



URBAN HOUSING AFFORDABILITY IN KENYA

A Case Study of the Mortgage Housing Sector in Nairobi

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DECLARATION

I hereby declare that this thesis is my original work and has not been presented for a degree in any other University

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Raphael M. Kieti

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DEDICATION

I dedicate this work to the victims of slums fire disasters all over the world and especially the victims of the **SINAI FIRE DISASTER** that occurred in Nairobi, Kenya (September 12, 2011), whose lives would have been saved if decent housing was accessible and affordable to all.

ABSTRACT

Over 70 % of urban households in Kenya experience severe housing affordability challenges. Affordability problems are manifested in the high levels of homelessness, poor human settlement conditions, high price of housing relative to the incomes of households, mortgage delinquencies, defaults and foreclosures. This study investigated factors affecting housing affordability in Kenya. Previous studies on housing in Kenya have been descriptive in nature and little or no emphasis has been made on empirical studies on factors affecting affordability especially with regard to contribution of the factors to housing affordability. The result has been a lack of knowledge on which factors are critical in explaining the affordability problems of urban households in Kenya. The objectives of this research work were therefore to: identify significant factors that affect housing affordability, determine the influence of the significant factors and rank them with respect to contribution to housing affordability and, suggest policies necessary to address the urban housing affordability problem in Kenya.

The research focused on affordability in the home-ownership mortgage housing sector in Nairobi. The methodology was based on a questionnaire survey to households with mortgage loans from Housing Finance Institutions and Banks. A total sample size of 390 households was targeted for the study. However, 353 households responded to the survey yielding a response rate of 90.5%. Information relating to social-economic characteristics of the households, loan and property data as well as macroeconomic data was analyzed in order to address the objectives of the study. The analyses were done using qualitative and quantitative approaches with the aid of the Statistical Package for Social Sciences (SPSS) software. Three statistical procedures, namely; descriptive statistics, correlation analysis and regression analysis were performed on the data with the aim of identifying factors which are significant predictors of housing affordability.

The research found that there is a significant linear relationship between housing affordability and the factors: Interest on loan, Number of dependants (outside the nuclear family), Number of family members with income, Construction cost, Size of the household, Loan-to-value (LTV) ratio, Land value, Real gross domestic product (GDP) per capita, Job position/status of the individual paying the mortgage, Type of mortgage instrument, Loan term, Loss of regular employment income and the rate of inflation. The results indicated that the interest charged on mortgage loan has the greatest influence on the affordability of the households. The interest on loan which reflects the mortgage interest rate charged by the banks influence

affordability because it determines the borrower's monthly mortgage repayment amounts. The results showed that an increase in the amount of interest charged on the loan increases the monthly loan repayment placing a higher repayment burden on the households thus affecting their affordability.

Applying Multiple Regression Analysis (MRA) to determine the contribution of the significant factors and, therefore, rank them with respect to contribution to affordability, the results showed that eight (8) factors namely; Interest on loan, Number of dependants (outside the nuclear family), Loan-to-value (LTV) ratio, type of mortgage instrument, Number of family members with income, Loan term, real GDP per capita and size of the household, have a significant contribution to affordability and are therefore the most critical factors that influence affordability in the home ownership (mortgage) housing sector in Kenya.

The regression model comprising of the eight critical factors has a correlation coefficient (R) of 0.833 and a coefficient of determination (R^2) of 0.693. The model has a significant F-value of 97.127, indicating that the eight factors are significant predictors of housing affordability. Among the eight factors, interest on loan is the most important factor accounting for 52.8% of the variance in affordability, while the size of household is the least important factor.

From the literature review and the results of the analyses performed in this study, it was concluded that housing affordability is influenced by clusters of factors related to the households' social economic characteristics, loan characteristics, property attributes and macro-economic factors. The households social economic characteristics among others include; the Loss of regular employment income, Number of dependants, Number of family members with income and Size of the household. The loan factors include the Interest charged on loan, Loan-to-value (LTV) ratio, Loan term and the Type of mortgage instrument. The property attributes are the Cost of construction, Land value, Developers profit and Property transfer costs. The macro economic factors include the Rate of inflation, Real gross domestic (GDP) per capita and Unemployment rate.

The results of the analyses showed that the social economic factors affect affordability because they influence households' income. The loan factors influence affordability because they affect the price of housing and the monthly mortgage repayments of the households. The property factors affect the price of housing and therefore the monthly loan repayments. The macro economic factors affect both the income of households and housing price as well as

mortgage interest rates charged by the banks and financial institutions. Policy measures have been proposed to reduce or stabilize mortgage interest rates, reduce the price of housing, and improve household's income so as to enhance access to housing and improve affordability among urban households in Kenya.

The research thesis is organized into six chapters. Chapter one covers the general background to the study in the form of introduction, problem statement, study objectives and hypothesis as well the significance and limitations of the study. At the end of the chapter, the organization of the study is presented. Chapter two provides a general over view of the urban housing problem with reference to developing countries. The purpose of the review is to develop a frame work and lay a solid foundation necessary to contextualize the urban housing affordability problem generally and in particular factors affecting affordability in Kenya.

Chapter three provides the theoretical and conceptual framework of the study. In particular, the theories that explain the urban housing affordability problem in developing countries are identified and explained. Review of theories in research studies is important because they offer a theoretical basis for undertaking the research study. Theories explain the phenomenon that is being studied and offers tentative theoretical answers or solutions to the problem that is being investigated. The last section of the chapter reviews literature on the factors affecting affordability and formulates a conceptual model of affordability and its determining factors.

Chapter four defines the research design and methodology adopted to address the research questions and objectives of the study. The chapter begins with a brief description of the case study area, Nairobi, its location in Kenya, population dynamics and the housing situation that necessitates the need for policy interventions to address the affordability challenges of households in the City and Kenya in general. The chapter then discusses the research design adopted for the study by highlighting the sources and types of data used, the procedures employed in deriving the research variables and a description of the relevant variables and data used in the study. Chapter five identifies the factors that affect housing affordability in the home ownership mortgage housing sector and ranks them with respect to contribution to affordability. Chapter six provides a summary and discussion of the main research findings, the conclusions drawn from the research findings as well as contribution to knowledge, policy recommendations and suggested areas of further research.

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LIST OF ABBREVIATIONS

AFDB	African Development Bank
AHURI	Australian Housing and Urban Research Institute
ARM	Adjustable Rate Mortgages
ANHS	Australian National Housing Strategy
BAI	Banco Africano De Investimento
BBK	Barclays Bank of Kenya

CAHF	Centre for Affordable Housing Finance
CBK	Central Bank of Kenya
CGT	Capital Gains Tax
CMA	Capital Markets Authority
CRBs	Credit Reference Bureaus
CRI	Collateral Replacement Indemnity
CFC	CFC Stanbic Bank
CPI	Consumer Price Index
COHRE	Centre on Housing Rights and Evictions
DBL	Development Bank Limited
EMCA	Environmental Management and Coordination Act
EA	Environmental Audit
EIA	Environmental Impact Assessment
EFinA	Enhancing Financial Innovation and Access
FXBs	Forex Bureaus
FRM	Fixed Rate Mortgages
GDP	Gross Domestic Product
GNI	Gross National Income
GCR	Greater Cairo Region
HFI	Housing Finance Institutions
HFCK	Housing Finance Company of Kenya/ Housing Finance
HIDTF	Housing Infrastructure Development Trust Fund
IMF	International Monetary Fund
IRA	Insurance Regulatory Authority
JCHS	Joint Centre for Housing Studies
KCB	Kenya Commercial Bank
KIPPRA	Kenya Institute of Public Policy Research and Analysis
KSHS	Kenya Shillings
KNBS	Kenya National Bureau of Statistics
LRP	Land Readjustment Program
LTP	Land Taxation Policy
LTV	Loan -to- Value Ratio
LPTs	Listed Property Trusts
MBS	Mortgage Backed Securities

MRA	Multiple Regression Analysis
MFC	Mortgage Finance Company
MF4A	Making Finance Work for Africa
MLF	Mortgage Liquidity Facility
NCEO	City of Nairobi Environment Outlook
NGOs	Non Governmental Organizations
NHFC	National Housing Finance Corporation of South Africa
NPLs	Non Performing Loans
NSE	Nairobi Securities Exchange
NSW	New South Wales
PMIs	Primary Mortgage Institutions
PIERT	Public Interest Economic Regulation Theory
REITs	Real Estate Investment Trusts
SPSS	Statistical Package for Social Sciences
SACCOs	Savings and Credit Cooperative Societies
TMRC	Tanzania Mortgage Refinance Company
UN- HABITAT	United Nations Human Settlement Programme
UNCHS	United Nations Centre for Human Settlement
US	United States of America
US DOLLAR	United States of America Dollar
VIF	Variance Inflation Factor

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.0 Introduction

Housing is regarded as a system made up of shelter and the supporting basic infrastructure required by man. It is a basic human need in every society and is considered a fundamental right of every individual (Akinwunmi, 2009). The right to housing is embedded in various international instruments including the United Nations Human Rights Declaration of 1948, the International Covenant on Economic, Social and Cultural Rights of 1966, the Istanbul Declaration and Habitat Agenda of 1996 and the Declaration on Cities and other Human Settlements of 2001 (Republic of Kenya, 2004). The right to housing is further embedded in the Constitution of Kenya 2010. Article 43 (1b) of the Constitution provides that every person has the right to accessible and adequate housing, and to reasonable standards of sanitation. Nabutola (2004) has equated shelter to food, which is a human need, so much so that those who cannot afford it still need it.

Since the early times, man has made relentless efforts to obtain housing. The struggle for this basic need has increased progressively as the human race has advanced in numbers and cultural diversity. Housing has economic, social and political roles and is an indicator of development and welfare in a country (Chirchir, 2006). On the economic front, investment in housing contributes towards reducing poverty, generating employment, raising incomes, improving health and increasing productivity of the labour force. Housing plays a major role in serving as an asset (Alhashin and Dwyer, 2004). For a typical house-owner, the house is a major asset in his portfolio and for many households, the purchase of a house represents the largest (and often only) lifelong investment and a store of wealth. Socially, housing has substantial benefits including the welfare effects of shelter from the elements, sanitation facilities and access to health and education services (Chirchir, 2006). Habitable housing contributes to the health, efficiency, social behavior and general welfare of the populace (Nubi, 2008). Improved health and education and better access to income earning opportunities can lead to higher productivity and earnings for families. Housing plays the role of promoting privacy, dignity, safety and status among people. Politically, proper housing reduces political unrest emanating from shelter

deprivation and frustration of people living in slums and informal settlements. Semple (2007) argues that housing is important to the development of stable and sustainable communities.

The importance of housing stands in contrast to the current housing situation in most cities of developing countries. While a number of countries have responded to their respective housing problems, majority of developing countries still face acute housing deficits. In the developing countries of Africa, almost every country is experiencing a housing shortage which in most cases is growing. According to UN-habitat (2011), estimates of housing deficits for the period 2001-2011 indicated that over 60 million new dwellings needed to be constructed to accommodate the rapidly growing number of new urban households in Africa. The condition of housing in these countries is also very poor, with majority of people living in slums and informal settlements. A UN-habitat global audit on slums in 2001 showed that 3 out of 10 inhabitants living in urban areas were slums dwellers. Among the regions of the world, Sub-Saharan Africa has the highest slum growth rate of 4.53% per annum and also the highest proportion of slum dwellers at 61.7% in 2010 (UN- habitat, 2011).

The reasons for poor housing conditions in developing countries is a combination of poor policies and the limited resources available to meet the investment needs of rapid urban population growth. This has given rise to substantial gaps between housing supply and demand in most cities of the developing world leading to high house prices in these countries. According to UN-habitat, 2011, house prices in the developing countries of Africa are too expensive. The inputs to housing are too expensive especially land, finance and building materials. Data from selected countries in Africa on the cheapest newly built house by a formal developer show that in 2013, the cheapest house for sale in Mali was US dollar 5,800 (excluding land), US dollar 13,300 in Egypt, US dollar 28,000 in Tanzania and US dollar 50,000 in Gambia (CAHF,2013).

Like most of the other developing countries in Africa, Kenya's housing sector has experienced severe housing shortages relative to demand. While demand has been rising consistently over the years, supply has been slow to respond, meeting only approximately between 0.1 % and 2.2 % of the actual demand (Gachuru, 2005). Since independence, the government of Kenya through designed public housing schemes made efforts to develop houses to boost supply and contain the deficit. As a result, the housing deficit was contained at 60,000 units per year until the 1980's (Chirchir, 2006). Over the years, the shortfall has cumulatively increased. Currently, an

estimated 750,000 and 1,500,000 households in urban and rural areas respectively are in need of housing (Republic of Kenya, 2004). The estimated current urban housing needs are 150,000 units per year while the production rate of new houses is estimated at only 20,000- 30,000 units annually, giving a housing shortage of over 120,000 units per year.

According to Chirchir (2006), the key factors among many that have contributed to this unprecedented housing shortage include the government's reduced budgetary allocation on public housing and infrastructure development, high rural-urban migration rate that has stretched housing demand in urban areas, high cost of land and building materials and the limited and high cost of housing finance. The effect of these factors as well as the rapid increase in the urban population of towns and cities in Kenya have further widened the supply/demand gap inevitably leading to the high prices and rents being charged on housing. This has given rise to affordability challenges among urban households in Kenya. Problems of affordability have been exacerbated by the low income levels of households. Poverty statistics in Kenya show high number of people living below the designated poverty line (Economic Survey, 2014). In Nairobi, 22% of the population live in poverty (CAHF, 2012). According to the Africa Housing Finance Year Book 2012, by the Centre for Affordable Housing Finance in Africa (CAHF), only about 11% of Kenyans earn enough to support a mortgage. This means that most households cannot afford an average mortgage necessary to buy an entry-level house. Affordability is currently the main urban housing challenge affecting the urban population in Kenya. While efforts have been undertaken to tackle this challenge, the affordability problem has persisted and is more acute among low and middle income groups in society. In order to tackle this problem, there is need to investigate the significant factors that affect housing affordability in Kenya. Further, there is need to determine the contribution of the factors to housing affordability. Knowledge of the significant factors and their contribution to affordability is essential for the development and design of appropriate policies to tackle the serious challenge of housing affordability in Kenya.

1.1 Problem Statement

During the last three decades, Kenya has been experiencing very rapid urbanization resulting from natural population growth and large-scale rural-urban migration driven by rapid social economic changes and development. This phenomenon of urbanization has brought with it enormous challenges manifested in the acute shortage of housing resulting to overcrowding, high house prices, substandard human settlement conditions such as slums and squatter settlements, inadequate infrastructure, community facilities and services (Obudho and Aduwo, 1998; Kusienya, 2004). The acute housing shortage in Kenya has given rise to serious affordability challenges as demand for housing continue to outstrip supply. The affordability problems are manifested in the high levels of homelessness, poor human settlement conditions, high price of housing relative to the incomes of households, mortgage delinquencies, defaults and foreclosures.

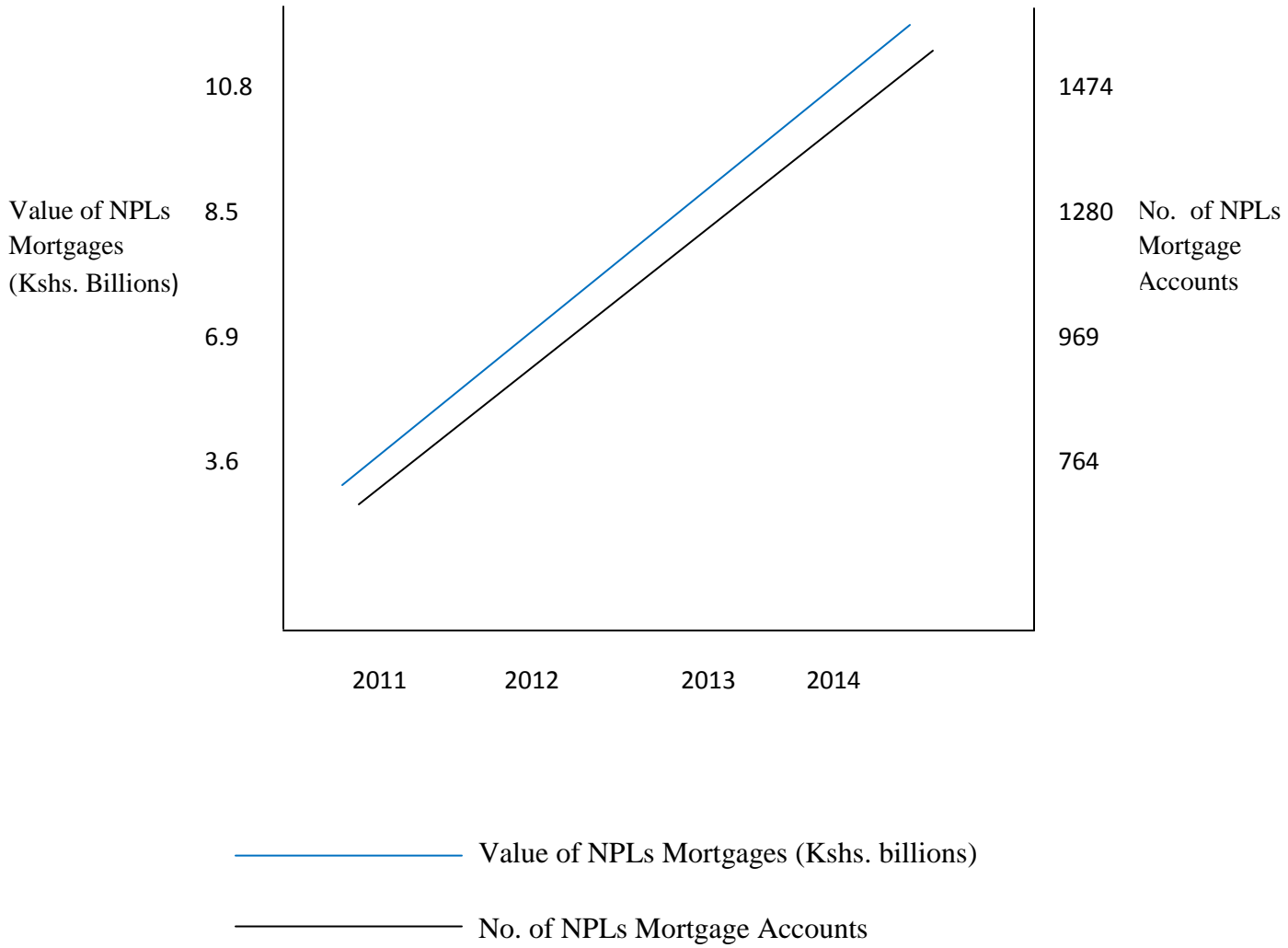
House prices in Kenya's urban centres have increased tremendously over the last decade. Property values have increased by over 3 times since year 2000. The average value of a property grew from Kshs. 7.1 million in 2000 to Kshs. 22.3 million in 2012 (HFCK, 2012). The Hass Consult property index shows property price rise of 1.3% in 2012 and 1.4% in 2011. The price for both detached and semi-detached houses rose by 1.8%, while apartment prices increased by 2.3% in 2013(Hass Consult Report, 2013). According to the Africa Housing Finance Year book 2012 and 2013 by the Centre for Affordable Housing Finance in Africa (CAHF), the cheapest newly built house by a formal developer in Kenya costs between US dollar 13,000 and US dollar 18,000 and would require a monthly income of US dollar 677 with a 10% deposit on a 20 year mortgage at 19% interest rate. Given a statutory minimum wage of US dollar 162 in Kenya, it would take on average the equivalent of between 7 to 9 salary years for a household on the minimum wage to complete paying the mortgage for the cheapest house. This is based on the assumption that the household shall spend all its earnings on housing which is unrealistic. According to the 9th Demographia International Housing Affordability Survey 2013, households should not spend more than the equivalent of 3 salary years to complete paying for their mortgages.

There are many factors that contribute to the high prices of houses in Kenya, among them, the cost of land and infrastructure, cost of labour and building materials and the high cost of finance due to the high interest rates charged by Banks and Financial Institutions. The rates of mortgage interest in Kenya have been high over the last decade. In the year 2000, for example, interest rates on mortgages were high at 19% and remained at almost the same level until the year 2002. The rates of mortgage interest averaged 13% from the year 2003 to 2007. In the year 2011, interest on mortgages averaged 20%. In the year 2012, interest rates charged by banks in Kenya were on average 18% and ranged from 11% to 25%, and in 2013, the average interest on mortgages was 16.89% ranging between 15.5% and 19% (CBK Annual Reports, 2012 and 2013).

The high mortgage interest rate regime that has prevailed in the country over the past years has impacted negatively on the performance of the mortgage market in Kenya. Consequently, as a result of the high interest rates, only a tiny proportion of the urban population in Kenya can afford a mortgage at market interest rate. The Hass Consult Limited estimates that only 50% of people living in urban areas can service a kshs. 700,000 mortgage, only 4% are able to take up a kshs. 3.9 million mortgage and only 1% can afford a kshs.5.9 million home loan at the current interest rates (Hass Consult Ltd, 2013). Given an average mortgage loan size of kshs. 6.4 million in Kenya, it means that mortgage affordability is limited to a very small proportion of the urban population.

Affordability problems in the mortgage housing sector in Kenya are manifested by delinquencies and defaults in loan servicing. According to the Central Bank of Kenya (CBK) mortgage market survey reports of 2011 and 2012, the value of non-performing mortgage loans (NPLs) increased from Kshs 3.6 billion in 2011 to Kshs. 6.9billion in 2012, representing an increase of Kshs.3.3billion, or over 90% growth of non-performing mortgages (CBK Annual Reports, 2011 and 2012). As indicated in Graph 1.0 and Table 1.1, the number of non-performing mortgage accounts over the same period increased from 764 to 969 accounts, which is a growth of 27% of non-performing mortgage accounts. The value of non-performing mortgage loans increased to Kshs. 8.5 billion in 2013 and Kshs. 10.8 billion in 2014, with the number of non-performing mortgage accounts increasing from 1,280 to 1,474 accounts over the same period (CBK Annual Reports, 2013 and 2014). The increase in the value and number of non-performing mortgages is

an indication of affordability challenges experienced by households in the mortgage housing sector in Kenya.



Graph 1.0 Value and Number of Non-Performing (NPLs) Mortgages 2011- 2014

Source: Author's Construct with data from CBK Annual Reports of 2011- 2014

Table 1.1 Residential Mortgages Market Performance 2011&2012

Source: CBK Annual Reports, 2011 and 2012

Year	2011				2012			
Financial Institution	Value of Mortgages Outstanding (Ksh. Bns)	Value of NPLs Mortgages (Ksh. Bns)	No. of Mortgage Accounts	No. of NPLs Mortgage Accounts	Value of Mortgage Outstanding (Ksh. Bns)	Value of NPLs Mortgages (Ksh. Bns)	No. of Mortgage Accounts	No. of NPLs Mortgage Accounts
Housing Finance Ltd	25.8	1.6	4,932	310	30.3	2.3	5,235	396
Kenya Commercial Bank	18.1	1.0	4,073	204	31.5	2.2	5,091	282
CFC Stanbic Bank	8.8	0.83	1,210	9	9.5	0.19	1,340	24
Standard Chartered Bank	7.8	0.12	1,251	32	9.7	0.16	1,480	30
Barclays Bank Ltd	4.4	0.22	939	14	4.3	0.19	1,021	6
Co-operative Bank Ltd	2.2	0.42	289	1	6.6	0.31	398	33
National Bank Ltd	3.1	0.81	154	18	4.1	0.57	221	15
Consolidated Bank	2.8	0.69	302	4	3.8	0.29	566	28
Equity Bank Ltd	3.4	0.24	682	6	3.7	0.35	702	10
Others	14.2	0.57	2,197	166	18.6	0.74	3,123	145
TOTAL	90.4	3.6	16,029	764	122.2	6.9	19,177	969

Affordability problems in Kenya are exacerbated by low incomes of households. According to the Economic Survey 2014, average annual wage earnings per employee in both public and private sectors was kshs. 497,488 in 2013, which translates to an average monthly income of kshs. 41,000. Clearly, this income is insufficient to meet the monthly loan repayments for the average loan size of kshs. 6.4 million which would require approximately kshs 99,000 per month at an interest rate of 18% repayable over a period of 20 years. Table 1.2 shows the average annual wage earnings per employee in both the public and private sectors between years 2009 and 2013.

Table 1.2. Average Wage Earnings Per Employee, 2009-2013 (Kshs. Per Annum)

Source: Economic Survey, 2014

Year	2009	2010	2011	2012	2013
Public sector	380,454.3	402,328.5	432,521.6	485,016.0	565,755.2
Private sector	384,429.3	391,769.1	404,521.3	420,570.1	467,689.7
Public& Private Sector (Average)	383,187.6	395,014.7	413,164.1	440,364.1	497,488.0

As a result of the low earnings, and given the high unemployment rate which currently is estimated at 40%, poverty levels are high in both rural and urban areas in Kenya. According to the 2005/2006 Integrated Urban Household Budget Survey, 46.6% of Kenyans were living in poverty and in 2009, 45.2% lived below the poverty line (Economic Survey, 2014). In urban areas, 33.5% translating to approximately 3.9 million people live below the poverty line. Poverty incidence in Nairobi is currently 22%, meaning that 2 in every 10 people in Nairobi live in poverty (Economic Survey, 2014).

The main aim of this research work was to identify significant factors that influence affordability in the mortgage housing sector in Kenya and to determine the contribution of the

factors to affordability. While there exist a lot of literature on housing in Kenya, unfortunately, there is no empirical research on housing affordability and especially on the factors affecting affordability. There is, therefore, a lack of knowledge on which factors are critical in explaining the affordability problems of urban households in the mortgage housing sector in Kenya. Previous studies on housing in Kenya have been descriptive in nature and have focused on the supply of low cost housing, slums and informal settlements, housing finance and sustainable housing delivery.

A report by Syagga, Mitullah and Karirah (1999 cited by Warah, 2001), for instance, focused on slums and informal settlements. Several publications by the United Nations Centre for Human Settlement (UNCHS) have also extensively examined the urban slum challenge in Kenya. Nabutola (2004) highlighted the constraints to affordable housing provision. Gachuru (2005) analyzed the impact of financial de-regulation on mortgage loan performance in Kenya. Chirchir (2006) examined the potential role of retirement benefits in promoting home- ownership, while Kiriko (2013) offered a critical analysis of urban housing deficits in Kenya. Clearly, housing affordability studies have not been given attention in the academic housing literature in Kenya.

However, within the international housing literature, there have been some empirical studies on factors affecting affordability. Bujang et al (2010) analyzed the relationship between demographic factors and housing affordability in Johor Bahru in Malaysia and found that affordability is influenced by four factors related to households' social economic characteristics, that is, marital status, level of education, monthly income and number of income earners in a household. In the study by Mostafa et al (2005) on the relationship between housing affordability and economic development in Hong Kong, three macro economic factors, that is, gross domestic product, inflation rate and income were found to have a significant relationship with affordability in Hong Kong.

The study by Bujang et al (2010) and that of Mostafa et al (2005), however, did not identify the most critical factor neither did they rank the factors with respect to contribution to affordability. The subject study bridges that gap by contributing to the empirical analysis of factors affecting affordability through an objective identification and measurement of the contribution of the significant factors to mortgage affordability in Kenya.

Further, while the studies by Bujang et al (2010) and Mostafa et al (2005) are important in understanding the causes of affordability problems, there is need to identify more social economic and macro economic factors that influence mortgage affordability. Also, in an effort to extend the studies and to fully understand the causes of affordability problems, it is important to investigate other factors that are critical in explaining the affordability problems of households especially within developing countries like Kenya. Examining the causes of affordability problems from the point of view of only the social economic and macro economic factors fails to capture the multi- dimensional nature of affordability. Property attributes like the size and value of land, cost of construction, developers profit and property transfer costs are important factors in house price determination and, therefore, have the potential to influence affordability. The impact of these property related factors on affordability has, however, not been analyzed. The impact of loan factors like the loan repayment period, loan -to- value ratio and type of mortgage instrument on mortgage affordability has also not been studied.

In order to fully address the pressing affordability challenges in the mortgage housing sector in Kenya, this study proposes that the causes of affordability problems should be examined from the point of view of households' social economic characteristics, property attributes, loan characteristics and the macro economic factors. A rigorous analysis of these factors especially with regard to their contribution to affordability will enrich housing research and give policy on affordability in Kenya some kind of direction and focus.

1.2. Study Hypothesis

Null Hypothesis (H₀): “The interest charged on a mortgage is not the most important factor that affects housing affordability in Kenya.”

Alternative Hypothesis (H_A): “The interest charged on a mortgage is the most important factor that affects housing affordability in Kenya.”

1.3. Research Objectives

The specific objectives of the research work are:

- i). To identify significant factors that affect affordability in the mortgage housing sector in Kenya
- ii). To determine the influence of the significant factors and rank them with respect to contribution to housing affordability
- iii). To develop a model to guide policy on affordability in the mortgage housing sector in Kenya.

1.4. Research Questions

The study is guided by three fundamental research questions:

- i). Which significant factors explain affordability problems of urban households in the mortgage housing sector in Kenya?
- ii). What is the contribution of the factors to housing affordability?
- iii). What policy measures are necessary to address the affordability problems of households in the mortgage housing sector in Kenya?

1.5. Scope and Area of Study

The study focused on urban housing sector and, therefore, considered affordability problems of urban households. The study was limited to the urban housing sector because urban housing problems in Kenya are more severe than rural housing problems both in their intensity and complexity. The main housing problems of rural areas revolve around housing quality issues in terms of sanitation and infrastructure of existing housing and not affordability. Housing affordability problems are of less importance in rural areas than in urban areas. In Kenya, urban areas have higher population growth rates and higher population densities. Urban areas also have higher costs and values of land and property and higher levels of income and employment disparity. Consequently, overcrowding, high house prices, slums and informal settlements are common features of the Kenyan urban land scape. Thus the study focused on the urban sector because it has more severe housing problems.

In terms of geographical scope, the study covered Nairobi and considered affordability in the home-ownership mortgage housing sector. Home-ownership housing sector was considered because it is the preferred tenure choice by majority of urban households because of the security and stability it offers as opposed to renting. Mortgage housing was selected for the study because it offers immediate access to decent and adequate housing as opposed to incremental building. Mortgage housing is the dominant mode of home acquisition in Nairobi with majority of households (over 30%) acquiring homes through mortgage financing (Republic of Kenya, 2005, 2009). There is thus the need to find solutions to affordability problems in the mortgage housing sector in order to promote home-ownership in Kenya.

The study covered households in the four zones/ locations of Nairobi covering residential estates located in the South of Nairobi which included estates in Langata, South B and South C estates and also estates off Mombasa Road. The study also included residential estates in the East of Nairobi covering the estates in Buruburu, Donholm, Savannah, Greenfields and Baraka estate in Embakasi, among others. The study further included the West of Nairobi including households in Westlands, Parklands, Ngong Road, Kilimani, Kileleshwa and Lavington, among others. Lastly, the study covered the North of Nairobi including Rosslyn Estate, Nyari, Runda, Muthaiga, Thome and Garden estate, among others.

Nairobi is chosen because it is the largest and fastest growing city in Kenya. Nairobi is an important city in the national economy contributing about 47.5% of the total Gross Domestic Product (Economic Survey, 2014). Information in Nairobi is accessible and is fairly current and well documented. Households in Nairobi have a major housing affordability problem with over 60 % of the population living in slums and squatter settlements (Cohre, 2008). Compared to other towns in Kenya, the population of Nairobi currently estimated at over 3 million people is high and the number of households estimated at 985,016 households means a higher demand for housing, hence the high prices and rents charged on housing in Nairobi. Incomes are low and poverty levels are high with over 22% of households in Nairobi living below the poverty line (Economic survey, 2014). The dependency ratio, defined as the proportion of the population in Nairobi that is dependent is currently high at 52.7% and this ratio is much higher among the poor at 71.3%. Home-ownership rate in Nairobi is quite low at 7.6% compared to 87.9% of households who rent their accommodation. The low incidence of home-ownership is attributed to

the high cost of housing and the low incomes of households which explain the pressing affordability challenges of households in Nairobi. Understanding the factors affecting affordability in Nairobi, therefore, serves as a useful guide towards understanding and appreciating the general urban housing affordability problem in Kenya.

1.6. Significance of the Study

The analyses and findings from this research are of interest to researchers, academicians and policy makers. Researchers and housing experts are keen to understand the affordability determinants which are relevant and significant in the Kenyan mortgage housing sector. Knowledge of the significant affordability determinants would guide policy makers in housing policy formulation to achieve immediate and sustained housing affordability which is necessary towards the realization of Kenya Vision 2030. The Vision 2030 strategy envisions a Nation that is adequately and decently housed in a sustainable environment. The main goal of Vision 2030 with regard to housing is to increase production of housing and to achieve better development and access to affordable housing among all the households in Kenya. The findings emanating from this research would help economic planners and policy makers to design appropriate and more focused policies targeting the factors which have been found in this study to be more critical in explaining affordability problems of households in the mortgage housing sector in Kenya. The findings would also help in providing information necessary to guide general economic policy formulation and intervention programmes affecting the housing sector of the economy. Further, given the current dearth of empirical studies on mortgage housing affordability, this study constitutes an important pioneering work and contributes towards filling the existing literature gap in this area of housing research in Kenya as well as other countries.

1.7 Limitations of the Study

The key limitations encountered in the course of this study were data related, mainly, inherent in the information on which the study relied upon. The study sought to analyse affordability of households with mortgages from Housing Finance Institutions (HFIs) and Banks in Kenya. Information from these institutions was difficult to get and despite numerous efforts, only one Housing Finance Institution, that is, the Housing Finance Limited agreed to release its data. Whereas relying on mortgage data from only one Financial Institution has the potential to affect

the outcome of the study, The Housing Finance Limited accounts for over 25 % of all mortgages in Kenya and upto 40% of all the Mortgages in Nairobi. The information obtained from Housing Finance Limited was thus taken as representative of the mortgage market in Kenya. Further, data on macro-economic factors affecting affordability were obtained from secondary sources, for example, Annual Economic Survey Reports and yearly Statistical Abstracts from the Kenya National Bureau of Statistics (KNBS). Current information on some macro economic data from these secondary documents was not available thus posing a limitation to the study.

1.8. Organization of the Study

The study is organized into six chapters. Chapter one covers the general introduction of the study in the form of introduction, problem statement, study objectives and hypothesis as well as the significance and limitations of the study. At the end of the chapter, the organization of the study is presented. Chapter two provides a general overview of the urban housing problem with reference to developing countries. The purpose of the review is to develop a frame work and lay a solid foundation necessary to contextualize the urban housing affordability problem generally and in particular factors affecting affordability in Kenya.

Chapter three provides the theoretical and conceptual framework of the study. In particular, the theories that explain the urban housing affordability problem in developing countries are identified and explained. Theory plays an essential role in research as it guides the development of research questions, selection of methodologies, and interpretation of results. Most importantly, the utilization of theory is necessary for the advancement of knowledge. Further, review of theories in research studies is important because they offer a theoretical basis for undertaking the research study. Theories explain the phenomenon that is being studied and offers tentative theoretical answers or solutions to the problem that is being investigated. The last section of the chapter reviews literature on the factors affecting affordability and formulates a conceptual model of affordability and its determining factors.

Chapter four defines the research design and methodology adopted to address the research questions and objectives of the study. The chapter begins with a brief description of the case study area, Nairobi, its location in Kenya, population dynamics and the housing situation that necessitates the need for policy interventions to address the affordability challenges of

households in the City and Kenya in general. The chapter then discusses the research design adopted for the study by highlighting the sources and types of data used, the procedures employed in deriving the research variables and a description of the relevant variables and data used in the study. Chapter five identifies the factors that affect housing affordability in the home ownership mortgage housing sector and ranks them with respect to contribution to affordability. Chapter six provides a summary and discussion of the main research findings, the conclusions drawn from the research findings as well as contribution to knowledge, policy recommendations and suggested areas of further research.

1.9 Summary

This chapter has presented the general introduction and broad justification of the study. The affordability problem of the urban housing challenge in Kenya has also been explained. Generally, the high cost of housing, the low incomes of households and the proliferation of slums and squatter settlements in the urban areas of Kenya are the most vivid manifestation of affordability problems. House prices in Kenya's urban centres are high relative to the incomes of the households. House prices have increased tremendously over the last decade. Property values have increased by over 3 times since year 2000. Many factors have contributed to the high price of housing in Kenya, among them the cost of land and infrastructure, cost of labour and building materials and the high cost of finance due to the high interest rate charged by banks and financial institutions.

The rates of mortgage interest in Kenya have been high over the last decade. In the year 2000 for example, interest rates on mortgages were high at 19% and remained at almost the same level until the year 2002. The rates of mortgage interest averaged 13% from the year 2003 to 2007. In the year 2011, interest on mortgages averaged 20%. In the year 2012, interest rates charged by banks in Kenya were on average 18% and ranged from 11% to 25%, and in 2013, the average interest on mortgages was 16.89% ranging between 15.5% and 19%. The high mortgage interest rate regime that has prevailed in the Country over the past years has impacted negatively on the performance of the mortgage market in Kenya with non- performing loans increasing from Kshs. 3.6 billion in 2011 to kshs. 6.9 billion in 2012. As a result of the high interest rates, only a tiny proportion of the urban population in Kenya can afford a mortgage at market interest rate.

Household incomes on the other hand have been low and have not grown to match the rapid increase in house prices. Average monthly income based on wage earnings in Kenya is kshs. 41,000/= and is insufficient to meet the monthly loan repayments of kshs. 99,000 for the average mortgage size at current mortgage interest rates.

The factors that affect affordability of urban households in the home ownership (mortgage) sector in Kenya can be explained from the point of view of the household's social economic characteristics, mortgage loan characteristics, property attributes, and the macro-economic environment.

The next chapter reviews literature on the urban housing problem with reference to developing countries.

CHAPTER 2

AN OVERVIEW OF THE URBAN HOUSING PROBLEM

2.0 Introduction

This chapter provides a general overview of the urban housing problem with reference to developing countries. The purpose of the review is to develop a framework and lay a solid foundation necessary to contextualize the urban housing affordability problem generally and in particular factors affecting affordability in Kenya. Developing countries especially those in Sub-Saharan Africa (SSA) are faced with a myriad of urban housing problems which ranges from housing deficits, the poor state of housing and affordability. An estimated one billion people around the world are inadequately housed, and of these more than 100 million are absolutely homeless. In most cities of the developing world, up to one-half of the urban population live in informal slums or squatter settlements which are neither legally recognized nor serviced. According to UN-habitat (2011), Sub-Saharan Africa has a high urban growth rate at 4.58% and slum growth rate at 4.53%, and also the highest proportion of slum dwellers at 61.7% in 2010.

The problems are exacerbated by the low income levels of households in these countries. About 36.5% of Africa's population earn below US dollar 2 per day (AFDB, 2011). In Sub-Saharan Africa, up to 75% live below the poverty line, and only about 3% of the population has income viable for a mortgage (CAHF, 2013). The house finance sector in these countries is seriously constrained by lack of adequate financial system. The Finance Institutions in developing countries are few, they charge very high interest rates and have high eligibility requirements making them inaccessible by majority of the urban population in these countries. On average, less than 20% of households in developing countries in Africa have access to formal financial services (MFW4A, 2013). This makes it difficult for households to acquire decent housing and explains the huge housing backlogs and affordability problems being experienced in developing countries.

The first part of this chapter offers analysis of housing deficits and provides country statistics of housing backlogs and current housing needs in selected African countries, the second section examines housing conditions and quality. The third section examines the issue of housing finance and finance markets in developing countries. The fourth section looks at the concept of

housing affordability, affordability measures and provides an overview of housing affordability problems in developing countries. The last section is the summary.

2.1 Housing Deficits

Housing deficit is generally understood to mean the unaddressed need for housing in a given locality. It is the shortfall occasioned by demand being higher than the supply of housing (Kiriko, 2013). Housing units needed is a function of such factors as the rate of new households formation, number of obsolete units, and the number of housing units that are required to relieve over-crowding. Housing supply is, on the other hand, dependent on the number of new housing units produced and existing units that have to be rehabilitated or up-graded to acceptable standards so as to be released into the housing market or to be allocated for occupation (Republic of Kenya, 1999).

Urban housing problems in both developed and developing countries are characterized by severe housing deficits and shortages. In 2003, the total housing need in Russia reached 1.6 billion square meters and nearly 1.5 million housing units are needed to meet Turkey's housing shortfall (Ultimate Contagion, 2013). India needs to spend US dollar 80 billion to fill its housing shortage and Brazil housing shortage now exceeds 6.5 million units. In Philippines, the housing backlog was estimated at 2.6 million in 2005 and Pakistan faces a shortfall of 6 million housing units (Ultimate Contagion, 2013). The housing shortage in Iraq is estimated at 1.4 million units while Iran needs to build over 1 million housing units annually to meet its demand.

In the developing countries of Africa, almost every country is experiencing a housing shortage, which in most cases is growing. According to UN-habitat (2011), estimates for the period 2001-2011 indicated that over 60 million new dwellings needed to be constructed to accommodate the rapidly growing number of new urban households in Africa. This figure does not, however, account for replacement of inadequate and dilapidated housing units or construction of additional units to relieve overcrowding.

In Table 2.1, current housing deficit figures in selected African countries as documented by UN-habitat (2011) and the Centre for Affordable Housing Finance (CAHF) 2012 show that Angola had an estimated housing deficit of 700,000 units in 2001 and this figure could double to 1.4 million by 2015. Housing supply in Angola is constrained by poor basic infrastructure, lack of

land tenure laws and regulations in the urban areas. The construction sector in Angola is underdeveloped and the local construction materials industry remains inadequate to meet the demand for mass housing.

Table 2.1 Housing Needs and Housing Backlogs in Selected African Countries

Source: UN-Habitat (2011), CAHF (2012)

Country	Estimated Housing Need and Housing Backlogs (No. of Housing Units)
Angola	700,000
Algeria	1,200,000
Zambia	1,300,000
Nigeria	14,000,000
Ghana	2,800,000
Cameroon	70,000 units annually
Zimbabwe	1,092,460
Libya	492,000
South Africa	2,100,000
Tanzania	3,000,000
Uganda	1,500,000
Kenya	150,000 units annually

In Algeria, the 5-year plan from 2010-2014 called for the delivery of 1.2 million housing units with another 800,000 to be completed between 2015- 2017. The standard of housing is also very poor, between 1998 and 2008, sub standard housing as a percentage of total housing stock rose from 5.9% to 9.1% respectively. Housing supply in Algeria is militated by constraints on the availability of land and a cumbersome land registration system.

Zambia has a housing shortage especially in the urban areas. A UN-habitat estimate suggests a backlog of 1.3 million units across the country and recommends an annual delivery rate of 46,000 units (CAHF, 2012). Between 2001- 2011, however, the delivery rate was only 11,000

housing units per year. Most urban housing in Zambia is informal. UN-Habitat has determined that 70% of housing in Lusaka is informal.

The housing need in Senegal is estimated at 200,000 units with an annual increase of 100%. There are several constraints to the housing supply in Senegal including the lack of formal market players, limited availability of relevant financial products, high construction costs worsened by difficult and bureaucratic plan approval process, a weak policy and a complicated and expensive land registration system.

In Nigeria, there are about 10.7 million houses, and regardless of the policies, institutions and regulations which the Nigeria Government has put in place since independence in 1960, there is still a dearth of housing. The housing backlog is estimated at 14 million units and it will require US dollar 326 million to bridge the housing deficit based on an estimated average cost of US dollar 23, 333 per housing unit (EFInA, 2010). A fundamental difficulty in housing supply in Nigeria has been with ownership rights under the land use Act of 1978, which vests ownership of all land to the governors of each state and is a significant deterrent to housing and housing finance in Nigeria (EFInA, 2010). Other factors affecting housing supply include limited access to finance, slow bureaucratic procedures, and the high cost of land registration and titling.

