) have no effects on house prices in the non-parametric model. (2) Non-parametric liked much more than parametric model by reason of the results obtained.

Li & Prud'Homme&Yu (2006),33,595 observation	Linear,Semi-Logarithmic, Log-Linear and Box-Cox	***Dependent Variable*** House selling price ***Independent Variable*** (1) Total square footage of living area in the unit, (2) Total square footage of lot area, (3) Number of bedrooms, (4) Number of bathrooms, (5) Number of Garages (6) Number of fireplaces, (7) Number of total appliances, (8) Age of a unit, (9) Age of aunit^2, (10) Exterior finish is brick, (11) New House, (12) Unit has hardwood, (13) Heating fuel is natural gas, (14) Unit is at corner, (15) Unit is at cul-de-sac, (16) Terrace, (17) Distance to the shopping center, (18) Central/Built-in vacuum, (19) Indoor or outdoor pool, (20) Whirlbath, (21) Sauna (22) Air condition system, (23) Unit is located at downtown, (24) South, (25) East, (26) WestDogu, (27) West then farwest, (28) Unit is located at inner suburb	(1) The Chow test results indicate that structural changes between adjacent years are mild though statistically significant. (2) The pooled regression for the semi-log model, however, results in a price index that closed matched those from separate regressions on the annual base. (3) In fact the hedonic price indexes are insensitive to structural changes over the years and to the differences in the Laspeyres and Paasche types formulation. (4) The Box-Cox analysis rejects the linear, semi-log and log-linear functional forms. It also suggests that the problem of heteroskedasticity can be mitigated by choosing the more correct functional form.

Source: Compiled by the Author