A recent study by UN-habitat indicates that Ghana's housing need is expected to hit 5.7 million units by 2020. Currently, according to the Bank of Ghana, the housing backlog is estimated at 2.8 million units. The annual housing needs stands at 70,000 units while the supply is about 35% of this figure (UN-habitat, 2011). Ghana's housing sector is affected by a complicated land administration system characterized by the co-existence of overlapping systems namely; traditional, state and private. Unreliable title documents intensify the risk in house construction and mortgage lending in Ghana. Estimates show that Cameroon has an annual housing deficit close to 70,000 units. The DRC has an estimated housing shortfall of 240,000 units, and the annual requirement for new dwellings in Ethiopia is estimated to be between 73,000 and 151,000 housing units.

The urban housing deficit in Zimbabwe in 1992 was estimated at about 670,000 units, but by 1999 the figure had risen to over 1 million. The 2005 mass evictions and informal clearances in Zimbabwe, termed, "Operation Murambatsvina" that is, "Operation restore order" by the

Government, added an additional 92,460 housing units needed in Zimbabwe. Government estimates in Morocco puts the housing shortage at 1 million units. Libya had an estimated housing shortage of 240,000 units in 2000, and needed around 492,000 new dwellings between 2000 and 2010 with most about 81% in urban areas. In the greater Cairo region (GCR), at least 2 million housing units needs to be built between 2010-2020 to accommodate population growth and new urban household formations (UN- habitat, 2011).

Housing supply in South Africa is dominated by government subsidized housing delivery. However, despite impressive delivery in the subsidized market, the housing backlog persists and is growing. The backlog in South Africa is now officially defined as 2.1 million units, of which 1.1 million households live in informal settlements. A key factor constraining housing delivery in South Africa is the lack of serviced land for housing development and also, infrastructure backlogs in many of the cities undermines the capacity to deliver affordable and subsidized housing.

In Rwanda, the housing need is estimated at 6000 annually and 28% of this is needed in urban areas, according to a 2012 World Bank report. Housing delivery in Rwanda is constrained by high cost of construction. The costs are high in Kigali at between US dollar 400 and 600 per square meter because of the high cost of building materials.

Tanzania has an estimated housing backlog of 3 million units. Most Tanzanians self- build their housing mostly incrementally rather than relying on formal housing suppliers. Housing supply in Tanzania is hampered by shortage of serviced land. There is lack of land titles in Tanzania. Data from the Bank of Tanzania suggests that 75% of land is not surveyed in Dares salaam.

Estimates of the national housing backlog in Uganda vary and in 2012 ranged from 560,000-1.6 million units (CAHF, 2012). However, according to UN-habitat (2011), Uganda has an estimated current housing backlog of about 1.5 million units of which 211,000 are in urban areas and 1.3 million units are needed in the rural areas. The Government of Uganda has noted that the housing backlog could hit 8 million by 2020 if nothing is done to improve supply. Housing supply in Uganda is constrained by the high house prices. Most houses built by real estate companies range between US dollar 32,000 and US dollar 225,000.

In Kenya, according to Sessional Paper No. 3 on National Housing Policy for Kenya 2004, the estimated current housing needs are 150,000 units per year. It is however estimated that the current production of new housing in urban areas is about 20,000 to 30,000 housing units annually, giving a shortfall of about 120,000 units per annum. Formal housing supply in Kenya is undermined by a number of factors including the limited availability of serviced plots in urban centers, limited access to housing finance as a result of high interest rates and stringent lending requirements, the high cost of construction due to high prices of building materials and the cost of labour and reduced government budgetary allocation to housing and infrastructure development. The shortage of housing supply in Kenya has given rise to mushrooming of informal settlements, construction of unauthorized extensions in existing residential estates like in Buruburu estate, Umoja estate and the Komarock estate (Kusienya, 2004). The shortage in supply has further resulted in high property prices which have negatively affected housing affordability.

2.2 Housing Conditions

Housing conditions or housing quality comprises three main aspects, namely; type of house in terms of building materials, size of house in terms of living space per person, quality of neighbourhood and available amenities such as kitchen, toilets, water and electricity (Republic of Kenya, 2005). The definition of housing conditions further encapsulates extreme urban housing quality problems manifested in slums, informal settlements and homelessness. The term slum and informal settlements are sometimes used interchangeably to describe a wide range of poor human living conditions. Dwellings in such settlements vary from simple shacks to more permanent structures, and access to basic services and infrastructure tends to be limited or badly deteriorated (UNCHS, 2003). Homelessness on the other hand is an extreme form of housing poverty and refers to the number of people per thousand of the urban population who sleep outside dwelling units on streets, parks, under bridges and on pavements (Republic of Kenya, 1999).

There is a dearth of information on housing conditions in both the developed and developing countries. Available information, however, shows deterioration in housing conditions. An estimated one billion people around the world are inadequately housed and of these more than 100 million are absolutely homeless. In most cities of the developing world, up to one-half of

urban population lives in informal slums or squatters settlements which are neither legally recognized or serviced (UNCHS, 2003). According to a UN-habitat global audit on slums in 2001, 3 out of 10 inhabitants living in urban areas were slum dwellers. Table 2.2 shows the distribution of urban slum dwellers across various regions of the world. The table shows that in 2001, about 924 million people or 31.6% of the world's urban population lived in slums and the majority of these were in the developing regions accounting for 43.0% of the urban population. This is in contrast to only 6.0% in many developed nations. Within the developing regions, Sub-Saharan Africa had the largest proportion of the urban population resident in slums accounting for 71.9%.

Table 2.2 Distribution of the World's Urban Slum Dwellers, 2001

Source. Reconstructed from UN-Habitat 2003, 2004

Region	Urban Population (Millions)	% of the Total Population	Urban Slum Dwellers (Thousands)	% of the Total Urban Population
World	2,923	47.7	923,986	31.6
Developed Regions	902	75.5	54,068	6.0
Developing Regions	2,022	40.9	869,918	43.0
Sub-Saharan Africa	231	34.6	166,208	71.9

According to UN-habitat (2011), Sub-Saharan Africa has the highest slum growth rate of all the regions of the world at 4.53% per annum and also the highest proportion of slum dwellers at 61.7% in 2010. Between 1990 and 2005, the number of slum dwellers almost doubled from 101 million in 1990 to 199 million in 2005, which equates to 6 out of every 10 urban dwellers. In Nigeria for, instance, over 72 million are either homeless or live in rented sub-standard homes in areas best described as slums (Omirin and Nubi, 2007). In Addis Ababa in Ethiopia, Kampala in Uganda, Luanda in Angola and Lagos and Ibadan in Nigeria, more than 40% of the urban

population lives in over-crowded houses. In Zambia 80% of the housing stock is classified as informal with Lusaka alone having about 70% of its housing classified as informal accommodating about 90% of the city's population and occupying only 20% of the residential land (CAHF, 2012). In Dar esalaam, Tanzania between 75% - 80% of housing is considered as slums and in South Africa about 1.1 million households live in informal settlements. The quality of housing in Burundi is poor. According to the 2006 household survey, 87.5% of households in Burundi live in houses with mud floor, and roofing is mostly of informal materials; 20.3% of the homes are roofed with stubble or palm leaves, and 21% are roofed with dry grass or thatch (CAHF, 2012).

Kenya hosts some of the most dense unsanitary and insecure slums in the world. Yahya and Nzioki (1993), in their study of informal settlements in Kenya, noted among other things that slums have been growing in most cities in Kenya at a rate faster than the urban population growth. Most of the slums in Kenya are found within the capital city, Nairobi which currently has an estimated population of over 3 million people, 60% of whom are residing in informal slums. Paradoxically, in terms of actual physical space, those living in informal settlements occupy only 5% of the city's residential land (Cohre, 2008). More than 200 informal settlements in Nairobi are crammed into this tight space accommodating more than half of the city's residents (Cohre, 2008). Examples of slum settlements in Nairobi include Kibera, Mukuru Kwa Njenga and Mathare valley slum. Kibera is one of the largest slum settlement in Africa, accommodating the largest population density of any slum in Nairobi, where roughly 2500 people live per hectare or per 10,000 square meters of land, that is, on average one person per every four square meters.

Slums and informal settlements in Nairobi are characterized by inadequate housing manifested by structures/houses built of temporary materials of mud and wattle or cardboards. Slums in Nairobi are also characterized by serious environmental degradation, high population densities, insufficient or non-existent infrastructure services, forced evictions, and extremely or unsteady incomes of the inhabitants (Kusienya, 2004). However, some slums in Kenya for example, Mathare and Kibera slums have in the recent past benefited from up- grading initiatives from the government of Kenya supported by various donor agencies. The slum up-grading projects,

although not yet completed, have led to the improvement of infrastructure including water supplies, roads and new conventional housing.

2.3 Housing Finance

Housing finance is interpreted to mean the capital required for the construction of housing or housing projects, the resources required to acquire or access housing by households or the credit supplied by financial institutions (UNCHS, 1991). As noted by Diamond and Lea (1992 in Akinwunmi, 2009), housing finance is a major factor determining the quality and tenure of housing consumption, the overall financial portfolio of the public and the stability and effectiveness of the financial system. Stephens (2009) has argued that housing finance has an important role to play in shaping each country's wider housing system.

However, due to the huge capital resources required in the construction or acquisition of housing, many urban households in developing countries are unable to raise housing finance through own savings and often result to credit financing from financial institutions. The finance markets in developing countries are, however, characterized by great operational inefficiencies and seldom serve the needs of the majority of urban population. The finance institutions in these countries are few, they charge very high interest rates and have high eligibility requirements making them inaccessible by majority of urban households especially those in the low and middle income categories.

As observed by Okpala et al (2006), lending by finance institutions in developing countries is associated with a standard package of terms and conditions which the poor and those with modest means find it difficult to comply, hence are left out in the allocation of credit financing. The terms and conditions of lending, for instance, usually specify the contribution of deposit (down- payment), interest to be charged on loan and whether fixed or variable, the period of the loan with penalties for early and late repayments; and loan -to- value ratios which specify the maximum percentage of the loan against a verified value of the dwelling. The terms and conditions for lending also specify the amount the loan institution is willing to lend in relation to the borrower's income. Those able to meet such terms often find they are still excluded from formal financial services by cost barriers in the form of high interest rates, transaction fees or substantial minimum requirement for savings balances or loan amounts (MFW4A, 2013).

Faced with the challenge of accessing housing finance in the formal finance markets, poor and middle income households in urban areas of developing countries often resort to informal mechanisms of financing for their housing. Here, many households use a combination of means which allow them to:

- a). Build while they save
- b). Save in building and;
- c). Earn by building

Building while saving or incremental building is perhaps the most common of these means, whereby a household will construct and occupy a partly built house and improve and extend it over time. Such early occupation allows the household to save on rent. In the short-term, however, the house will most likely be classified as 'substandard'. Saving in building refers to building at costs that are well below the market rates through utilizing family labour, self-help effort, cheap professional help and craftsmen. Earning by building on the other hand is achieved through renting out part of house which is under construction and perhaps using the money realized to complete the dwelling (UNCHS, 1991). In addition to these informal financing mechanisms, poor urban households access funding from a variety of other informal sources including rotating savings and loan associations, for example, 'chamas' (investment groups) in Kenya and 'esusu' in Nigeria, private money lenders, housing saccos and borrowing from friends and family. The informal funding sources operate on the basis of third party guarantees and rely on peer pressure to ensure prompt repayment. They are, however, unsecured and lack the magnitude of accumulation of funds required for large investment (Akinwunmi, 2009).

While the informal finance mechanisms and means have achieved some success in enabling urban households in developing countries acquire their own homes, the JCHS (2005) has noted that informal finance usually provide slow incremental housing based on retained savings which is more costly to the end user. "Self-development" by owners using small craftsmen results in high real resources cost reflecting inflation, a lack of economies of scale and organization (JCHS, 2005). With the shortcomings of the informal finance mechanisms, there is need to devise means to expand the supply of formal credit to low and moderate income households.

There is the need for developing countries to develop effective formal housing finance systems that will work for all income ranges (JCHS, 2005).

An effective and efficient housing finance system and market channels resources to support housing demand, allowing households to accelerate purchase and construction of housing and facilitates a better allocation of resources between housing, other goods and savings over the life cycle. An effective housing finance system also makes housing loans available to qualified borrowers without excessive wait, provides loans whose relative cost is in line with the cost of credit in the economy generally, and reflects the risks of the investment (JCHS, 2005).

2.3.1 Forms of Housing Finance

There are two main forms of financing for housing, namely; debt finance and equity finance.

2.3.1.1 Debt Finance

Debt finance can be classified into short-term and long- term finance

Debt finance from micro-finance institutions are usually short-term construction loans with high interest rates and are less appealing for housing acquisition and construction (Nubi, 2005). The most popular funding instrument for housing is the long term loan. Here, a specified maturity date sets the time for repayment of the loan amount and interest. Term loans vary from short-term (bridging finance, working capital, trade finance) through the medium term (two to five years for working capital) to long-term (project finance, capital expenditure) which might have a tenure of between 10 and 30 years (Heffernon, 2003 in Akinwunmi 2009). Lending for commercial purposes are short-tenured while the typical tenure of mortgage loans varies between 10 years to as long as 30 years.

2.3.1.2 Equity Finance

Equity finance consists of all monies pulled together from friends, relatives or business entities who are interested in maintaining interest in the house purchased with the money raised. The most common equity-financed model for housing is the Real Estate Investment Trust (REITs). The REITs structure is designed to provide a similar structure for investment in real estate as mutual funds provide for investment in stocks. The concept of REITs began in the United States

in the 1960s but became popular in early 1990s (Seiler and Seiler, 2009). REITs started in Australia as listed property Trusts (LPTs) since 1970 and in January 2007, REITs were introduced in the United Kingdom with Germany and Italy also introducing REITs in 2007. In Kenya, the Capital Market Authority (CMA) has already designed and formulated regulations to guide investment in REITs and the necessary regulations and legislation have been approved by parliament.

2.3.2 Sources of Housing Finance for Lenders

The dominant source of funding for housing (mortgage) finance in both the developed and developing countries is the customer savings deposits. This funding mechanism, however, has the short-coming in the sense that customer deposits being short- term liabilities can be withdrawn at any time, and, are therefore not appropriate funding source for long - term illiquid assets, like mortgages.

According to the commercial bank loan theory, banks should not grant long - term loans such as housing/ real estate loans or loan for financing purchase of plant and machinery because they are considered too illiquid. Shin (2009) has observed that within a financial system where short-term liabilities are being used to acquire long- term illiquid assets, any disturbance in the leverage level (ratio of total assets to equity) has to show up somewhere within the financial system. Given that short-term liabilities can be withdrawn at any point in time, financial institutions relying on short-term liabilities to fund long term illiquid assets are likely to face a liquidity crisis (Shin, 2009).

However, despite the short-coming in utilizing deposits liabilities to fund long term mortgage loans, Cho (2007) has observed that a large percentage of financial institutions in developing countries are still relying on short- term deposits to fund long-term mortgage assets.

There is, therefore, the need for financial institutions and banks in developing countries to pursue alternative sources of funding long-term illiquid assets like mortgages. Secondary mortgage markets offer an important alternative source of long term funding and have largely been utilized in the developed countries as a source of funding for mortgages. Secondary lenders source long-term funds from the international investment markets and also from local institutional investors which they lend to commercial banks who then lend to individual borrowers at competitive

interest rates. Secondary lenders also source long term funds from the capital markets. Specifically, secondary lending institutions buy the mortgage assets of loan originating banks and issues securities in the capital markets which are backed or secured by those mortgages in what is referred to as mortgage backed securities (MBS). Mortgage backed securities (MBS) are investments similar to stocks, bonds or mutual funds, whose value is secured or backed by the value of an underlying bundle of mortgages.

With a well functioning secondary mortgage market, commercial banks do not have to hold mortgages until maturity since they can sell them to the secondary lending institutions and this effectively enhances the liquidity of the loan originating banks thus enabling them to lend to many borrowers at affordable interest rates (Ergungor, 2008). There is, however, no efficient secondary mortgage market in developing countries and this puts enormous pressure on housing finance institutions and banks to carry mortgage loans to maturity and this limits the ability of the banks to originate more loans and at affordable interest rates (EFInA, 2010).

Besides customer deposits and securitization, there are other innovative ways of mobilizing long term funds in order to improve the supply of housing finance in developing countries. These innovative finance products include; Issuance of Diaspora Bonds, Migrant Remittances, Pension Funds and Bonds, Mortgage Liquidity Facility (MLF) and Insurance Life-funds. These are briefly discussed below:

i) Issuance of Diaspora Bonds

A Diaspora Bond is a debt instrument issued by a country or a private corporation to raise financing from its citizens in a foreign country. Several countries have used this method to raise long-term funds for example, India and Israel raised US dollar 11 million and 25 million, respectively from diaspora bonds (Ratha et al, 2008). In 2006, the South African government issued a reconciliation and development bond targeting their citizens abroad. Ghana sold a golden jubilee savings bond to Ghanaians in Europe and the United States and Kenya launched its form of Diaspora bond in 2008.

Diaspora bonds have that selling point of the desire by the residents abroad of the need to contribute to the development of their home country. It is an alternative to investing directly in their countries of origin. However, despite the potential market for Diaspora bonds, some of the

countries in the developing world are still struggling with weak and non-transparent legal systems for contract enforcement and lack of effective regulations on their financial intermediations (Akinwunmi, 2009)

ii) Migrant Remittances

Remittances are defined as the sum of workers' remittances, compensation of employees and migrant transfer (World Bank, 2007). Remittances are considered as a stable source of external finances that can be effectively utilized for development purposes, one of which is housing finance that requires long-term funding. Remittances to developing countries have increased on average by 16% in annual terms since 2000 (Gupta et al, 2009). As at 2006, the total remittances to Sub-Saharan Africa countries stood at US dollar 9 billion having grown from US dollar 8 billion in 2004. Remittances to developing countries increased by 12.5% in 2011 to US dollar 355 billion from US dollar 316 billion in 2010 (CBK, 2013). In Kenya, remittances in 2013 rose to US dollar 1.29 billion (Kshs. 110.76 billion) from US dollar 1.17 billion (Ksh. 100.4 billion) recorded in 2012 (CBK annual reports, 2012& 2013).

iii) Bonds and Pension Funds

Many countries in developing world have a relatively advanced bond markets. In South Africa and Nigeria, for example, there is a well developed market for government securities and corporate bonds have seen significant growth in recent years (Blommestein and Horman, 2007). In 2008, the Federal Government of Nigeria raised US dollar 400 million from the capital market to finance affordable housing projects.

There is also increasing utilization of pension funds to finance long-term developments like housing. Most developing countries including Kenya have enacted legislation to allow use of pension funds to finance mortgages.

iv) Mortgage Liquidity Facility (MLF)

A mortgage liquidity facility (MLF) is a finance institution that re-finances the mortgage portfolio of primary lenders. A mortgage liquidity facility improves the liquidity of participating banks and enables them to lend to many borrowers and at competitive interest rates. Many countries in the developing world have already set up MLF. A good example is the Tanzania

Mortgage Re-Finance Company (TMRC) that was established in 2010. This World Bank supported MLF had financed 636 mortgages in Tanzania by October 2012 (CAHF, 2013). Egypt's mortgage liquidity facility launched in 2006 increased the total mortgages to 29,631 by 2011. In Togo, a regional mortgage liquidity facility- the Caisse Regional de Refinancement HypotheCaire, was created in 2012 to promote easy access to long-term financing for commercial banks to enable them to finance housing loans. The Nigeria government is working with the World Bank to develop a mortgage liquidity facility which is expected to increase mortgages to 200,000 in the next 5 years (CAHF, 2013). Kenya does not have a mortgage liquidity facility

v) Insurance Life -Funds

Life funds of insurance companies are long- term savings in form of annuities or endowment policies, which can only mature at the occurrence of certain events, which might be at death, accident, retirement or at maturity. Life funds are not only long-term savings but relatively cheaper than deposits (Pilbeam, 2005). Therefore Insurance companies have funds appropriate for financing housing construction and other long-term investments. However, as Anderson et al (2009) has aptly observed, insurance companies are traditionally the most conservative lender to housing and real estate. In Kenya, lending by the insurance companies is regulated by the Insurance Act and the Insurance Regulatory Authority (IRA) which limits the amount of assets of insurance companies that can be lend for housing.

2.3.3 Housing Finance Markets in Developing Countries

While in developed countries, housing finance markets are large and well developed, the markets in most developing countries are in the developing stages and others in their infancy stage. In countries like Britain, Denmark and the United States, outstanding mortgage loans are almost equivalent to their gross domestic product (GDP) (Akinwunmi, 2009). In 2006, mortgage outstanding as a percentage of GDP was 86% in the United States, 72% in the United Kingdom and 90% in Denmark. The minimum ratio for any of the developed economies is Germany which had a ratio of 52% of GDP (Saravanan, 2007).

In contrast, however, the size of mortgage markets in developing countries is quite small compared to counterparts in developed economies. As shown in Table 2.3, outstanding mortgage

debt to GDP in most countries in Africa except South Africa, Namibia and some economies in North Africa is less than 5% and some even less than 1%.

Table 2.3: Mortgages as a Per cent of GDP in Selected African Countries

Source: CAHF (2013)

Country	Total Mortgages as a % of GDP	Year
Central African Republic	0.07	2005
Senegal	0.07	2005
Mozambique	0.14	2008
Burkina Faso	0.29	2013
Tanzania	0.32	2013
Nigeria	0.38	2013
Ghana	0.45	2013
Cameroon	0.5	2005
Malawi	0.51	2013
Uganda	0.98	2013
Egypt	1	2011
Zimbabwe	1.15	2012
Algeria	1.19	2013
Burundi	1.2	2013
Zambia	1.53	2012
Kenya	1.88	2013
Botswana	2.29	2013
Rwanda	2.3	2010
Tunisia	9.25	2013
Mauritius	12.99	2011
Morocco	13.85	2013
Namibia	18.21	2011
South Africa	33.9	2012

As at December 2013, total mortgages as a percentage of GDP was 0.29 in Burkina Faso, 0.32% in Tanzania, 0.38% in Nigeria and 0.45% in Ghana. Total residential mortgage portfolio in Uganda was estimated at 0.98% while in Kenya, the ratio of mortgage debt to GDP was 1.88%. South Africa and Namibia are the market leaders for Sub-Saharan Africa with ratios of 33.9 % and 18.21% respectively.

South Africa has a fairly well developed finance sector compared to regional standards. The country has 32 registered banks of which 4 dominate the mortgage market. There is also a small but growing housing micro-finance sector who lend micro loans to borrowers seeking to improve their housing. The 1994 South Africa housing policy implemented measures to enhance access to housing finance which saw the establishment of the National Housing Finance Corporation (NHFC) of South Africa.

In Namibia, there are 4 commercial banks, one savings bank, 10 insurance companies and 348 micro-lenders. In recent years, there has been an increase in bank lending to households and corporations with about 40% of these loans being in the form of mortgages. Namibia's mortgage market is currently 18% of GDP which is relatively high by African standards and second only to South Africa. Mortgage finance is also available from informal housing finance services supported by NGOs and other informal savings groups including money borrowed from friends and relatives.

In Nigeria, despite the size of its economy, mortgage debt to GDP is very small at 0.38 as at December 2013. Only about 5% of the 13.7 million housing units in Nigeria are financed with a mortgage (CAHF, 2013). Most residential mortgage loans are provided by the commercial banks, primary mortgage institutions (PMIs) and some institutional employers. Mortgage lending in Nigeria is constrained by several factors, among them the limited availability of long-term funds, weak capital base of the PMIs, difficulty in accessing land and secure title partly due to the mandatory governor's consent for all land transactions, in adequate legal framework and poor housing market infrastructure (EFInA, 2010). The high mortgage interest rates in Nigeria currently between 18-24% undermine housing finance affordability and access to mortgage finance (CAHF, 2012). Informal housing finance sources are however available provided by the esusu (rotating savings and loan

associations), traditional co-operative system, private money lenders, credit cooperatives, individuals and family savings (EFInA, 2010).

Ghana's finance sector comprises of 29 banks, a stock exchange, pension firms and micro finance sector which offer housing micro-finance. The Ghanaian mortgage market is however small with mortgages outstanding at 0.45% to GDP in 2013. There are five major players within the Ghanaian mortgage market. These banks offer a variety of mortgage products including mortgages for home purchase, improvement or completion of homes, as well as home equity mortgages. The mortgage market in Ghana is constrained by cumbersome property registration process which remains manual and fraught with administrative limitations, lack of titled land also inhibit development of the mortgage sector (CAHF, 2012).

In Angola, access to banking finance is for the privileged few, with only 8% of the population using the formal financial system. As of 2011, there were 23 banks with significant concentration among just a few banks. There is however, growing interest in the mortgage market with one bank, Banco Africano de investimento (BAI) currently offering loans of up to 20 years, financing up to 85% of the value of the property. The micro- finance sector in Angola is still under-developed. Mortgage lending in Angola is constrained by among other factors, lack of access to a well developed credit information system (CAHF, 2012).

Zambia's mortgage market is quite small. Only a few of the commercial banks offer mortgage finance. The sector is however growing rapidly. In 2012, the mortgage loan portfolio stood at about US dollar 239.3 million having increased by more than 50% as at the 2011 figure (CAHF, 2012). A key challenge for residential mortgage lenders in Zambia is access to funding as the whole- sale finance sector and capital markets remain undeveloped. Mortgage interest rates offered by commercial banks and building societies are high. The average interest rate by the commercial banks in 2011 was 18.8% for a 24-year mortgage loan. Building societies' interest rates are higher at 20% and above.

Burundi's housing finance sector has grown over the last 5 years. The mortgage portfolio has increased by over 150% from US dollar 1.17 million in 2007 to US dollar 3.54 million in

2010. As a percentage of GDP, however, the housing finance sector is insignificant by regional standards. In 2010, the number of mortgages in the market were estimated at about 350, and the average size of a mortgage was US dollar 10,000. By 2011 and mid 2012, the total number of mortgages issued by the financial institutions was estimated at about 500 targeting only high income earners. A major challenge in providing mortgage finance in Burundi is the lack of long term funding schemes within the domestic banking system and lack of a developed pensions and insurance industry which are crucial in resource mobilization and maturity transformations. Other challenges include the high prices of houses (CAHF, 2012 & 2013).

In Rwanda, the banking system comprises of 14 financial institutions as listed by the National Bank of Rwanda, up from 11 in 2011. Mortgage lending accounts for about 15-20% of the country's US dollar 70 billion loan book, and the value of mortgages to GDP stood at 2.3% in 2010. Informal house finance sector in Rwanda comprises Sacco's and there are 88 licensed Sacco's and micro-finance institutions (MFIs) as of march 2012. A major challenge to mortgage lending in Rwanda is lack of liquidity for long – term finance for mortgages as well as for micro - finance institutions. The Rwandan mortgage market also lacks a good source of credit information. The existing public credit registry does not have sufficient coverage as it covers only 0.7% of the adult population. There are no private credit reference bureaus in Rwanda (CAHF, 2012).

Tanzania's house finance market is the smallest in the East African region. The value of mortgages outstanding to GDP stood at 0.32% in 2013. Mortgage lending in Tanzania has over the years been constrained by a poor land tenure system and a weak capital base of the lenders. As at 1995, Tanzania had only provided 14,000 mortgages through the collapsed Tanzania Housing Bank. However, recently, important development in the mortgage industry is the establishment of the Tanzania Mortgage Refinance Company (TMRC). The TMRC is a Mortgage Liquidity Facility (MLF) established by the Government of Tanzania with the support of the World Bank, and created as a private sector institution owned by the banks with the sole purpose of supporting banks to do mortgage lending by refinancing the banks' mortgage portfolios. The TMRC serves as an important source of long - term funding at attractive interest rates. Funding raised through TMRC is charged at 10% interest which

translates into 13% on mortgages supported with the TMRC, while other lenders who do not have a stake in the TMRC charge 19 -20% interest on mortgage loans (CAHF, 2012). There are also informal housing finance sources in Tanzania supported by Saccos and NGOs which cater for the low income categories.

In Uganda, the banking sector continues to grow. The number of commercial banks has increased to 23, with 3 licensed credit institutions and only 4 licensed micro-finance institutions. Only 9 financial institutions in Uganda offer mortgage finance of which 5 dominate. With interest rates above 15% as at 2012, mortgages remain expensive, and the residential mortgage sector mainly serves middle and high level income earners. The ratio of understanding mortgage debt to GDP was at 0.98% as at December 2013(CAHF, 2013)

Kenya's financial system is relatively well developed but remains vulnerable to considerable government influences and weaknesses in the supervisory regime (MFW4A, 2013). According to the Central Bank of Kenya (CBK) annual reports of 2012 and 2013, the financial system in Kenya consists of the Central Bank of Kenya (CBK) as the regulatory authority, 44 banking institutions (43 commercial banks and 1 mortgage finance company-MFC), 5 representative offices of foreign banks, 8 deposit taking micro-finance institutions (DTMs), 2 credit reference bureaus (CRBs) and 112 forex bureaus (FXBs). The finance system in Kenya also comprises of 42 insurance companies and the Nairobi Securities Exchange (NSE) which has 50 listed firms across the financial, industrial, commercial and agricultural sectors). Pension firms also form part of the Kenya financial system.

Kenya has a fairly dynamic mortgage industry compared to counterparts in the East Africa region, but quite low by international standards. The ratio of mortgages outstanding was at 1.88% of GDP as at December 2013 having declined from 2.51 % as at 2012. There were 19,177 mortgage loan accounts in the market in December 2012 up from 16,029 in 2011 (CBK, 2012). The average mortgage loan size increased from kshs. 5.6 million in 2011 to kshs. 6.4 million in 2012 (CBK, 2012). The increase was attributed partly to increase in property prices.

Despite the high number of financial institutions offering mortgages in Kenya, about 71% of lending to mortgages market was by 5 institutions. The same institutions dominated the mortgage market on the 2011 CBK mortgage survey (CBK, 2011).

The main providers of mortgages in Kenya are the Housing Finance (HF) Limited, the Kenya Commercial Bank (KCB), CFC Stanbic Bank, Standard Chartered Bank (SCBK) and the Barclays Bank of Kenya (BBK) Limited. According to the CBK annual reports of 2011 and 2012, Housing Finance (HF) Limited was the mortgage market leader both in terms of value of mortgage loans and number of customers in 2011. In 2012, Housing Finance (HF) maintained the lead in terms of number of mortgage customers, but Kenya Commercial Bank (KCB) led in terms of the value of mortgages outstanding.

As shown in Table 2.4, mortgage customers for Housing Finance (HF) Ltd stood at 5,235 in 2012 compared to Kenya Commercial Bank (KCB) whose total mortgage accounts were 5,091. The value of mortgages for Housing Finance (HF) was however slightly below at Kshs. 30 billion compared to KCB at kshs. 31 billion.

Table 2.4: Number of Mortgage Accounts and Mortgages Outstanding in 2012

Source: CBK (2012)

Bank	No. of Mortgage Accounts	% of Total	Value of Mortgages Outstanding (Kshs in Billions)	% of Total
Housing Finance (HF)	5,235	27.3	30.3	24.7
Kenya Commercial Bank (KCB)	5,091	26.5	31.5	25.6
Standard Chartered Bank (SCB)	1,480	7.7	9.7	7.9
CFC Stanbic Bank (CFC)	1,340	6.9	9.5	7.7
Barclays Bank of Kenya (BBK)	1,021	5.3	4.3	3.5
Equity Bank Ltd (EBL)	702	3.6	3.7	3
Development Bank Ltd (DBL)	579	3	2.6	2.1
Consolidated Bank Ltd	566	2.9	3.8	3.1
Co-operative Bank	398	2	6.6	5.4
Others	2,765	14.8	20.4	17
Total	19,177	100	122.2	100

Various factors have militated against mortgage lending in Kenya, among them is the high interest rates charged by banks and financial institutions. High interest rates for the first half of 2012 impacted negatively on the mortgage market performance in Kenya and this saw Non Performing Loans (NPLs) increasing from kshs.3.6 billion in December 2011 to kshs 6.9 billion in December 2012(CBK, 2012).

The interest rates charged on mortgages in Kenya were on average 18% in 2012 and ranged from 11% - 25%. In 2013, interest rates on mortgages averaged 16.89% and ranged from between 15.5% - 19% (CBK, 2012, 2013).

Other factors that have constrained the performance of the mortgage market in Kenya as identified by CBK (2012) include the following:

- Stringent lending requirements by banks
- Lack of long- term funds for lending
- Low level of income
- Credit risk (limited credit histories, documented income)
- Lack of understanding of mortgage products by consumers
- Burden of regulation (prohibiting capital reserve requirement, liquidity rules by the regulatory authority which limits number of banks in the industry.
- High cost and time of foreclosing on a property
- Difficulties with property registration/titling
- Lack of capacity/ skills in banking sector to develop attractive mortgage products,
- AIDS/HIV as an inhibitor of long- term lending.

2.4 Housing Affordability

While there is no single agreed definition of housing affordability, the term refers broadly to a person's ability to pay for their housing (O'Flynn, 2011; Bujang et al, 2010). It is a tenure-

neutral term. By this it means that it relates to both home-ownership affordability and rental market affordability. In this study, however, the term is used within the context of home ownership affordability.

According to Gabriel et al (2005), one of the most helpful statements about what housing affordability entails was provided by MacLennan and Williams (1990) in stating that;

‘Affordability’ is concerned with securing some given standard of housing (or different standards) at a price or rent which does not impose, in the eyes of some third party (usually government), an unreasonable burden on household incomes’.

A research for the Australian Housing and Urban Research Institute (AHURI) cited in O’Flynn, (2011) considered housing affordability to be;

‘An expression of the social and material experiences of households, in relation to their individual housing situations. Affordability expresses the challenge each household faces in balancing the cost of their actual or potential housing, on the one hand, and their non-housing expenditures, on the other, within the constraints of their income’

The Australian government’s National Housing Strategy (NHS) cited in Yates et al (2007) defines affordability as;

‘The notion of reasonable housing costs in relation to income, that is, housing costs that leave households with sufficient income to meet other basic needs such as food, clothing, transport, medical care and education.’

In New Zealand, housing affordability is defined as;

‘The ability of households to rent or purchase housing in an area of choice at a reasonable price, the capacity of households to meet on going costs, and the degree that discretionary income is available to achieve an acceptable standard of living.’ (Yates et al, 2007).

Bramley (1990 in Mostafa et al, 2005) has specified that ‘households should be able to occupy housing that meets well established (social housing) norms of adequacy (given household type and size) at a price or rent which leaves them enough income to live on without falling below some poverty standard’.

A household is said to have a housing affordability problem if after paying for housing services it is left with insufficient income to enable it meet its other basic needs. This expression agrees with the definition of affordability as given by the Australian National Housing Strategy (NHS) as stated above, which emphasize the need for households to pay for housing at costs which leaves them with sufficient income to pay for other household basic needs.

Affordability is, therefore, expressed as the relationship between housing expenditure and household income and establishes a standard in respect of which the amount of income spent on housing is deemed unaffordable. The standard is defined in terms of an absolute residual income once housing costs have been met, or as a ratio measure specifying the acceptable proportion of household income to be spent on housing.

In the section below, the various approaches to measuring affordability are discussed. The main approaches are the ratio and the residual measures. As noted in the discussion, the ratio measures are the simplest and most explicit approaches to measuring affordability and have been adopted in this study as the appropriate definition and measurement of housing affordability in the home ownership mortgage housing sector in Kenya. Specifically, the simple housing cost-to- income ratio has been adopted as the appropriate measure of affordability of the households considered in the study.

2.4.1 Affordability Measures

There are two main approaches to measuring affordability. These are:

- i. Ratio measures
- ii. Residual measures

2.4.1.1 The Ratio Measures

Ratio measures are the most commonly used measures of housing affordability. The approach is variously referred to as; housing expenditure- to- income ratio, house purchase-to- income ratio or simply the housing cost approach. The ratio approach conceives housing affordability as a measure of the ratio between what households pay for their housing and what they earn. In simple terms, the ratio is an expression of the relationship between household's income and housing expenditure and indicates the proportion of family income that goes into the payment for their housing (Bujang et al, 2010). In the home ownership (mortgage) housing sector, the ratio is the proportion of the household's income that goes into repayment of the mortgage loan.

There are two main derivatives of the ratio measure, these are;

- a).The simple “housing cost to income” ratio
- b). Fixed ratio with benchmarks/ rule of thumb standard.

Simple Housing Cost - to - Income Ratio

This simply indicates the proportion of household income being dedicated to housing. A higher ratio indicates the household is spending too much of its income on housing while a lower ratio shows the household is spending little on housing. Other factors held constant, households with higher ratios are likely to experience affordability problems compared to those with lower ratios because such households will have little income remaining for other basic needs after paying for their housing. A household with a ratio of say 10% for example, is considered to have better affordability (less affordability problem) compared to another with say a ratio of 40%.

Simple ratios can, therefore, be used to monitor shifts in affordability of households over time. They can also be used to tell whether the affordability of a household is improving or worsening (Gabriel et al, 2005). Simple house cost -to- income ratio can also be used to compare the affordability levels of different households.

While simple ratios are useful in tracking shifts in affordability, they do not provide a clear rationale for policy intervention. In order to make such ratios more responsive to policy objectives, ratio measures have been linked to a normatively ascribed affordability benchmark or rule of thumb standard. The affordability benchmark is used to determine the point at which affordability is deemed to be a problem for the average household and which in turn require some form of policy intervention (Gabriel et al, 2005). The affordability benchmarks and rule of thumb standards are discussed below under the fixed ratio approach.

Fixed Ratio with Benchmark

Under the fixed ratio approach, households are said to have unaffordable housing if their housing costs (e.g. mortgage payments) take up more than some pre-determined proportion of their income. The fixed ratio approach specifies the acceptable maximum proportion of households' income to be spent on housing, beyond which housing will be regarded as unaffordable (Johnston, 2008). Usually a “ rule of thumb” standard of no more than 25% or 30% of households monthly income being spend on housing costs is deemed appropriate and affordable (Stone, 1993 in Okechukwu, 2009). This rule of thumb standard has been used by mortgage credit institutions in their risk assessment of potential customers. The ratio has also been used by the World Bank, United Nations Development Programme and the United Nations Human Settlement Programme in their urban management programmes.

However, despite the use of the ratio approach, critics have expressed concerns about setting the affordability benchmark at a particular level without any clear, scientific rationale (Free man et al, 2000). Various scholars have specifically questioned about the application of the 25 or 30% affordability benchmarks. Stone (1993 in Nelson et al, 2002) has for instance argued that high income and small households can afford to spend much more than 30% of their income on housing and still have enough income left over to satisfy other basic needs. Conversely, extremely low income and large households that pay even 10% of their income on housing costs may be forced to forego essential medical care, health and food. The ratio, therefore, has a tendency to under- estimate the affordability problems of lower income households and over-estimates the problems of high income households.

Other limitations of the ratio approach is that the ratio does not control for changes in housing quality and the impact of expected appreciation in cost of housing over time; it fails to account for the actual financial constraints that may be faced by home-owners; and that the ratio does not account for differences in household sizes, household types, and locational variations in income and mix of homes available for sale; neither does it discern cases of high house price to income ratio that may be due to a preference for high housing consumption (Burke and Ralston, 2003).

There are, however, some advantages in the use of the ratio, which have sustained its popularity over the years and its continued use especially for policy and research. The ratio, for instance, is easy to calculate and to interpret and can easily be understood by non- experts; the data required for calculating the ratio are also readily available from official sources in many countries; the ratio is amenable to use in comparative studies across different areas and over different periods; and as has been observed by Bogdon and Can (1997 in Okechukwu, 2009), if used in conjunction with other affordability measures, the house price- to- income ratio has the potential to provide a useful starting point to examine housing affordability problems.

2.4.1.2 Residual Measures

Residual measures are variously referred to as “after poverty”, “non- shelter first”, “shelter poverty”, “living standard measures” or simply basic non-housing cost approach. Residual measures conceive housing affordability from a basic non-housing consumption perspective. The measures are concerned with the relationship between housing costs and the capacity of a household to maintain an acceptable standard of living after paying for the cost of their housing (Johnston, 2008).

According to Milligan (2003 in Gabriel et al 2005), residual measures focus on the income remaining after housing costs are met and considers whether housing is affordable in the context of current income levels and essential household expenditure. Under the residual approach, a household after paying for housing should be left with adequate residual income that enables it to comfortably meet other household basic necessities such as food, clothing, health and education.

Stone (1993 in Okechukwu, 2009) argue that since housing costs generally make the first claim of a household’s disposable income with non-housing expenditure having to be adjusted to

whatever remains of the income, the most a household should be required to pay for housing is that which leave it able to meet non-housing basics at a minimum level of adequacy. A household is, therefore, paying more than it can afford for housing if after paying for housing, it is left with insufficient income to meet other basic household needs.

Residual measures thus entail establishing the minimum residual income that will enable households to sustain an acceptable standard of living. The acceptable residual income to guarantee minimum standard of living after paying for housing is determined using either the poverty line approach or the budget standards approach. Under the poverty line approach, residual incomes are linked to the official poverty line thresholds as defined by countries for specific localities or regions. Budget standards are also prepared for countries and can also be used to define the minimum residual income for households. Budget standards determine the acceptable minimum standard of expenditure consistent with a modest budget (Burke, 2003). According to Saunders et al (1998b), a budget standard for a country sets to represent what households' needs in a particular place at a particular point in time, in order to achieve a specific standard of living.

Yates and Gabriel (in O'Flynn 2011), consider the main advantage of residual measure to be its ability to consider the impact of household structure on household needs by taking into account differences in non-housing needs for different household types. However, they emphasize that this is also a weakness of the measure because it requires a judgment (sometimes subjective) to be made as to what these non-housing needs are. A perceived further weakness of the residual measure is that it imposes "more onerous data requirements" and can be complex and time consuming.

2.4.1.3 Other Measures

Although the ratio and residual measures are the most common approaches to measuring affordability that have been identified in the literature, there are also other measures of affordability which needs to be mentioned. There is for instance, the Accessibility/Deposit Gap Method which only applies to measurement of home-ownership affordability. The method attempts to measure the savings/deposit required to purchase a home and the ability of the purchaser to secure the necessary mortgage for the purchase. As noted by smith (in O'Flynn

2011), this is often seen as the difference between house prices and the maximum borrowing capacity of households, or the gap that needs to be made up by a deposit. The other approach of measuring affordability is by comparing house price with incomes. That is, you compare the rate of increase of house prices with rate of increase in incomes and see whether affordability is increasing or decreasing.

2.4.2 Housing Affordability Problems in Developing Countries

Access to adequate and affordable housing is a current and growing problem in almost all countries in Africa. According to the UN-habitat (2011), housing problems are largely to do with affordability. Housing is expensive and incomes are too low. The inputs to housing are too expensive especially land, finance and building materials. Land supply is insufficient, is poorly serviced and lacks security of tenure. Conventional housing finance in the developing countries of Africa is underdeveloped and inflexible and seldom serves households in low and middle income categories. While microfinance and community based savings groups are providing alternative housing finance, they remain constrained by unsupportive institutional and regulatory frameworks (UN- habitat, 2011).

According to the World Bank (2007), only 3% of the entire population in Africa has income viable for a mortgage. The Africa Development Bank (AFDB) estimates that just under 20% of the African population earns more than US dollar 20 per day and 36.5% of the population live below the international poverty line of US dollar 2 per day (AFDB, 2011).

House prices in Africa are too expensive. Data from selected countries on the cheapest newly built house by a formal developer show that in 2013, the cheapest house for sale in Mali was US dollar 5,800 (excluding land), US dollar 13,300 in Egypt, US dollar 28,000 in Tanzania, and US dollar 50,000 in Gambia. In Kenya, the price of the cheapest newly built house by a formal developer in 2013 was US dollar 18,000 (CAHF, 2013).

In order to conceptualize the nature and extent of affordability problems of households in developing countries of Africa, the relationship of house prices to the purchasing power of individuals in these countries is analyzed. In Table 2.5 and Graph 2.0, the Gross National Income (GNI) per capita taken as a very loose indicator of income per country per person is plotted against the 2013 house prices in selected African Countries. The Gross National Income (GNI)

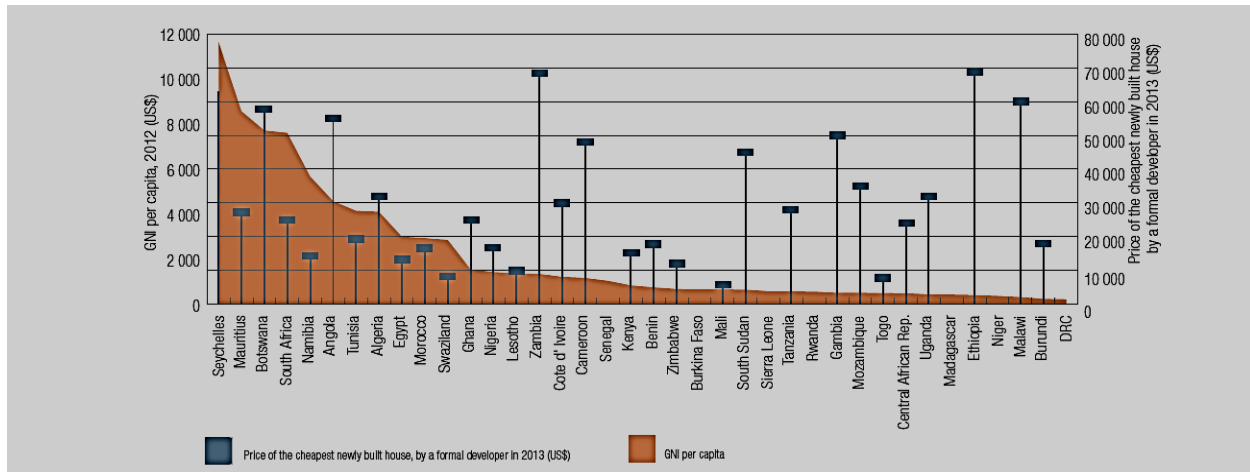
per capita 2013 figures are obtained from World Development Indicators data base by the World Bank.

Table 2.5. Relationship of Income to House Price in Selected Countries in Africa

Note: GNI per capita and House price figures quoted are for year 2013 except Rwanda, whose figures for 2013 are not available

Source: CAHF (2013), World Bank, 2014

Country	GNI per capita 2013 figures(in US dollar)	Price of cheapest newly built house by a formal developer in 2013(US dollar)
Ethiopia	470	68,000
Gambia	510	50,000
Nigeria	2760	18,000
Algeria	5290	32,000
Egypt	3160	13,000
Ghana	1760	25,000
Botswana	7,730	58,000
Rwanda	800 (year 2012)	79,000(year 2012)
Tanzania	630	28,000
Kenya	930	18,000
Burundi	280	19,000
Uganda	510	28,000
South Africa	7,190	24,000
Mali	670	5,800



Graph 2.0 Relationship of Income to House Prices in Selected Countries of Africa

Source: CAHF, 2013

Table 2.5 and Graph 2.0 shows that in Ethiopia, the cost of the cheapest newly built house of 125m² in floor area is US dollar 68,000. A buyer ordinarily would deposit 10% of this amount (i.e. US dollar 6800). To afford a mortgage for the difference at current interest rate of 9.5% over a 20 year period, the buyer would have to earn US dollar 2061 per month (CAHF, 2013). Such a house is however unaffordable to the majority, as 66% of Ethiopians live on less than US dollar 60 per month. The income per capita is also very low at US dollar 470 (World Bank, 2014)

Housing development in Gambia is targeted at the high income market. The houses are large measuring approximately 225m² and are very expensive starting at US dollar 50,000 for a two bedroom house. Most Gambians cannot afford this house, as majority about 55.9% live on less than US dollar 60 per month (CAHF, 2013). The income per capita is also low at US dollar 510 (World Bank, 2014). Majority of Gambians self- build their housing incrementally.

In Ghana, the cheapest newly built house for sale is US dollar 25,000 and measures roughly 75m². A buyer has to put down US dollar 2500 deposit and earn US dollar 970 a month to afford a 20 year mortgage at 13.5% interest rate. Most Ghanaians, however, are poor with 51.8% living below the international poverty line of less than US dollar 2 per day. The cheapest newly built house in Mali is US dollar 5,800, plus another us dollar 1,000-4,000 for the land, depending on the location. This is however far beyond the affordability of the majority with about 78.66% of Malians living on less than US dollar 2 per day. In Nigeria, a household earning a minimum

wage of US dollar 116 per month could only afford to borrow US dollar 4,685 which is not enough for the cheapest house, which is at US dollar 18,000 costing almost 4 times that amount (CAHF, 2013). About 78.4% of Nigerians live on less than US dollar 60 per month.

In South Africa, according to the World development indicators by the World Bank, Gross National Income(GNI) per capita in 2013 was US dollar 7190, and with the entry level house at US dollar 24000, only about 15% of the population can afford it. In Algeria, the cheapest newly built house measuring 75m² is US dollar 32,000 and is only affordable to the top tiny minority. The bulk of the population in Algeria about 72% earns between US dollar 2-10 per day (CAHF, 2013). Most developers in Rwanda build homes priced about US dollar 100,000, affordable to a tiny majority as 82.4% of Rwandese live on less than US dollar 60 per month. The income per capita is also low at US dollar 800. In Tanzania, 87.9% live on less than US dollar 2 per day. Housing is unaffordable to the majority as the cost of the cheapest house for sale is US dollar 28,000.

In Burundi, the cheapest newly built home measures approximately 125m² and sales at US dollar 19,000, affordable to less than 5% of the population. Most Burundians self build and incremental construction is the dominant form of house construction (CAHF, 2013). About 93.4% of the population in Burundi lives below the international poverty line. To buy the cheapest house in Uganda, a household would spend US dollar 32,000 including the costs of transfer, legal charges and taxes; the borrower has to pay a deposit of US dollar 6,400-9,600, which is far beyond most households, as about 64.7% live below the poverty line. High interest rates in Uganda over 18% in 2012 compromises loan affordability. Stringent loan requirements for example, deposit requirement that range from 20%-30% further restricts mortgage affordability (CAHF, 2013).

In Kenya, 67.2% live below the international poverty live. High interest rates undermine affordability even for modestly priced housing. Interest rates in 2013 averaged 16.8% and ranged between 15.5% to 19%. The cheapest newly built house measuring approximately 50m² costs between US dollar 13,000 to US dollar 18,000 and would require a monthly income of US dollar 677(kshs.58, 522), with a 10% deposit on a 20 year mortgage at 19% interest rate. Given a statutory minimum wage of US dollar 162 (kshs. 14,000), it would take on average the equivalent of 7 to 9 salary years for a household on the minimum wage to complete paying for the cheapest house. Income per capita is also low at US dollar 930 as at 2012. Affordability in

Kenya is further constrained by high cost of building materials. Cost of building materials in Kenya are relatively high compared to regional standards. For example, the cost of a 50kg bag of cement (a major input in house construction) was at US dollar 9 in Kenya in 2012, while in Botswana, Ethiopia, Mauritius, Senegal, Gambia, Nigeria and Tunisia, a similar bag of cement costed between US dollar 4 -8 (CAHF, 2012 & 2013).

2.5 Summary

Urban housing problems in developing countries vary greatly across different house tenures and social- economic groups with low and middle income groups experiencing severe housing challenges.

This chapter has reviewed urban housing problems within the context of four key issues, namely; housing deficits, housing conditions, housing finance and affordability.

The housing shortage in developing countries is huge and steadily increasing with almost every country experiencing severe deficits relative to demand. In the developing countries of Africa, almost every country is experiencing a housing shortage, which in most cases is growing. Estimates indicate that over 60 million new dwellings are needed to be constructed to accommodate the rapidly growing number of new urban households in Africa. The condition of housing is poor with up to one -half of the urban population in the developing countries living in slums and informal settlements with basic services lacking exposing residents to serious health risks of water and airborne diseases.

Access to housing finance also poses major challenges to the goal of adequate housing in developing countries with the main housing finance problems being availability, accessibility and affordability of finance by all income groups. Housing Finance Institutions in developing countries are few; they charge very high interest rates on loans and have high eligibility requirements thereby serving the interests of only the upper-middle and high income groups. Majority of middle and low income groups are left to seek housing finance from informal sources.

Housing affordability is perhaps the main urban housing challenge experienced by virtually all urban households in all tenures. Affordability problems are mainly the result of rising house

prices and declining or low incomes of households. The affordability aspect of urban housing problems has been introduced and discussed in the last part of this chapter and will form the subject of further review and analysis in the proceeding chapters. The next chapter presents the theoretical and conceptual framework of the study.

CHAPTER 3

HOUSING AFFORDABILITY: TOWARDS A THEORETICAL AND CONCEPTUAL FRAMEWORK

3.0 Introduction

This chapter presents the theoretical and conceptual framework of the study. Theoretical framework is a collection of interrelated ideas based on theories. Kombo and Tromp (2006) have defined theoretical framework as a reasoned set of prepositions which are derived from and supported by data or evidence. Theory plays an essential role in research as it guides the development of research questions, selection of methodologies, and interpretation of results. Most importantly, the utilization of theory is necessary for the advancement of knowledge (Steggell et al. 2003). Further, review of theories in research studies is important because they offer a theoretical basis for undertaking the research study. Theories explain the phenomenon that is being studied and offers tentative theoretical answers to questions, issues and problems before a researcher practically confirms through research that the answer is correct.

Conceptual framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny. It is a systematic presentation which identifies the variables that when put together explain the phenomenon being investigated. The conceptual framework is therefore the set of broad ideas used to explain the relationship between the independent variables (factors) and the dependent variable (outcome) (Makori and Memba, 2015).

The first part of this chapter reviews theories that have been applied in housing research and provides analysis of the theories that explain urban housing affordability problems in developing countries. Other issues that are important on affordability are also discussed. The last part of the chapter reviews literature on the factors affecting urban housing affordability and formulates a conceptual model of affordability and the determining factors.

3.1 Theories of Housing Affordability

There are several theories that have been advanced to explain various phenomena in housing. The theories have been applied to a wide variety of topics in housing research including housing decisions, housing satisfaction and preferences, residential mobility, and effects of home ownership (Steggel et al 2003).

The Morris and Winter theory of housing adjustment has been applied to explain how households make decisions in choosing their housing. Developed from the sociological model of human behavior, Morris and Winter theory argues that, in choosing their housing, people seek respect from self and others. The theory contends that if a household believes that its housing is below the norms of the society (i.e below the standard and, therefore, a threat to respect), that household will feel dissatisfied and seek to change its situation, either by moving to a different house or altering its current house to improve its status.

The rational choice theory has been advanced to explain what motivates young people to move away from their parents' homes. First developed by Morgenstern and Von Neumann in 1947 and expanded by Savage in 1954, the theory is premised on the idea that individuals consider each individual situation and determine the appropriate course of action to take by weighing the consequences of a particular action against the consequences attributed with alternative courses of action. The individual then pursues the course of action that creates the greatest benefits, or the lowest cost.

The social economic model of residential segregation has been used to explain the clustering of families with similar social-economic attributes in similar locations and neighbourhoods. According to this theory, the income level of households capable of supporting rental payments is considered the main factor that determines the distribution and segregation of families.

The theory of human motivation has been used in housing research to explain housing satisfaction of households. The theory was developed by Abraham Maslow and suggests that people are motivated by a desire to satisfy their own needs and that they will strive to reach the highest levels of their capability. According to Maslow, human needs are arranged in a

hierarchy, ranging from the most basic physiological needs to the highest needs referred to as self- actualization.

The ownership model has been proposed and advanced in housing research to explain satisfaction people derive from home ownership. The model suggests that home ownership creates feelings of overall well-being. According to this theory, home ownership produces a sense of permanency, leading to psychological and economic investments in the neighbourhood. The resulting increase in residential stability produces greater concern for the overall residential environment and increases investment in informal neighbourhood interaction networks (Steggell et al 2003)

While these theories are useful in advancing knowledge in housing research, they do not explicitly explain the aspect of housing affordability which is the subject of this research. The best theories that explain affordability are those drawn from the classical welfare economics. The two important theories on affordability that have been identified in the literature are the Public Interest Economic Regulation Theory (PIERT) and the Theory of Distributive Justice. When applied to housing affordability, the two theories argue that affordability problems are as a result of imperfections in the housing market. The imperfections in the housing market contribute to the volatility of house prices sometimes pushing them beyond the reach of segments of the population with modest incomes. The two theories call for governments to intervene in the housing market to correct the imperfections and make housing accessible and affordable to all social economic groups in society. The following discussion examines in detail the Public Interest Economic Regulation Theory (PIERT) and the Theory of Distributive Justice.

3.1.1 Public Interest Economic Regulation Theory (PIERT)

Public interest economic regulation theory (PIERT) , also referred to as the normative theory of market- failure , is built around the classical welfare economics which is concerned with the promotion and protection of people's utility and welfare .

This theory offers solution to affordability problems by advocating for appropriate government intervention in the housing market to ensure optimal and efficient allocation of the housing resource. The theory is based on the idea of an existence of common interest (public interest) of

which governments are more suited to provide and protect through regulation. Regulation in this context refers to legislative and administrative controls and actions that governments employ to influence prices, production and market entry including interventions in the form of quotas, tariffs, subsidies, and taxes (Okechukwu, 2009).

The public interest theory holds that government interventions in markets through regulation are a reaction to demands by the public for the government to correct inefficient or inequitable market practices (Guerin, 2003). Regulation is instituted on the assumption that markets are inherently inefficient and that only the government is capable of fixing the market failure so that the optimal efficient outcome is realized. Regulation further assumes that the benefits of government interventions in markets outweigh the costs created by the interventions. According to Guerin (2003), benefits from regulation may take many forms but these can be distilled down to an improvement in the welfare of an individual or group, and may occur through reduced costs of goods and services or increased income of the producers of goods and services. Rittenberg et al (2004) indicates that regulation is necessary to lower prices of goods and services, to increase output and to prevent cut throat competition. Regulation is also necessary to guarantee the availability and accessibility of essential goods and services.

Theoretically, under conditions of perfect competition, markets are able to allocate resources equitably and efficiently. However, in practice, this is usually not so, as many forces in the real world often influence the market to allocate resources less efficiently than the ideal competitive market. The conditions of perfect competition include, among others; uniformity or homogeneity of the product, few or negligible transaction costs are involved and that the market is assumed to have so many buyers and sellers all with perfect knowledge and information about the market and the product being traded. In the real world, however, most markets rarely operate within such ideal conditions and this leads to inefficiencies in the allocation of goods and resources due to “market failures” in the form of, for example, monopolies, incomplete markets, externalities, public goods and imperfect information. The situation is worse in the housing market, which is characterized by serious imperfections. The imperfections in the housing market are as a result of the peculiar or unique characteristics of housing that are discussed in section 3.2 of this chapter.

Public interest economic regulation theory is built around the imperfections and inefficiencies of markets. The theory argues that market failure is principally caused by self-seeking behavior of agents and lack of incentives to act co-operatively or take account of social costs of their actions within market process. This situation justifies a third party (usually government) intervention to mediate, remedy or enhance cooperative behavior among agents within the society (Hagg, 1997; Mackay; 1999; Hertg, 2003). The theory predicts that regulation will be instituted to improve economic efficiency and protect social values by correcting market imperfections. This will eventually result to equitable access to resources by all segments of the population and at a more affordable cost.

Applying this theory to housing would mean that governments are expected to ameliorate housing market failures and moderate such markets through appropriate interventions that deliver adequate housing to its citizens. The challenge for governments is, however, on how best to intervene efficiently in order to ensure the development of a more equitable housing delivery system. As has been observed by pro-market theorists, inappropriate government controls and regulation are themselves bad and could lead to more distortions in the housing market. In fact, dominant International Financial Institutions such as the World Bank and International Monetary Fund (IMF) discourage and condemn direct government involvement in housing as distortions that hinder market efficiency insisting that pro-market policy reforms promote market efficiency and stimulate economic growth (Pugh, 1994).

The theory of public interest economic regulation, however, advocates for careful government intervention in a way that does not distort the housing market. It calls for better and more viable means of market intervention in the effort to develop national housing sectors and guarantee the housing interest of the lower and middle income groups of the urban population. Key areas where intervention is needed include the land market, housing finance, infrastructure and access to cheap building materials. The cumulative effect of the interventions should be to improve access to adequate housing and reduce the cost of housing per person thus making housing more affordable and accessible among all social-economic groups in the society.

3.1.2 The Theory of Distributive Justice

Distributive justice generally refers to justice in assigning benefits (and burdens) among members of the society. According to Maiese (2003), distributive justice is concerned with the fair allocation of resources among diverse members of a community. Armstrong (2012) defines distributive justice as the ways in which the benefits and burdens of our lives are shared between members of a society. The theory of distributive justice is thus concerned with justice and fairness in the distribution of social goods and services within a community. The theory argues that common resources should be distributed in a reasonable manner which guarantees every individual a fair share of the distributed resource.

However, given the scarcity of resources, the challenge has been on how to allocate scarce resources among diverse individuals, groups and sectors that make up any given society. What actually constitute fair share has always been a very contentious issue. As has been contended by Michael Strevens (in Okechukwu,2009), there are deep conflicts embedded in our way of thinking about distributive justice so that in certain kinds of cases, we are internally divided about the guidelines we should follow to decide who deserves what in resource distribution.

The criteria in resource allocation and distribution in many societies have always been guided by three principles, namely; *equality*, *equity* and *need*. However, each of the criterion has some limitations. For example, according to the equality criterion, goods should be distributed equally among all persons giving each person same amount of resources. With this criterion, therefore, people with different levels of needs end up getting the same amount of resources and this often result to an unfair distributive outcome. For example, if every student who gets grade A in High School qualifies for a university scholarship of kshs. 100,000 while the actual fee is kshs. 500,000, then this distribution will only be fair to those students and parents who can afford the difference, but is of no help to families who can not afford to pay the additional fee to attend university. Ideally, students from poor backgrounds should be able to qualify for more scholarship.

If the equity criterion is adopted which would ensure that benefits are shared in proportion to the individuals' contribution, those who make a greater contribution to their group would end up receiving greater benefits irrespective of needs. The equity criterion thus tends to reinforce and

perpetuate inequality within the society. The richer members of the society, who normally make greater productive contributions to the economy, would continue to enjoy greater proportions of benefits which tend to reinforce social inequality while undermining the ability of the less privileged to compete within the same economy.

And if the *needs* criterion is applied, an equal distributive outcome would result as those who need more would receive more. However, this criterion ignores differences in talent and effort which would serve as a dis-incentive to production and efficiency. The people who contribute more in the production process will feel discouraged when they see others who are less efficient or less productive enjoying the same level of benefits.

According to Maiese (2003), some philosophers have suggested a system of resource distribution that includes safety nets for those members of society who cannot compete. This system combines the principle of equity with that of need and tries to reward people for their productivity while at the same time ensuring that their basic needs are met. Also, resources might be distributed according to social utility, or what is in the best interest of society as a whole. This is the argument that is frequently fronted by highly- paid company chief executives, who not only argue that they deserve their high salary package and allowances because of their contribution to their company businesses, but they also claim that they are the “job creators”, thus paying them handsomely benefits society as a whole!

In their work on equity, equality and need, Folger, et al (1995) have suggested that these criteria of resource distribution are not principles adopted for their own sake but rather endorsed to advance some social goal. For example, equity criterion tends to foster productivity, principle of equality stresses the importance of positive interpersonal relationships and a sense of belonging among society members while the need criterion tends to ensure that everyone’s basic and essential needs are met (Maiese, 2003).

It has been observed that given that these (equity, equality and need) principles are often in tension with one another, one of them is usually taken as the central criterion of resource distribution.

There has been, however, considerable debate on which principle is to be adopted in resource allocation. While some writers have argued in favour of strict egalitarianism or strict equality in resource sharing, others have argued in favour of the “needs criterion” in resource distribution among members of society. For example, John Rawls (1996) while contributing to the theory of distributive justice suggested that all social and basic goods should be distributed equally unless an unequal distribution of any or all of the goods is to the advantage of the least favoured in society. Thus according to Rawl (1996) in the distribution of resources, favourable considerations in benefits should be directed to the least advantaged (i.e. needy) in the society, and as long as this is done, it doesn't matter even if the resource distribution mechanism is perceived as being unequal.

Fleischacker (2005) has asserted that, distributive justice represents a norm of equality which insists that *“everyone is rewarded in proportion of his or her merit such that it is unjust for unequals in merit to be treated equally or equals in merit to be treated unequally”*. Applying Fleischacker's view to resource distribution, one would argue that it is unfair to allocate same amount of resources to persons who are not equal, for example, allocating same level of resources to a rich and a poor person. Likewise, it is unfair and unjust to allocate different amount of resources to persons who are equal.

Both Rawl's and Fleischacker's arguments appear to support the view that in the distribution of resources, consideration should be made to the social-economic differences of members of the society. Roemer (1996) and Fleurbaey (2004) have contended that distributive justice advances the interest of the least advantaged in the society by justifying as a fair distributive system, a resource allocation mechanism that directs more benefits to the worse -off groups (Roemer, 1996 and Fleurbaey, 2004). Differences or inequalities in society are allowed only to the extent that they benefit the least advantaged (Lamont, 2002).

The theory of distributive justice just like the public interest economic regulation theory, thus supports the case for government intervention in housing and housing market to facilitate access to adequate and affordable housing by all social-economic groups in society. Evidence in developing countries has demonstrated that market forces of demand and supply cannot be relied upon to guarantee equitable re-distribution of resources within any society. The poor in particular

cannot compete effectively for resources in the open market. Distributive justice demands that the poor (needy) and those with modest means be favoured in resource allocation, hence the need for government intervention to ensure fairness and justice in the allocation of the housing resources through among other things ensuring affordability of housing and of the factor inputs in the housing production process.

Having discussed the public interest economic regulation theory and the theory of distributive justice, the following is a discussion on some special housing characteristics that encourage market failure when such markets are not regulated and therefore justifies the case for government (state) intervention in the housing market with a view of making the housing market more efficient to facilitate access to adequate and affordable housing.

3.2 Special Characteristics of Housing

Housing has some special characteristics that distinguish it from other products, and which tend to impair the efficiency of the price mechanism and prevent optimal resource allocation through the market system. These characteristics make the housing market imperfect and hamper its smooth operation and efficiency in delivery of adequate and affordable housing.

The imperfections contribute to the volatility of house prices sometimes pushing them beyond the reach of segments of population with modest means. The role of government is, therefore, to try to correct the imperfections so that housing as a product can be accessible and affordable by all individuals and groups in society. The characteristics of housing which necessitates the need for government (State) intervention are as follows:

a) Heterogeneity or diversity

Housing as a product is not standardized. No two houses are exactly the same. They always differ in certain aspects, for example, size, design, repair conditions, amenities and tenure system. Even if two houses are the same in all aspects they will always differ in location. This heterogeneity or non-standardization of the housing product necessitates the development of a range of several and diverse housing sub-markets. Therefore, contrary to many consumption goods, there is no homogenous housing market and this makes the dissemination of market information to the

market participants' very difficult leading to serious distortions in house prices sometimes making them unaffordable by a majority of the participants in the market.

b) Inelasticity of supply

A fundamental economic feature of housing is the difficulty of varying its supply. The physical overall supply of land is virtually fixed and the mix of various land uses is difficult to alter because of planning controls. Due to the time taken to obtain planning permission, organize development finance, construct buildings and arrange disposals, the housing industry is slow to respond to an increase in demand. Conversely, it is difficult for supply to react to a reduction in demand. It is not always viable or practicable to demolish or change buildings to meet such a reduction in demand. This lack of responsiveness (or inelasticity of supply) in the housing industry leaves it abnormally vulnerable to economic booms and slumps. When the market is already booming, it is too late for developers to respond, by the time developers do so, the boom may be over. An oversupply at this stage will actually worsen a slump. In the period before developers effectively responds to demand, house prices are likely to be abnormally high.

c) Fixity of location

The nature of housing is such that each house occupies a fixed location and is localized to a particular neighborhood. This can sometimes mean that the number of buyers or sellers is so restricted that monopolistic conditions prevail (Syagga and Aligula, 1999). Monopoly has the adverse effect of sometimes keeping prices of products very high. But even though the housing market may be local, as for instance, in high, middle or low income neighborhoods, its area may extend beyond wide limits. This in essence makes it difficult to estimate the number of potential buyers and sellers since those in higher income groups do trade in lower income markets. In such situations, full information necessary for a competitive market is often absent.

d) High transaction costs

Consuming housing services involves relatively high transaction cost relative to other consumption goods. For instance, buying or selling housing often involves such costs as advertising costs, agent's commission, legal fees and taxes such as stamp duty. Reconstruction or modification of existing housing especially in urban areas attracts additional approval costs and

fees. These incidental costs on housing transactions often discourage mobility and tends to slow down the response in market conditions.

e) High purchase cost

Housing, as a product, is very expensive often much more expensive than other consumer goods. In most cases, housing cannot be purchased outright from household income or savings given the often high cost involved. The cost of housing is the biggest item in most family's budgets (Smith et al, 1998 and Stone, 1993). Hence, financing for housing is often done through different arrangements from different sources such as outright purchase or mortgage with money borrowed from banks or other finance sources. Thus, the delivery of housing services is closely tied to the availability and supply of adequate finance in the finance market. As a result, changes in the finance market often have dramatic impact on the housing market.

Other distinctive features of housing make its acquisition a unique experience for any household. Being larger, durable and tied to location, housing is often purchased as a complete dwelling unit not as a shopping basket of separately selected items (rooms, facilities, amenities, and location) in the way that food and clothing are purchased. Unlike food, it is not purchased a new on a regular and frequent basis. Once a household occupies a particular dwelling, it is hard to alter the amount and type of housing services consumed (Stone, 1993). Due to its bulkiness, its immobility and its attachment to land, when people obtain housing they are not just purchasing the services of the dwelling but the advantages and disadvantages of the location, physical characteristics, neighborhood, accessibility and services, among other attributes of housing.

These characteristics of housing make it a unique complex product and process, inherently susceptible to externalities and other attributes that lead to market imperfections more than any consumption good. As a result, the housing sector, especially in developing countries is marked by pronounced market failures, which justify government (state) intervention as argued by the economic regulation theory and distributive justice theory. As stated earlier, State intervention in the market is needed to offer market stability and ameliorate the adverse impacts of inadequate and unaffordable housing on households and by extension the larger society.

The following is a discussion on the contentions of state intervention versus free market system in the provision of affordable housing.

3.3 State Intervention versus Free-Market Debate in Housing Affordability

The debate on state intervention versus free market in affordable housing provision revolve around whether the state (government) should intervene in the housing market or whether allocation of housing resources should be left to the market forces of demand and supply.

Proponents of the free-market system consider this as the option that would guarantee efficient and optimal allocation of resources in the housing sector. They argue that government involvement in housing only serves to distort the operation of the free market forces of demand and supply. Free market theorists further consider government intervention in housing sector such as direct public housing delivery, provision of price subsidies of any sort (including rent controls) and acquiring dominant control in the use of land as distortions that mitigate against the possible functioning of the free market and, therefore, should be minimized at most or removed where possible (Okechukwu,2009).

The free- market resource allocation system is built around the neo-classical economics that was developed in the later part of the 19th century by the English Economist William Stanley Javons along with the Australian Economist Carl Menger and Bohm- Bawerk as a reaction to the classical economics of Karl Marx and David Ricardo.

According to the neo-classical economists, the market mechanism ensures an efficient allocation of scarce resources by channeling productive factors into the supply of most demanded goods and services within any given market. They argue that under perfect market competition conditions, the market maximizes social welfare of citizens by ensuring efficient allocation of resources between different outputs and also allocation of outputs between individuals to ensure maximum utility. Under the market system, individuals within a given income, in satisfaction of their preferences buy goods and services in a manner that ensures that the benefits derived from the last unit purchased equals the price paid for it. Thus consumers maximize their benefits within their income and budget constraints. On the other hand, in order to maximize profits, producers usually supply to the market in a manner that ensures that the price paid for any

additional unit of output they produce is at least equal to the additional cost of producing such output. Thus, the market system mutually satisfies the interest of the consumer and the producer through the Price mechanism, which also serves as an indicator for each group to rationalize or increase consumption or production (Stafford, 1978 in Okechukwu, 2009). Thus it is argued that the market price mechanism maximizes the use of scarce resources by ensuring that they are distributed into productive activities in such a way that satisfy consumer's preferences.

Efficiency and optimal resource allocation through the market system, however, is only achieved in conditions of perfect competition which are built upon four major underlying assumptions; (a) production of goods and services reflect the preference of consumers at all times (b) all the individuals and firms in the market have perfect information at all times; (c) all the individuals and firms in the market maximize their utility and profit respectively; (d) production of goods and services are assumed to be flexible with each of the factor of production easily interchangeable (Bassett and Short, 1980; Okechukwu, 2009).

The housing market, however, is far from perfect and therefore these characteristics of perfect competition rarely exist. The imperfections in the housing market are due to the special or peculiar characteristics of housing, namely; its heterogeneity, its durability, high cost of transfer, its locational fixity, in-elasticity of supply and credit dependency. The special housing characteristics have, among others, the effect of influencing the supply response to housing demand and the flow of market information which explain the imperfections in the housing market and the consequent distortions in house prices. Affordability problems are due in part to these imperfections. An inelastic supply, for instance, means that when there is increased housing demand, its impact is largely reflected in house price increases rather than in the quantity of housing supplied. The increased house prices have the effect of dampening affordability unless there is commensurate increase in household incomes. The high cost of transfer and the fixity of location of property also contribute to high property prices thus affecting affordability.

As a result of the special characteristics of housing and its inherent imperfections, the housing market is incapable on its own of providing an adequate supply at affordable prices for a substantial portion of the urban population especially the low and middle income groups. Hence,

there is the need for considerable government (state) intervention, primarily fiscal but to some extent regulatory to compensate for the imperfections and stimulate the private housing market.

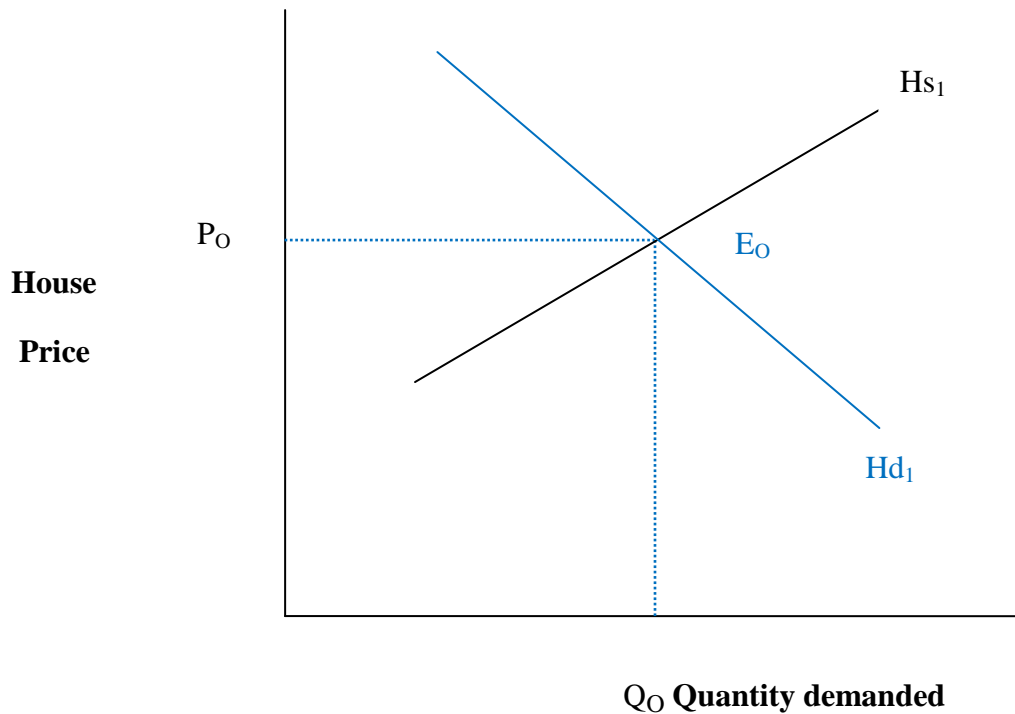
The need for state intervention in housing has over the years gained impetus within the international housing policy discourses. The Habitat Agenda and the Istanbul Declaration, for instance, implicitly requires effective government mediation in the housing market to ensure a more equitable access to housing for all segments of the population (Okechukwu, 2009). The enablement approach within the Global Strategy for Shelter to the year 2000, though advocates for private sector and market- driven housing delivery, has an important caveat that it must be pursued within a framework that addresses areas where the private and the unregulated markets do not work, thus effectively underscoring the need for state intervention in housing. Many housing researchers and scholars have also continued to maintain their believe in direct and effective government intervention as part of the solution to the affordability problems of the society. Stone (1993) has for example advocated for housing to be removed from the market system and be made a non- profit good.

The next section reviews literature on factors affecting housing affordability and presents a conceptual model of affordability and its determining factors. The conceptual model of affordability is subjected to analyses later in the study with the view of identifying factors which are relevant and critical in the Kenyan mortgage housing sector.

3.4 Factors Affecting Housing Affordability

Yates et al (2007) has noted that the causes of affordability problems are complex and diverse with major driving factors found both within the housing system and beyond it. According to O'Flynn (2011), the two pivotal factors are the demand for and supply of housing with a host of other issues in turn influencing both demand and supply of housing. The interaction of both demand and supply factors influence the price of housing which in turn affects affordability. Basic economic theory postulates that, all things being equal, a rise in the price of housing leads to a fall in housing demand, giving a downward-sloping demand curve for housing as shown in Graph 3.0. An increase in housing price will, however, lead to an increase in housing supply as developers will be motivated to construct more houses to benefit from the higher price. There is

therefore a positive relationship between housing price and the quantity of housing supplied as shown in Graph 3.0 below.

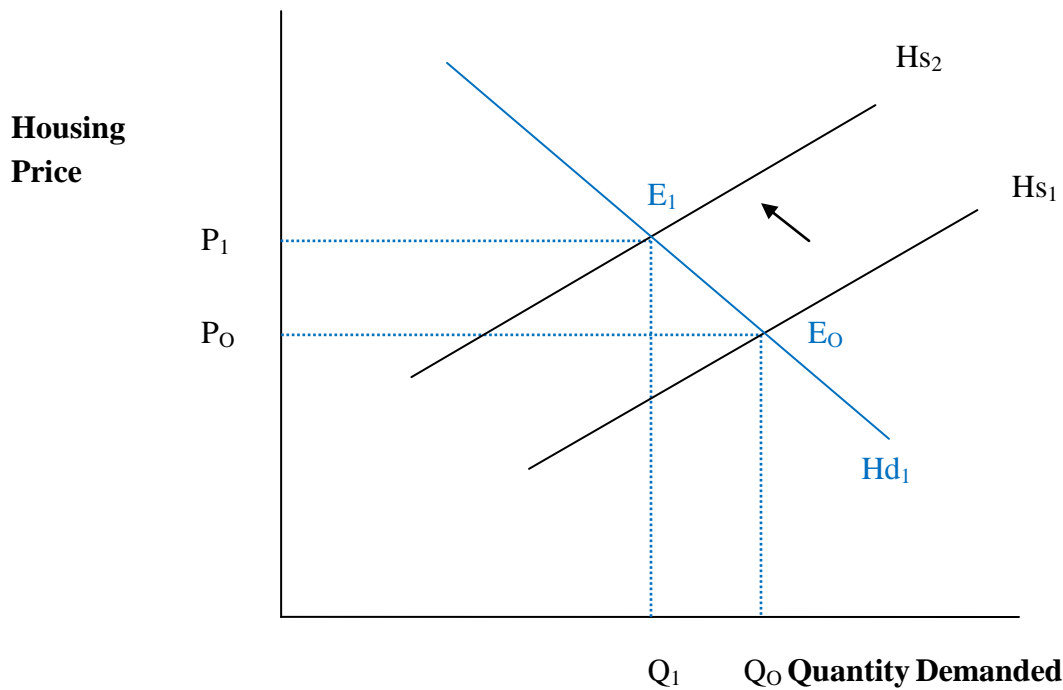


Graph 3.0 Housing Market in Equilibrium State

Source: Adapted and Modified from Pilbeam (2005)

From Graph 3.0, Hs_1 represents housing supply and Hd_1 represents housing demand. The point at which Hs_1 and Hd_1 crosses one another is the equilibrium price E_0 . It is the price at which the quantity of housing demanded equals the quantity supplied.

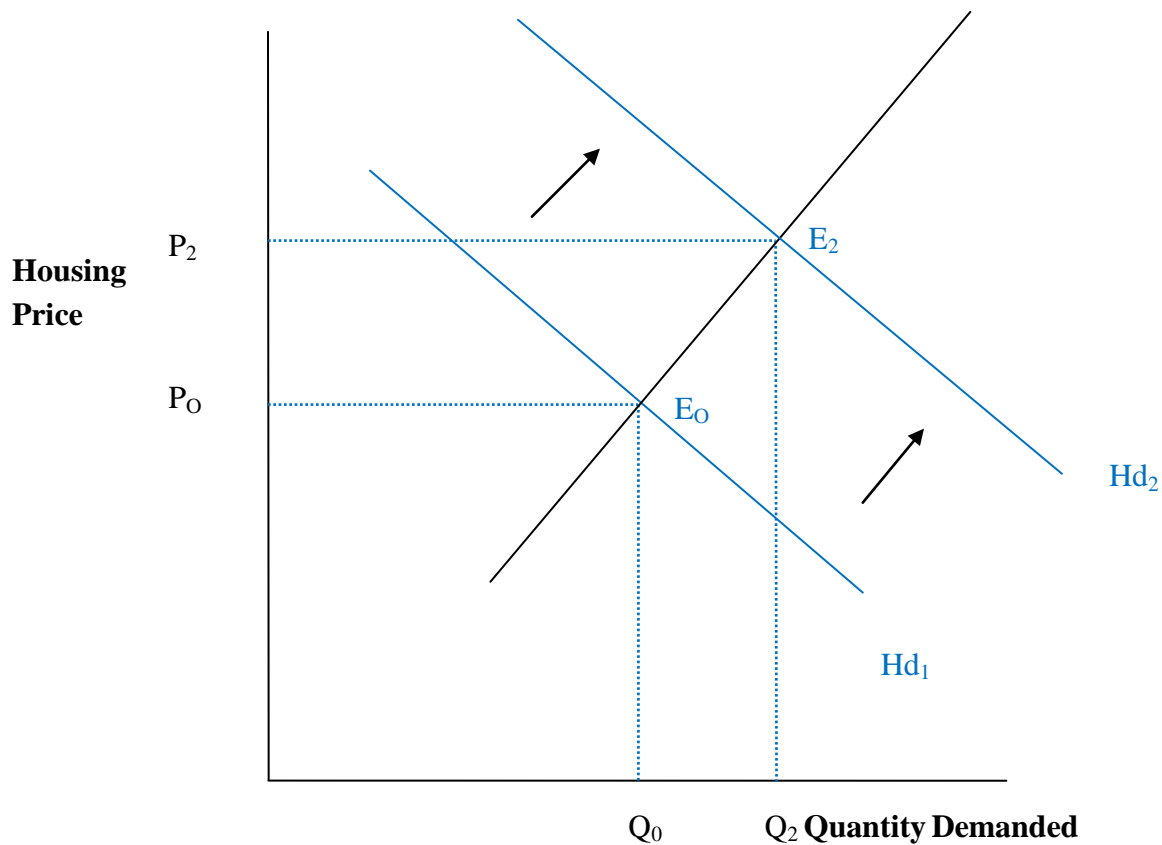
An increase in the supply of housing will result in outward shift of the supply curve as illustrated in Graph 3.0a.



Graph 3.0a Housing Market with a Shift in the Supply Curve

Source: Adapted and Modified from Pilbeam (2005)

When the Hs1 curve shifts to the Hs2 with the demand curve still at Hd1, the new equilibrium price is E1. At point E1, the price of housing will move to P1 and the quantity demanded moves to Q1. This means that when the supply side of housing is affected and the supply curve shifts to the left as shown in Graph 3.0a, the price of housing increases and quantity demanded reduces and this indirectly affects the affordability of households to obtain housing as their income is fixed (Pilbeam, 2005). On the other hand, if the demand side of housing is affected and the demand curve shifts to the right as represented by Hd2 in Graph 3.0b, with the supply curve still at Hs1, the equilibrium price shifts to E2 and the quantity demanded moves to Q2 at price of P2.



Graph 3.0b Housing Market with a Shift in Demand Curve

Source: Adapted and Modified from Pilbeam (2005)

The resultant shifts in supply curve to the left and the demand curve to the right, which effectively shifts the equilibrium price, is caused by factors that lead to increases in housing demand and supply. The demand side factors include household growth (in turn affected by natural increase, immigration, household formation); real incomes; real wealth; tax concessions

to both owner occupied and rental housing; concessions to first home buyers; return on alternative investments; cost and availability of finance for housing; and the institutional structure affecting housing finance (O’Flynn,2011). The supply side factors include factors that affect the cost of house provision such as the cost and availability of land, land development processes and policies, infrastructure costs (including development charges), the cost of construction, costs of professional services; and property related taxes (Yates et al 2007; O’Flynn 2011).

The following discussion examines in detail the housing demand and housing supply factors that influence housing affordability.

3.4.1 Demand-Side Factors

The factors affecting demand for housing are considered to influence affordability because they affect household income which in turn affects the ability of households to pay for their housing. These factors are as follows:

i. Macro- economic environment

The demand for housing is a function of several macro-economic factors that directly impact on people’s incomes and ability to pay. The macro-economic factors are usually regarded as important indicators of economic performance of the country and a measure of the wealth/living standards of the people. The factors include inflation rate, level of employment/un employment, interest rate, exchange rate and real gross domestic product (GDP).

According to Stephens (2003), the macro-economic variables reflect the strength and stability of the economy. Increasing real GDP for instance, signifies a growing economy, while falling GDP reflects poor economic performance. Samuelson and Nodhaus (2001) have noted that growth in real GDP is usually associated with rising real incomes and living standards of the general populace. Improved incomes means greater purchasing power of households which in turn stretches demand for basic commodities like housing pushing up house prices. Conversely, falling GDP may lead to a decline in the incomes of households which will dampen housing demand leading to a reduction in house prices.

The level of interest rates also has direct impact on demand because it directly affects access to mortgage credit. Gyntelberg et al (2007) have argued that if lower interest rates are perceived to be permanent, households can afford to borrow more, which tend to push up house prices. High interest rates on the other hand will dampen house demand resulting to reduced house prices. Interest rates in the economy are affected by such factors as the availability of funds for lending and general inflation rate which is a risk to be compensated by high interest rates. Increased rates of inflation are, therefore, likely to increase the rate of interest hence the cost of borrowing.

Unemployment rate also influence housing demand. An unstable economy will high rates of unemployment leads to a decline in real incomes and could lead to negative loan amortization in real terms creating difficulties in mortgage loan repayment.

Level of exchange rate also affects house demand. In Kenya, for instance, the rate of exchange plays an important role in the housing market since most developers (public and private) usually import building materials especially cement, sanitary fittings and finishes. Fluctuations in the level of exchange rate is therefore likely to affect the demand for housing which in turn would influence house price and affordability.

ii. Demographic/Social- economic factors

Clara (2006 in Bujang et al. 2010) defines demography as a study of human populations with emphasis on the statistical analysis of the quantities and characteristics of the people who live in a particular area, especially in relation to their age, how much money they have and what they spend it on. Demographic factors also include social economic factors such as age, income, sex, occupation, education and family size (Bujang et al. 2010). Idrus and Ho (2008 in Bujang et al 2010) demonstrated that demographic factors are important variables for house price determination in the long-term. The growth of urban population, in particular, is an important driving force in the demand for housing. Lee (2009) noted that rapid population growth is likely to increase demand for houses and hence put an upward pressure on house prices hence affect affordability. George Masnick (in Goodman and Rhoda, 2005) compared affordability problems between 1990 and 2000 in some US States and found that affordability problems were in States with strong population growths. The rate of formation of households has a more direct impact on housing demand considering that every newly formed household would require a home.

Households social-economic characteristics, for instance, level of education, marital status, rates of divorce/separation, size of households, number of family members with income, loss of income by households all have important impact on housing demand and therefore affordability.

iii. Government policies

Government policies that influence household incomes and savings have direct impact on housing demand and affordability. Government incentives on income tax, for example, deducting mortgage loan interest and property taxes before taxing income, tax relief on mortgage payments, tax exemptions and tax credits all serves to increase housing demand. Government policies on infrastructure development, land and housing supply policies could also have a positive or negative impact on housing demand and house prices. For example, if government invests heavily on infrastructure and provides roads, sewer, and electricity, this is likely to increase demand for such housing.

iv. Property attributes

The characteristics of properties in a region or locality have an influence on demand for housing in the area. Property attributes which affect housing demand include the size and cost of the plot and the house, age, quality of architectural design, type of building materials and finishes as well as presence of such amenity features as gardens, garage/parking and views. Property transaction costs, for example, lawyers fees, government stampduty on property transfer and professional fees increases the overall cost of housing and therefore affects housing demand. Infrastructure costs and developers profit also adds to the overall price of housing.

v. Mortgage loan characteristics

Some factors affecting housing demand are loan related. These factors influence demand for residential housing because they influence the demand for mortgages. The factors include the duration (term) of mortgage loans, loan amount and deposit required by banks, type of mortgage instrument in use and the mode of loan re payment, as well as the amount of insurance premiums for mortgage protection. Such loan related factors affect the demand for housing and therefore the price of housing.

vi. Alternative investments

The performance of alternative investment markets, for instance, the shares and bonds market has an impact on housing demand hence affordability. In particular, how investors' judge expected returns in the housing market as opposed to the stock and bonds market directly impacts current demand. When the equity (bonds, share) market is performing well, investors have a tendency to direct their financial resources towards this market and this has the effect of dampening demand in the housing market.

3.4.2 Supply -Side Factors

i. Macro-economic environment

Just like housing demand, the supply of housing is affected by such macro-economic variables like inflation rate, interest rates, exchange rate and general performance of the economy as reflected by the level of real gross domestic product. The cost of credit offered by banks and financial institutions will for instance, determine the level of housing construction, and similarly prices such houses would sale in the market. Macro-economic factors will also influence the cost of the various inputs in house production, for example, the cost of building materials, labour, infrastructure costs and professional design fees which would in turn affect housing supply.

ii. Planning regulations

Planning regulations imposed by zoning rules, building codes, subdivision and density regulations, property taxation and other fiscal policies by both national and local government have an influence on housing supply. Sabal (2005) noted that planning and regulations on the use of land influence supply and that the more strict and unresponsive the planning authorities are to demand, the higher housing prices will be. Restrictive land use policies which prescribe both the minimum and maximum plot size for an area, makes provision for open spaces, only serves to limit the amount of developable land and therefore affects house supply. High building standards imposed by building codes and local/county government regulations have the effect of increasing the cost of housing. Development regulations also prolong the time and duration of obtaining relevant building approvals and this discourages many developers wanting to invest in housing.

iii. Environment regulations

Environmental rules and regulations imposed by various state agencies have an impact on housing supply. In an effort to achieve environmental sustainability in development projects including those in the building industry, most governments have enacted legislations which require Environmental Impact Assessment (EIA) and Environmental Audits (EA) to be conducted on new and existing developments likely to have negative impacts on the environment. In Kenya, for instance, there is the Environmental Management and Coordination (EMCA) Act of 1999, which require all proposed developments likely to have negative impacts on the environment to be preceded by EIA studies. The costs of such studies are usually high and this increases the overall cost of housing projects affecting supply of housing. Getting approvals and license from environmental authorities is usually a lengthy and time consuming process which contributes to delays in housing development.

iv. Government policies

Government policies on taxation, land supply and infrastructure development could have significant impacts on housing supply. For example, a government policy to exempt certain categories of building materials from taxation or to lower the tax levels on such materials could drastically reduce the cost of house construction increasing the supply of housing. Similarly government policies to allocate more funds towards infrastructure development are likely to bring down the cost of house production and improve the supply of housing. Further, land re-adjustment programmes by the government increases supply of serviced land hence improves on housing supply

3.5 A Conceptual Model of Factors Affecting Affordability

A model is a construct or diagram which explains the underpinnings of a theory base (Akinwunmi (2009). Daresh and Playko (1995) describe a model as interrelationships of variables or factors in a theoretical statement depicted graphically. Also, a model is a description used to show complex relationships in an easy to understand term (Lunenburg and Irby, 2008). Models are empirical and testable.

As explained in the previous section 3.4 and depicted in Figure 3.0, a model of housing affordability is built by the interrelationships of factors/variables which influence the demand and supply of housing, and also other factors which directly influence house prices and incomes. Specifically, affordability is influenced by the house prices, interest rates and households' income. House prices as shown in Figure 3.0 are determined by the market forces of demand and supply. The factors affecting both demand and supply of housing have already been discussed in section 3.4. However, as a link-up, Figure 3.0 shows that housing supply is influenced by macro economic factors which include, inflation rate, exchange rate and real gross domestic product(real GDP), among other factors. Housing supply is also influenced by the availability and cost of land, the cost of construction which in turn is affected by prices of building materials, labour, infrastructure costs, planning restrictions and environmental regulations.

The demand for housing on the other hand is affected by macro-economic factors, the price of housing and household income. Housing demand is also influenced by mortgage loan characteristics including the availability and terms of lending which include the requirements for downpayment/ deposit, loan repayment period/ loan term, loan-to-value (LTV) ratio, mortgage insurance amounts, among other factors. House demand is also influenced by property attributes which include the size and value of land and house, the house design, property transaction costs and developers profit. Figure 3.0 further shows that demographic factors which include population growth, household formation and other social-economic characteristics of households influence housing demand and therefore affect house prices and affordability.

Affordability can therefore be conceptualized to be a function of housing demand and supply, which are in-turn influenced by factors related to the macro economic environment, property characteristics, mortgage loan characteristics, demographic and household social economic factors and a host of other factors that directly influence housing price, interest rates and household income.

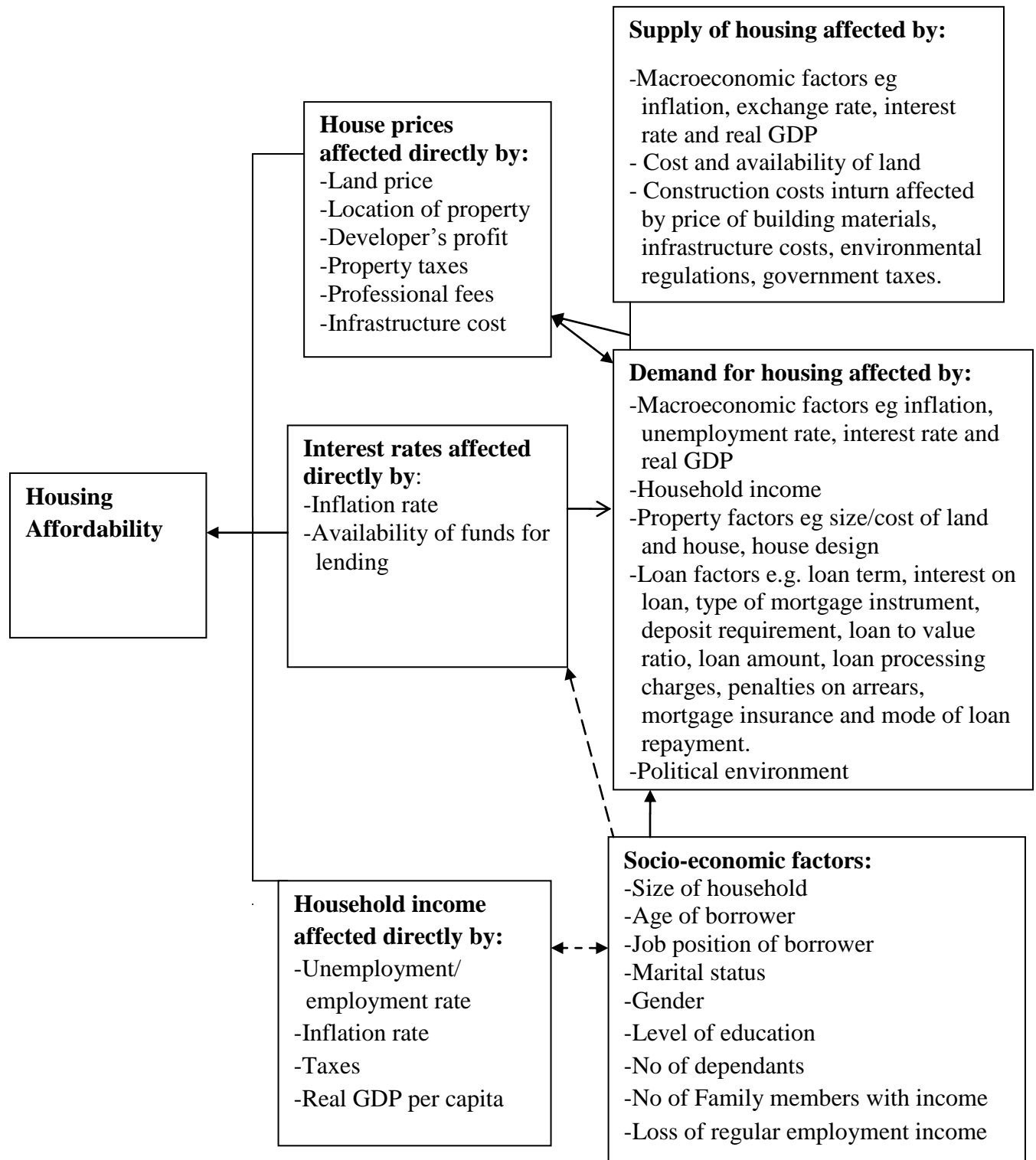


Figure 3.0 Factors Affecting Housing Affordability

Source: Adapted and Modified from O'Flynn, 2011

3.6 Summary

This chapter has reviewed theories of housing affordability and formulated a conceptual model of affordability and the determining factors.

The theories that explain housing affordability problems are the public interest economic theory of regulation and the theory of distributive justice. The theories are built around the classical welfare economics and present the case for government intervention in the housing market as a means of addressing the pressing affordability problems in developing countries.

The special characteristics of housing that impair the efficiency of the housing market thus necessitating the need for state intervention in housing are discussed, as well as a debate on state intervention vs. free- market system in the delivery of affordable housing.

The last section of the chapter has reviewed literature on the factors affecting housing affordability and formulated a conceptual model relating affordability and the determining factors.

The factors that affect affordability are mainly the supply and demand for housing. The supply and demand for housing are in turn affected by factors related to the macroeconomic environment, property attributes, loan characteristics, demographic and household social economic factors, and a host of other factors. As already mentioned, the primary objective of this study is to identify the significant factors that influence affordability in the home ownership (mortgage) housing sector in Kenya and rank the factors with respect to contribution to housing affordability. The next chapter presents the methodology of conducting the research study.

CHAPTER 4

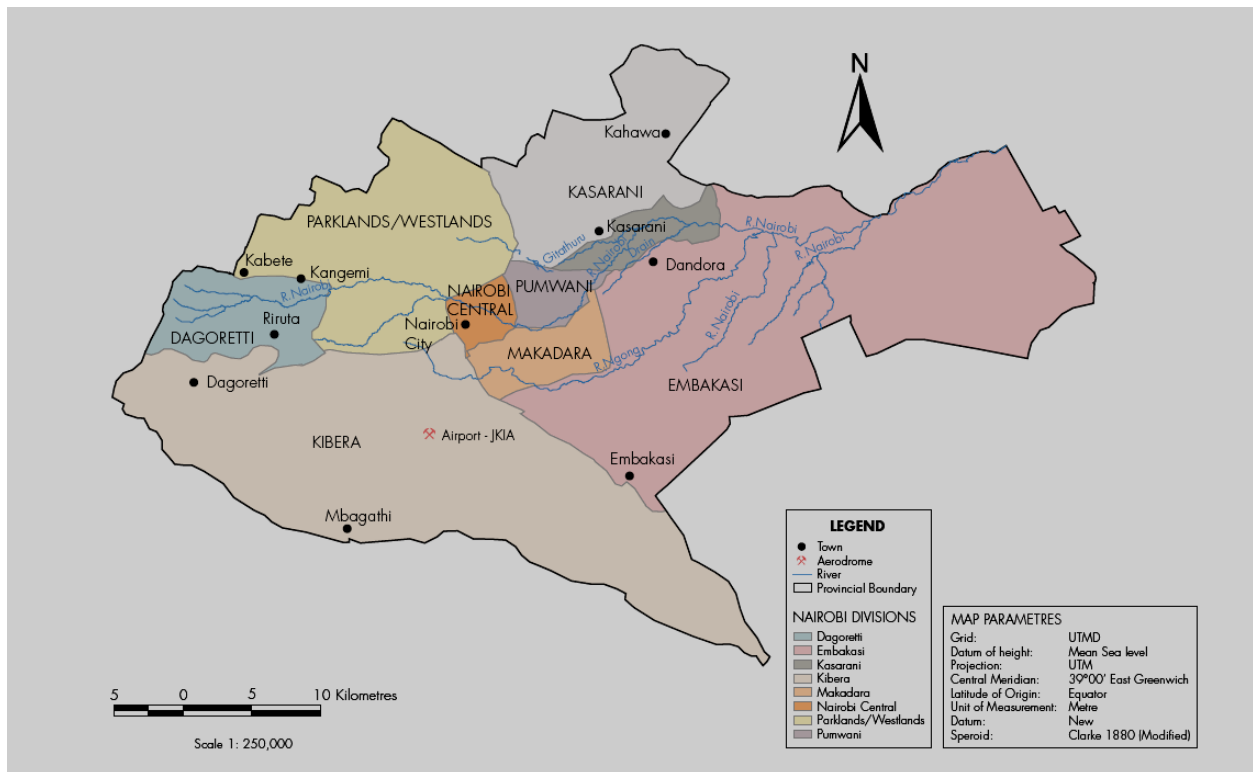
RESEARCH DESIGN AND METHODOLOGY

4.0 Introduction

This chapter describes the methodology of conducting the research and details of the methods used in data collection, data measurement and data analysis needed to accomplish the research objectives. The chapter begins with a brief description of the case study area, Nairobi, its location in Kenya, population dynamics and the housing situation that necessitates the need for policy interventions to address the affordability challenges of households in the City and Kenya in general. The chapter then discusses the research design adopted for the study by highlighting the sources and types of data used, the procedures employed in deriving the research variables and a description of the relevant variables and data used in the study.

4.1 Over view of Nairobi City

Nairobi is the capital city of Kenya. It is situated at the south-eastern end of the agricultural heartland of Kenya. The immediate environment of Nairobi consists of the productive highlands area extending northwards and westwards to embrace the rich farming lands of the Rift Valley. The boundary of the present day Nairobi is shown in Map 4.0.



Map 4.0: Showing Boundary of the Present Day Nairobi Indicating the Main Administrative Divisions and Subdivisions

Source: NCEO Report, 2007

According to the 2009 Population and housing census, Nairobi city was divided into four (4) zones, namely; Nairobi East, Nairobi West, Nairobi North and Westlands (Republic of Kenya, 2009). According to the census report, the population distribution count consisted of 1,144,416 people in Nairobi East, 684,765 people in Nairobi West, 1,062,086 in Nairobi North and 247,102 in Westlands. This gives an overall population of 3,138,369 of which 1,605,230 are male and 1,533,139 are female. There are in total 985,016 households in Nairobi of which majority over 70 per cent are male headed for both poor and non poor categories. Nairobi's average household size is 3.8 which is well below the country's mean household size of 5.1 and slightly below the average household size of 4.0 for all urban areas. The dependency ratio, defined as the

proportion of population that is dependent, is at 52.7 per cent but this ratio is much higher among the poor at 71.3 per cent (Republic of Kenya, 2009).

Home ownership rate in Nairobi is quite low at 7.6 per cent compared to 87.9 per cent who rent their accommodation. The low incidence of owner occupation is attributed to the high cost of housing and the low incomes of households. Majority of households over 30 per cent acquire their homes through mortgage financing while a small proportion of 19.7 per cent buy their homes in cash (Republic of Kenya, 2005, 2009). The challenge for authorities in Nairobi is, therefore, on how to increase home ownership as well as improving the affordability of households.

4.2. Research Design

This study investigated factors affecting urban housing affordability in the home ownership mortgage housing sector in Kenya. The research utilized the survey method employing questionnaires to collect field data from households in Nairobi acquiring homes through mortgage financing.

A survey is a system for collecting information to describe, compare or explain knowledge, attitudes and behavior of people (Fink, 1995b cited in Wachira, 2008). It is appropriate where the individual respondents are the units of analysis and primary data (not available elsewhere) are required to describe the population. The survey method studies a phenomenon of the moment by asking people questions about the issues under study and tabulating their answers (Leedy and Ormrod, 2001 in Wachira, 2008). Data used in the survey method can also be obtained indirectly by reviewing written, oral and visual records of people's thoughts and objects in natural or experimental settings (Wachira, 2008).

The survey method was selected for several reasons. Firstly, households acquiring homes through mortgage are located in diverse zones/ locations in Nairobi. The survey method is appropriate for collecting data from such a population because it allows for cluster and stratified sampling which ensures that households from every zone are represented in the study. Secondly, the survey method allows for data to be collected from several respondents so that the affordability challenges of several households can be investigated.

Figure 4.0 Shows the Operational Framework of the Study.

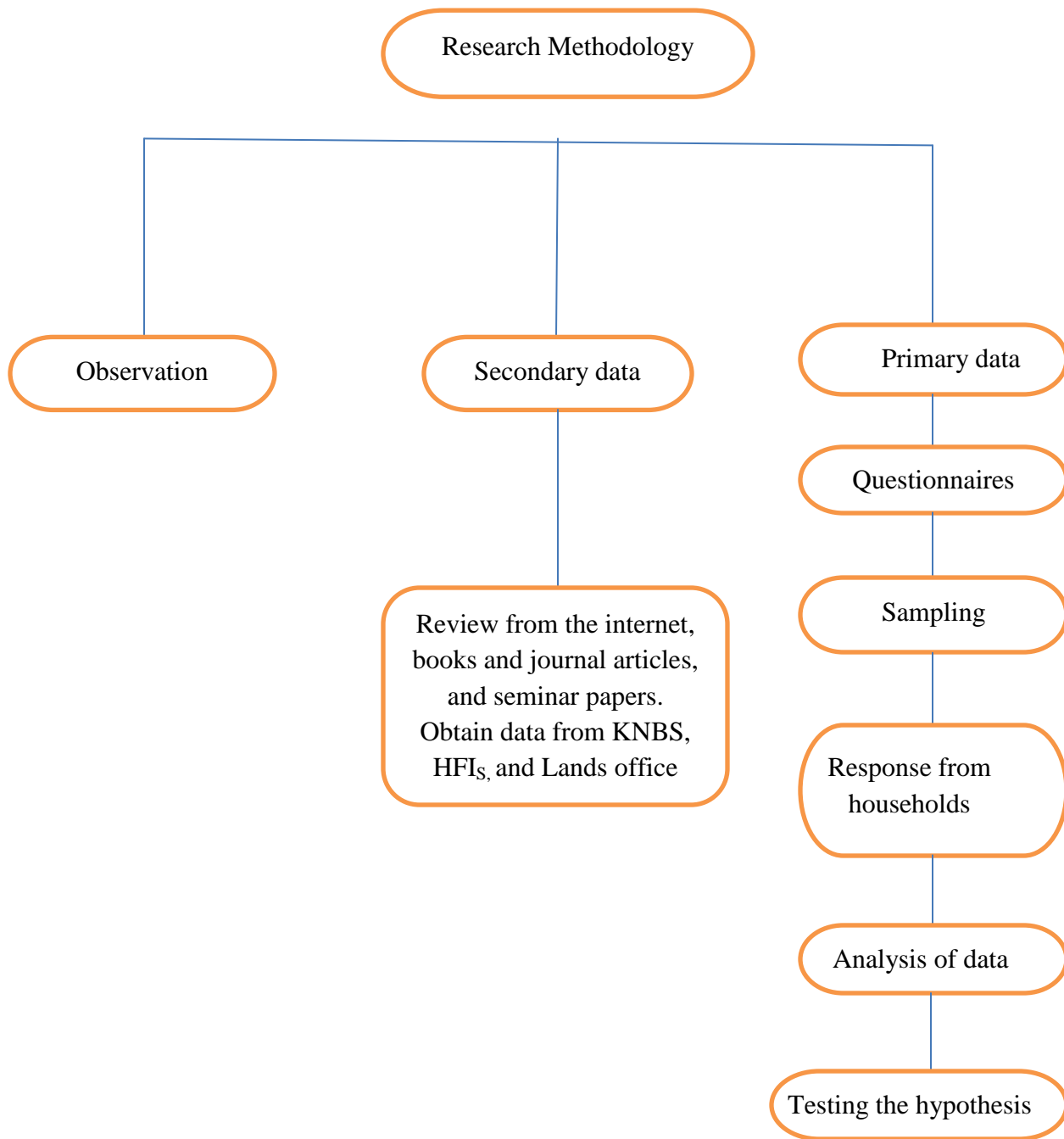


Figure 4.0: Operational Framework of the Study

Source: Adapted and Modified from Bujang et al. (2010)

The detailed methodology is discussed as follows:-

4.2.1. Population, Sample Size and Sampling Techniques

The population in this study consists of all households in Nairobi with mortgage loans from Housing Finance Institutions (HFIs) and Commercial Banks. The main providers of mortgages in Kenya are the; Housing Finance (HF) Limited, Kenya Commercial Bank (KCB), CFC Stanbic Bank (CFC), Standard Chartered Bank (SCBK) and the Barclays Bank of Kenya (BBK). The five institutions control 71% of the mortgage market in Kenya. According to the Central Bank of Kenya annual reports of 2011 and 2012, Housing Finance (HF) Limited was the mortgage market leader both in terms of value of mortgage loans and number of customers in 2011. In 2012, Housing Finance (HF) maintained the lead in terms of number of customers, but Kenya Commercial Bank (KCB) Limited led in terms of the value of mortgages outstanding. In 2012, the number of mortgage accounts in Housing Finance Limited was 5,235 compared to KCB total mortgage accounts of 5,091.

Information in Housing Finance Institutions (HFIs) and Banks in Kenya is usually difficult to access due to an implicit contractual requirement to maintain confidentiality of customer information by these institutions. The researcher had, therefore, to obtain the necessary permission from the HFIs. However, despite numerous efforts, not all the HFIs and Banks agreed to release their data, which led to scaling down on the number of institutions included in the study to only one HFI, that is, Housing Finance (HF) Limited that agreed to release its data. Since Housing Finance Limited is the mortgage market leader in Kenya, the information obtained was considered a representative of the entire mortgage market. It was therefore from the mortgage data availed by Housing Finance (HF) Ltd that the population frame for the study was defined based on the set criteria, as follows:

- i). Households included were those holding mortgages on residential homes including flats, maisonettes, town houses and bungalows mostly purchased as ready-made units from developers.
- ii). Households included were those holding mortgages at market interest rates and not employer funded/ non- funded scheme loans or staff loans which are usually at subsidized or discounted interest rates.

Based on these criteria, records from the Housing Finance Institution showed that there are 2,013 households with mortgages in Nairobi originated at different times between the years 2000 and 2012. This figure formed the population for the study. The period of the years 2000 to 2012 for loan origination was selected because the research sought to elicit views from households who had paid their mortgages for varied periods and for a reasonable time. This was to ensure the reasons cited to affect affordability were reflective of different circumstances and experiences of the households over their repayment periods. Further, households who had paid mortgages for a reasonably long period were considered to be in a better position to share experiences on factors affecting affordability.

Due to the limitations imposed on the research of money and the challenges anticipated in accessing and administering questionnaires to the respective households with mortgages in the selected HFI, a sample size of at least 30 mortgages (corresponding to 30 households mortgage holders) for each year beginning from the year 2000 to the year 2012 was targeted which resulted into a total sample size of 390 households. However, the actual number of mortgages selected for each year was in proportion to the total mortgages for the particular year (see table 4.1). A target sample size of 30 households for each year was based on rules of thumb standard established in previous studies. For example, Roscoe (1975 in Masu, 2006) suggests that where samples are to be broken into sub-samples, a minimum sample size of 30 for each category is acceptable. In this study, the total sample size of 390 consists of households who originated their loans over the entire period from year 2000 to 2012 and, therefore, households with loans originated for each year can be treated as sub-samples. A total sample size of 390 is reasonable because studies involving multiple regression analysis require a fairly large sample for meaningful generalization.

Table 4.1. Below Presents the total number of mortgages (corresponding to total number of households mortgage holders), target sample size and responses from households by year of loan origination.

Table 4.1: Total Number of Mortgages, Sample size and Responses from Households for Each Year (2000-2012).

Source: Author's Construct from Records in HFI and Field Survey, (2012 &2013)

Year of Loan Origination	Total No. of Mortgages	Target Sample Size	Actual No. of Mortgages Selected in Proportion to Total Mortgages	No. of Responses	Response Rate (%)
2000	36	30	23	21	91.3%
2001	26	30	20	17	85%
2002	22	30	14	12	86%
2003	42	30	25	24	96%
2004	40	30	24	21	88%
2005	45	30	26	23	88%
2006	54	30	27	22	81%
2007	130	30	32	29	91%
2008	190	30	36	33	92%
2009	210	30	38	37	97%
2010	385	30	41	38	93%
2011	450	30	44	36	82%
2012	383	30	40	40	100%
Total	2,013	390	390	353	90.5%

In determining the sample size required, the rule of thumb should be to obtain as big a sample size as possible (Mugenda et al, 1999). However, resources and time tend to be major constraints in deciding on the sample size to use. Gay (1981 in Murigu, 2005) points out that the sample size depends on factors such as the number of variables in the study, the type of research design, the method of data analysis and the size of the accessible population. Gay (1981 in Murigu, 2005) goes further and suggests that for correlation research, 30 cases or more are required, for descriptive studies, 10% of the accessible population is enough and for experimental studies, at least 30 cases are required per group. Alreck and Seattle (1995 in Murigu, 2005) have proposed that a sample size of 100 cases is adequate. Mugenda et al, (1999) has recommended that if there

is no estimate available for the proportion of the target population assumed to have the characteristic of interest, 50% should be used as sample size. Gay (1996 in Wachira, 2008) provides the following guidelines with regard to determination of sample sizes:

- For small population ($N < 100$), survey the whole population.
- If the population is around 500, 50% of the population should be sampled.
- If the population size is around 1,500, 20% should be sampled
- For a population equal to or exceeding 5000, the population size is considered irrelevant and a sample size of 400 will be adequate.

Roscoe (1975 in Masu, 2006) proposes the following rules of thumb for determining sample size:

- Samples large than 30 and less than 500 are appropriate for most researches.
- Where samples are to be broken into sub- samples (e.g. male/females, juniors/ seniors), a minimum sample size of 30 for each category is necessary.
- In multi- variate research (including multiple regression analysis) the sample size should be several times (preferably 10 times or more) as large as the number of variables in the study.
- For simple experimental research with tight experimental controls (Matched pairs etc), successful research is possible with samples as small as 10 and 20 in size.

From the foregoing, considering the contentions and opinion of the above scholars as regards determination of sample size, and considering that personal and mortgage information of households is very secretive and therefore difficult to access, it is felt that a sample size of 390 mortgages (corresponding to 390 households with mortgages in Nairobi) would be adequate and appropriate for the subject study.

From the households' mortgage data obtained from the selected Housing Finance Institution, it was observed that the households with mortgages from the HFI, are geographically interspersed into the various zones/locations of the city of Nairobi, namely, the East, West, South and North of Nairobi. The cluster or area sampling technique was therefore employed in the selection of the households. According to Nachmias, et al (1996), cluster sampling is frequently used in large

scale studies because it is the least expensive sample design. It involves first selecting large groupings called clusters and then selecting the sampling units from the clusters. The clusters are selected by a simple random sample or a stratified sample. Each of the four zones/ locations in the city formed a cluster. Considering the stratified nature of the mortgage holders by house/ property type, a stratified random sampling method was adopted to draw the sample of loans originated between the years 2000 to 2012. Each stratum consisted of households with any of the category of houses, that is, bungalows, flats/apartments, maisonettes and town houses that were available in the particular location. From each stratum, the specified sample size was chosen by simple random sampling. The application of the cluster sampling, stratified and simple random sampling ensured that the sample size of 390 contained households with loans originated in each year from year 2000 to year 2012. It also ensured that the sample consisted of households with properties/ houses located in the four zones/ locations in Nairobi and also that the different types of houses were represented depending on the house types that were available in the particular zone. This ensured an unbiased representation of the sample and helped eliminate or minimize any form of sampling error which could adversely affect the final outcome of the study.

Of the 390 households mortgage holders randomly selected from records availed by the HFI, the researcher sought to first extract data of the individual households as contained in the loan application form, valuation reports, legal correspondence and monthly bill statements. Luckily, this information was available in electronic form. Application records provided information on the loan applicant such as age, gender, marital status, date of application and approval, income and loan amount. Valuation reports provided information on the initial value of the property used as collateral and other attributes of the property such as the size of the land and house, construction and accommodation details. Information on monthly loan repayment was obtained from copies of the monthly bill statements whose details were availed in soft copy.

The information obtained from records in the HFI, however, had shortcomings. As expected, a lot of personal data of applicants had changed from the time they filled the loan application forms. It was, therefore, necessary to conduct a field survey targeting the sampled households in order to capture their current information and also to understand the nature of affordability challenges they were experiencing. The field survey was also necessary in order to understand

the factors affecting the affordability of the households. Further, field survey was important to guarantee the validity and reliability of the data used in the research study.

The field survey, however, resulted into scaling down of the sample size. Out of the 390 households targeted for the study, 353 households responded to the survey yielding a response rate of 90.5%. The reasons for failure to respond to the survey by those that did not respond were not given. However, common reasons for non response as stated by Masu (2006), Murigu (2005) are as follows:

- Respondents simply refuse to respond because they are busy at home or at work
- Sensitivity /confidentiality of the subject matter
- Lack of information asked for by the researcher; and
- Some respondents simply refuse to respond for purely uncooperative reasons.

As a result of the non- response by some targeted households, the sample size was thus reduced to 353 households. This, however, did not affect the outcome of the survey as the responding households came from at least all the four zones/ locations in Nairobi, and most of the house/ property categories were represented. Of the 353 households who responded to the survey, 135 respondents were from residential estates located South of Nairobi which included estates in Langata, South B and South C estates and estates off Mombasa Road. 68 respondents were from the East of Nairobi covering residential estates in Buruburu, Donholm, Savannah, Greenfields and Baraka estate in Embakasi, among others. 137 respondents were from the West of Nairobi covering households in Westlands, Parklands, Ngong Road, Kilimani, Kileleshwa and Lavington, among others. 13 respondents were from the North of Nairobi including Rosslyn Estate, Nyari, Runda, Muthaiga, Thome and Garden estate. Among the 353 responding households, 117 were living in Maisonettes, 48 households were in Bungalows, 165 households were in Flats/Apartments and 23 households were in Town Houses (See appendix D for the details of the specific estates covered in the study).

Alreck and Seattle (1985 cited in Murigu, 2005) are of the opinion that a response rate of 50% is adequate for analysis and reporting. A response rate of 60% is good and one of 70% and over is very good. The authors have, however, stated that all means available ought to be used to increase the response rate in order to have a representative sample for meaningful generalization.

They have also indicated that there should be concern where 30% or more respondents do not respond to the survey. This study achieved a response rate of 90.5% which is considered large enough to give valid and reliable results.

4.2.2. Data Collection

Data collection was carried out for a period of eight (8) months from November 2012 to June 2013. The data collection exercise commenced with an application for research authorization to the Ministry of Education, Kenya.

The researcher sought to collect both primary and secondary data. The primary data of interest to the study related to information on households social- economic and demographic characteristics including the age, sex, marital status, level of education, job status and households income. Primary data also included information on the households' mortgage loans such as the year of loan origination, loan amount, loan term, loan- to- value (LTV) ratio, interest on loan, among other relevant information. Primary data further included information on the collateralized property including the property's land reference number, location of property within Nairobi, size and value of land and house, construction and accommodation details. The secondary data of relevance to the study included information on macro- economic factors such as the level of inflation, gross domestic product (GDP), exchange rate, unemployment rate, among other important data on the performance of the economy.

Both the primary and secondary data were necessary to address the objectives of the study. Primary data were obtained through standard questionnaires administered to the sampled households. The first draft of the questionnaire was given to supervisors and colleagues for their comments. Their comments were incorporated into the second draft which was then pre- tested on ten respondents drawn from among the 390 sampled households. The purpose of pilot- testing was to determine whether questions and instructions were clear and unambiguous, and whether respondents found the questions appropriate. The pilot- test respondents felt that some questions were inappropriate due to sensitive/ confidential nature of the subject matter. They also indicated that respondents would prefer to remain anonymous. Questions found to be inappropriate were either re-constructed or removed. The final version of the questionnaire had a total of 18 questions and was divided into four (4) sections. The first section solicited general information

on households demographic and social- economic characteristics. The second section of the questionnaire sought to gather information about the households' consumption and expenditures. The third section obtained information about the households' mortgage loans, while the fourth section sought to capture factors which influence the affordability of the households. The questions were both structured (closed- ended) and unstructured (open- ended). The unstructured or open- ended questions were for the purposes of harnessing factors and information that may have been missed out. They were also helpful in cases where there was need for further clarification about the factors. The researcher also had informal discussions with developers of housing schemes, officers in HFIs and colleagues in the real estate profession to further knowledge and understanding on factors affecting mortgage affordability. However, the main sample unit and population in this study were the individual households with mortgages because it was considered such households were in a better position to share information on factors affecting affordability.

Information about the collateralized property was obtained through physical survey/ inspection of the houses with the aim of observing, measuring and recording information about the house design, size, value, construction materials and finishes as well as level of accommodation. Property information was also obtained through search information from land records in the ministry of lands. Secondary data on macro- economic variables was obtained from yearly statistical abstracts from the Kenya National Bureau of Statistics (KNBS), Annual Economic Survey Reports and Central Bank of Kenya (CBK) economic bulletins. More secondary data was obtained from review of literature from the internet, books, journals, scholarly articles and seminar papers.

4.3 Variable Identification, Description and Measurement

A variable is any characteristic that can vary across people or situations and is of different levels or types (Hammond et al, 2000; Burns, 2000; Cresswell, 2003 in Ikpe, et al (2011). There are two basic kinds of variables: dependent and independent variables (Cresswell, 2003 in Ikpe, et al 2011). The independent variable is one in which the experiment manipulates or controls and as such is the variable whose effect interests the researcher (Ikpe et al, 2011). Independent variables are also called “explanatory” or “predictor” variables because they explain or predict the amount

of variation that occurs in another variable. A dependent variable, on the other hand, is the behavioural measure by the experimenter. A dependent variable, sometimes also called the “response” or “criterion” variable, attempts to indicate the total influence arising from the effects of the independent variables. Dependent variable, therefore, varies as a function of the independent variables.

4.3.1 The Dependent Variable

The dependent variable in this study is identified as ‘housing affordability’ denoted by (Affordability). A detailed description and definition of this variable was presented in chapter two section 2.4. However, as a link- up, affordability is the ability of a person in providing something, which is usually referred to his ability in financial terms (Bujang et al. 2010). Housing affordability has been referred to by a number of researchers in many different ways. According to Mostafa, et al (2006 in Bujang, et al. 2010), house affordability is a condition when people have the potential to save certain portion of their income to pay for a house, as well as to pay for other household expenses. Housing affordability is expressed as the relationship between household income and housing expenditure and is measured as the proportion of family income that goes into the payment for a house (Mostafa, et al, 2005; Bujang et al, 2010). Affordability in the home- ownership mortgage housing sector is thus defined as the proportion of the household’s monthly income that goes into repayment of the mortgage loan. In this study, therefore, the affordability of each sampled household was measured using the simple housing cost- to- income ratio as follows:

Housing affordability of household = (household’s monthly mortgage repayment/ household’s monthly income) x 100%

When all the other factors are held constant, a household that commits a higher proportion of its income on housing is likely to experience challenges in meeting its other basic needs. Housing affordability problems thus arises, when after paying for housing, a household is left with insufficient income to meet its other needs. Therefore, if all other factors are assumed to be constant, a high affordability ratio or proportion of family income being spent on housing would indicate diminished or reduced affordability of the household, while a low affordability ratio denotes better or improved affordability of the household. Thus, in a study of factors affecting

housing affordability, the factors that increase the affordability ratio are considered to diminish the affordability of households, while those that decrease the affordability ratio are deemed to improve affordability level of households.

4.3.2 Independent Variables

The independent variables in this study were obtained from literature review on housing affordability and empirical studies on affordability determinants, house price determinants and studies on household incomes obtained from journals both published and unpublished by scholars in Kenya and other countries. The variables obtained from literature search are summarized in the conceptual model of housing affordability that was presented in chapter three of this study. The variables obtained from literature search were subjected to the sampled respondents using structured or closed- end questionnaire in order to determine whether such factors were significant and relevant in their circumstances. More variables were obtained using unstructured or open- ended questions to enable households identify factors that had been missed out in the literature search. Informal discussions with supervisors, professionals in the housing and real estate sector, officers in Housing Finance Institutions and colleagues also revealed some other variables not identified using previous methods. The researcher's own experience and knowledge having worked and taught in the housing and real estate sector was also useful in the identification of some factors. The affordability factors identified have potential to influence the demand and supply of housing since they affect the incomes of households as well as the price of housing. The factors relate to the social economic characteristics of the households, the characteristics of the mortgage loan, property attributes and the macro economic environment, as well as other factors that directly influence household incomes and housing price. In total thirty two (32) independent variables were identified. These are:

1. Age

The variable age is defined as the age of the mortgage borrower and is measured as the difference between the current date and the date of birth of the loan applicant as stated in the loan application form and confirmed during field survey. Age is considered to influence affordability because it determines the amount of the monthly mortgage repayment of the household. The age

of an individual also determines the amount of premiums under the mortgage insurance protection cover. The variable age is measured quantitatively in years.

2. Gender

Whether the individual paying the mortgage is male or female influences the affordability of that individual. In patrilineal societies, where the male gender had better employment and income generating opportunities than female, male headed households had better affordability compared to female headed households. However, this trend is now changing as more women have gained access to education and employment opportunities guaranteeing them sufficient income to pay for housing. The variable 'gender' is a qualitative variable and is assigned a value of 1 if male gender, and 2 if female gender.

3. Marital status

The marital status is important in determining the affordability of households. Bujang et al (2010) concluded that when a person entered into marriage life, his affordability is likely to diminish due to the possibility that the increase in the number of household dependants may cause more income to be spend on them. These possibilities will in turn decrease their affordability in buying a property having a higher level of price. However, if the spouse has some income, the situation may be different as the affordability of the household is likely to improve.

4. Number of family members with income/ number of income earners in family

Bujang et al. (2010) further stated that the number of income earners in a household is a factor having positive correlation with housing affordability. This positive correlation means that a bigger number of income earners in a household would result in better affordable housing. Therefore, if both the husband and wife have incomes, then this is likely to improve their affordability as compared to if only one had income. The variable number of family members with income was measured quantitatively as the number of income earners in the family.

5. Level of education

The level of education of the borrower is important in determining the affordability of household. Linneman and Megbolugbe's (1992 in Bujang et al, 2010) observed that the problem of affordability level especially among lower and middle-class households is due to the low levels of job skills and education level they had. They noted that the level of education will determine the income earned among the people and in turn, it will differentiate the affordability level in owning a house.

6. Household size

The size of household will determine the expenditure behaviour in the family hence affect affordability. Large sized families are likely to spend more of their income on food, education, transport and health and, therefore, are likely to experience difficulties in paying for their housing. The variable 'household size' is a quantitative variable and is defined and measured as the number of family members within the nuclear family.

7. Number of dependants (outside the nuclear family)

An increase in the number of members of the extended family living in a household is likely to increase the volume of family expenses hence affect the income of the household which could diminish the ability of the household to pay for its housing services. Households that are also supporting the education of their siblings, the health of their aging parents are likely to experience affordability difficulties. In this study, the number of dependants (outside nuclear family) is taken as those extended family relatives who are residing with the borrower in his/ her home in Nairobi.

8. Job status/ position.

This is defined as the job position held by the loanee, whether professional/ managerial position, technical or clerical, within his/ her workplace. Holders of professional/ managerial jobs are likely to have a more stable income as they are able to generate extra incomes outside their formal employment. Professionals such as doctors, architects, engineers, quantity surveyors and valuers who are employed in public institutions/ organizations are able to get private assignments

within their expertise which helps them generate extra income. Holders of managerial positions also enjoy certain allowances which help them supplement their normal employment income. The variable 'job status' is a qualitative variable and is assigned a value of 1 if professional/managerial job and 2 for technical/ clerical jobs.

9. Loss of regular employment income

Individuals whose employment contracts are terminated or retired are likely to experience affordability challenges because of loss of regular employment income. Such households have to rely on incomes from other sources especially the businesses which they start after losing their jobs to finance their mortgage loans. Incomes from such sources are usually unreliable exposing such persons to higher risks of mortgage delinquencies and defaults. Gachuru (2005) noted that trigger events such as a sudden loss of income occasioned by job loss, illness and divorce among other events, may affect the size and stability of the family income hence affect their mortgage affordability.

10. Loan amount

The factor loan amount is defined as the amount of mortgage loan that the individual borrower is awarded by the bank towards the purchase of the house. A higher amount of loan borrowed is likely to translate into higher repayment amounts and this could influence the affordability of the household.

11. Loan- to- value (LTV) ratio

The loan- to- value (LTV) ratio is defined as the proportion of the value of the collateralized property that is taken as loan. Loan-to-value (LTV) ratio determines the loan amount and therefore the monthly loan repayments. Loan-to-value (LTV) ratio also determines the amount of loan deposit payable by the borrower. A higher LTV means that the borrower has less equity in the property, and it also increases the monthly mortgage repayment which eventually increases the probability of a borrower encountering repayment difficulties hence affecting affordability. In Kenya, the LTV ratio ranges between 50% and 80% for rural and urban properties, respectively (Gachuru, 2005). However, sometimes the LTV is adjusted according to individual borrower circumstances.

12. Interest on mortgage loan

Interest rate affects affordability directly because it determines borrowers repayment burden which impacts on the household's income. An increase in mortgage interest rate will increase the monthly loan repayment of households. This results in either temporary or permanent disruption in monthly loan affordability especially if family income remains constant. The rates of mortgage interest in Kenya have been high over the last decade. In the year 2000 for example, interest rates on mortgages were high at 19% and remained at almost the same level until the year 2002. The rates of mortgage interest averaged 13% from the year 2003 to 2007. In the year 2011 interest on mortgages averaged 20% and in 2012 and 2013 mortgage interest rates were on average 18% and 16.89%, respectively. The high mortgage interest rate regime has negatively affected the performance of the mortgage market in Kenya. The variable "interest on mortgage loan" is a quantitative variable and is measured as the amount of interest in Kenya shillings payable by each household included in the study.

13. Type of mortgage instrument

The impact of changes in the interest rates on mortgage affordability depends on the mortgage instrument in use. There are basically two types of mortgage instruments available in the market: Fixed rate mortgages (FRM) and Adjustable rate mortgages (ARM). With a fixed rate mortgage, loan repayment remains constant throughout the life of the loan and is amortized over a fixed term of years. For an ARM instrument, which is the dominant mortgage instrument in Kenya, changes in interest rate are normally shifted to the borrower. An increase in the interest of an ARM would, therefore, lead to an increase in monthly loan repayment for households, leading to a higher risk of delinquency and default (Ja ffee and Renaud, 1997 in Gachuru, 2005).

14. Mode of loan repayment

The mode of loan repayment is defined as the mode or the method of repaying the mortgage loan. There are two methods of repaying a mortgage loan that have been identified in the literature: the straight line method and reducing balance method. With the straight line method, the monthly repayment for principal and interest is constant throughout the period of the loan, and with the reducing balance method, the interest for each month is based on the remaining

principal after deducting the repayment for the previous month. Thus, the monthly repayment for a reducing balance loan reduces gradually as the loan matures. Reducing balance mortgages are, therefore, more affordable than loans repayable through the straight line method. The variable mode of loan repayment is a qualitative variable and is assigned a value of 1 for loans on reducing balance and 2 for loans repayable on straight line method.

15. Loan term

This is the tenure of the loan and is defined as the period from the loan contract date to maturity date. Most residential mortgages in Kenya are issued for a term of between 10 and 15 years, with only a small percentage of loans being granted for 18 and 20 years (Gachuru, 2005). The period of loan repayment would generally affect affordability because it affects directly the monthly loan repayment amounts. Loans with shorter repayment periods are likely to attract higher monthly repayments placing a higher repayment burden on households as compared to loans with longer repayment periods.

16. Loan processing charges

These are the loan closing charges payable at loan contract date and they include legal fees and commitment fees charged at 1% of the loan amount.

17. Penalties on Arrears

Mortgage loans in arrears are charged a penalty in the form of “interest on arrears” which varies from one financial institution to the other. At the Housing Finance (HF), a leading Housing Finance Institution in Kenya, the interest on arrears is currently at 19.75%. The amount of penalties charged would therefore ordinarily place an extra financial burden on household income thus affecting affordability.

18. Mortgage insurance

All residential mortgages carry an insurance policy against both physical and financial loss to include fire and loss of life (Gachuru, 2005). Borrowers are, therefore, required to have life insurance under the lender’s group mortgage protection scheme. The risk of loss is transferred to insurance companies which charge a premium for the policy issued (Ndung’u 2001 in Gachuru,

2005). The amount of monthly insurance premium for both fire and mortgage protection affect the affordability of households.

19. Location of property

Chan (1989 in Murigu, 2005) defines location as the situation of the property in relation to other properties and to the facilities that serve the property such as roads, public transport and other complementary uses. In any given region, there are some specific areas that are more desirable, popular or exclusively famed because of various factors. These factors include the history of the area, the unique locality, the facilities and services available, the general cleanliness of the surroundings, the nature of the neighborhood, natural attractiveness, distant from the CBD or any other centre of gravity (Swazuri, 1996). Some locations/ neighborhoods would, therefore, attract higher values of houses making housing more unaffordable in those locations. In Nairobi for instance, locations in the north and west zones including areas such as Westlands, Parklands, Kilimani, Lavington and Kileleshwa are considered to be more superior neighbourhoods compared to other areas in the South and East of Nairobi. The variable “Location” is a qualitative variable and is assigned a value of 1 for neighborhoods perceived to be superior, 2 for modest neighborhoods and 3 for inferior neighborhoods in Nairobi.

20. Size of land

The plot size measured in square metres would affect the value of housing hence influence the affordability of such housing.

21. Value of land

The value of land/ plot is an important component in the overall price of housing contributing about 20% of the price of a dwelling unit. Land value is a function of its locational, physical and neighborhood characteristics of the property. The variable “land value” is measured quantitatively in Kenya Shillings.

22. Size of house

The size of the house is the plinth area of the collateralized property and is measured quantitatively in square feet.

23. House design

The quality of architectural design has an influence on the value of the property that has been used to secure the mortgage loan. Aspects of design that influence house value includes the size of the house, specifications of building materials and finishes, fixtures and facilities incorporated into the design to improve on comfort, use and enjoyment of the property. For instance, residential houses of superior construction materials and finishes such as those with wood parquet floors, ceramic, granite or porcelain tiles, tiled roof and ensuite bedrooms may be considered to be of high quality or superior design; houses with modest materials, finishes and fixtures such as PVC floors, terrazzo floors, asbestos sheets roof and ensuite bedrooms may be considered to be of modest design while those with inferior materials, finishes and fixtures such as cement screed floors, GCI roofs and without ensuite bedrooms may be considered to be of inferior design. The variable “house design” is a qualitative variable and is assigned a value of 1, if house is of superior design, 2 if of modest design and 3, if of inferior design.

24. Construction cost

Construction cost refers to the cost of building or constructing a housing unit. This cost consists of the price or the cost of building materials, cost of labour, professional design fees and other incidental expenses incurred during the construction of a house. The variable “construction cost” for each collateralized property is quantitative and is measured at the ratio scale in Kenya Shillings.

25. Transaction cost

Overall housing price and affordability is influenced by such property transfer costs such as the level of government stamp duty, lawyers conveyance fees, registration and title charges as well as valuation and agency fees. The variable “transaction cost” for each sampled property is measured quantitatively as the sum of stamp duty assessed at 4% of house value and an overall rate of 2% of the house value to cover lawyers fees, registration and title charges.

26. Developers profit

The profit the developer makes or expects to make after the sale of a house greatly influences the price he/ she eventually sells the house. This profit affects affordability because it determines the house price hence the monthly mortgage repayment by the borrower. Developer's profit is a quantitative variable measured as the difference between the price realized for the sale of house and the actual or estimated construction cost of the house including cost of land. The variable is measured in Kenya Shillings.

27. Inflation

Inflation generally denotes a rise in the general level of prices. According to Samuelson and Nordhaus (2001), inflation is measured by the consumer price index (CPI) which is the weighted average of the cost of a standard basket of goods and services bought by the average consumer. Inflation generally impacts on household's purchasing power by reducing the real value of money. The impact of inflation is largely felt in the consumption of basic commodities like food, clothing and housing. Inflation impacts on the price of building materials, the cost of labour and the cost of mortgage financing thus affecting house prices. Higher inflation has a negative impact on house prices. Higher inflation and interest rates backload the repayment of the mortgage principal and increases the real value of repayment in the early part of the repayment period of loan. According to Gachuru (2005), inflation is a systematic risk factor that affects mortgage delinquency and default by increasing nominal interest rates and hence the repayment burden. In the long run however, higher inflation may dampen housing demand and, therefore, cause a decrease in house price thus improving affordability. The variable "inflation" is measured quantitatively and entered in the analysis as overall rate of inflation for Nairobi.

28. Real gross domestic product (real GDP)

Real GDP is a measure of the market value of goods and services produced in a country in the course of one year adjusted for inflation. GDP is a measure of economic growth which typically refers to growth in a nation's output overtime and is one of the main indicators of economic performance of a country. Increasing GDP normally signifies a growing economy; falling GDP

reflects poor economic performance, while a persistent decline in GDP is associated with recessionary economic trends (EconEd Link, 2005 in Gachuru (2005)).

According to Samuelson and Nordhaus (2001), growth in GDP is usually associated with rising incomes and living standards of people in a country. The most important measure of the impact of real GDP on the population's well-being is the GDP per capita, which refers to GDP per every person in the country. This is obtained by dividing overall GDP by the total population of the country. Increased real GDP per capita could lead to increases in incomes and this may improve housing affordability. In the long run however, increased incomes of the populace may stretch housing demand leading to high house prices which can negatively affect affordability.

In this study, the impact of GDP on the affordability of households is analyzed using the GDP per capita. The GDP per capita at constant 2001 prices is used in the analysis.

29. Exchange rate

The exchange rate is the price of one currency in terms of another currency. Exchange rate is determined in the foreign exchange market, which is the market where different currencies are traded. Exchange rate represents the amount of foreign currency that can be bought with one unit of the domestic currency. Exchange rate has a significant impact on the volume of international trade hence it greatly affects the nation's economy. Fluctuations in the level of exchange rate reflect the relative importance of the economy through exports and commodity prices, trade and capital movements (Gachuru, 2005). In Kenya, the rate of foreign currency exchange plays an important role in the housing market since most developers of housing (public and private) usually imports buildings materials, finishes and fixtures. The rate of exchange is thus considered to influence affordability and is included in the analysis as the rate of exchange of the Kenya shilling to the U.S dollar.

30. Unemployment rate

Barry, Casteneda and Lipscomb (1994 in Gachuru 2005) have noted that an unstable economy with high rates of unemployment would lead to a decline in real incomes of households, and could lead to negative loan amortization in real terms creating difficulties in loan repayment. A

high unemployment rate is thus considered to negatively affect affordability in the mortgage housing sector.

31. Performance of alternative markets.

The performance of alternative investment markets, for instance shares and bonds market, has an impact on housing prices, hence affordability. In particular, how investors judge expected returns in the housing market as opposed to the stock and bonds market critically impacts current house demand and supply. When the equity (shares, bonds) market is performing well, investors tend to shift their finances towards this market and this has the effect of dampening demand in the housing market, which may significantly influence housing affordability in either the short or in the long run. In Kenya, shares and stocks are traded in the Nairobi Securities Exchange (NSE) market. The performance of this market is measured by the NSE share index. There are two types of NSE share indices: The NSE all share index which tracks the performance of all listed companies and the NSE 20 share index which tracks the performance of 20 most profitable listed companies. The NSE 20 share index is regarded as the best measure of stock market performance and is thus selected in this study to determine the impact of performance of equity market on housing affordability.

32. Political Climate

Political instability coupled with poor governance and corruption affects investments in a country and could lead to loss of jobs and a general deterioration in the well-being of the population. This may affect the ability of households to pay for basic services including housing.

Table 4.2 is a Summary of the Variables as Explained Above

Source: Author's Construct, 2013

Variable Code	Variable Name	Variable Definition and Measurement	Value
affordability	Housing affordability	Monthly mortgage repayment/monthly household income *100%	Quantitative ratio
age	Age of borrower/loanee	Years from date of birth to date	Quantitative
gender	Gender of borrower/loanee	Value of 1 if male gender, 2 if female gender	Qualitative
m_status	Marital status of borrower	Value of 1 if single, 2 if married, 3 if divorced/separated/other	Qualitative
l_educ	Level of education of borrower	Value of 1 for Doctorate, 2 for masters/ first degree and 3 for diploma/certificate	Qualitative
h_size	Size of household	Number of family members within the nuclear family	Quantitative
Nf_income	Number of family members with income	Number of family members with income	Quantitative
N_depdt	Number of dependants	Number of dependants (outside nuclear family)	Quantitative
J_status	Job status/position of borrower	Value of 1 for professional/management jobs, 2 for technical/clerical jobs	Qualitative
L_income	Loss of regular employment income	Dummy variable 0 ,if borrower lost employment income, 1 if didn't lose	Qualitative
L_amt	Loan amount	Total loan amount at origination in Kenya shillings.	Quantitative
LTV	Loan -to- value ratio	Calculated as a ratio of the loan amount to the property value at time of origination	Quantitative
L_charge	Loan processing charges	Amount of charges in Kenya shillings	Quantitative
term	Loan repayment period	Loan repayment period in years	Quantitative
interest	Interest on loan	Monthly interest on loan in Kenya shillings	Quantitative

M_intr	Type of mortgage instrument	Value of 1 if FRM, 2 if VRM	Qualitative
Md_lrp	Mode of loan repayment	Value of 1 if reducing balance loan, 2 if straight line loan	Qualitative
P_arrears	Penalties on arrears	Kenya shillings	Quantitative
M_Insura	Mortgage insurance premiums	Kenya shillings	Quantitative
Location	Location of property	Value of 1 if in superior location, 2 if in a modest location, 3 if in inferior location	Qualitative
L_size	Land/plot size	Square meters	Quantitative
L_value	Land value	Kenya shillings	Quantitative
P_size	House/property size	Square feet	Quantitative
H_design	Quality of house design	Value of 1 if superior design, 2 if modest design, 3 if inferior design	Qualitative
C_cost	Construction cost	Kenya shillings	Quantitative
T_cost	Property transaction cost	Kenya shillings	Quantitative
D_profit	Developers profit	Kenya shillings	Quantitative
Inf_rate	Inflation rate	Inflation rate	Quantitative
GDP_cap	Gross domestic product per capita	Kenya shillings	Quantitative
Ex_rate	Exchange rate	Kenya shillings to US dollar currency exchange rate	Quantitative
R_unempl	Unemployment rate	Annual unemployment rate	Quantitative
P_mrk	Performance of the stock market	NSE 20 share index	Quantitative
P_climate	Political climate	Political climate	Qualitative

4.4. Method Used to Rate the Factors that Affect Housing Affordability

All the above 32 factors that influence housing affordability were put to the respondents using structured questionnaires in order to rate and rank them in their order of importance. The ranking of the factors was done with the aid of the horizontal numerical rating scale which is the advisable scale to use in judging items on a single dimension or continuum (Alreck and Seattle, 1985 in Murigu, 2005). To facilitate the devising of the scale, a review of literature on the rating of research variables was carried out as well as interviews with randomly selected key participants in the housing and real estate sector. The participants included: 2 housing policy experts from the Ministry of Housing, 2 home-loan specialists from HFIs, 2

private developers in Nairobi, 2 valuers/ property managers, 2 Architects and 2 Quantity surveyors. On the basis of their views and information obtained from the review of literature, a numerical scale of 1- 4 representing the two extremes of “not important” and “very important” was devised as follows:

1. – Not significant
2. – Less significant
3. – Significant
4. – Very significant

This scale was shown to a different randomly selected group of two housing policy experts, 2 home- loan specialists in HFIs, 2 private developers, 2 valuers/ property managers, 2 architects and 2 quantity surveyors to corroborate the opinion of the first group. The general observation from the respondents was that the scale was adequate enough to capture and rate the factors that influence housing affordability in the home ownership (mortgage) housing sector. The scale provides both absolute measure of importance and also ranking of factors in their order of importance/ significance.

In devising a horizontal numerical scale, Talukhaba (1999) had consulted 2 architects, 2 quantity surveyors and 2 clerks of works, who were randomly selected. The scale developed by these 6 participants in the construction industry was further corroborated by a further 6 participants thereby giving a total of 12 participants. Murigu (2005) devised a rating scale using 3 commercial property owners, 3 valuers, 3 property managers, 3 architects and 3 quantity surveyors whose views were corroborated by a similar number giving a total of 30 participants. It was, therefore, felt that a total of 24 participants in the housing and real estate sector would come up with a scale that was adequate to enable the identification and ranking of the factors that affect housing affordability in the home- ownership housing sector in Kenya. The factors that affect housing affordability were ranked using the mean ratings of the variables.

4.5. Testing the Hypothesis Using the Population Mean Score

All the 32 variables identified had two hypotheses. The null hypothesis (H_0) was that the variables were not significant determinants of housing affordability. The alternative hypothesis (H_a) was that the variables were significant determinants of housing affordability. Failing to accept the null hypothesis meant accepting the alternative hypothesis. It was, therefore, important that a decision point is set, that is, a point at which to accept or fail to accept the null hypothesis based on the population mean score. Since it was assumed that the characteristics of the sampled households were similar to that of the entire population of households being studied, and also, since the population was assumed to obey the normal distribution, the four possible scores of 1- 4 in the devised numeric scale had an equal chance of occurring and, therefore, the population mean score was **2.5** on the rating scale. This is a point higher than less significant on the decision scale and forms the decision point (Talukhaba, 1999 and Masu, 2006). Therefore, any variable that achieved a mean score of above 2.5 was considered a significant factor affecting housing affordability.

4.6. Testing the Hypothesis Using the Critical Z- Value

Although the results of the hypothesis testing using the population mean score offered an opportunity to identify the significant factors affecting affordability, the confidence levels had not been set. Confidence level assists in eliminating/ minimizing errors in the identification of significant factors. There are two types of errors that may be committed in the process of identifying significant factors. The one type of error is where the researcher concludes that a particular factor is significant when actually it is not, or differently put, the researcher may reject the null hypothesis when it is true. This type of error is referred to as the Alpha error or the type 1 error. The other type of error referred to as the Beta error or type II error occurs when it is erroneously concluded that a particular variable is not significant when actually it is, or when the null hypothesis (h_0) is accepted when it is false (Masu, 2006).

A careful evaluation and elimination of chances of committing any of the two errors involves establishing the possibility of committing any of the errors. Harper (1994 in

Talukhaba, 1999) argues that type 1 error can be avoided by setting a lower confidence level of 95%. He further argues that type II error can be avoided by setting a higher confidence level of say 99%. In a study of factors affecting housing affordability, committing type 1 error was considered less harmful than committing type II error.

A higher confidence level of 99% was, therefore, set in the Z- test analysis of the variables and the one-tail Z- test was selected in the analysis. This was because any score above the population mean score of 2.5 was already significant. The Z- value calculated for each variable was obtained using the equation:

$$z = (\bar{x} - \mu) / (\delta / \sqrt{n})$$

Where,

z = calculated z- value

\bar{x} = mean variable score for each variable

μ = population mean score which is 2.5 for subject population,

n = sample size.

The Z -value calculated for each variable was compared with the Critical Z- value at the selected confidence level of 99% in a one-tail Z-test which in this case was **2.33**. Critical Z-values at various confidence levels have been provided by Mark Sirkin (2006) as shown in Table 4.3 as follows:

Table 4.3: Critical value of Z

Source: Mark Sirkin (2006)

Probability (level of significance)	One -tailed test	Two-tailed test
0.05 (95% confidence level)	1.65	1.96
0.01 (99% confidence level)	2.33	2.58
0.001	3.09	3.29

Where the Z- value calculated for each variable was greater than the Critical Z- value at the selected confidence level, the researcher was confident that the particular variable was a significant determinant of housing affordability.

4.7 Data Analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS) software. Three main statistical procedures, namely; Descriptive statistics, Correlation and Regression analysis were performed on the data. Descriptive statistics was performed on the data for the purpose of summarizing the variable data and, therefore, enhance its understanding and consumption. It was also done to confirm on the completeness of the data sets. Descriptive statistics was further performed to check whether data sets for each variable under investigation obey the normal distribution (Murphy, 1989 in Nzau, 2003). The importance of checking for normal distribution before regression is because regression analysis is usually performed on data sets that obey the normal, symmetric distribution. The descriptive statistics selected for this study include the mean, mode, median, variance, standard deviation, kurtosis and skewness, frequencies, maxima and minima.

Correlation analysis was performed on both the dependent and independent variables and was done for the purpose of showing how the variables are related and how they explain each other. Correlation was also done to check for Multi-collinearity. The term multicollinearity (or collinearity) is used to describe the situation where a high correlation is detected between two or more independent variables. Such high correlations cause problems when trying to draw inferences about the relative contribution of each independent variable to the success of the model. Multi collinearity in multiple regression modeling is bad because it can adversely affect the end results and, therefore, should be checked before further statistical procedures are performed on the data. In choosing the independent variables, one should select those that are correlated with the dependent variable, but leave those that are strongly correlated with the other independent variables in order to avoid the undesirable effects of multi collinearity (Murphy, 1989 in Nzau, 2003).

The last statistical analysis performed on the data was Regression analysis. In regression analysis, the Multiple Regression Analysis (MRA) statistical technique was selected for the analysis.

4.7.1 The Multiple Regression Analysis (MRA) Technique

The Multiple Regression Analysis (MRA) technique was employed in this study to measure the marginal and relative contribution of the significant affordability factors on housing affordability. This enabled the ranking of the significant factors with respect to their contribution to housing affordability.

The general MRA equation takes the form of:-

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + e$$

Where,

Y - is the response or dependent variable which in our case is Housing Affordability (Affordability). $X_1 - X_3$ are the independent or predictor variables which in our case are the various determinants of housing affordability.

$b_1 - b_3$ are the regression coefficients. They show how much Y changes as a result of a unit change in x.

b_0 is the “constant” or the y – intercept which means the value of y when $x = 0$. It is where the curve cuts the y-axis. At that point $x = 0$. Therefore, the interpretation of the “Constant” is contribution to affordability by factors not considered in the analysis because they are not known or were forgotten by the researcher.

e = is the residual or error which is the difference between an actual and its predicted value. When analyzing true parameters, this difference is called an “error”. When using estimated parameters, this difference is called a “residual” (Sall et al, 2001).

Regression analysis calculates b_1 - b_n values in a manner that minimizes the sum of squared errors between actual and predicted values; that is, MRA minimizes:

$$\sum e_1^2 = \sum (S_1 - S_2)^2$$

Where,

$\sum e_1^2$ is the sum of squared errors between actual and predicted affordability values

S_1 is the actual /observed housing affordability value.

S_2 is the predicted/estimated housing affordability value.

According to Berry (1993; Field, 2000 in Akinwunmi, 2009), MRA modeling has to satisfy the following regression assumptions;

1. Variable type- The predictor/independent variables and the outcome (dependent) variables must belong to the same class of measurement, either quantitative or qualitative

2. Linearity-The relationship between the dependent variable (housing affordability) and the independent variables are linear in the parameters. Linearity means that the Marginal Contribution to value of an independent variable is constant over the entire range of the variable.

3. Homoscedasticity –means that the error terms have a constant variance. Constant variance of error terms implies that the residuals are uncorrelated with the dependent variable, housing affordability. Violation of this assumption is called heteroscedasticity.

4. Normal distribution- variable data must obey the normal distribution. Normal distribution is checked by plotting the normal curve to see whether its bell- shaped. Normal distribution can also be checked by the descriptive statistics of mean, median, standard deviation, skewness and kurtosis. A small value of standard deviation, for instance, indicates the values are normally distributed. Also, if the value of the mean and median of variable under investigation are the same or are very close, this is an indication that the data sets obey the normal distribution. Further, a skewness value less than one (1) indicates a distribution that is close to normal, symmetric distribution. A skewness value of zero (0) shows perfect normal distribution. A kurtosis value of three (3) or less shows normal distribution, while a kurtosis value of zero shows perfect normal distribution.

6. Multicollinearity- MRA assumes that the independent variables are uncorrelated. That is, there should not be perfect linear relationship between two or more predictor/ independent variables. Violation of this assumption is called Multicollinearity. In checking for multicollinearity, the following checks must be undertaken;

- Check the correlation coefficient between independent variables, if the coefficient(R) is greater than 0.70, there is presence of multicollinearity
- Check whether the largest variance inflation factor (VIF) is greater than 10, if yes, there is presence of multicollinearity
- Check whether the average VIF is substantially greater than 1, if yes the regression might be biased
- There is an acute problem if tolerance is below 0.1. Also, tolerance below 0.2 is a sign of presence of multicollinearity

MRA modeling has a number of weaknesses as follows:

- a) The accuracy of the value of the dependent variable (Housing affordability) depends on the quality of factors (independent variables) entered in the analysis.
- b) Multi Collinearity- as noted earlier, multi collinearity is a serious problem in MRA models. It is impossible to identify all factors that affect the dependent variable, housing affordability. In addition, many of the variables are likely to be highly correlated such that their values change in similar ways. This can lead to incorrect and biased estimate for the housing affordability value.
- c) MRA technique is relatively complex to implement and interpret requiring a high degree of statistical expertise in correlation and regression analyses. Also, large amounts of data must be gathered and analyzed statistically.
- d) Some factors which affect housing affordability are abstract/qualitative in nature and therefore difficult to measure. Measurement of variables enables statistical analysis to be performed on the data. If data cannot be measured, it cannot be statistically analyzed.

Despite the weaknesses, the MRA Modeling is the preferred method in the identification of significant factors that influence housing affordability. MRA Modeling uses actual house prices obtained from the housing market, and household income. MRA is capable of analyzing several independent variables unlike the simple regression model where only one variable can be analyzed at a time. Also, unlike other Modeling techniques, MRA is easy to apply and interpret and is widely used in many social and behavioral research studies. Records of the various data sets are available and easily accessible from many sources. MRA Modeling also leads to a more accurate estimation of housing affordability. The regression constant calculated indicate the contribution to affordability value by factors not included in the analysis, hence, it improves on human error and inefficiency.

4.7.2. Performing Multiple Regression Using SPSS

In performing multiple regression analysis using the Statistical Package for Social Sciences (SPSS) software, three methods are employed, namely; the “Simultaneous” methods, “Hierarchical” methods and the “Statistical” methods. In the simultaneous method (which SPSS calls the Enter method), the researcher specifies the set of independent variables that make up the model. The success of this model in predicting the dependent variable is then assessed. The use of the Enter method is preferred when there is relatively low number of cases being studied (Brace et al, 2003). The Enter regression method allows the researcher to analyze the performance of all the independent variables including both the weak and strong predictors of the dependent variable. Hierarchical methods enter the variables into the model in a specified order. The order specified should reflect some theoretical consideration or previous findings. If you have no reason to believe that one variable is likely to be more important than another you should not use this method. As each variable is entered into the model its contribution is assessed. If adding the variable does not significantly increase the predictive power of the model, then the variable is dropped (Brace, et al, 2003).

In “Statistical” methods, the order in which the independent (predictor) variables are entered into (or taken out of) the model is determined according to the strength of their correlation with the dependent variable. There are several versions of this method, called *forward selection*, *backward selection* and *stepwise selection*. In forward selection, SPSS enters the variables into

the model one at a time in an order determined by the strength of their correlation with the dependent variable. The effect of adding each variable is assessed as it is entered, and variables that do not significantly add to the success of the model are excluded. In backward selection, SPSS enters all the independent variables into the model. The weakest independent variable is then removed and the regression re-calculated. If this significantly weakens the model then the independent variable is re-entered. However, if after removing the variable, the model improves, then the independent variable is deleted. This procedure is then repeated until only useful independent (predictor) variables remain in the model (Brace et al, 2003).

Stepwise is the most sophisticated of the statistical methods. Each variable is entered in sequence and its value assessed. If adding the variable contributes to the model then it is retained, but all other variables in the model are then re-tested to see if they are still contributing to the success of the Model. If they no-longer contribute significantly they are removed. Thus this method should ensure that you end with the smallest possible set of independent variables included in your model (Brace et al, 2003). The use of the stepwise method has some advantages. One advantage is that it should always result in the most parsimonious model. This could be important if you wanted to know the minimum number of variables you would need to measure to predict the dependent variable. Stepwise also has the advantage in that it automatically excludes from the analysis variables that are insignificant in predicting the dependent variable. Presence of insignificant variables in the analysis could weaken other variables that are good predictors. The stepwise regression method is also capable of showing how the variables entered the equation; it shows the first variable to be analyzed, the second, third and so on. Each independent variable is analyzed one at a time and the results are clearly displayed by SPSS. Hence, it is easy to see the relative strength and contribution of each variable and the effect of having or not having such a variable/s in the model. Lastly, stepwise has the advantage that it is capable of showing the percentage contribution of each independent variable to the overall coefficient of determination R^2 or adjusted R^2 of the model. Therefore, using stepwise regression, it is easy and possible to rank the variables (factors) according to their strength and importance in explaining variation in the dependent variable.

In view of the advantages of the stepwise regression technique, this study uses the statistical method of stepwise selection to identify significant factors that influence housing affordability.

The “simultaneous” Enter Method is also selected in order to compare the results obtained in the final analysis.

4.8 Summary

In this chapter the detailed methodology of conducting the research has been presented. The chapter began with a brief description of the case study area, and then followed by a review of the research design, methods of data collection, details of sampling and sampling techniques and the identification, description and measurement of the variables under investigation. The next chapter presents the results of the analysis of field data and interpretation of the research findings which will form the basis of policy recommendations and the way forward.

CHAPTER 5

FACTORS THAT AFFECT AFFORDABILITY IN THE MORTGAGE HOUSING SECTOR IN KENYA

5.0 Introduction

This chapter presents analysis of the factors affecting housing affordability. The factors that affect affordability in the home ownership mortgage housing sector were obtained from a variety of sources including from the review of literature and questionnaires administered to households in Nairobi with mortgage loans from Housing Finance Institutions and Banks. In the first part of this chapter, the factors are identified and ranked in their order of importance using the horizontal numeric scale that was devised in the previous chapter (see section 4.4). The significant factors are then identified using the population mean score and the critical z- value test. The last part of the chapter employs the statistical techniques of correlation and regression analysis to determine the strength and contribution of the identified significant factors and therefore enable the ranking of the significant factors with respect to their contribution to housing affordability.

5.1 Factors that Affect Affordability in the Mortgage Housing Sector in Kenya

From the literature review, the factors that affect affordability were conceptualized to be a function of the supply and demand for housing. Housing demand and supply are in-turn influenced by factors related to the households' social economic and demographic characteristics, loan characteristics, property characteristics and macro economic factors, as well as other factors that influence housing price and household income. In this study, the specific factors that influence affordability in the mortgage housing sector in Kenya were identified as thirty two (32no.) factors and are as follows:

1. Age
 2. Gender
 3. Marital status
 4. Number of family members with income
 5. Level of education
- { Social- economic factors }

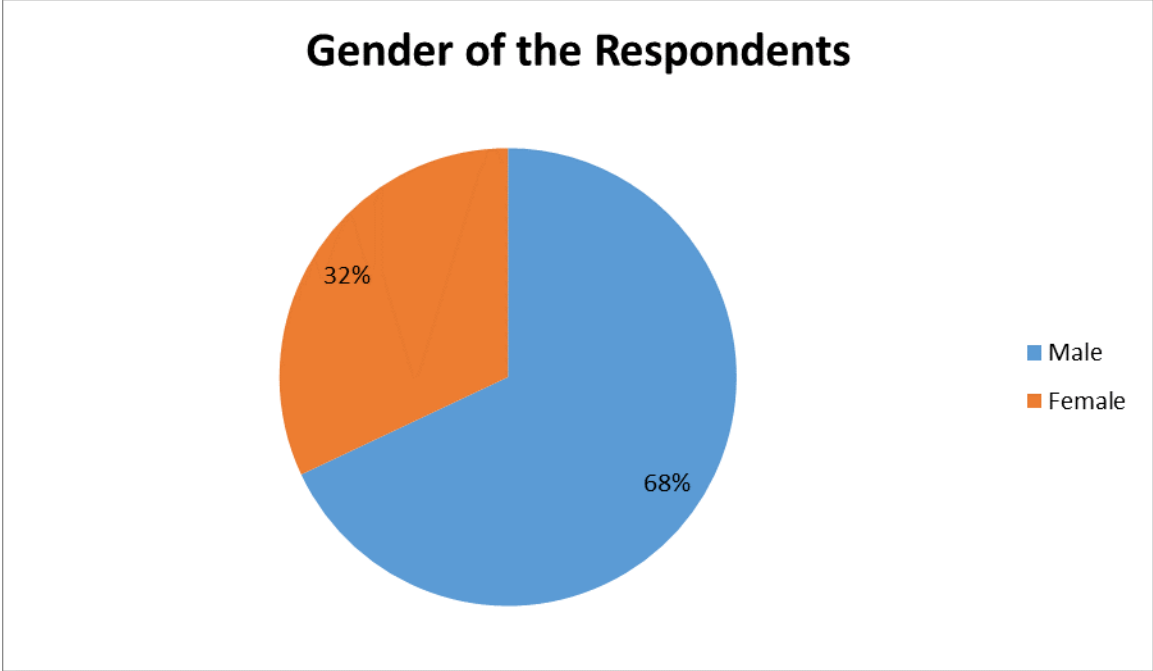
6. Household size
7. Number of dependants (outside the nuclear family)
8. Job status
9. Loss of regular employment income

10. Loan amount
11. Loan term
12. Loan-to-value (LTV) ratio
13. Interest on loan
14. Type of mortgage instrument **{ Loan factors}**
15. Mode of loan re- payment
16. Loan processing charges
17. Penalties on arrears
18. Mortgage insurance premiums

19. Location of property
20. Size of land
21. Value of land
22. Size of house **{Property factors}**
23. House design
24. Construction cost
25. Transaction cost
26. Developers profit

27. Inflation
28. Gross domestic product (GDP) per capita
29. Exchange rate **{ Macro-economic factors}**
30. Unemployment rate
31. Performance of alternative markets
32. Political climate

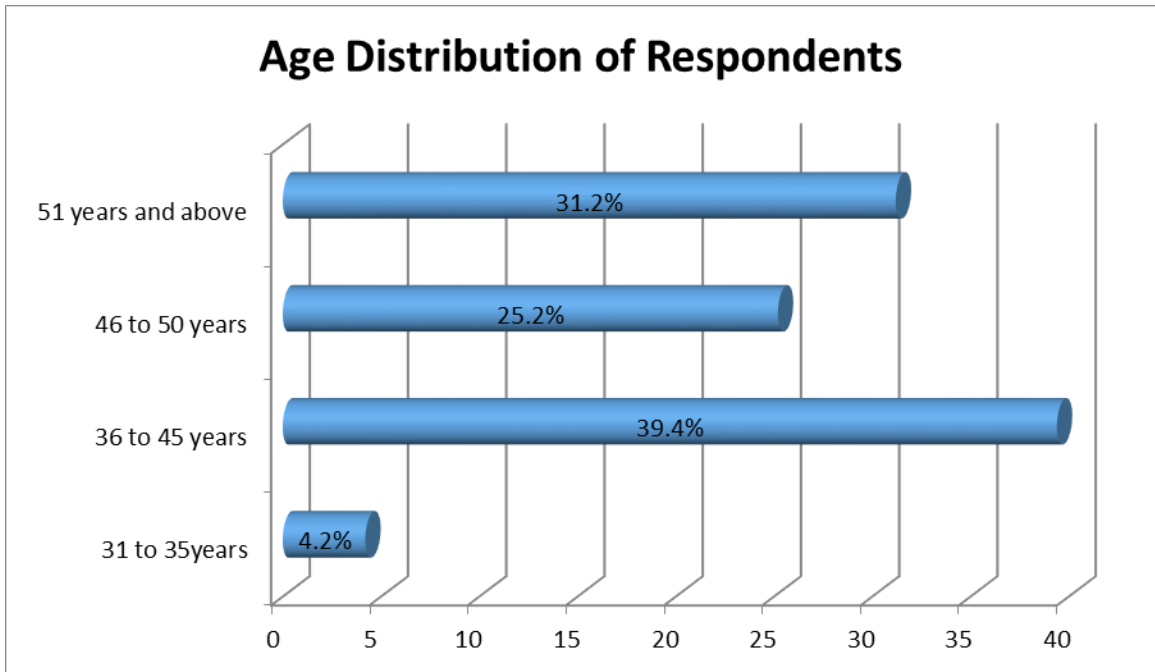
Of the 390 respondents targeted for the study, 353 households responded to the questionnaires yielding a response rate of 90.5%. The respondents comprised 68% males and 32% females as shown in Pie Chart (5.0) below.



Pie Chart 5.0: Gender of the Respondents

Source: Data Analysis Results, 2014

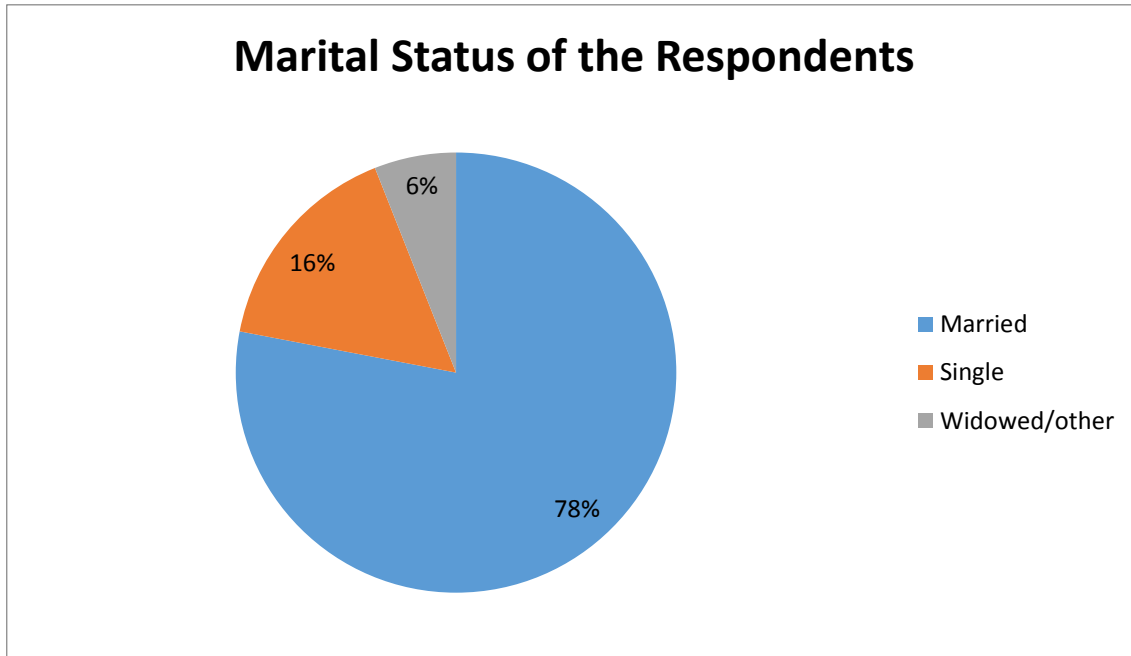
As shown in Bar Chart 5.1 below, most of the respondents, about 39.4%, were aged between 36 years to 45years, followed by 31.2% of the respondents aged 51 years and above and 25.2% aged between 46 years to 50 years. None of the respondents were aged 30 years and below which means that most individuals who access mortgages in Kenya are of a relatively advanced age.



Bar Chart 5.1: Age Distribution of Respondents

Source: Data Analysis Results, 2014

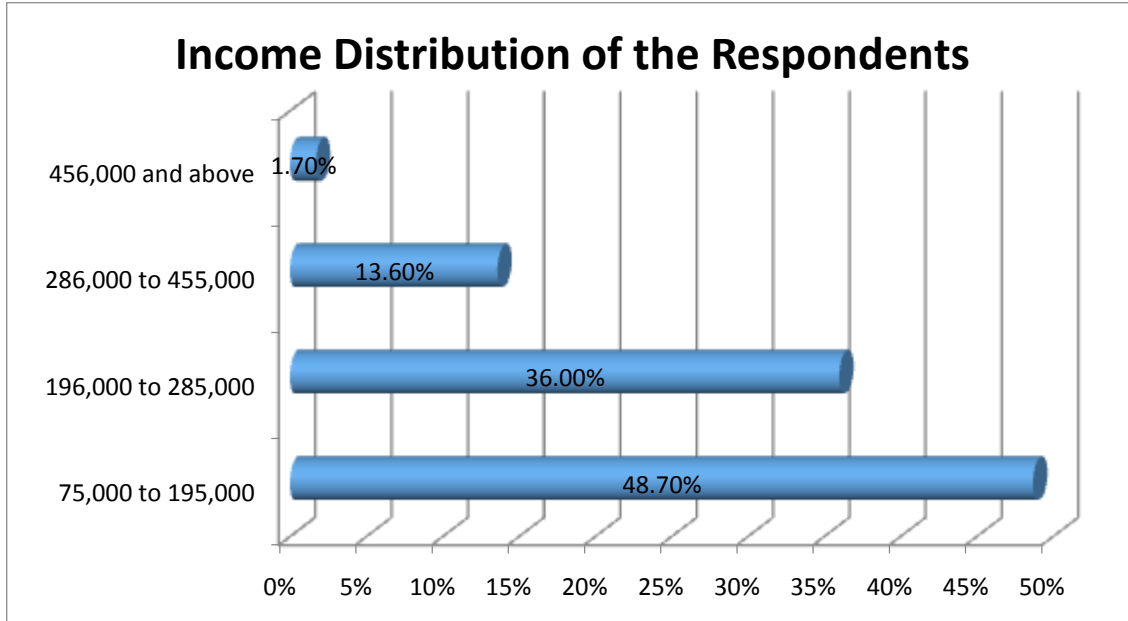
About 78% of the responding households were married and 16% were single, while only 6% were either widowed or of other marital status as shown in Pie Chart (5.2) below.



Pie Chart 5.2: Marital Status of Respondents

Source: Data Analysis Results, 2014

The income distribution of the respondents showed that most of the households about 48.7% had a monthly income of between Kshs. 75,000 to Kshs. 195,000, followed by 36.0% of the households whose estimated monthly income was between Kshs.196,000 to Kshs. 285,000 and 13.6% of respondents with estimated monthly income of between Kshs.286,000 to Kshs.455,000. Only 1.7% of the responding households indicated their monthly incomes were Kshs. 456,000 and above, as shown in Bar Chart 5.3 below.



Bar Chart 5.3: Income Distribution of the Respondents

Source: Data Analysis Results, 2014

5.2 Significant Factors Affecting Housing Affordability

In order to identify the significant factors affecting affordability in the mortgage housing sector, the 353 respondents were asked to rate the significance of the factors on a 4-point horizontal numerical scale. The results of the value rating of the ten (10) most important factors as rated by the respondents are shown in Table 5.0. The table shows the value ratings accorded to the factors by the respondents, the frequency and percentage.

Table 5.0 Rating of the Variables by the Respondents**Source: Data Analysis Results, 2014**

	Affordability Factor	Rating	Frequency	Percentage
1.	Loss of regular employment income	4	259	73.4%
		3	94	26.6%
2.	Loan amount	4	247	70.0%
		3	106	30.0%
3.	Interest on loan	4	234	66.3%
		3	119	33.7%
4.	Construction cost	4	191	54.1%
		3	161	45.6%
		2	1	0.3%
5.	Land value	4	183	51.8%
		3	169	47.9%
		2	1	0.3%
6.	Location of property	4	153	43.3%
		3	198	56.1%
		2	2	0.6%
7.	Inflation rate	4	166	47.0%
		3	167	47.3%
		2	20	5.7%
8.	Number of dependants	4	83	23.5%
		3	270	76.5%
9.	No. of family members with income	4	78	22.1%
		3	271	76.8%
		2	4	1.1%
10.	Job status of borrower	4	72	20.4%
		3	279	79.0%
		2	2	0.6%

Table 5.0 shows that, out of the 353 sampled respondents, 259 or 73.4% of the respondents rated the factor ‘loss of regular employment income’ as very significant in the scale of 1-4. 26 % rated the factor as “important” while none of the respondents rated the factor as “less important” or “not important”. The factor ‘loan amount’ was considered to be very important by 247 or 70% of the responding households while about 106 or 30% of the respondents rated this factor as important. None of the respondents considered this factor as less important or not important in influencing their affordability. 234 or 66.3% of the respondents rated the factor ‘interest on loan’ as very significant in the scale of 1-4 while 119 or 33.7% rated the factor as important, with none of the respondents rating the factor as less important or not important. The factor ‘construction cost’ was rated as very important affordability factor by 191 or 54.1% of the respondents while 45.6% rated this factor as important in the scale of 1-4. Only 0.3% of the respondents rated this factor as less important. The performance of the other variables is as indicated in Table 5.0.

The means of the value ratings were computed for each factor in order to rank the factors according to their importance and the results are shown in Table 5.1. The table shows the mean ranking of importance of each factor, the minimum and maximum value score for each factor and the standard deviation. The maximum value indicates the highest possible score awarded for each factor by the respondents while the minimum value indicates the lowest score. The standard deviation indicates the variations of the value score for each factor.

Table 5.1: Mean Rating of the Factors Affecting Housing Affordability

Source: Data Analysis Results, 2014

Affordability factor	Mean rating of importance (on a 4- point scale)	minimum	maximum	Std. deviation
1. Loss of regular employment income	3.73	3	4	.443
2. Loan amount	3.70	3	4	.459
3. Interest on loan	3.66	3	4	.473
4. Construction cost	3.54	2	4	.505
5. Land value	3.52	2	4	.506
6. Location of property	3.43	2	4	.507
7. Inflation rate	3.41	2	4	.597
8. No. of dependants (outside nuclear family)	3.24	3	4	.425
9. No. of family members with income	3.21	2	4	.435
10. Job status	3.20	2	4	.413
11. GDP per capita	3.14	2	4	.382
12. Loan-to- value ratio (LTV)	3.05	1	4	.589
13. Rate of unemployment	2.97	2	4	.513
14. Type of mortgage instrument	2.90	1	4	.675
15. Household size	2.88	2	4	.409
16. Loan term	2.87	1	4	.455
17. Developer's profit	2.80	2	4	.467
18. Property transfer cost	2.78	2	4	.665
19. Mode of loan re payment	2.60	1	4	.513
20. Age	2.54	1	3	.553
21. House design	2.53	1	3	.527
22. Marital status	2.50	2	3	.501
23. Exchange rate	2.48	1	4	.559
24. Level of education	2.22	1	3	.806
25. Land size	2.04	1	3	.570
26. House size	1.92	1	3	.641
27. Political climate	1.66	1	3	.491
28. Mortgage insurance premiums	1.52	1	2	.500
29. Performance of alternative markets	1.52	1	4	.549
30. Loan processing charges	1.42	1	2	.494
31. Penalties on arrears	1.35	1	2	.477
32. Gender	1.34	1	2	.473

The analysis of the mean value ratings of the factors in Table 5.1 show that respondents considered the loss of regular employment income ($\bar{x} = 3.73$) as the most important factor affecting their affordability. This finding shows that most households considered the stability of their regular income to be an important factor that could influence their affordability. If family earnings are interrupted by risk factors such as temporary or permanent loss of job occasioned by termination of employment, retirement or even death of the individual paying the mortgage, then this is likely to adversely affect the ability of the household to meet the monthly loan repayment obligations which will lead to defaults or even foreclosure of the mortgaged property.

The second important factor as ranked based on the rating by the respondents was loan amount which achieved a mean score of 3.70. This factor was defined as the amount of mortgage loan that the household is awarded by the bank or financial institution. A higher loan amount translates to high monthly loan repayments and vice versa. The amount of loan borrowed reflects the loan -to- value (LTV) ratio which is the proportion of the value of the property given as loan. A higher loan- to- value ratio means a higher loan amount which has the effect of increasing the monthly mortgage repayments and increases the probability of the borrower encountering repayment difficulties.

The third important factor according to the respondents was interest on loan which is the amount of interest charged by the banks and financial institutions. This factor had a mean value rating of 3.66. Interest rate affects mortgage affordability directly because it determines the borrower's monthly repayment burden. The amount and volatility of mortgage interest rates affects the household's income and this may result in either temporary or permanent disruption in monthly loan affordability especially if family income remains constant. The rates of mortgage interest in Kenya have been high over the last decade. In the year 2000, for example, interest rates on mortgages were high at 19% and remained at almost the same level until the year 2002. The rates of mortgage interest averaged 13% from the year 2003 to 2007. In the year 2011 interest on mortgages averaged 20%, and in 2012 and 2013, mortgage interest rates were on average 18% and 16.89% , respectively. The high mortgage interest rate regime prevailing in the country over the past years could, therefore, be the reason that prompted the respondents to rate this factor very highly in influencing their affordability.

The factor 'type of mortgage instrument' was also rated highly by the respondents. The impact of mortgage interest rate on mortgage affordability depends on the type of mortgage instrument in use. There are basically two types of mortgage instruments available in the Kenyan mortgage market, that is, Fixed Rate Mortgage (FRM) and Adjustable Rate Mortgage (ARM). With a fixed rate mortgage, monthly loan repayments remain constant through out the life of the loan, while for an adjustable rate mortgage, changes in interest rate are normally shifted to the borrower. An increase in the interest of an ARM would, therefore, lead to an increase in monthly loan repayment for households, leading to a higher risk of mortgage default. In Kenya, adjustable rate mortgages (ARM) are more common with banks than fixed rate mortgages (FRM) because of the desire of the banks to shift the risk of interest rate variations to the borrowers which in most cases end up hurting the affordability of the households. According to the Central Bank of Kenya (CBK) annual report of 2012, in the year 2011, 90% of mortgage loans in Kenya were on variable interest rate (ARM) and in 2012, 85.6% of mortgages were adjustable rate mortgages. The high tendency for banks and financial institutions in Kenya to grant mortgage loans on variable interest rate explain the affordability problems of households with mortgage loans from these institutions. Among the 353 households who responded to the questionnaires in this study, 351 households had ARM loans, and only two (2no) households had FRM loans. This explains why this factor was important in the rankings by the respondents.

The cost of construction, land value and location of property were ranked fourth, fifth and sixth important factors, respectively. These three factors are property related and have a direct influence on the price of a house. A high cost of construction, high land value and superior location of a property translates into high prices that properties will be sold in the open market. High property prices will definitely translate into high mortgage repayments for households and will affect affordability especially at the initial stages of accessing the loan and also during the repayment of the loan. House prices are also affected by developer's profit and property transaction costs which were also ranked highly by the respondents with mean ratings of 2.80 and 2.78, respectively. The cost of construction is affected by such factors as the cost or price of building materials, cost of labour, professional design fees and other incidental expenses incurred during the construction of a house. Cost of building materials especially cement and steel has been high in Kenya over the past years. The price of a 50kg bag of cement for instance was on average kshs 750 in 2012.

The rate of inflation was ranked as the seventh most important factor affecting affordability. Inflation is a macro economic factor which impacts on households' purchasing power by eroding the real value of money. As such, the impact of inflation is largely felt in the consumption of basic commodities like food, clothing and housing. In the building construction industry, the impact of inflation is felt on the prices of building materials, the cost of labour and the cost of mortgage finance. A high rate of inflation is likely to increase house prices and interest rates charged by banks and financial institutions thereby diminishing the affordability of households. Between the years 2000 and 2013, inflation rates in Kenya have been very volatile going as high as 17.8% in 2008 to as low as 1.8% in 2002. In 2011, inflation rate was at 14% and in 2013, the overall rate of inflation was 5.7%. The volatility of inflation rate might have contributed to the changes in mortgage interest rates and this could be the reason why respondents considered this factor as important in influencing their affordability. Other macro economic factors like the real gross domestic product (real GDP), exchange rate and rate of unemployment were also ranked fairly highly with mean ratings of 3.14, 2.48 and 2.97 respectively. Growth in real GDP is usually associated with rising incomes and living standards of the general populace and is therefore expected to improve affordability. Real GDP growth rates in Kenya have however been low averaging 5.8% in 2010, 4.4% in 2011 and 4.6% in 2012. The real GDP growth rate was at 1.6% in 2008 having dropped from 6.4% in 2007.

The number of dependants, number of family members with income and size of household were ranked eighth, ninth and fifteenth with mean ratings of 3.24, 3.21 and 2.88, respectively. The factor; number of dependants (outside the nuclear family) was defined as the number of extended family relatives who are living with the mortgage borrower in his or her home in Nairobi. An increase in the number of members of the extended family living with a household is likely to increase the volume of family expenses hence affect the income of the household which could diminish the ability of the household to pay for its housing services. Households who are also supporting the education of their siblings, the health of their aging parents are likely to experience affordability challenges. The dependency ratio in Kenya and Nairobi in particular is quite high at 52.7% and is higher among the poor at 71.3%. The households sampled in this study had at least one dependant with some households having upto four dependants in their homes which explains the importance of this factor in the ranking by the respondents. The factor number of family members with income or number of income earners was defined as the number

of family members within the household who have atleast some income. If a household has two or more of its members with income either from employment or business, then this is likely to improve their affordability compared to if only one member had income. The situation is worse if none of the family members has income. The households sampled had atleast two of its members with income.

The 'gender' of the borrower was ranked the least important factor with a mean rating of 1.34. This means that whether an individual is male or female does not in any way influence their affordability. The other factors which play less important roles in influencing the affordability of the households as indicated by their mean value ratings were: Penalty on arrears ($\bar{x} = 1.35$), loan processing charges ($\bar{x} = 1.42$), mortgage insurance premiums ($\bar{x} = 1.52$), performance of alternative markets ($\bar{x} = 1.52$), political climate ($\bar{x} = 1.66$) and house size ($\bar{x} = 1.92$).

Having identified and ranked the factors that affect affordability using the mean rating of the variables by the respondents, the next step was to isolate the significant factors in a fairly objective manner. This was done using the population mean score and the Critical Z- value tests. These two analyses provided a means of accepting or failure to accept the null hypothesis.

Using the population mean score, each of the factors had two hypotheses. The null hypothesis (h_0) was that the factor was not significant in influencing housing affordability and the alternative hypothesis (h_a) was that the factor was significant. Failing to accept the null hypothesis meant accepting the alternative hypothesis. To facilitate this analysis, a decision point had to be set, that is, a point at which to accept or reject the null hypothesis based on the population mean score. The population mean score is 2.5 on the devised rating scale of 1-4. This is a point higher than less significant on the decision scale and forms the decision point.

The results of the mean value rating of the factors as shown in Table 5.1 show that 19 factors have their mean value scores greater than the population mean (2.5). These factors are considered to be of major importance in affecting affordability and they are: *loss of regular employment income by the borrower* ($\bar{x} = 3.73$), *loan amount* ($\bar{x} = 3.70$), *interest on loan* ($\bar{x} = 3.66$), *construction cost* ($\bar{x} = 3.54$), *land value* ($\bar{x} = 3.52$), *location of property* ($\bar{x} = 3.43$), *inflation rate* ($\bar{x} = 3.41$), *no. of dependants (outside the nuclear family)* ($\bar{x} = 3.24$),

no. of family members with income ($\bar{x} = 3.21$), job status of the borrower ($\bar{x} = 3.20$), GDP per capita ($\bar{x} = 3.14$), loan- to- value ratio ($\bar{x} = 3.05$), rate of unemployment ($\bar{x} = 2.97$), type of mortgage instrument ($\bar{x} = 2.90$), Household size ($\bar{x} = 2.88$), loan term ($\bar{x} = 2.87$), developers profit ($\bar{x} = 2.80$), property transfer cost ($\bar{x} = 2.78$), and mode of loan re payment ($\bar{x} = 2.60$).

The factors whose mean value ratings are statistically equal to the population mean of 2.5 are considered to be of average importance in influencing affordability. These factors are: *age of borrower ($\bar{x} = 2.54$), quality of house design ($\bar{x} = 2.53$), marital status of borrower ($\bar{x} = 2.50$), and exchange rate ($\bar{x} = 2.48$).*

Those factors whose mean rating are statistically less than the population mean (2.5) are considered to be of minor importance in influencing affordability and they are: *level of education ($\bar{x} = 2.22$), mortgage insurance premiums ($\bar{x} = 1.52$), performance of alternative markets (1.52), house size ($\bar{x} = 1.92$), land size ($\bar{x} = 2.04$), political climate ($\bar{x} = 1.66$), loan processing charges ($\bar{x} = 1.42$), penalties on arrears ($\bar{x} = 1.35$) and gender ($\bar{x} = 1.34$).*

The results of this analysis show that all the 32 factors identified in this study are important factors affecting affordability. This is because all the factors achieved a mean value rating which is statistically above 1, meaning that they are all important determinants of housing affordability. The results suggest that in order to address the problem of affordability, policy makers should focus on all the factors identified but at least give more emphasis on those factors whose mean ratings are statistically equal or above the population mean of 2.5.

The above analysis of the factors using the population mean score did not, however, conclusively isolate the significant factors. This is because the confidence level had not been set. Confidence level assists in eliminating or minimizing errors that may occur in the identification of the significant factors. Two possible errors may occur in the identification of significant factors. One error is when a conclusion is made that a factor is significant when actually it is not. This error is referred to as the alpha error or type 1 error. The other type of error is referred to as the Beta error or the type 11 error and it occurs when it is erroneously concluded that a factor is not

significant when actually it is. These two errors are dangerous and have the potential to adversely affect the outcome of the study.

The possibility of committing any of the two errors is evaluated by conducting the Z-test of statistical significance on the factors to identify those that are significant. The Z-test analysis provides a conclusive way of either accepting or failing to accept the null hypothesis. In this study, the Z-test was carried out only on those factors found to be of major and average importance in influencing affordability. These are twenty three (23) factors and are as follows:

1. Loss of regular employment income
2. Loan amount
3. Interest on loan
4. Construction cost
5. Land value
6. Location of property
7. Inflation rate
8. Number of dependants (outside the nuclear family)
9. Number of family members with income
10. Job status of the borrower
11. GDP per capita
12. Loan-to-value (LTV) ratio
13. Rate of unemployment
14. Type of mortgage instrument
15. Household size
16. Loan term
17. Developers profit
18. Property transfer cost
19. Mode of loan re- payment
20. Age of borrower
21. Quality of house design
22. Marital status of the borrower
23. Exchange rate

All the twenty three (23) factors above had two hypotheses. The null hypothesis (H_o) was that the factors were not significant; while the alternative hypothesis (H_a) was that the factors were significant. Failure to accept the null hypothesis meant accepting the alternative hypothesis and therefore concluding that the particular factor was a significant determinant of housing affordability. The Z- value associated with each factor was computed and compared with the Critical Z- value which is **2.33** for a one- tail Z- test at 99% confidence level. Where the Z- value associated with each factor was found to be greater than the Critical Z- value at the specified confidence level, then the null hypothesis was rejected and a firm conclusion was made that the particular factor was significant in affecting housing affordability. Table 5.2 shows the results of the Z- test of statistical significance.

Table 5.2: Z- Test of Statistical Significance.**Source: Data Analysis Results, 2013**

Variable	Critical Z- Value at 99% Confidence Level (One- Tail)	Calculated Z- Value	Hypothesis Testing	Remarks
1.Loss of regular employment income	2.33	52.166	Fail to accept H _o	Factor is significant
2.Loan amount	2.33	49.120	Fail to accept H _o	Factor is significant
3.Interest on loan	2.33	46.077	Fail to accept H _o	Factor is significant
4. Construction cost	2.33	38.666	Fail to accept H _o	Factor is significant
5. Land value	2.33	37.874	Fail to accept H _o	Factor is significant
6. Location of property	2.33	34.464	Fail to accept H _o	Factor is significant
7. Number of dependants (outside the nuclear family)	2.33	32.714	Fail to accept H _o	Factor is significant
8. Job status of borrower	2.33	31.845	Fail to accept H _o	Factor is significant
9. GDP per capita	2.33	31.478	Fail to accept H _o	Factor is significant
10. .Number of family members with income	2.33	30.666	Fail to accept H _o	Factor is significant
11. Inflation rate	2.33	28.639	Fail to accept H _o	Factor is significant
12.Loan-to- value (LTV) ratio	2.33	17.544	Fail to accept H _o	Factor is significant
13.Household size	2.33	17.456	Fail to accept H _o	Factor is significant
14. Rate of unemployment	2.33	17.213	Fail to accept H _o	Factor is significant
15. Loan term	2.33	15.278	Fail to accept H _o	Factor is significant
16. Developers profit	2.33	12.070	Fail to accept H _o	Factor is significant
17. Type of mortgage instrument	2.33	11.134	Fail to accept H _o	Factor is significant
18. Property transaction cost	2.33	7.911	Fail to accept H _o	Factor is significant
19. Mode of loan re payment	2.33	3.662	Fail to accept H _o	Factor is significant
20. Age	2.33	1.359	Accept H _o	Factor is not significant
21. House design	2.33	1.070	Accept H _o	Factor is not significant
22. Marital status	2.33	0	Accept H _o	Factor is not significant
23. Exchange rate	2.33	-0.672	Accept H _o	Factor is not significant

In the above analysis, 19 factors had their calculated Z- values statistically greater than the Critical Z- value at 99% confidence level. In all these factors, the null hypothesis (H_0) was rejected and a decision was made that the factors are significant determinants of housing affordability. Arranged according to their respective categories as discussed in the literature review, the significant factors as ranked based on the rating by the respondents are presented in Table 5.3 (In descending order of importance).

Table 5.3: Significant Factors Affecting Housing Affordability

Significant Factor	Category
1.Loss of regular employment income	Social- economic factor
2.Loan amount	Loan factor
3.Interest on loan	Loan factor
4.Construction cost	Property factor
5.Land value	Property factor
6.Location of the property	Property factor
7. Number of dependants	Social- economic
8.Job status of borrower	Social-economic
9. GDP per capita	Macro- economic factor
10. Number of family members with income	Social- economic
11. Inflation rate	Macro- economic factor
12. Loan-to-value (LTV) ratio	Loan factor
13. household size	Social- economic
14. Rate of unemployment	Macro-economic
15. loan term	Loan factor
16. Developers profit	Property factor
17. Type of mortgage instrument	Loan factor
18. Property transaction cost	Property factor
19. Mode of loan re payment	Loan factor

All the above 19 significant factors have potential to influence the price of housing and the income of households and, therefore, affordability. The loss of regular income by the household for example could have a major impact on the ability of the household to meet the monthly repayment of the mortgage hence affecting its affordability. Loss of regular income could be caused by such events like loss of job, illness and divorce or separation, among other events, and may affect the size and stability of the family income hence affecting their mortgage affordability. The factors; loan amount, interest on loan, Number of dependants and number of family members with income as explained earlier in section 5.1 have potential to influence household income and therefore affordability. The factors; cost of construction, land value, developers profit and property transaction costs affect affordability because of their influence on the price of housing. The macro economic factors such as the rate of inflation, real GDP per capita and unemployment rate affects affordability because they have potential to influence the price of housing and household income. The significant factors affecting affordability are related to the households' social- economic characteristics, mortgage loan characteristics, property attributes and the macro-economic environment.

In the next section, the 19 significant factors are subjected to the final statistical analyses to determine their contribution to housing affordability. The procedure involves the use of Multiple Regression Analysis (MRA) to measure the marginal and relative contribution of each significant factor to housing affordability. This will enable the ranking of the significant factors with respect to their contribution to housing affordability.

5.3 Significant Factor Contribution to Housing Affordability

While the analyses performed in section 5.2 identified and ranked the significant factors as rated by the respondents, the strength and contribution of the significant factors to housing affordability was not determined and, therefore, the influence or impact of the significant factors on affordability could not be ascertained. Hence, the need for further analyses to determine the strength and the contribution of the identified significant factors and, therefore, establish in a more objective way the influence of the significant factors to housing affordability. This is important to enable the ranking of the significant factors with respect to their contribution to affordability which is necessary to guide policy development on housing affordability in Kenya.

The procedure of establishing the strength and contribution of the identified significant factors to affordability was carried out using the statistical techniques of correlation and regression analysis. In regression analysis, the multiple regression analysis (MRA) was selected for the analysis. Correlation analysis measures the strength of the correlation/ relationship between the identified significant factors and affordability.

The technique of Multiple Regression Analysis on the other hand measures the marginal and relative contribution of each significant factor to affordability and helps to formulate a regression model comprising of the factors having a significant contribution to housing affordability. The advantage of correlation and regression analysis is that they are more objective in the identification of the significant factors especially with regard to the strength and contribution of the factors to affordability. Multiple Regression Analysis (MRA) relates one factor (variable) called the dependent variable as a function of several other factors called independent variables. The dependent variable in this study is housing affordability while the independent variables are the identified significant factors. As shown in Table 5.3, the significant factors as identified by the respondents are nineteen (19) out of the initial number of thirty two (32) factors. Arranged in a descending order of importance, the significant factors are as follows:

1. Loss of regular employment income
2. Loan amount
3. Interest on loan
4. Construction cost
5. Land value
6. Location of property
7. Inflation rate
8. Number of dependants (outside the nuclear family)
9. Number of family members with income
10. Job status of the borrower
11. GDP per capita
12. Loan-to-value (LTV) ratio
13. Rate of unemployment
14. Type of mortgage instrument

- 15. Household size
- 16. Loan term
- 17. Developers profit
- 18. Property transfer cost
- 19. Mode of loan repayment

Among the nineteen (19) significant factors, four (4) factors, that is, Loan amount, location of property, rate of unemployment and mode of loan repayment were not included in the formulation of the multiple regression function because of multicollinearity, lack of data and measurement complication of the variables. The omission of the four (4) factors leaves 15 significant factors to be analyzed using multiple linear regression.

The general Multiple Regression Analysis (MRA) equation is expressed as;

$$Y = a_0 + b_1x_1 + b_2x_2 + b_3x_3 \dots\dots\dots b_nx_n + \epsilon$$

Where,

Y – is the dependent variable

a_0 – is the regression constant

$x_1 - x_n$ – are the independent/predictor variables

$b_1 - b_n$ – are the regression coefficients

ϵ - is the error term

Using the 15 significant factors, the multiple regression equation can be hypothesized to be;

$$\text{Affordability} = a_0 + b_1L_income + b_2interest + b_3C_cost + b_4L_value + b_5Infl_rate + b_6N_Depdts + b_7Nf_income + b_8J_status + b_9GDP_Cap + b_{10}LTV + b_{11}M_intr + b_{12}h_size + b_{13}term + b_{14}D_profit + b_{15}T_cost + \epsilon$$

Where,

Affordability – Housing affordability (Dependent variable)

a_0 – Regression constant

$b_1 - b_{15}$ – are the regression coefficients

L_income – loss of regular employment income

Interest – Interest charged on mortgage loan

C_cost – Construction cost

L_value- Land value

Infl_rate – inflation rate

N_Depdts – No. of dependants

Nf_income – No. of family members with income

J_status – Job status of mortgage borrower

GDP_Cap – real GDP per capita.

LTV – Loan – to – value ratio

M_intr – Type of mortgage instrument

h_size – size of household

Term – loan repayment period/loan term

D_profit- Developers profit

T_cost- Property transaction costs

All the variable data in the hypothesized MRA equation are subjected to three (3) statistical procedures, namely; Descriptive statistics, Correlation analysis and Regression analysis

5.3.1 Descriptive Statistics

Descriptive statistical analysis was performed on both the dependent and the independent variables. Descriptive statistics considered relevant for this study were; the mean, mode, median,

standard deviation, skewness, kurtosis, minimum and maximum. The aim of descriptive statistics was to check for frequencies, completeness of the data sets, normal distribution and generally to enhance understanding and consumption of the variable data. It was important to check for normal distribution in order to fulfill this important assumption of MRA which assumes that data sets should obey the normal symmetric distribution. The results of the analyses are displayed in Tables 5.4 and 5.5.

In Table 5.4, the results of the descriptive statistics of the dependent variable (housing affordability) indicate that the distribution of the values of housing affordability is close to normal distribution. This is because the value for the mean and median are close. The value of the mean as indicated in Table 5.4 is 0.3464. This is the average affordability ratio of the households sampled and it means that on average, the households sampled spend at least 35% of their monthly income towards the repayment of their mortgage loan. The median value of 0.3200 indicates the affordability ratio of the median household. It means the median household spends 32% of its monthly income towards the repayment of its mortgage loan. A mode value of 0.40 means that most of the households sampled spend 40% of their monthly income to meet their monthly mortgage loan repayment. The value for skewness indicates close to normal distribution. In general, a skewness value less than one (1) indicate normal symmetric distribution (Murphy 1989 in Nzau, 2003). In our case, the skewness value for housing affordability data is less than one (i.e. 0.807) indicating close to normal distribution. The shape of the normal curve is displayed in Figure 5.0. As it can be seen from the shape of the curve, the distribution of housing affordability values of the sampled respondents is close to normal, symmetric distribution.

Table 5.4 Descriptive Statistics of the Dependent variable, Housing Affordability.

Source: Data Analysis Results, 2014. N = Sample Size

N	353
Mean	0.3464
Median	0.3200
Mode	0.40
Std.Deviation	0.19076
Skewness	0.807
Kurtosis	0.378
Minimum	0.01
Maximum	0.99

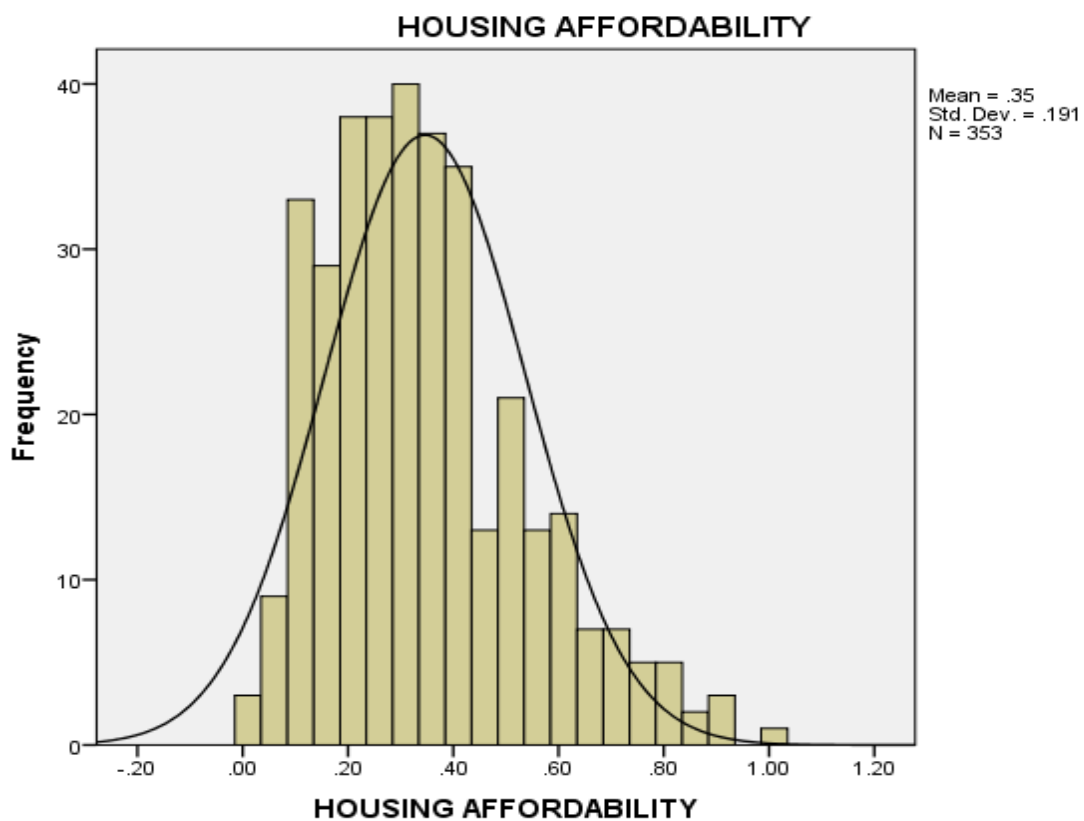


Figure 5.0: Histogram and Normal Curve for the Dependent Variable, Housing Affordability

Source: Data Analysis Results, 2014

In Table 5.5, the mean, median, mode and standard deviation of all independent variables are checked. It can be seen that the values for the mean and median of each independent variable are either the same or are close, meaning that the variable data obey the normal, symmetric distribution. For example the variable “size of household denoted by h_size” has a mean value of 4 and a similar value for the median. The variable “number of family members with income or Nf_income” has a mean of 1.68 and a median of 2 which are very close values meaning that the variable data obey normal distribution.

A mean value of 4 for the variable “size of household” implies that the households sampled had on average 4 family members. From the literature review, the size of the household was defined as the number of family members within the nuclear family. A high number of family members within the household is likely to diminish the ability of the household to pay for their housing because a greater proportion of its income will be directed towards meeting other essential household needs like education, health, transport and clothing. Large sized households are therefore likely to experience housing affordability challenges compared to small families. A mode value of 2 for the variable “No. of family members with income” means that most of the households sampled had at least 2 income earners. A high number of income earners in the family is expected to improve affordability because of enhanced or increased income for the household. Therefore, if both spouses in the family have some income, then this is likely to improve affordability as compared to if only one spouse had income. A mean value of 0.65 for the factor Loan-to-value (LTV) ratio means that on average the households’ sampled had taken about 65% of the value of their properties as loan. Loan-to-value ratio as previously explained determines the loan amount and therefore the monthly loan repayments. A higher loan amount will translate into higher repayment burden for households and this is likely to affect their affordability. A mean value of 14.82 for the variable loan term means that on average the households included in the sample had taken loans repayable over a period of 15 years. From literature review, loans of longer repayment periods are more affordable than loans with shorter repayment periods. Loans with shorter repayment periods are likely to attract higher monthly repayments placing a higher repayment burden on families as compared to loans with longer repayment periods. The values of the standard deviation for each variable show the variation of all the observed cases. The minimum and maximum values show the lowest and highest value of the observed cases.

Table 5.5 Descriptive Statistics of Independent Variables

Source: Data Analysis Results, 2014

VARIABLE CODE															
Statistics	h_size	Nf_income	N_deppts	J_status	L_income	LTV	term	interest	M_intr	L_value	C_cost	T_cost	D_profit	Infl_rate	GDP_cap
N	353	353	353	353	353	353	353	353	353	353	353	353	353	353	353
Mean	4	1.68	1.72	1.32	0.89	0.6574	14.82	56241.7	1.99	6134532.58	5158711.05	791334.28	4,550,000	0.10071	36169.25
Median	4	2	2	1	1	0.7	16	38997.3	2	4000000	4200000	650000	3,400,000	0.096	36933
Mode	4	2	1	1	1	0.8	11	10792	2	3000000	4200000	700000	1,500,000	0.112	36962
Std. Deviation	1.276	0.65	0.811	0.717	0.31	0.2416	4.18	55899.96	0.075	7850873.06	3718874.31	737197.908	4,754,000	0.04576	2415.9
Minimum	1	1	1	1	0	0.03	6	333	1	500000	690000	110000	100,000	0.018	32846
Maximum	7	4	4	11	1	1.54	28	427806	2	120000000	25000000	8500000	40,000,000	0.173	39609

Variable Names: h_size means size of the household, Nf_income is number of family members with income, N_deppts is number of dependants, J_status is job status of the mortgage borrower, L_income is loss of regular income, LTV is loan to value ratio, term is period of loan repayment, interest is interest charged on mortgage loan, M_intr means type of mortgage instrument, L_value is land value, C_cost is construction cost, T_cost means property transfer cost, D_profit is developers profit, Infl_rate means rate of inflation and GDP_cap is real GDP per capita

5.3.2. Correlation Analysis

The next statistical analysis performed on the identified significant factors was correlation analysis. Correlation was performed on both the dependent and independent variables. Correlation analysis between the dependent variable (housing affordability) and the independent variables (which are the identified significant factors) was done for the purpose of determining the strength of the relationship between housing affordability and each of the identified significant factors. The aim was to select factors with a significant relationship with affordability and leave out factors with weak relationship with affordability. It is only those factors having a significant relationship with affordability that are included in the formulation of the multiple regression function. Correlation analysis of the independent variables (identified significant factors) is done to identify the significant factors which are highly related in order to avoid the undesirable effects of multi collinearity. Therefore in choosing the significant factors, one should select those that are significantly related with affordability and leave those that are strongly related with each other in order to avoid the adverse effects of multi collinearity.

Correlation is measured by the coefficient of correlation denoted by (R). The value of R ranges from -1 to +1 with both extremes indicating a perfect correlation. The sign of the coefficient indicates the direction of the relation (positive or negative). A positive R implies that when the value of one variable increases, the other variable increases, while a negative R implies that when one variable increases the other decreases (Nzau 2003, 2004). The absolute value of the correlation coefficient indicates strength with large absolute values indicating strong relationships. A correlation coefficient of zero (0) indicates that the two variables are not related at all. Misri (2003 in Bujang et al, 2010) has indicated that a correlation coefficient of less than 0.3 shows that the variables do not have a strong correlation with each other. Swazuri (1996) noted that a correlation coefficient of 0.5 indicates strong relationship between variables. Murphy (1989 in Nzau, 2003) noted that a correlation coefficient more than or equal to 0.70 indicates a strong explanatory interrelationship between the variables which can cause multicollinearity. However, Bryman and Cramar (2005 in Masu, 2006) argued that multicollinearity would occur if the correlation coefficient between independent variables is in excess of 0.80. According to Pallant (2007; Tabachnick and Fidel 2007 in Akinwunmi, 2009),

multicollinearity would occur if the correlation coefficient between independent/predictor variables is greater than 0.90.

The term multicollinearity is used to describe the combined influence of a number of independent variables where the influence of each variable is difficult to isolate. Multicollinearity in MRA modeling occurs when the independent variables are highly correlated. Multicollinearity is bad because it can adversely affect the MRA results. Hair et al (1998 in Akinwumni, 2009) have argued that presence of multicollinearity makes it difficult to determine the contribution of each predictor variable. According to Masu (2006) multicollinearity is a problem because it means that the regression coefficients may be unstable. Presence of multicollinearity among the predictor variables should, therefore, be checked before further statistical procedures are performed on the variable data. Table 5.6 shows the correlation results of the participating variables (Dependent and independent variables).

As shown in Table 5.6, correlation analysis using SPSS software yields both the correlation coefficient (R) and the significance level (α) associated with the coefficients. As a general rule, if the significance level is very small (less than 0.5) then the correlation is significant and the two variables are linearly related, and if the significance level is relatively large (for example ≥ 0.50) then the correlation is not significant and the two variables are not linearly related.

From the correlation results in Table 5.6, the significance level between housing affordability and every predictor variable is small ranging between ($\alpha = 0.000$ to 0.356) meaning that there is a significant linear relationship between housing affordability and all of the predictor variables being analyzed. The strength of the relationship however varies with some predictor variables having strong relationship while others have weak relationship with affordability. In terms of their strength of relationship with affordability, the significant factors are arranged as follows (in a descending order of strength of relationship with affordability):

1. Interest on loan
2. Number of dependants (outside the nuclear family)
3. Number of family members with income
4. Construction cost

5. Property transfer cost
6. Developer's profit
7. Size of the household
8. Loan-to- value (LTV) ratio
9. Land value
10. Real gross domestic product (GDP) per capita
11. Job status of the borrower
12. Type of mortgage instrument
13. Loan term
14. Loss of regular employment income
15. Inflation rate

Table 5.6 Correlation Results (Dependent and Independent Variables)

Key: R-Correlation Coefficient, α –Significance Level; Source:

Data Analysis Results, 2014

Variable Code	Affordability	h_size	Nf_inco me	N_depdt	J_status	L_income	LTV	term	interest	M_intr	L_value	C_cost	T_cost	D_profit	inflation	GDP_Cap	
Affordability	R α	1.000	0.303 0.000	-0.361 0.000	0.605 0.000	-0.163 0.001	0.025 0.323	0.291 0.000	-0.096 0.035	0.727 0.000	-0.132 0.006	0.24 0.000	0.338 0.000	0.323 0.000	0.309 0.000	-0.02 0.356	0.213 0.000
h_size	R α	0.303 0	1.000	0.239 0.000	0.431 0	-0.083 0.06	-0.151 0.002	-0.043 0.21	-0.182 0	0.237 0	-0.03 0.288	0.142 0.004	0.257 0.000	0.192 0.000	0.217 0.000	0.04 0.227	-0.029 0.296
Nf_income	R α	-0.361 0	0.239 0	1.000	-0.321 0.000	0.024 0.33	-0.029 0.294	-0.213 0.000	-0.143 0.003	-0.243 0.000	0.021 0.345	-0.034 0.263	-0.038 0.239	-0.064 0.116	-0.084 0.058	0.006 0.453	-0.029 0.291
N_depdt	R α	0.605 0.000	0.431 0.000	-0.321 0.000	1.000	-0.114 0.016	-0.019 0.363	0.155 0.002	-0.038 0.237	0.434 0.000	0.02 0.351	0.155 0.002	0.263 0.000	0.244 0.000	0.29 0.000	0.109 0.021	-0.011 0.416
J_status	R α	-0.163 0.001	-0.083 0.06	0.024 0.33	-0.114 0.016	1.000	-0.023 0.33	-0.006 0.459	-0.102 0.027	-0.211 0.000	-0.019 0.361	-0.164 0.001	-0.188 0.000	-0.169 0.001	-0.136 0.005	0.051 0.168	0.014 0.393
L_income	R α	-0.025 0.323	-0.151 0.002	-0.029 0.294	-0.019 0.363	-0.023 0.33	1.000	0.169 0.001	0.134 0.006	0.008 0.438	-0.026 0.312	-0.102 0.028	-0.088 0.049	-0.107 0.022	-0.103 0.027	0.046 0.194	-0.048 0.182
LTV	R α	0.291 0.000	-0.043 0.21	-0.213 0.000	0.155 0.002	-0.006 0.459	0.169 0.001	1.000	0.24 0.000	0.137 0.005	-0.031 0.28	-0.189 0.000	-0.185 0.000	-0.215 0.000	-0.206 0.000	-0.018 0.368	-0.167 0.001
term	R α	-0.096 0.035	-0.182 0.000	-0.143 0.000	-0.038 0.237	-0.102 0.027	0.134 0.006	0.24 0.000	1.000	0.264 0.000	-0.003 0.476	0.012 0.414	0.01 0.428	0.001 0.491	0.008 0.443	-0.041 0.220	0.09 0.045
interest	R α	0.727 0.000	0.237 0.000	-0.243 0.003	0.434 0.000	-0.211 0.000	0.008 0.438	0.137 0.005	0.264 0.000	1.000	-0.067 0.105	0.466 0.000	0.564 0.000	0.552 0.000	0.507 0.000	-0.047 0.187	0.300 0.000
M_intr	R α	-0.132 0.006	-0.03 0.288	0.021 0.345	0.02 0.351	-0.019 0.361	-0.026 0.312	-0.031 0.284	-0.003 0.476	-0.067 0.105	1.000	0.035 0.256	0.051 0.17	0.034 0.261	0.009 0.435	-0.024 0.324	-0.097 0.035
L_value	R α	0.24 0.000	0.142 0.004	-0.034 0.263	0.155 0.002	-0.164 0.001	-0.102 0.028	-0.189 0.000	0.012 0.414	0.466 0.000	0.035 0.256	1.000	0.702 0.000	0.920 0.000	0.66 0.000	-0.020 0.353	0.058 0.139
C_cost	R α	0.338 0.000	0.257 0.000	-0.038 0.239	0.263 0.000	-0.188 0.000	-0.088 0.049	-0.185 0.00	0.01 0.428	0.564 0.000	0.051 0.17	0.702 0.000	1.000	0.871 0.000	0.771 0.000	-0.049 0.177	0.023 0.337
T_cost	R α	0.323 0.000	0.192 0.000	-0.064 0.116	0.244 0.000	-0.169 0.001	-0.107 0.022	-0.215 0.000	0.001 0.491	0.552 0.000	0.034 0.261	0.920 0.000	0.871 0.000	1.000	0.863 0.000	-0.029 0.292	0.057 0.144
D_profit	R α	0.309 0.000	0.217 0.000	-0.084 0.058	0.29 0.000	-0.136 0.005	-0.103 0.027	-0.206 0.000	0.008 0.443	0.507 0.000	0.009 0.435	0.66 0.000	0.771 0.000	0.863 0.000	1.000	-0.017 0.378	0.015 0.390
inflation	R α	-0.02 0.356	0.04 0.227	0.006 0.453	0.109 0.021	0.051 0.168	0.046 0.194	-0.018 0.368	-0.041 0.22	-0.047 0.187	-0.024 0.324	-0.02 0.353	-0.049 0.177	-0.029 0.292	-0.017 0.378	1.000	-0.008 0.443
GDP_Cap	R α	0.213 0.000	-0.029 0.296	-0.029 0.291	-0.011 0.416	0.014 0.393	-0.048 0.182	-0.167 0.001	0.09 0.045	0.300 0.000	-0.097 0.035	0.058 0.139	0.023 0.337	0.057 0.144	0.015 0.390	-0.008 0.443	1.000

The results of the correlation analysis (see table 5.6) show that the variable “interest on loan” has the strongest correlation with affordability as indicated by the coefficient ($R = +0.727$) between the two variables. The relationship between the two variables is highly significant as indicated by the significance level. The positive sign of the correlation coefficient between interest rate and affordability implies that when the interest on loan increases, the affordability ratio increases, meaning that housing becomes less affordable to the household. The affordability ratio as indicated in the literature review is the dependent variable in this study and was defined and measured as the proportion of the household’s monthly income that goes into the repayment of the mortgage loan. All other factors held constant, a higher affordability ratio of a household means diminished or reduced affordability of the household, while a low affordability ratio denotes better or improved affordability of the household. Thus, if an increase in the value of a given factor leads to an increase in the affordability ratio of the household, that factor is considered to diminish or reduce the affordability of the household and vice versa. From the literature review, it was explained that interest rate affects mortgage affordability directly because it determines the borrower’s monthly repayment burden. The amount and volatility of mortgage interest rates affects the household’s income and this may result in either temporary or permanent disruption in monthly loan affordability especially if family income remains constant. The rates of mortgage interest in Kenya have been high and very volatile over the last decade. For instance, in the year 2000, interest rates on mortgages were high at 19% and remained at almost the same level until the year 2002. The rates of mortgage interest averaged 13% from the year 2003 to 2007. In the year 2011 interest on mortgages averaged 20% and in 2012 and 2013 mortgage interest rates were on average 18% and 16.89% , respectively. The high level and volatility of mortgage interest rates in Kenya explain the strong correlation between the variable ‘interest on loan’ and affordability. As indicated earlier in section 5.2 (Table 5.1), the respondents sampled had also rated this factor highly with a mean rating of 3.66.

The factors ‘number of dependants’ and ‘number of family members with income’ also showed strong correlation with affordability with correlation coefficients of +0.605 and -0.361 respectively. These two factors are related to the household social economic characteristics and have the potential to influence household income. A positive sign for the correlation coefficient associated with the factor number of dependants means that if the number of people who depend on the household increases, the affordability ratio increases which increases the possibility of the

household falling into housing affordability challenges. As explained in the literature review, the factor number of dependants (outside the nuclear family) was defined as the number of extended family relatives who are living with the mortgage borrower in his or her home in Nairobi. An increase in the number of members of the extended family living with a household is, therefore, likely to increase the volume of family expenses hence affect the income of the household which could diminish the ability of the household to pay for its housing services. A negative sign of the correlation coefficient for the factor number of family members with income implies that when the number of income earners in a family increases, the affordability ratio decreases, which means housing becomes more affordable to the household. The increase in affordability is due to the fact that when there are more income earners in a family, there is more income which enables the household to pay for its housing as well as other basic household needs without much difficulty. The results of the correlation analysis for these two factors, therefore, indicate that the affordability of households is highly dependent on the households' level of income such that any factor that changes the level of income either by increasing or decreasing the family income is likely to have a major impact on affordability. These two factors were also rated highly by the respondents with mean ratings of 3.24 and 3.21, respectively meaning that the respondents sampled considered the factors as important in influencing their affordability. The factor size of the household also showed a strong correlation with affordability with correlation coefficient of +0.303. The positive sign of the correlation coefficient implies that when the size of household increases, the affordability ratio increases meaning housing becomes less affordable to the household. This factor like the factors number of dependants and number of family members with income affect affordability because it has an influence on household income. Other factors held constant, an increase in the size of a household may decrease the level of disposable income which may cause such household to encounter difficulties in paying for its basic needs including housing.

The other factors which showed strong correlation with affordability are: construction cost ($R = 0.338$), property transfer cost ($R = 0.323$), developers profit ($R = 0.309$) and land value ($R = 0.240$). From the literature review, these factors are property related and influence affordability because they affect the price of housing. The four property factors were also rated highly by the respondents with mean ratings of 3.54, 2.78, 2.80 and 3.52, respectively meaning that the respondents sampled considered the factors as important in influencing their affordability. A

high cost of construction, high land value and developers profit translates into high prices that properties will be sold in the open market. High property prices will definitely translate into high mortgage repayments for households and will affect affordability especially at the initial stages of accessing the loan and also during the repayment of the loan. The cost of construction is affected by such factors as the cost or price of building materials, infrastructure costs, cost of labour, professional design fees and other incidental expenses incurred during the construction of a house. Property transfer costs are the expenses incurred during transfer of property and include lawyers' conveyancing fees and government stampduties payable during the purchase of property.

The factor loan-to-value (LTV) ratio showed a strong correlation with affordability with a correlation coefficient of 0.291. The respondents sampled also considered this factor as important in influencing their affordability with a mean rating of 3.05. From the literature review, the loan- to- value (LTV) ratio was defined as the proportion of the value of the property that is taken as loan. Loan-to-value (LTV) ratio determines the loan amount and therefore the monthly loan repayments. A higher loan amount will translate into higher repayment burden for households and this is likely to negatively affect their mortgage repayment affordability.

The other remaining predictor variables, that is, loss of regular employment income ($R = -0.025$, $\alpha = 0.323$), loan term ($R = -0.096$, $\alpha = 0.035$), type of mortgage instrument ($R = -0.132$, $\alpha = 0.006$), job status ($R = -0.163$, $\alpha = 0.001$), inflation rate ($R = -0.020$, $\alpha = 0.356$) and Real GDP per capita ($R = 0.213$, $\alpha = 0.000$), have weak correlation with affordability because their correlation coefficients are less than 0.30 (Misri 2003 in Bujang et al 2010). However, despite having weak correlation with affordability, the correlation results show that their correlation with affordability is significant as indicated by their respective significance levels which are all less than 0.50. The loss of regular income by the household for example could have a major impact on the ability of the household to meet the monthly repayment of the mortgage hence affecting its affordability. Loss of regular income could be caused by such events like loss of job, illness and divorce or separation, among other events, and may affect the size and stability of the family income hence affecting its mortgage affordability. The factor loan term was defined in the literature as the period of loan repayment. The results of the correlation analysis indicate that this factor is significantly correlated with affordability. A longer repayment period translates to

reduced monthly loan repayments thus making a mortgage more affordable to a household. Conversely, a shorter loan repayment period increases the monthly loan repayment amounts and therefore makes a loan less affordable to the household. The real gross domestic product (GDP) per capita and the rate of inflation are macro economic factors with significant correlation with affordability. As explained in the literature review, the two factors influence affordability because of their effect on household income and the price of housing.

The results of the correlation analysis confirms the findings in the literature review and field survey that the factors that influence affordability in the home ownership (mortgage) housing sector in Kenya are related to the households social economic characteristics, property attributes, loan characteristics and the macro- economic environment. The household social economic factors with significant correlation with affordability are: Number of dependants (outside the nuclear family), Number of family members with income, size of the household, Job status of the borrower and loss of regular employment income. The property factors are the cost of construction, property transfer costs, developers profit and land value. The loan factors are the interest on loan, loan -to- value (LTV) ratio, Loan term and the type of mortgage instrument. The macro economic factors are the real gross domestic (GDP) per capita and the rate of inflation.

The results of the correlation analysis show that the interest on loan which reflects the mortgage interest rate charged by banks and financial institutions in Kenya has the strongest correlation with affordability and, therefore, plays the dominant role in explaining the affordability problems of households in the homeownership (mortgage) housing sector in Kenya. The factor interest on loan was also ranked very highly by the respondents with a mean rating of 3.66 meaning that the respondents sampled considered this factor as important in influencing their affordability.

While most of the factors that showed strong correlation with affordability were also ranked highly based on the ratings by the respondents, some factors like loss of regular employment income which was ranked highly by the respondents with a mean rating of 3.73, showed a weak correlation with affordability with a correlation coefficient of 0.025. This weak correlation coefficient can be explained by the fact that there were very few respondents in the survey who indicated that they had lost their employment income either through retirement, resignation or termination of employment. Out of the 353 households who responded to the survey, only 13 individual mortgagors indicated that they had lost their regular employment income (see

appendix B). The few number of households with this characteristic could have affected the performance of this variable in the correlation analysis. However, as already explained, despite this factor (Loss of regular employment income) having a weak correlation with affordability, the results of correlation analysis show that its correlation with affordability is significant as indicated by the significance level of 0.323, which is below the significance threshold of 0.50 as explained in the literature review.

Multicollinearity

Another important finding in the results of the correlation analysis is the presence of multicollinearity among some predictor variables. As shown in table 5.6, there is multicollinearity between the variables; property transfer cost and land value ($R = 0.920$), construction cost and property transfer cost ($R = 0.871$), developer's profit and property transfer cost ($R = 0.863$), construction cost and developer's profit ($R = 0.771$). Interestingly, all the four factors displaying multicollinearity are important variables in house price determination.

In order to avoid the undesirable effects of multicollinearity, the variables; developer's profit and property transfer cost are excluded in the subsequent analysis. The remaining thirteen (13) significant factors, that is, Interest on loan, Number of dependants (outside the nuclear family), Number of family members with income, Construction cost, Size of the household, Loan-to-value (LTV) ratio, Land value, Real Gross Domestic Product (GDP) per capita, Job status of the borrower, Type of mortgage instrument, Loan term, Loss of regular employment income and Inflation rate, were subjected to the final statistical analysis - Regression Analysis.

5.3.3 Regression Analysis

Regression analysis was performed to determine the contribution of the significant factors to housing affordability and to rank the factors with respect to their contribution to affordability.

Regression analysis with the SPSS software was performed using both the ENTER and the STEPWISE regression methods. The ENTER regression method allows the researcher to analyze the performance of all the affordability factors (ie both the weak and strong predictors). The ENTER method does not, however, show how the individual factors contributed to affordability, and, therefore, it is not possible to rank the significant factors with respect to contribution to

affordability using the ENTER regression method. The STEPWISE regression method on the other hand automatically “knocks out” or excludes from the analysis factors which are weak predictors of affordability and only shows the performance of the strong predictors. So using STEPWISE, the researcher never gets to know how the weak predictors performed in the analysis and why they were excluded. The STEPWISE method, however, is capable of showing how each factor contributed to affordability and this enables the ranking of the significant factors with respect their contribution to affordability.

Regression using the ENTER method was done in two phases.

In the first phase, all the thirteen (13) independent variables, namely ; Interest on loan, Number of dependants (outside the nuclear family), Number of family members with income, Construction cost, Size of the household, Loan-to-value (LTV) ratio, Land value, Real Gross Domestic Product (GDP) per capita, Job status of the borrower, Type of mortgage instrument, Loan term, Loss of regular employment income and Inflation rate, were regressed against the dependent variable, Housing Affordability. The results are displayed in Tables (5.7), (5.8) and (5.9).

In explaining these results, it is important to understand some of the statistical parameters used in their interpretation. The most important ones are;

B Coefficients

These are unstandardized coefficients which tell how much the dependent variable (Housing Affordability) changes in respect to a one unit change in the independent variable. The B coefficients are the $b_1 - b_n$ values in the general MRA equation that was presented earlier. For example, as shown in Table 5.9, a B coefficient of 0.014 for the variable “size of household” means that when the size of household increases by one unit (i.e a new member is added in the family), the affordability ratio for that household increases by 1.4%, which implies a decrease in affordability of the household. As explained earlier, affordability ratio is the dependent variable in this study and was defined and measured as the proportion of the household’s monthly income that goes into the repayment of the mortgage loan. Assuming other factors are held constant, a higher ratio means diminished or reduced affordability of the household, while a lower ratio means better or improved affordability of the household. An increase in the affordability ratio

means the household is spending more of its income on housing and therefore other factors held constant such a household is likely to experience affordability challenges. From the literature review, it was explained that the factor ‘size of the household’ affects affordability because it affects household income. Large sized households are likely to spend more of their income on food, education, transport and health and therefore are likely to encounter difficulties in paying for their housing as compared to small sized households.

Coefficient of Determination (R square or R^2) and Adjusted R^2

This is the percentage of variation in the dependent variable that can be explained by the combined influence of all the independent variables in the regression model. The R^2 is an indication of how much of the variance in the dependent variable is accounted for by the regression model (Akinwunmi, 2009). Possible values of R^2 ranges from 0 to 1. When R^2 equals 0, none of the variation in dependent variable is explained by the MRA model. On the other hand, when R^2 equals 1, all variation in the dependent variable is explained by the regression equation.

From the regression results in table 5.7, our model’s R^2 is 0.696 and tells how much of the variance in the dependent variable (housing affordability) is explained by the model. Expressed in percentage, it means that the model comprising of the thirteen (13) variables explain 69.6% of the variance in housing affordability.

R^2 is a measure of how good a prediction of the dependent variable we can make by knowing the independent variables. Usually an R^2 value of 0.50 or higher is considered reasonable in explaining the success of a regression model. However, the more the R^2 value approaches one (1), the better is the regression model in predicting the dependent variable.

Coefficient of determination (R^2) tends to somewhat over-estimate the success of the model when applied in real world, so an Adjusted R^2 value is calculated which takes into account the number of independent variables in the model and the number of observations (participants) the model is based on. The Adjusted R^2 value gives the most useful measure of the success of the model. Adjusted R^2 is, therefore, regarded as a better measure of the combined influence of the independent variables on the dependent variable. Our model’s adjusted R^2 is 0.684.

The Standard Error of the Estimate (SEE)

The SEE measures the amount of deviation between the actual/observed value and the predicted value of the dependent variable. It is a measure to test the accuracy and reliability of the MRA model. Thus, the lower the SEE, the more accurate and reliable the MRA model is.

F- Statistic

This is a statistical test to determine the significance of the total regression equation. When there are more than 10 observations, F - value should exceed 5. As a rule of the thumb, anything above $F = 5$ means that the model is acceptable at 95% confidence level (Murphy 1989 in Nzau 2003). The results of analysis of variance (ANOVA) in Table 5.8 show the model comprising of the thirteen (13) variables has a significant F - value of 59.703.

Table 5.7: First Regression Results (Model Summary)

Source: Data Analysis Results, 2014

Model	R	R.square	Adjusted R. square	Std. error of estimate (SEE)	Change statistics				
					R. Square change	F change	df1	df2	Sig. F change
1	0.834	0.696	0.684	0.10718	0.696	59.703	13	339	0.000

Table 5.8: Analysis of Variance (ANOVA)

Source: Data Analysis Results, 2014

Model	Sum of squares	df	Mean square	F- value	Sig.
1 Regression	8.915	13	0.686	59.703	0.000
Residual	3.894	339	0.011		
Total	12.809	352			

Table 5.9: First Regression Results (Model Coefficients)

Source: Data Analysis Results, 2014

Model	Unstandardized coefficients		Standardized coefficients	t-values	Sig.	Collinearity Statistics	
	B	Std. error	Beta			Tolerance	VIF
(constant)	0.315	0.195		1.613	0.108		
Size of household	0.014	0.006	0.092	2.376	0.018	0.603	1.659
No. of family members with income	-0.041	0.011	-0.138	-3.826	.000	0.686	1.458
No. of dependants	0.063	0.01	0.268	6.609	.000	0.545	1.836
Job status	-0.007	0.008	-0.025	-0.816	0.415	0.933	1.071
Loss of regular income	-0.01	0.019	-0.017	-0.532	0.595	0.929	1.076
Loan to value ratio	0.135	0.028	0.172	4.925	.000	0.739	1.354
Loan term	-0.004	0.002	-0.094	-2.815	0.005	0.803	1.245
Interest on loan	1.849E-006	.000	0.542	11.251	.000	0.386	2.588
Type of mortgage instrument	-0.207	0.077	-0.082	-2.682	0.008	0.97	1.031
Land value	8.368E-010	.000	0.034	0.800	0.424	0.483	2.068
Construction cost	6.574E-10	.000	0.013	0.266	0.79	0.387	2.582
Inflation rate(Nairobi)	-0.121	0.127	-0.029	-0.951	0.342	0.966	1.035
Real GDP per capita	6.639E-006	.000	0.084	2.469	0.014	0.773	1.294

T- Statistic

While the F-Statistic helps in determining the significance of the total regression model, the T-statistic measures whether each independent variable is making a significant contribution to the model.

When t-value is large, one can be confident that an independent variable is significant in predicting the dependent variable. Conversely when t-value is low, the independent variable is unimportant in explaining the variation in the dependent variable.

As a general rule, provided that the sample size is large (at least 50), a t-statistic in excess of ± 2.00 indicates that one can be 95% confident that the independent variable is significant in predicting the dependent variable. Similarly, a t - statistic of above ± 2.58 indicates that one can be 99% confident that the independent variable is significant in prediction of dependent variable (Eckert et al 1990 in Nzau, 2003).

From the regression results in table 5.9, the variables; job status ($t = - 0.816$), loss of regular employment income ($t = -0.532$), land value ($t = 0.800$), construction cost ($t = 0.266$), inflation rate ($t = - 0.951$) were found to be insignificant predictors of housing affordability as indicated by their respective t – values which were all either below +2 or above -2. From the literature review, the factor ‘job status’ was defined as the job position held by the borrower in his or her work place, that is, whether professional or managerial position, technical or clerical position. The results of the t-value suggest that the job category of the borrower does not matter in affordability as it is making an insignificant contribution to housing affordability. In our every day life, we come across people who hold very junior positions in their places of work yet such people are able to live very comfortable lives and most are able to pay for their housing without any difficulties. This finding, therefore, supports the view that most households have other sources of income and donot entirely depend on their employment income to pay for their housing. The poor performance of the factor ‘loss of regular employment income’ as indicated by its t-value also supports the view that households do not entirely rely on their employment income to pay for their basic needs including housing. However, as earlier explained, the poor performance of the factor loss of regular employment income could also be explained by the fact that only a few respondents had indicated that they had lost their employment income. The poor performance of the factors ‘land value’ and ‘construction cost’ as indicated by their t-values could be explained by the fact that the households sampled had been repaying their mortgages for some time and, therefore, the impact of the initial value of their houses on their affordability had decreased over time as a result of decrease in the monthly repayments given that their loans are on reducing balance. The factor inflation rate also performed poorly as indicated by its t-

value. This is probably because, as explained earlier, its impact on affordability is also reflected by the factor interest on loan which performed very well as indicated by its t-value of 11.251. Consequently, as a result of the poor performance of these five (5) variables with regard to prediction of affordability as indicated by their respective t- values, they were eliminated at this stage.

The other remaining eight (8) variables namely, size of household ($t = 2.376$), No. of family members with income ($t = - 3.826$), No. of dependants ($t = 6.609$), Loan – to – value ratio ($t = 4.925$), loan term ($t = - 2.815$), interest on loan ($t = 11.251$), type of mortgage instrument ($t = - 2.682$), and Real GDP per capita ($t = 2.469$), were subjected to the final regression analysis using the ENTER method and the results are tabulated in Tables 5.10, 5.11 and 5.12

The results in table 5.12 show that all the eight (8) variables are significant predictors of housing affordability as indicated by their respective t-values which are all either below $- 2$ or above $+2$. Their combined influence on the dependent variable, housing affordability has improved from the previous model's Adjusted R^2 of 0.684 (see table 5.7) to the current model's Adjusted R^2 of 0.686 (see table 5.10). The adjusted R^2 (which as explained earlier is R^2 adjusted to account for the number of independent variables) is usually regarded as a better measure of the combined influence of the independent variables on the dependent variable. The F-value associated with the model has also changed from the previous F-value of 59.703 (see Table 5.8) to the current model's F- value of 97.127 (see Table 5.11) and is highly significant (sig. = 0.000) indicating that the model built with the eight (8) factors is a significant predictor of housing affordability.

The standard error of the estimate (SEE) has also improved from the previous model's estimate of 0.10718 (see Table 5.7) to the current model's estimate of 0.10689 (see Table 5.10). As already explained, the standard error of the estimate (SEE) measures the amount of deviation between actual and predicted affordability values. The lower the SEE, the more accurate and reliable the model is.

The results of the final regression analysis show that the eight (8) independent variables, that is, Size of household, Number of family members with income, Number of dependants, Loan-to-value (LTV) ratio, Loan term, Interest on loan, Type of mortgage instrument and Real GDP per

capita, are the most critical factors affecting housing affordability in the home- ownership mortgage housing sector in Kenya.

Using the unstandardized B coefficients in Table 5.12, it is possible to explain how some of the eight independent variables influence affordability. For example, a B Coefficient of 0.013 for size of household means that if a household size increases by one unit (i.e. one new member is added to the family), the affordability ratio of that particular household increases by 1.3% meaning housing becomes less affordable to the household. As explained earlier, a higher affordability ratio means diminished or reduced affordability of the household, while a lower affordability ratio means better or improved affordability of the household. A B coefficient of -0.041 for the variable “No. of family members with income means that when the number of income earners in the family increases by one, the affordability ratio decreases by 4.1% which translates to better or improved affordability of the household. The results suggest that when there are more family members in the household with income like say if both spouses (husband and wife) have some income, then the affordability of that household is better compared to if only one or none of the spouse had some income. A B Coefficient of 0.063 for the variable No. of dependants implies that if the number of dependants increases by one, the affordability ratio increases by 6.3% meaning housing becomes less affordable to the household. This means that if a household has many people in the extended family that it is supporting financially, then such a household is likely to experience affordability challenges. A B Coefficient of -0.211 for the variable type of mortgage instrument means that if the type of mortgage instrument changes from ARM to FRM, the affordability ratio decreases by 21.1%, which translates to improved or increased affordability of the household. The results suggest that FRM loans are more affordable compared to ARM loans because as explained in the literature review, for a Fixed Rate Mortgage (FRM), loan repayments remain constant through out the life of the loan, while for an Adjustable Rate Mortgage (ARM), changes in interest rate is shifted to the borrower. An increase in the interest of an ARM loan would therefore lead to an increase in monthly loan repayment for households which may cause affordability challenges for the households.

The regression “constant” of 0.284 indicates the influence of factors not considered in the regression model to the affordability of the households.

Table 5.10: Final Regression Results (Model Summary)

Source: Data Analysis Results, 2014

Model	R	R Square	Adjusted R Square	Std error of estimate (SEE)	Change statistics				
					R square change	F change	df1	df2	Sig. F change
1	0.833	0.693	0.686	0.10689	0.693	97.127	8	344	0.000

Table 5.11: Analysis of Variance (ANOVA)

Source: Data Analysis Results, 2014

Model	Sum of Squares	df	Mean square	F-value	Sig.
1 Regression	8.878	8	1.110	97.127	.000
Residual	3.931	344	0.011		
Total	12.808	352			

Table 5.12: Final Regression Results (Model Coefficients)

Source: Data Analysis Results, 2014

Model	Unstandardized coefficients		Standardized coefficients	t- values	Sig.	Collinearity statistics	
	B	Std. error	Beta			Tolerance	VIF
(Constant)	0.284	0.191		1.486	0.138		
Size of household	0.013	0.006	0.089	2.356	0.019	0.620	1.612
No. of family members with income	-0.041	0.011	-0.139	-3.859	.000	0.691	1.448
No. of dependants	0.063	0.009	0.267	6.679	.000	0.559	1.789
Loan- to- value ratio	0.147	0.026	0.186	5.755	.000	0.854	1.170
loan term	-0.004	0.002	-0.088	-2.652	0.008	0.819	1.221
Interest on loan	1.779E-006	0.000	0.521	13.786	0.000	0.624	1.604
Type of mortgage instrument	-0.211	0.077	-0.083	-2.757	0.006	0.981	1.019
Real GDP per capita	6.995E-006	0.000	0.089	2.711	0.007	0.835	1.197

In the next analysis, the STEPWISE regression method is employed to explain how the critical affordability determinants were analyzed and how they entered in the regression model. STEPWISE method also shows the percentage contribution of each variable to the overall coefficient of determination (R^2) or adjusted R^2 of the total regression model. Therefore, using the STEPWISE regression results, it is possible to rank the critical factors with respect to their contribution to housing affordability.

The STEPWISE regression output is shown in Tables 5.13 and 5.14. The tables are explained as follows:

Model 1. (Interest on loan {interest})

As shown in Tables 5.13 and 5.14, the variable ‘interest on loan’ {interest} was the first to enter the regression equation meaning it was the first variable to be analyzed. The variable interest on loan was measured as the amount of interest in Kenya shillings payable by each respondent with a mortgage loan from a Financial Institution. Interest on loan is therefore a reflection of the mortgage interest rate charged by the Banks and Finance Institutions.

The results in Table 5.14 show the interest charged by banks as the most critical factor affecting affordability of households in Kenya. When the variable “interest on loan” is the only predictor variable in the model, the value of R^2 comes to 0.528. This means that this model built with the variable interest on loan alone, accounts for 52.8% of the variation in housing affordability.

Model 2 (interest, No. of dependants {N _ depdts})

The second variable to enter the equation and hence the second variable to be analyzed was number of dependants {N_depdts}. This variable was measured as the number of extended family relatives residing with the mortgage borrower in his/her home in Nairobi. The results show this variable as the second most critical factor in explaining the affordability problems of urban households in Kenya. Where the variables interest on loan and No. of dependants are the only predictor variables in the model, the value of R^2 comes to 0.632, meaning that the two variables explain 63.2% of the variance in housing affordability. The contribution of the variable No. of dependants, therefore, comes to 0.104 ($0.632 - 0.528$). This translates to contribution of 10.4% to the variance in housing affordability.

Model 3 (interest, N_depdts, loan-to-value {LTV} ratio)

The third variable to enter the regression equation and hence the third most critical factor in explaining variation in housing affordability is loan – to – value ratio {LTV}. LTV was taken as the proportion of the value of the collateralized property that is given as loan. The analysis shows that loan – to – value ratio determines the loan amount and, therefore, directly affects the monthly mortgage repayments. The entry of the variable loan – to – value ratio raises the R^2 to

0.657 meaning that the three variables account for 65.7% of the variation in housing affordability. The contribution of loan-to-value ratio to the overall R^2 is, therefore, 0.025 (0.657 – 0.632) which translates to contribution of 2.5% to the variance

Model 4 (interest, N _ depdts, LTV, type of mortgage instrument {M _ intr})

The fourth variable to enter the regression model and hence the fourth most important factor affecting affordability is type of mortgage instrument {M_intr}. This variable was measured at the nominal scale of measurement as either Fixed Rate Mortgage (FRM) or Adjustable Rate Mortgage (ARM). The analysis shows that the type of mortgage instrument would affect mortgage affordability. With a fixed rate mortgage (FRM), loan repayments remain constant throughout the life of the loan. For an adjustable rate mortgage (ARM), changes in interest rate are normally shifted to the borrower. An increase in the interest of an ARM would, therefore, lead to an increase in monthly loan repayments for households thus affecting their affordability. The final regression results in Table 5.12 show a B coefficient of - 0.211 for the variable type of mortgage instrument. It means that if type of mortgage instrument changes from ARM to FRM, the affordability ratio decreases by 21.1%, which translates to improved or increased affordability of the household.

The entry of the variable type of mortgage instrument in the model raises R^2 to 0.667 meaning that the four variables together account for 66.7% of variation in housing affordability. The contribution of this variable “type of mortgage instrument” to overall R^2 comes to 0.01 (0.667 – 0.657) which translates to a contribution of 1% to the variance.

Model 5 (interest, N _ depdts, LTV, M _ intr, No. of family members with income {Nf _ income})

The fifth variable to enter the equation is number of family members with income {Nf_income}. This variable was measured as the number of income earners in the household. With the entry of this variable into the model, R^2 increased to 0.674 meaning the combined influence of the five variables explain 67.4% of all variation in housing affordability.

Model 6 (interest, N_depdts, LTV M_intr, Nf _ income, loan term {term})

The sixth variable to be analyzed was loan term {term}. This variable is taken as the period of loan repayment and is measured in years. The analysis shows that longer loan repayment periods improve affordability because of reduced monthly loan repayment. Long tenured mortgage loans are, therefore, more affordable than short tenured loans. When the variable loan term entered into the model, R^2 increased to 0.682 meaning that the six factors together account for 68.2% of the variation in housing affordability.

Model 7 (interest, N_depdts, LTV, M_intr, Nf _ income, term, Real GDP per capita {GDP_Cap})

The seventh variable to be analyzed was Real GDP per capita {GDP_Cap}. The real GDP per capita was taken as a reflection of the level of income and living standards of people in the country. The entry of the variable real GDP per capita into the model raised R^2 to 0.688 meaning the seven factors account for 68.8% of the variation in housing affordability.

Model 8 (interest, N_depdts, LTV, M_intr Nf _ income term, GDP Cap and size of household {h _ size})

The eighth and last variable to be analyzed was size of household {h_size}. The variable “size of household” was defined and measured as the number of family members within the nuclear family. The entry of this variable into the regression model increased R^2 to 0.693 meaning that the combined influence of all the eight factors could explain 69.3% of variation in housing affordability.

Table 5.13: STEPWISE Regression Results (Model Coefficients)

Source: Data Analysis Results, 2014

Model	Unstandardized coefficients		Standardized coefficients	t -values	Sig	Tolerance	VIF
	B	Std. error	Beta				
1 (constant)	0.207	0.010		20.866	.000		
interest	2.480E-006	.000	0.727	19.814	.000	1.000	1.000
2 (constant)	0.092	0.015		6.334	.000		
interest	1.950E-006	.000	0.572	15.877	.000	0.812	1.232
N_deppts	0.084	0.008	0.358	9.933	.000	0.812	1.232
3 (constant)	0.018	0.020		0.9	0.369		
interest	1.903E-006	.000	0.558	15.985	.000	0.807	1.239
N_deppts	0.080	0.008	0.338	9.674	.000	0.803	1.246
LTV	0.128	0.025	0.162	5.103	.000	0.970	1.031
4 (constant)	0.513	0.159		3.232	0.001		
interest	1.872E-006	.000	0.549	15.875	.000	0.802	1.248
N_deppts	0.081	0.008	0.345	9.962	.000	0.800	1.250
LTV	0.126	0.025	0.160	5.078	.000	0.969	1.032
M_intr	-0.248	0.079	-0.098	-3.142	0.002	0.992	1.008
5 (constant)	0.572	0.158		3.611	.000		
interest	1.836E-006	.000	0.538	15.633	.000	0.792	1.263
N_deppts	0.076	0.008	0.321	9.126	.000	0.757	1.321
LTV	0.114	0.025	0.145	4.583	.000	0.942	1.061
M_intr	-0.244	0.078	-0.096	-3.131	0.002	0.992	1.009
Nf_income	-0.028	0.010	-0.094	-2.857	0.005	0.859	1.164
6 (constant)	0.620	0.158		3.934	.000		
interest	1.942E-006	.000	0.569	15.972	.000	0.723	1.383
N_deppts	0.070	0.008	0.298	8.336	.000	0.719	1.391
LTV	0.131	0.025	0.165	5.169	.000	0.897	1.115
M_intr	-0.237	0.077	-0.093	-3.063	0.002	0.990	1.010
Nf_income	-0.031	0.010	-0.104	-3.166	0.002	0.851	1.176
term	-0.004	0.002	-0.097	-2.947	0.003	0.842	1.188
7 (constant)	0.345	0.191		1.810	0.71		
interest	1.836E-006	.000	0.538	14.387	.000	0.646	1.548
N_deppts	0.073	0.008	0.31	8.661	.000	0.706	1.416
LTV	0.144	0.026	0.183	5.627	.000	0.856	1.169
M_intr	-0.221	0.077	-0.087	-2.872	0.004	0.984	1.016
Nf_income	-0.030	0.010	-0.102	-3.129	0.002	0.850	1.176
term	-0.005	0.001	-0.100	-3.052	0.002	0.841	1.19
GDP_cap	6.541E-006	0.000	0.083	2.526	0.012	0.840	1.19
8 (constant)	0.284	0.191		1.486	0.138		
interest	1.779E-006	.000	0.521	13.786	.000	0.624	1.604
N_deppts	0.063	0.009	0.267	6.679	.000	0.559	1.789
LTV	0.147	0.026	0.186	5.755	.000	0.854	1.17
M_intr	-0.211	0.077	-0.083	-2.757	0.006	0.981	1.019
Nf_income	-0.041	0.011	-0.139	-3.859	.000	0.691	1.448
term	-0.004	0.002	-0.088	-2.652	0.008	0.819	1.221
GDP_cap	6.995E-006	0.000	0.089	2.711	0.007	0.835	1.197
h_size	0.013	0.006	0.089	2.356	0.019	0.620	1.612

Table 5.14: STEPWISE Regression Results (Model Summary)

Source: Data Analysis Results, 2014

Model	R	R. square	Adjusted R square	Std. error of the estimate
1	0.727	0.528	0.527	0.13125
2	0.795	0.632	0.63	0.11609
3	0.811	0.657	0.654	0.11215
4	0.817	0.667	0.663	0.11075
5	0.821	0.674	0.670	0.10962
6	0.826	0.682	0.677	0.10843
7	0.830	0.688	0.682	0.10760
8	0.833	0.693	0.686	0.10689

5.3.4 Selecting the Appropriate Regression Model

Among the eight (8) models explained above, **model 8** which comprises of the factors; interest on loan, No. of dependants, Loan to value (LTV) ratio, Type of mortgage instrument, No. of family members with income, Loan term, Real GDP per capita and Size of the household, is adopted as the appropriate regression model since its R^2 and adjusted R^2 are the highest at 0.693 and 0.686, respectively (see Table 5.14). The correlation coefficient (R) of 0.833 also shows an impressive linear relationship between housing affordability and the eight critical factors. Model 8 has the lowest standard error of the estimate (SEE) compared to the other models 1-7, meaning it is more accurate and reliable in predicting housing affordability. The t- values associated with the variables in model 8 are all either below -2 or above +2 meaning that each of the eight factors contributes significantly to affordability. The Model has a significant F - value of 97.127 (see Table 5.11), indicating that the eight factors are significant in predicting the affordability of households. As indicated in Table 5.13 the variance inflation factor (VIF) and tolerance of all the variables in model 8 are below 10 and above 0.1, respectively, indicating absence of

multicollinearity among the eight predictor variables. This means the results are free from any bias.

It can be seen that the STEPWISE regression results in Table 5.13 (model 8) and Table 5.14 (model 8), and the final regression results obtained using the ENTER regression method (see Tables 5.10 and 5.12) are similar indicating that the eight factors, namely; **interest on loan, number of dependants, loan-to-value ratio, type of mortgage instrument, number of family members with income, loan term, Real GDP per capita** and **size of household** are the most critical factors affecting affordability as shown by both the ENTER and STEPWISE regression methods. The eight factors together account for 69.3% of the variance in housing affordability. The eight factors are the most important factors which affect affordability because they have the greatest impact on the affordability of households, and therefore require some urgent policy interventions in order to address the affordability problems of urban households in the home ownership mortgage sector in Kenya. Among the eight critical factors, the factor ‘interest on loan’ is the most important factor because it has the greatest impact on the affordability of the households accounting for 52.8% of the variance in affordability.

However, although these eight factors are the most critical factors influencing the affordability of households, all the other factors identified earlier using the mean rating of factors by respondents, the population mean score, critical z- test and correlation analysis are also important factors and should be given attention in policy development if we are to fully address the pressing problem of housing affordability in Kenya.

Using the B coefficients associated with the eight critical affordability factors identified in this study (see the unstandardized B coefficients in Table 5.12 and Table 5.13 (Model 8), it is possible to formulate a Multiple Regression Function that can predict the affordability of households if the values for the critical factors are known. Therefore, using the coefficients, the prediction equation of housing affordability can be expressed as;

$$\text{Affordability} = 0.284 + [1.779E - 006 \text{ interest}] + [0.063N_depdts] + [0.147LTV] - [0.211 M_intr] - [0.041Nf_income] - [0.004term] + [6.995E - 006GDP_Cap] + [0.013h_size]$$

5.3.5 Hypothesis Testing

The main objective of this study was to identify significant factors that affect affordability in the mortgage housing sector in Kenya. The study also sought to determine the influence of the significant factors and rank them with respect to contribution to housing affordability. The Null Hypothesis (H_0) was that ‘the interest charged on a mortgage is not the most important factor that affects housing affordability, while the Alternative Hypothesis (H_A) was that ‘the interest charged on a mortgage is the most important factor that affects housing affordability.

From the results of the correlation and regression analysis, the factor ‘interest on loan’ with a correlation coefficient (R) of 0.727 and coefficient of determination (R^2) of 0.528, has the strongest correlation with affordability and the greatest contribution to the affordability problems of households and is, therefore, the most important factor that affects affordability in the mortgage housing sector in Kenya. The Null Hypothesis is thus rejected and the Alternative hypothesis is supported.

5.4. Summary

This chapter has analyzed the factors that affect affordability in the home ownership (mortgage) housing sector in Kenya with the aim of identifying significant factors that influence affordability. The significant factors have been identified using the mean ranking of the factors as rated by the respondents, the population mean score, the critical z- test, correlation and regression analysis. Using the mean ranking of the factors, the population mean and the critical z-test, one may conclude that the factors that affect affordability of the households are: Loss of regular employment income, Loan amount, Interest on loan, Construction cost, Land value, Location of property, Inflation rate, Number of dependants (outside the nuclear family), Number of family members with income, Job status of the borrower, GDP per capita, Loan-to-value (LTV) ratio, Rate of unemployment, Type of mortgage instrument, Household size, Loan term, Developers profit, Property transfer cost and the Mode of loan repayment.

Correlation and regression analyses of the identified significant factors have been performed in order to determine the strength and the contribution of the identified significant factors and, therefore, establish in a more objective way the influence of the significant factors on housing affordability. This has enabled the ranking of the significant factors with respect to their

contribution to affordability which is necessary to guide policy development on housing affordability in Kenya. Correlation analysis is performed on the significant factors to identify those that are highly correlated and, therefore, exclude them in the analysis in order to avoid the undesirable effects of multicollinearity. Consequently, the significant factors: loan amount, location of property, rate of unemployment, developers profit and property transfer cost are excluded from the analysis to avoid the undesirable effects of multicollinearity. The factor “mode of loan repayment” is also eliminated because the values assumed by this factor among the households sampled do not vary and, therefore, the factor could not be measured making it difficult to analyze it using correlation and regression analysis.

The results of the correlation analysis show that there is a significant linear relationship between housing affordability and all of the remaining significant factors. The strength of the relationship, however, varies with some predictor variables having strong relationship while others have weak relationship with affordability. In terms of their strength of relationship with affordability, the significant factors are arranged as follows (in a descending order of strength of relationship with affordability): Interest on loan, Number of dependants (outside the nuclear family), Number of family members with income, Construction cost, Size of the household, Loan-to-value (LTV) ratio, Land value, Real gross domestic product (GDP) per capita, Job status of the borrower, Type of mortgage instrument, Loan term, Loss of regular employment income and Inflation rate.

Applying multiple regression analysis (MRA) to determine the influence of the significant factors and therefore rank them with respect to contribution to affordability, the results show that eight (8) factors namely; Interest on loan, Number of dependants (outside the nuclear family), Loan-to-value (LTV) ratio, type of mortgage instrument, Number of family members with income, Loan term, real GDP per capita and size of the household, have a significant contribution to affordability and are therefore the most critical factors that influence affordability in the home ownership (mortgage) housing sector in Kenya. The regression model comprising of the eight critical factors has a correlation coefficient (R) of 0.833 and a coefficient of determination (R^2) of 0.693. The model has a significant F-value of 97.127, indicating that the eight factors are significant predictors of housing affordability. Among the eight factors, interest on loan is the most important factor accounting for 52.8% of the variance in affordability, while the size of household is the least important factor.

However, although the eight factors are the most critical factors influencing the affordability of households, all the other factors identified earlier using the mean rating of factors by the respondents, the critical z- test and correlation analysis are also important factors and should be given attention in policy development if we are to fully address the pressing problem of housing affordability in Kenya. The results of all the analyses performed in this chapter suggest that housing affordability is influenced by factors related to the households' social economic characteristics, property attributes, loan characteristics and macro economic factors. The households social economic characteristics among others include; the loss of regular employment income, Number of dependants, Number of family members with income and size of the household. The property attributes are the cost of construction, land value, developers profit and property transfer costs, among others. The loan factors include the interest charged on loan, loan-to-value (LTV) ratio and the type of mortgage instrument. The macro economic factors include the rate of inflation, real gross domestic (GDP) per capita and unemployment rate.

As explained in this chapter, the households' social economic factors affect affordability because they influence household's income. The property factors affect the price of housing and therefore influence the monthly loan repayments hence affect affordability. The macro economic factors affect both the income of households and housing price as well as mortgage interest rates charged by banks and financial institutions. Therefore policy measures to improve affordability are those that will reduce or stabilize mortgage interest rates, reduce the price of housing, and improve households' income.

The next chapter presents the summary and discussions of the main findings of the research, conclusions as well as contribution to knowledge, policy recommendations and the suggested areas of further research.

CHAPTER 6

SUMMARY, CONCLUSIONS, POLICY RECOMMENDATIONS AND AREAS OF FURTHER RESEARCH

6.0. Introduction

This chapter presents a summary and discussion of the main findings of the research study and their implications on policy development towards housing affordability in Kenya. The first part of the chapter is the summary and discussion of results, the second part presents the conclusions drawn from the research findings and contribution to knowledge, the third part presents some policy options and recommendations on affordability, and the last part proposes areas of further research.

6.1. Summary and Discussion of Results

This study set out to investigate factors that affect affordability in the home ownership (mortgage) housing sector in Kenya. The specific objectives of the study were to: identify significant factors that affect housing affordability, determine the influence of the significant factors and rank them with respect to contribution to housing affordability and, suggest policies necessary to address the urban housing affordability problem in Kenya. The study hypothesized that the interest charged on a mortgage is the most important factor that affects affordability in the mortgage housing sector in Kenya.

The factors affecting affordability were obtained from literature review and questionnaires administered to households in Nairobi with mortgage loans from Housing Finance Institutions and Banks. A total sample size of 390 households was targeted for the study. However, 353 households responded to the survey yielding a response rate of 90.5%.

From the literature review, the factors that affect housing affordability were conceptualized to be a function of the supply and demand for housing. Housing demand and supply are in-turn influenced by factors related to the households' social economic characteristics, loan characteristics, property attributes and macro economic factors, as well as other factors that directly influence house prices and incomes (see section 3.4 and Figure 3.0).

In this study, the specific factors that influence affordability in the home ownership mortgage housing sector in Kenya were identified as thirty two (32 no) factors. The respondents were asked to rate the significance of each factor using a 4- point numeric rating scale designed in section 4.4. The results analyzed using both the population mean score and the Z- test of statistical significance showed that nineteen (19 no) factors out of the initial thirty two (32 no) factors were significant factors affecting affordability. Arranged in a descending order of importance as rated by the respondents, the significant factors are: Loss of regular employment income, Loan amount, Interest on loan, Construction cost, Land value, Location of property, Inflation rate, Number of dependants (outside nuclear family), Number of family members with income, Job status of the mortgage borrower, Real Gross Domestic (GDP) per capita, Loan-to-value (LTV) ratio, Rate of unemployment, Type of mortgage instrument, Household size, Loan term, developers profit, Property transfer costs and the mode of Loan repayment.

The results of the ranking of the factors based on the ratings by the respondents showed that the factor “Loss of regular employment income” with a mean rating of 3.73 is the most important factor affecting the affordability of the households. The results suggest that most people consider the stability of their regular income to be an important factor that could influence their affordability. If regular households’ incomes are interrupted by risk factors such as; temporary or permanent loss of job, retirement or even death of the individual paying the mortgage, then this is likely to adversely affect the ability of the households to meet the monthly loan repayment obligations and hence affect their affordability. Therefore, in order to improve affordability, measures need to be taken to cushion people against the risk of loss of regular income.

The second most important factor based on the rating by the respondents was loan amount. This factor was defined as the amount of mortgage loan that the household is awarded by the bank or financial institution. For most households, the amount of loan borrowed relates to the Loan-to-Value (LTV) ratio which is the proportion of the value of the property given as loan. The loan-to-value ratio also reflects the loan deposit payable by a borrower in order to access a mortgage. A higher Loan-to-value (LTV) ratio means a higher loan amount which has the effect of increasing the monthly mortgage repayments and this increases the probability of the borrower encountering repayment difficulties. Since the loan amount depends on the loan-to- value (LTV) ratio which in-turn relates to the value or price of the mortgaged property, it means that if

measures are taken to reduce the price of housing, then affordability of households is likely to improve.

The third important factor according to the respondents was “interest on loan” which is the amount of interest charged by the banks and financial institutions. This factor achieved a mean rating of 3.66. Interest rate affects mortgage affordability directly because it determines the borrower’s monthly repayment burden. The amount and volatility of mortgage interest rates affects the households’ income and this may result in either temporary or permanent disruption in monthly loan affordability. The rates of mortgage interest in Kenya have been high over the last decade. The rate of mortgage interest for instance averaged 13% from the year 2003 to 2007. In the year 2011, interest on mortgages averaged 20% and in 2012 and 2013, mortgage interest rates in Kenya were on average 18% and 16.89% respectively. The high mortgage interest rate regime prevailing in the Country over the past years could therefore be the reason that prompted the respondents to rate this factor very highly in influencing their affordability. Therefore, if appropriate measures are taken to reduce and stabilize mortgage interest rates in Kenya, then this is likely to improve affordability in the mortgage housing sector.

The factor “Type of mortgage instrument” was also rated highly by the respondents. From the literature review, the impact of mortgage interest rates on mortgage affordability depends on the type of mortgage instrument in use. There are basically two types of mortgage instruments available in the Kenyan mortgage market, that is, Fixed Rate Mortgage (FRM) and Adjustable Rate Mortgage (ARM). With a fixed rate mortgage, monthly loan repayments remain constant throughout the life of the loan, while for an adjustable rate mortgage, changes in interest rates are normally shifted to the borrower. An increase in the interest of an ARM loan would therefore lead to an increase in monthly loan repayment for households, leading to a higher risk of mortgage default. In Kenya, Adjustable Rate Mortgages (ARM) are more common with Banks than Fixed Rate Mortgages (FRM) due to the desire of the Banks to shift the risk of interest rate changes to the borrowers which in most cases end up hurting the affordability of the households. According to the Central Bank of Kenya (CBK) annual report of 2012, in the year 2011, 90% of mortgages in Kenya were Adjustable Rate Mortgages and in 2012, 85.6% of mortgages were Adjustable Rate Mortgages. The high tendency for Banks in Kenya to grant Adjustable rate mortgages explains the affordability problems of households with mortgages from these

institutions. This also explains why the sampled households in the study rated this factor highly with regard to its influence on their affordability. Among the 353 households who responded to the survey, 351 households had Adjustable Rate Mortgages. This means that only two (2) households had Fixed Rate Mortgages. Affordability of households can therefore be improved if incentives are given to Banks to encourage them to grant more FRM loans instead of ARM loans.

The cost of construction, land value and location of property were ranked fourth, fifth and sixth important factors, respectively. The three factors have a direct influence on the price of a house. A high cost of construction, high land value and superior location of a property translates into high prices that properties will be sold in the open market. High property prices will translate into high mortgage repayment for households and will affect affordability especially at the initial stages of accessing the loan and also during the repayment of the loan. House prices are also affected by the factors; developers profit and property transfer costs which were also ranked highly with mean ratings of 2.80 and 2.78, respectively. The cost of construction is affected by such factors as the cost or prices of building materials, infrastructure cost and the cost of labour, among other factors. The results suggest that in order to improve affordability, measures should be taken to bring down the overall price of housing by reducing the cost of construction and the price or value of land.

The factor “rate of inflation” was ranked as the seventh most important factor affecting affordability. Inflation is a macroeconomic factor which impacts on households’ purchasing power by eroding the real value of money. In the building construction industry, the impact of inflation is felt on the prices of building materials, the cost of labour and the cost of mortgage finance. A high rate of inflation is likely to increase house prices and interest rates charged by banks and financial institutions thereby diminishing the affordability of households. Between the year 2000 and 2013, inflation rates in Kenya have been very volatile going as high as 17.8% in 2008 to as low as 1.8% in 2002. In the year 2011, inflation rate was at 14% and in 2013, the overall rate of inflation was 5.7%. The volatility of inflation rate might have contributed to the changes in mortgage interest rates in Kenya and this affected the affordability of the households. This explains why the respondents considered this factor as important in influencing their affordability. The other macroeconomic factors like the real gross domestic (GDP) per capita,

exchange rate and rate of unemployment were also ranked fairly highly with mean ratings of 3.14, 2.48 and 2.97 respectively. The growth in real GDP is usually associated with rising incomes and living standards of the general populace and is therefore expected to improve affordability. Real GDP growth rates in Kenya have however been low averaging 5.8% in 2010, 4.4 % in 2011 and 4.6% in 2012. The real GDP growth rate was at 1.6% in 2008 having dropped from 6.4% in 2007.

The factors: Number of dependants (outside the nuclear family), Number of family members with income and size of the household were ranked eighth, ninth and fifteenth with mean ratings of 3.24, 3.21 and 2.88, respectively. The factor, “Number of dependants (outside nuclear family)” was defined as the number of extended family relatives who are living with the mortgagor in his or her home in Nairobi. An increase in the number of the extended family members who depend on the household is likely to increase the volume of family expenses thus affecting the income of the household which diminishes the ability of the household to pay for its housing services. Households who are also supporting the education of their siblings, the health of their aging parents are likely to experience affordability challenges. The dependency ratio in Kenya and Nairobi in particular is quite high at 52.7% and is higher among the poor at 71.5%. The households sampled in this study had at least one dependant with some households having upto four dependants in their homes which explains the importance of this factor in the rankings based on the rating by the respondents. The factor “Number of family members with income” was defined as the number of income earners in the family. If a household has two or more of its members with income either from employment or business, then this is likely to improve their affordability compared to if only one family member had income. The situation would be worse if none of the family members had income. The households sampled had atleast two of their members will income.

The high rating of these two factors by the respondents indicate that inorder to improve affordability, measures need to be put in place to increase income generating opportunities and generally to grow households incomes.

The factors “loan term” and “mode of loan repayment were also ranked highly with mean ratings of 2.87 and 2.60, respectively. The factor loan term was defined as the period of loan repayment, which would affect affordability directly because it affects the monthly loan repayment amounts

for the households. Mortgage loans of short repayment periods are likely to attract high monthly repayments which would place a higher repayment burden on the households compared to loans of long repayment periods. Most households sampled in this study had their mortgage loans repayable over a period of 11 years, while the average repayment period was 15 years. These fairly short repayment periods explain the affordability problems of the households and explain why the households sampled considered this factor as important in influencing their affordability. The results indicate that in order to improve affordability, mortgage loans should be issued with longer repayment period in order to ease the repayment burden on the households.

While the above analysis of the factors affecting affordability identified and ranked the significant factors as rated by the respondents, the strength and contribution of the significant factors to housing affordability was not determined and therefore the influence or impact of the identified significant factors on affordability could not be ascertained. Hence, there was need for further analyses to determine the strength and the contribution of the significant factors and therefore establish in a more objective way, the influence of the significant factors on housing affordability. This was important to enable the ranking of the significant factors with respect to their contribution to affordability which is necessary to guide policy development on housing affordability in Kenya.

The procedure of establishing the strength and contribution of the identified significant factors to affordability was carried out using the statistical techniques of Correlation and Regression Analysis. In regression analysis, the Multiple Regression Analysis (MRA) was selected for the analysis. The technique of MRA measured the contribution of each significant factor to affordability and enabled the ranking of the significant factors with respect to their contribution to affordability. MRA further helped to formulate a regression model comprising of the factors having a significant contribution to housing affordability.

Correlation analysis on the other hand measured the strength of the correlation/relationship between the identified significant factors and affordability. The aim was to select those factors having a significant relationship with affordability and leaving out factors with weak relationship with affordability. It is only those factors having a significant relationship with affordability that were retained and included in the formulation of the multiple regression model. Correlation analysis of the significant factors helped to identify factors which are highly related with each

other. Such highly related factors ought to be eliminated from the analysis in order to avoid the undesirable effects of multicollinearity, which as explained in the previous chapter has the potential to adversely affect the final regression results. Consequently, from the earlier nineteen (19no) significant factors identified using the rating of the factors by the respondents, population mean score and critical z-test, the significant factors: Loan amount, Location of property, Rate of unemployment, Developers profit and Property transfer costs were excluded in the formulation of the Multiple Regression Model to avoid the undesirable effects of multicollinearity. Also, as earlier explained, the factor “Mode of loan repayment” was eliminated because the values assumed by this factor among the households sampled did not vary and therefore this factor could not be measured making it difficult to analyze it using correlation and regression analysis.

The elimination of the six (6) significant factors left thirteen (13 no) factors to be analyzed using correlation and regression analysis. The results of the correlation analysis showed that there is a significant linear relationship between housing affordability and all of the thirteen (13) remaining significant factors. The strength of the relationship however varied with some factors having strong correlation/relationship while others had weak relationship with affordability. In terms of their strength of correlation/relationship with affordability, the significant factors are arranged as follows (in a descending order of strength of relationship with affordability):

1. Interest on loan
2. Number of dependants (outside the nuclear family)
3. Number of family members with income
4. Construction cost
5. Size of the household
6. Loan - to- value (LTV) ratio
7. Land value
8. Real gross domestic product (GDP) per capita
9. Job status of the mortgage borrower
10. Type of mortgage instrument
11. Loan term
12. Loss of regular employment income
13. Inflation rate.

The results of the correlation analysis showed that the factor “Interest on Loan” has the strongest correlation with affordability as indicated by the correlation coefficient (R) of 0.727 between the two variables. The positive sign of the correlation coefficient between interest and affordability implies that when the interest on mortgage loan increases, the affordability ratio of the household increases, translating to a decrease in the affordability of the household. The affordability ratio as indicated in the literature review is the dependent variable in this study and was defined and measured as the proportion of the household’s monthly income that goes into the repayment of the mortgage loan. All other factors held constant, a higher affordability ratio of a household means diminished or reduced affordability of the household, while a low affordability ratio denotes better or improved affordability of the household. Thus, if an increase in the value of a given factor leads to an increase in the affordability ratio of the household, that factor is considered to diminish or reduce the affordability of the household and vice versa. The results of the correlation analysis indicate that the factor “interest on mortgage loan” has the greatest influence on the affordability of the households. As explained in the previous chapter, interest rate affects mortgage affordability directly because it determines the borrowers’ monthly repayment burden. The results showed that increases in the interest on mortgages would lead to an increase in the repayment burden on the households thus affecting their affordability. The respondents sampled also rated this factor highly with a mean rating of 3.66 indicating that the households considered this factor as important in influencing their affordability.

The factors, Number of dependants (outside nuclear family) and Number of family members with income also showed strong correlation with affordability with correlation coefficients of 0.605 and -0.361, respectively. These two factors are related to the households’ social- economic characteristics and have the potential to influence households’ income. A positive sign for the coefficient for the variable “Number of dependants” means that if the number of extended family relatives who depend on the individual paying the mortgage increases, the affordability ratio of the household increases, which implies diminished or a decrease in the affordability of the household. An increase in dependants will reduce the level of household income available to enable the household to pay for its basic needs including housing. This is likely to negatively affect the affordability of the household. A negative sign for the correlation coefficient for the factor “Number of family members with income” implies that when the number of income earners in the family increases, the affordability ratio of the household decreases, which

translates to improved or better affordability of the household. This is due to the fact that an increase in the number of income earners in the household is likely to improve the overall household income which will enable the household to pay for its essential needs without much difficulty. The results of the correlation analysis for these two factors therefore indicate that the affordability of households is highly dependent on the households' level of income such that any factor that changes the level of income either by increasing or decreasing the family income is likely to have a major impact on affordability. These two factors were also rated highly by the respondents with mean ratings of 3.24 and 3.21, respectively, meaning that the households sampled considered the factors as important in influencing their affordability.

The factors "Construction cost" and Land value" also showed a strong correlation with affordability with correlation coefficients of 0.338 and 0.240, respectively. These factors are property related and influence affordability because they affect the price of housing. A positive sign for the coefficient for "Construction cost" implies that when the cost of construction increases, the affordability ratio of the household increases, meaning a reduction or diminished affordability of the household. This is due to the fact that an increase in construction costs is likely to increase the price that houses will be sold and therefore an increase in the monthly loan repayment which would negatively affect the affordability of households. An increase in the value of land is also likely to increase the price of housing hence the monthly repayment burden for households. Therefore, any changes in cost of construction and land value are likely to affect affordability. The factors were also rated highly by the respondents with mean ratings of 3.54 and 3.42, respectively, indicating that the respondents sampled considered these two factors as important in influencing their affordability.

The factor "loan-to-value (LTV) ratio is a loan related factor which also showed strong correlation with affordability with a correlation coefficient of 0.291. Loan-to-value (LTV) ratio determines the loan amount and therefore the monthly loan repayment. A higher loan amount will translate into higher repayment burden for households and this is likely to negatively affect their mortgage repayment affordability. This explains the positive sign associated with the correlation coefficient for LTV, which means that increases in Loan-to-value (LTV) ratio will lead to an increase in the affordability ratio for the household, which translates to a decrease in the affordability of the household.

The other remaining predictor variables, that is, loss of regular employment income ($R = -0.025$, $\alpha = 0.323$), loan term ($R = -0.096$, $\alpha = 0.035$), type of mortgage instrument ($R = -0.132$, $\alpha = 0.006$), job status ($R = -0.163$, $\alpha = 0.001$), inflation rate ($R = -0.020$, $\alpha = 0.356$) and Real GDP per capita ($R = 0.213$, $\alpha = 0.000$), have weak correlation with affordability because their correlation coefficients (R) are less than 0.30 (Misri 2003 in Bujang et al 2010). However, despite having weak correlation with affordability, the correlation results showed that their correlation with affordability is significant as indicated by their respective significance levels (α) which are all less than 0.50.

Therefore, since all the thirteen (13) factors had significant relationship with affordability as indicated by their respective correlation coefficients and significance levels, they all qualified to be entered in the Multiple Regression Analysis (MRA) to help in the formulation of the Multiple Regression Model. As already explained, MRA was employed to identify factors which are significant predictors of affordability and also to measure the contribution of the significant factors to housing affordability. This assisted in the formulation of the final regression model and also enabled the ranking of the significant factors with respect to contribution to housing affordability.

The results of the regression analysis showed that five (5no) factors out of the thirteen (13no) factors that were entered in the regression analysis were insignificant predictors of housing affordability as indicated by their respective t-values. The t-statistics as explained earlier measures whether a predictor variable is making a significant contribution to the success of the model. The five (5no) factors having an insignificant contribution to the regression model and their associated t-values are as follows: Job status of the borrower ($t = -0.816$), Loss of regular employment income ($t = -0.532$), Land value ($t = 0.800$), Construction cost ($t = 0.266$), and Inflation rate ($t = -0.951$). From the literature review, the factor 'job status' was defined as the job position held by the mortgage borrower in his or her work place, that is, whether professional or managerial position, technical or clerical position. The results of the t-value indicate that the job category of the borrower does not matter in affordability as it is making an insignificant contribution to housing affordability. In our every day life, we come across people who hold very junior positions in their places of work yet such people are able to live very comfortable lives and most are able to pay for their housing without any difficulties. This finding therefore

supports the view that most households have other sources of income and do not entirely depend on their employment income to pay for their housing. The poor performance of the factor 'loss of regular employment income' as indicated by its t-value also supports the view that households do not entirely rely on their employment income to pay for their basic needs including housing. However, as earlier explained, the poor performance of the factor loss of regular employment income could also be explained by the fact that only a few respondents had indicated that they had lost their employment income. The poor performance of the factors 'Land value' and 'Construction cost' as indicated by their t-values could be explained by the fact that the households sampled had been repaying their mortgages for some time and therefore the impact of the initial value of their houses on their affordability had decreased over time as a result of decrease in the monthly repayments given that their loans are on reducing balance. The factor inflation rate also performed poorly as indicated by its t-value. This is probably because, as explained earlier, its impact on affordability is also reflected by the factor interest on loan which performed very well in the analysis. Consequently, as a result of the poor performance of these five (5) variables with regard to prediction of affordability as indicated by their respective t-values, they were not included in the formulation of the multiple regression model.

The final regression model therefore comprised of the remaining eight (8) factors, namely: Interest on loan ($t= 13.786$), Number of dependants (outside the nuclear family ($t = 6.679$), Loan – to – value (LTV) ratio ($t= 5.755$), Number of family members with income ($t= -3.859$), Type of Mortgage instrument ($t= -2.757$), Real GDP per capita ($t=2.711$), Loan term ($t= -2.652$), and Size of the household ($t=2.356$). The contribution of these factors to affordability was found to be significant as indicated by their respective t-values. The eight (8) factors are therefore the most critical factors that influence the affordability of households in the home ownership (mortgage) housing sector in Kenya. The actual contribution of the identified critical factors to affordability was measured by the coefficient of determination (R^2) which was 0.693 for the regression model comprising of the eight factors. With regard to the contribution of each critical factor to the overall coefficient of determination (R^2), the eight critical factors were ranked as follows in a descending order of importance with respect to their contribution to housing affordability.

1. Interest on loan
2. Number of dependants (outside nuclear family)

3. Loan-to -value (LTV) ratio
4. Type of mortgage instrument
5. Number of family members with income
6. Loan term
7. Real GDP per capita
8. Size of the household

The eight (8) critical factors together have a coefficient of determination (R^2) of 0.693 meaning that the regression model comprising of the eight factors accounted for 69.3% of the variance in housing affordability. Among the eight factors, the factor “Interest on loan” has the highest contribution to the overall R^2 accounting for 52.8% of the variance in affordability. The factor “Number of dependants (outside the nuclear family) accounted for 10.4% to the variance in affordability while the factor “Loan-to- value (LTV) ratio accounted for 2.5% to the variance in affordability. The factor with the lowest contribution to affordability was the “size of the household” which accounted for 0.5% to the variance in affordability.

Using the B coefficients associated with each of the eight critical factors, a Multiple Regression Function was formulated that can predict the affordability ratio of the households with known values of the critical factors. The multiple regression function was expressed as follows:

$$\text{Affordability} = 0.284 + [1.779E -006 \text{ interest}] + [0.063N_depdts] + [0.147LTV] - [0.211M_intr] - [0.041Nf_income] - [0.004term] + [6.995E - 006GDP_Cap] + [0.013h_size]$$

Where,

Affordability – housing affordability

interest - interest on loan

N_depdts - Number of dependants (outside nuclear family)

LTV – Loan-to-value ratio

M_intr - Type of mortgage instrument

Nf_income - Number of family members with income

term - Loan term or loan repayment period

GDP_Cap – Real gross domestic product (GDP) per capita

h_size - Size of the household.

In explaining this function, the 0.284 is the “Constant” in the general MRA equation which indicates the influence of affordability factors not considered in the equation. The positive sign of the regression coefficient for the factor “Interest on loan”, that is, $1.779E-006$ means that if interest on the mortgage loan increases by one (1) shilling, the affordability ratio of the household increases by 0.0001779% meaning that the mortgage loan becomes less affordable to the household. An increase in the interest charged on mortgage loan has the effect of increasing the monthly repayment on the loan and this makes the loan less affordable to the household. A positive sign of the coefficient for the variable “Number of dependants” implies that when the number of the extended family relatives who depend on the mortgage borrower increases by one, the affordability ratio of the household increases by 6.3%, which implies diminished or reduced affordability of the household. A positive sign of the coefficient for the variable “Loan-to-value (LTV) ratio of 0.147 means that if the loan-to-value (LTV) ratio increases by one unit, the affordability ratio of the household will increase by 14.7% meaning that the loan becomes less affordable to the household. The loan-to-value (LTV) ratio determines the loan amount borrowed and therefore any increase in the loan amount will increase the monthly loan repayment which will negatively affect the affordability of the household. A negative sign in the coefficient for the variable “Number of family members with income” of -0.041 means that if the number of income earners in a household increases by one, the affordability ratio of the household decreases by 4.1% which translates to improved or better affordability of the household. A negative coefficient for the variable “Loan term” of -0.004 means that if the period of loan repayment increases by one year, the affordability ratio of the household decreases by 0.4% meaning that the mortgage loan becomes more affordable to the household. The results suggest that mortgage loans of long repayment period are more affordable than loans of short repayment period. The positive sign in the regression coefficient for the variable “size of household” of 0.013 means that if the size of household increases by one, the affordability ratio of the household increases by 1.3%, meaning the mortgage loan becomes less affordable to the

household. An increase in the size of household is likely to negatively affect the household income and this explains the positive sign associated with the coefficient for this variable.

The Multiple Regression Function formulated here using the eight (8) critical factors was tested with the data for this study and was found to accurately predict the affordability ratio of the households.

6.2. Conclusion

From the results of the analyses of the factors using the rating of the factors by the respondents, the population mean score, the critical z-test and correlation analysis, one may conclude that the significant factors that affect housing affordability are: Interest on loan, Number of dependants (outside nuclear family), Number of family members with income, Construction cost, Size of the household, Loan-to-value (LTV) ratio, Land Value, Real Gross Domestic Product (GDP) per capita, Job status of the mortgage borrower, Type of mortgage instrument, Loan term, Loss of regular employment income, and Rate of inflation. Applying Multiple Regression Analysis (MRA) to determine the influence of the identified significant factors and therefore rank them with respect to contribution to affordability, the results showed that eight (8) factors namely; Interest on loan, Number of dependants (outside the nuclear family), Loan-to-value (LTV) ratio, Type of mortgage instrument, Number of family members with income, Loan term, Real GDP Per capita, and size of the household, have a significant contribution to affordability and are therefore the most critical factors that influence affordability in the home ownership (mortgage) housing sector in Kenya. The regression model comprising of the eight (8) factors has a correlation coefficient (R) of 0.833 and a coefficient of determination (R^2) of 0.693. The correlation coefficient (R) of 0.833 shows a strong correlation between the eight factors and affordability. The R^2 value of 0.693 indicates that the eight factors together accounted for 69.3% of the variance in housing affordability. The regression model also has a significant F- Value of 97.127, indicating that the eight factors are significant predictors of housing affordability.

The results show that the eight factors are the most important factors which affect affordability because they have the greatest influence on the affordability of the households. Among the eight factors, the factor “Interest on loan” is the most important factor because it has the greatest impact on the affordability of the households accounting for 52.8% of the variance in

affordability. The results of the correlation analysis showed that the factor “Interest on loan” with a correlation coefficient (R) of 0.727 has the strongest correlation with affordability and therefore plays the most important role in explaining the affordability problems of households in the home-ownership (mortgage) housing sector in Kenya.

The results of the correlation and regression analysis lead us to the Hypothesis testing. **The Null Hypothesis (H_0) adopted in this study was that “the interest charged on a mortgage is not the most important factor that affects housing affordability, while the Alternative Hypothesis (H_A) was that “the interest charged on a mortgage is the most important factor that affects housing affordability.”** From the results of the correlation and regression analyses, the Null Hypothesis is rejected and the Alternative Hypothesis is supported.

The objectives of the study have been achieved. The significant factors that influence affordability have been identified and ranked with respect to their contribution to housing affordability. The results suggest that in order to address the pressing affordability challenges in the home ownership mortgage housing sector in Kenya, greater emphasis on policy development should be directed towards the eight (8) critical factors. However, although the eight factors are the most important factors influencing the affordability of households, all the other factors identified earlier using the mean rating of the factors by the respondents, the population mean score and the critical z- test, are also important factors and should be given attention in policy development if we are to fully address the pressing problem of housing affordability in Kenya.

From the literature review and the results of all the analyses performed in this study, it is further concluded that housing affordability is influenced by clusters of factors related to the households’ social-economical characteristics, the loan characteristics, property attributes, and macro economic factors. The social economic factors, among others include: Loss of regular employment income by the mortgage borrower, Number of dependants (outside nuclear family), Number of family members with income, and size of the household. The loan factors include the Interest charged on loan, Loan term or the period of loan repayment, Loan-to- value (LTV) ratio and the type of mortgage instrument. The property attributes are the Cost of construction, Land value, Developers profit and Property transfer costs among other property related factors. The macro-economic factors include the Rate of inflation, Real GDP per capita and Unemployment rate. The households’ social economic factors affect affordability because they influence

households' income. The loan factors influence the price of housing and therefore affect the monthly loan repayment thus affecting affordability. The property factors also influence housing price and therefore affordability. The macro-economic factors affect the incomes of households, the price of housing, as well as the mortgage interest rates charged by banks and financial institutions.

Therefore, policy measures to improve affordability in the mortgage housing sector are those that will reduce or stabilize mortgage interest rates, reduce the price of housing, and improve households' income.

6.2.1. Contribution to Knowledge

The findings in this study contribute to knowledge in three fundamental ways. Firstly, as observed earlier in the problem statement, most research efforts on housing in developing countries and Kenya in particular have been descriptive in nature and little or no emphasis has been made on empirical studies on housing and particularly on factors affecting affordability. In an effort to bridge this gap, this study has contributed to the empirical analysis of housing affordability through an objective identification and measurement of the contribution of the significant factors to housing affordability. Further, the significant factors have been ranked in their order of importance in influencing housing affordability. The ranking of the factors with respect to contribution to affordability is expected to give policy on affordability in Kenya some kind of direction and focus which is important in addressing the pressing affordability challenges among urban households in Kenya. The ranking of the factors with respect to contribution to affordability has been lacking in previous studies on housing affordability. Secondly, the factors affecting affordability have been examined in a wider perspective compared to previous studies. The study has found that housing affordability problems can be explained from the point of view of households' social economic factors, property factors, loan factors and macro economic factors. Previous studies on factors affecting affordability have focused only on households' social economic factors and the macro economic factors. Lastly, the study has identified additional social economic factors and macro economic factors that influence affordability that had not been identified in previous studies. For instance, in the study by Bujang et al (2010) on the relationship between demographic factors and housing affordability in Johor Bahru in Malaysia, only four social economic factors, that is, marital status, level of education, monthly

income and number of income earners in a household, were found to have a significant relationship with affordability. In this study however, additional social economic characteristics of households like the size of household, number of dependants, job status of borrower and loss of regular income were identified by respondents as significant factors that influence the affordability of households in the Kenyan urban landscape. In the study by Mostafa et al (2005) on the relationship between housing affordability and economic development in Hong Kong, three macro economic factors, that is, gross domestic product (GDP), inflation rate and income were found to have a significant linear relationship with affordability in Hong Kong. In the Kenyan context, this study has found the real GDP per capita, inflation rate and unemployment rate as important determinants of affordability. Although it is widely believed that property attributes like land value, cost of construction, developer's profit, property transfer cost, have an influence on affordability, no previous study has analyzed the impact of these property factors on affordability. The impact of loan factors like the loan repayment period, interest on loan, loan – to- value ratio and type of mortgage instrument on mortgage affordability has also not been analyzed using a linear regression technique. The property and loan factors have been analyzed in this study and their impact on affordability determined. It is therefore expected that the research findings in this study will offer a holistic solution to the affordability problem of urban households in Kenya.

The next section presents the policy recommendations necessary to address the urban housing affordability problem in the mortgage housing sector in Kenya.

6.3. Policy Recommendations

Based on the findings from this study and also from the reviewed literature, the policy measures to improve affordability are those that will reduce or stabilize mortgage interest rates, reduce the price of housing, and improve households' income. The specific policy measures are discussed as follows:

A. Measures to Reduce Mortgage Interest Rates

A major reason why mortgage interest rates are high in Kenya is because commercial banks lack long-term funds for lending. As explained in the literature review, the dominant funding source for lenders in Kenya and many other developing countries is the customer savings deposits.

Since deposits are short term liabilities, banks have to charge high interest rates if they are to lend long-term illiquid assets like mortgages using deposits. There is therefore need for banks to diversify their funding sources so as to increase their liquidity and capital base. With enhanced liquidity and especially with availability of long term funds, banks will not only be able to offer mortgages at low interest rates but will also be able to offer mortgage loans with long repayment period which from the findings in this study are more affordable compared to loans of short repayment period. The following are suggested measures that the government can pursue to increase the liquidity and capital base of commercial banks in Kenya:

Secondary Mortgage Market

-Re-structure the financial sector in Kenya to create a secondary mortgage market. With a secondary mortgage market, banks will not have to carry mortgages till maturity. Secondary lenders normally buy the mortgage assets of primary loan originating banks and this enhances the liquidity of the banks. Secondary lenders also mobilize long-term funds on behalf of the primary loan originating banks. The secondary mortgage lenders for instance can raise money from the capital market through issuance of bonds and securities; they can source money from overseas and also from other local institutional and individual investors like insurance companies and pension funds. Such monies raised by the secondary mortgage institutions can be lend to the primary loan originating banks who will then lend to individual borrowers at competitive and affordable interest rates.

Mortgage Liquidity Facility (MLF)

-As an initial step towards having a secondary mortgage market in Kenya, consideration should be made towards establishment of a Mortgage Liquidity Facility (MLF). This is a financial institution that re-finances the mortgage port folio of participating banks. A MLF will buy the mortgage assets of banks and in-turn issue bonds in the capital markets which are backed by those mortgages in what is referred to as mortgage- backed securities (MBS). MLF enhances the liquidity of banks and this enables them to lend to many people and at competitive/affordable interest rates.

The concept of MLF has already been embraced by several African countries with impressive results. A good example is the Tanzania Mortgage Re - Finance Company (TMRC) which is a

MLF in Tanzania launched in 2010. This facility helped finance 636 mortgages in Tanzania by October 2012 and has tremendously improved the performance of the mortgage market in Tanzania. There is also a mortgage liquidity facility in Egypt launched in 2006 and had increased the total mortgages in Egypt to 29,631 by 2011. The Nigeria Government is currently working with the World Bank to develop a mortgage liquidity facility which is expected to increase mortgages to 200,000 in the next 5 years. With such impressive results, Kenya needs to consider establishing a MLF.

Financial Inclusion

-Increase financial inclusion by tapping the population in Kenya which is still unbanked. Although the financial inclusion in Kenya (which currently stands at 66%) is high by East Africa standards, there is need for banks to increase the number of people operating savings accounts in order to improve on their liquidity. In this regard, banks should devise innovative savings products to attract deposits from savers. The government can induce incentives to attract deposits through appropriate tax policies.

Regulate Mobile Money Transfer

-The government should introduce stricter regulations to govern/regulate mobile money transfer and mobile banking technology. To avoid so much money being kept outside the commercial banking system, there should be stricter regulations on monies kept in mobile phone accounts. Specifically, the regulations should control the amount and duration one should keep money in their mobile phone. For example, records show that in 2013, there were 26 million subscribers to the various mobile money transfer service providers in Kenya. Assume each individual held just 2000/= in their mobile phone account for one week, a whopping kshs. 52 billion will be kept outside the commercial banks in that one week. This will have serious implications on the liquidity of Banks. It means Banks will not have the much needed cash to lend and whatever little money is available, banks will have to charge very high interest rates.

-Other measures to reduce mortgage interest rates include measures by the government to control the rate of inflation. From the literature review, inflation is a risk factor which is reflected through increased interest rates. A high rate of inflation is likely to lead to high mortgage interest rates which will adversely affect mortgage affordability. The government can minimize the rate

of inflation by reducing the cost of basic consumable goods through appropriate tax policies and investing in food and energy production and reducing domestic borrowing. Mortgage interest rates can also be reduced by encouraging competition in the banking and the housing finance sector in Kenya. Increased competition will lead to competitive and affordable interest rates. The government can induce competition in the sector by enabling more banks to enter and operate in the banking sector. Entry into the banking sector can be encouraged by among other measures, lowering the Statutory Cash Reserve Requirement (CRR) and the Liquidity ratio. The CRR is the money that commercial banks are required to deposit with the Central Bank which currently is a minimum of Kenya shillings One Billion. The liquidity ratio is the money commercial banks are required to keep in liquid form which currently is 20% of the total bank assets. This is quite prohibitive and blocks many prospective new entrants in the banking sector in Kenya.

B. Measures to Reduce Housing Price

The price of housing is influenced by, among other factors, the price or value of land, cost of construction, developers profit and property transfer costs. These factors have been found in this study to influence affordability because they affect the price that houses would sell in the open market. Therefore, measures to reduce the price of housing include measures to reduce the price of land, cost of construction, developers profit and property transfer costs. Land prices in Kenya are high because there is limited supply of serviced land in good locations. The government can increase the supply of serviced land by adopting policy measures such as Land re adjustment programmes or land pooling. A land re-adjustment programme is a voluntary program where the government invites interested private land owners holding huge chunks of unserviced land to participate. The government after taking the huge unserviced land parcels from private individuals then spends money to put essential services like water, roads, electricity and sewer. The land after being serviced is sub-divided into smaller portions/lots; some portions are given back to the original owners participating in the programme, while the remaining portions are retained and sold by the government at market prices to recover the costs of services. Also, through a land readjustment programme, holders of small unserviced land parcels can pool them together and give them to the government free of charge for servicing, thereafter the government gives back portion of the serviced plots to the original owners in proportion to the value of their original land, while the rest is retained and sold by the government to recover the cost of

services. A land re-adjustment programme has the potential to open up more land for development in the outskirts of Nairobi for example in places like Embakasi- utawala, Ruiru, Njiru and kamulu where private land buying companies and individuals still hold huge chunks of unserviced land. This will help increase the supply of serviced land in such locations and therefore ease the demand pressures on land in areas like Kilimani, Lavington and Kileleshwa. Increased supply of serviced land would generally assist in bringing down the prices of land which would in-turn reduce the price of housing. Land prices are also high because of the tendency of people to hold land for speculation. To discourage holding of land for speculation, the government can adopt appropriate land taxation policies especially targeting idle land in the urban and the rural – urban fringes. A punitive tax on such land will discourage holding idle land for speculation and therefore ensure such land is released for development. Land taxes targeting the gains realized in property sales in the form of Capital Gains Tax (CGT) will also discourage holding of land for speculation and ensure land is released for development. This will reduce the price of land and also housing. To reduce the cost of construction, the government should design and introduce appropriate tax incentives targeting key construction materials like cement and steel. Alternatively, the government can support research in appropriate building technologies through the use of locally available building materials like prefabricated timber, burnt brick and thatch (Makuti) which are cheaper and locally available. In this regard, the government needs to support the implementation of grade 11 building by-laws that were gazetted in 1995 and which the local/county governments have been reluctant to adopt. The grade 11 by- laws are friendlier because they allow the use of appropriate and locally available building materials. Existing building by – laws and planning regulations have tended to favour high income earners by specifying very high building standards which make housing very expensive. The cost of construction can also be reduced by the government availing infrastructure for housing development. On infrastructure development, the National government should set up a Housing Infrastructure Development Trust Fund (HIDTF) to provide incentives to participating county governments to induce provision of housing related infrastructure in their counties. Infrastructure development will open up more land for development and also reduce the overall cost of housing provision by developers thereby reducing the price of housing. To reduce the cost of property transfer, the stamp duty on property transfer which currently is at 4% of value for urban properties needs to be on a graduated scale to make it more affordable. New house developers

buying land for residential development should be considered for stamp duty exemption. Government should also consider granting tax holidays to developers of residential housing.

C. Measures to Improve Households Income

Household income has been identified in this study as an important factor influencing the affordability of households. Improved incomes of households can be achieved by the government adopting appropriate macro – economic policies to improve the overall performance of the economy through increased real gross domestic product (GDP), and reduced inflation rate. Improved real GDP is associated with rising incomes of individuals and improved standards of living. GDP can be increased by increasing the overall production efficiency and consumption capacity of the Nation. Measures to increase production of goods and services include; improved efficiency in registering businesses, improved efficiency in government operations and service delivery, infrastructure development, investing in renewable energy, marketing the country as a tourist destination and improving security. Fighting corruption and minimizing wastage of public resources, investing in research and development are also important ingredients towards expanding the production capacity of the country.

D. Other Policy Measures on Affordability

Loan Guarantees

The loan deposit reflected by the loan-to-value (LTV) ratio was found in this study to be a significant factor affecting affordability in the mortgage housing sector in Kenya. The requirement to pay a deposit restricts individual borrowers' access and affordability of mortgage loans. The government can improve individuals' mortgage affordability by guaranteeing some portion of the loan made available to them. The loan guarantee serves to replace the cash collateral (Loan deposit) usually required by lenders and this makes the mortgage loan affordable and accessible to prospective borrowers.

Collateral Replacement Indemnity (CRI).

Alternatively, the government can support insurance companies wishing to partner with Mortgage Institutions to offer collateral replacement indemnity (CRI) to mortgage borrowers. A CRI is an insurance cover equivalent to a loan deposit. With the cover, the borrower does not

have to pay the deposit and the lender can offer a 100% loan without compromising its balance sheet. The lender remains in an equivalent risk exposure as it would have with a cash deposit. The government can support such initiatives by offering tax incentives to insurance companies to encourage them to accept risks they expose themselves by offering CRI. The CRI makes mortgages affordable because the borrower will not need to raise a deposit. It can therefore be targeted to borrowers in the lower to middle income groups who do not have the deposit required by mortgage lenders but who have the capacity to pay if spread over a period of time. Examples of countries in Africa which have already embraced CRI are Ghana, Rwanda, South Africa and Algeria

Mortgage Default Insurance

The loss of regular employment income by mortgage borrowers was identified as an important factor that influences the affordability of households. The government can support insurance companies wishing to offer insurance cover against such risks as loss of income by the borrower. Most households lose their mortgage homes because of unexpected events like sudden loss of job, non-renewal of contracts or unexpected demotions at work place. Insurance cover against such risks can improve housing affordability and home ownership.

Broadened Mortgage Contracts

Financial Institutions and Banks should devise innovative mortgage products which are friendly and affordable to borrowers. Examples include Fixed Rate Mortgage (FRM) whereby total payments are fixed over the life of the loan; a hybrid Adjustable Rate Mortgage (ARM) whereby the loan is initially a fixed rate mortgage but subsequently changes to adjustable rate mortgage; interest-only loan whereby initially, the mortgage payment does not include any repayment of principal, but later the payment is raised to the fully amortizing level; option ARM or flexible ARM whereby the borrower is offered options on how large a payment to make and; Accordion ARM whereby the payments are fixed but the repayment period is uncertain. With such a wide range of mortgage products, borrowers have a flexibility of choice that meets their abilities, expectations and affordability. Such initiatives however require government support. For example, with a fixed rate mortgage (FRM), it means the financial institution absorbs risks emanating from changes in interest rates, and probably would require some kind of

compensation through tax incentives if more Banks are to accept to offer more FRM to their customers.

6.4. Areas of Further Research

This study has employed the multiple linear regression technique to identify significant factors that influence affordability in the home ownership (mortgage) housing sector in Kenya. Given the increasing role of rental options in pursuing the goal of adequate shelter for all in developing countries, a regression - based study on factors affecting rental affordability is necessary to guide policy development towards growth of the rental housing market in Kenya. A research study is needed to determine the level of affordable housing price among the various income groups in Kenya. There is need to research on which categories of houses, that is, bungalows, maisonettes, flats and townhouses are affordable. There is need to analyze housing affordability in the newly created counties in Kenya as this will promote investment in the counties.

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APPENDIX A

QUESTIONNAIRE TO HOUSEHOLDS IN NAIROBI

QUESTIONNAIRE NO. ()

Dear Respondent,

I am conducting a study on “**Urban Housing Affordability in Kenya- A Case Study of the Mortgage Housing Sector in Nairobi.** Kindly assist in filling the questionnaire. Information provided will be treated with utmost confidentiality and will be used for academic purposes only.

SECTION 1

SOCIAL- ECONOMIC CHARACTERISTICS OF HOUSEHOLDS

1. Name of household head (borrower/loanee) (Optional)
2. Age of household head. Please indicate exact age on the side
 - i) 20- 25 years
 - ii) 26-30 years Exact age in years or date of birth
 - iii) 31-35 years
 - iv) 36-40 years
 - v) 41-45 years
 - vi) 46-50 years
 - vii) 51-55 years
 - viii) 56-60 years
 - ix) Above 60 years
3. Marital Status married () single () widowed () tick only one
4. Gender male () female () tick only one
5. Number of family members with income (1); (2); (>2) tick only one
6. Occupation of household head (professional job); (Managerial position);

(Technical position); any other (specify)

tick only one

7. Number of dependants
(outside nuclear family)

8. Number of children in school

9. Highest education attained (tick only one)

- i) Certificate
- ii) Diploma
- iii) Bachelors degree
- iv) Masters degree
- v) Doctorate
- vi) Any other (specify)

10. Size of the household (1) ; (2); (3) ; (4) ; (5); (6) ; other (specify) tick only one

SECTION 2

HOUSEHOLDS EXPENDITURE

11. Please indicate your average monthly expenditures on each of the following items:

i) Food (kshs 5000-10000); (kshs.11000-15000); (kshs.16000-20000);
(kshs.21000-25000); (kshs.26000-30000); (>ksh.30000) tick only one

ii) Monthly mortgage payment kshs.-----

iii) School fees per month (kshs 10,000-15,000); (Kshs.16,000-20000);
(kshs.21000-25,000); (kshs.26, 000-30,000);
(Kshs.31000-35,000); (kshs.36,000-40,000); any
other amount (specify)

- iv) Transport expenses (kshs.5000-10000); (ksh.11000-15000);
(Kshs.16000-20000); (>kshs.20000) tick only one
- v) Leisure and entertainment (kshs.2000-5000); (kshs.6000-10000); (kshs.11000-15000); (kshs16000-20000); (>20000) tick only one
- vi) Monthly savings (kshs.2000-5000); (kshs.6000-10000); (>10,000) tick only one
- vii) Services (water, electricity, security). (Kshs. 2000-5000); (kshs.6000-10000); any other amount (specify) tick only one
- viii) Health (kshs.2000-5000); (kshs.6000-10,000); any other amount (specify)

SECTION 3

HOUSEHOLDS MORTGAGE INFORMATION

12. Please state the mode of acquisition of your house

CASH

MORTGAGE LOAN

Please tick where appropriate.

13. If your house is on mortgage, please indicate the following about the mortgage loan:

- a) The year loan was granted. -----
- b) Amount of loan awarded. Kshs. -----
- c) Period of loan repayment. (10years); (15years); (20years); (25years); (>25years)
tick only one

- d) Please indicate how the mortgage interest rate on your loan has changed to date
- i) Interest rate at the year of loan approval. ----- Per cent
 - ii). Current interest rate charged. ----- Per cent
- e) Please indicate monthly mortgage payment at the time of loan approval and how the payments have changed to date
- i).Monthly mortgage payment at the time of loan approval. Kshs. -----
 - ii).current monthly mortgage repayment. Kshs. -----
- f) Indicate value/ price of your house at the time of loan application. Kshs.-----
- g) Indicate approximate value of your house today. Kshs. -----
- h) Please indicate the deposit/ down-payment charged by your bank at the time of loan application. kshs.-----
- i) Indicate the monthly insurance premiums you pay for your house for mortgage protection and fire risk. Kshs. -----
- j) Please indicate the amount your lawyers charged you for property transfer and other costs. Kshs.-----

SECTION 4

FACTORS AFFECTING HOUSING AFFORDABILITY

14. Which of these factors do you think have affected your ability to pay for your mortgage loan (tick in the box all that apply)
- i). Age of mortgage applicant ()
 - ii).Marital status of mortgage applicant ()
 - iii). Gender of applicant ()
 - iv). Mortgage applicants level of education ()
 - v). Size of household ()

- vi). Number of family members with income ()
 - vii). Number of dependants ()
 - viii).Number of children in school ()
 - ix). Occupation of household head ()
 - x). Job status/ position of applicant ()
 - xi). Loss of regular employment income ()
 - xii). Amount of mortgage loan awarded ()
 - xiii). Loan-to- value (LTV) ratio ()
 - xiv). Mode of loan repayment ()
 - xv). Type of mortgage instrument (ARM/FRM) ()
 - xvi). Period/ duration of loan repayment ()
 - xvii).Mortgage interest charged by the Bank ()
 - xviii).Amount of deposit/down payment charged by Bank ()
 - xix). Insurance premiums payable for the house ()
 - xx).Lawyers fees and loan processing charges ()
 - xxi) Size of land ()
 - xxii).Price/cost of land ()
 - xxiii).cost of construction of the house ()
 - xxiv). Developer's profit ()
 - xxv). Property transfer costs ()
 - xxvi).size of the house in terms of number of bed rooms and square footage ()
 - xxvii).Quality of house design in terms of building materials used and finishes ()
 - xxviii). Location of the house in terms of quality of neighbourhood, security, nearness to shopping centre and other social facilities, availability and quality of access roads ()
 - xxix). Inflation in the country as reflected by changes in prices of basic commodities ()
 - xxx).General economic performance of the country as reflected in GDP per capita ()
 - xxxi. Performance of alternative markets ()
 - xxxii). Value of the Kenya shilling as reflected by exchange rate to the US dollar ()
 - xxxiii). The political environment in the country ()
 - xxxiv). Any other factor (s) please specify ()
-

15. In the factors you have selected in 14 above, which do you consider significant (important) determinants of housing affordability? Rank in a scale of 1,2,3 and 4 (tick where applicable) **KEY: 1= NOT IMPORTANT; 2= LESS IMPORTANT; 3= IMPORTANT; 4= VERY IMPORTANT**

Factor	(1)	(2)	(3)	(4)
1. Age of mortgage applicant				
2. Marital status				
3. Gender				
4. Mortgage applicant's level of education				
5. Size of household				
6. Number of family members with income				
7. Number of dependants(i.e. outside nuclear family)				
8. Occupation/job position of household head (i.e managerial job, professional, technical, business)				
9. Loss of regular employment income				
10. Amount of mortgage loan awarded				
11. Mortgage interest charged				
12. Period/duration of loan repayment				
13. Loan-to-value ratio (i.e. proportion of property value				

awarded as loan)				
14. Insurance premiums charged				
15. Lawyers fees and other loan charges				
16. Type of mortgage instrument (FRM/ARM)				
17. Loan processing charges				
18. Penalties on loan repayment arrears				
19. Mode of repayment of loan(reducing balance/straight line)				
20. Property transfer cost eg stampduty tax				
21. Size of land				
22. Size of house (i.e. no. of bedrooms, sq.ft)				
23. Cost of construction of the house				
24. Developer's profit				
25. Quality of house design(i.e. materials used and finishes)				
26. Location of house(i.e. quality of neighborhood, nearness to shopping center, availability and quality of access roads)				
27. Inflation in the country				
28. GDP per capita				
29. Strength of the Kenya shilling to the US dollar (exchange rate)				
30. Political environment in the country				

31. Performance of alternative markets eg. equity/stock market				
32. Unemployment rate in the country				

16. Please indicate any challenges/difficulties (if any) you may have experienced during the period of mortgage loan repayment (tick all that apply)

- i). Unexpected changes in family expenses
- ii). Temporary loss of regular income
- iii). Permanent loss of regular income
- iv). Any other (please specify)

17. Are there any specific sacrifices or essential household needs you had to forego in order to sustain the repayment of your mortgage? Please tick only one

Yes () (NO)

18. If yes, please briefly explain the nature of sacrifices you made

APPENDIX B: HOUSEHOLD SOCIAL-ECONOMIC CHARACTERISTICS

Case No.	Age	Gender	Marital Status	Level of education	Size of household	No. of family members with income	No. of dependants (outside the nuclear family)	Job status	Loss of regular employment income	Current monthly income	Affordability ratio
1	39	Male	Married	First degree	4	1	2	Professional	No	175,000/=	.52
2	43	Male	Married	First degree	4	2	1	Management	No	195,000/=	.12
3	37	Male	Single	Diploma	1	1	1	Technical	No	80,000/=	.11
4	43	Male	Married	First degree	3	2	2	Professional	No	220,000/=	.21
5	54	Male	Married	Other/ certificate	4	1	1	Clerical	No	75,000/=	.15
6	46	Female	Single	Diploma	3	1	2	Technical /Clinical officer	No	135,000/=	.30
7	50	Male	Married	Diploma	5	1	2	Technician	No	120,000/=	.35

8	59	Male	Married	First degree	6	1	3	Management	No	125,000/=	.50
9	58	Female	Married	First degree	5	1	3	Professional	No	195,000/=	.36
10	39	Male	Married	Masters degree	3	1	1	Management	No	140,000/=	.39
11	37	Male	Married	First degree	4	2	2	Professional	No	220,000/=	.27
12	41	Male	Single	First degree	1	1	3	Management	No	220,000/=	.30
13	48	Female	Single	Certificate	2	1	1	Clerical	No	75,000/=	.18
14	63	Female	Single/ other	Certificate	5	3	1	Managing family Business	Yes	135,000/=	.27
15	57	Female	Married	Masters	5	2	3	Professional	No	245,000/=	.58
16	54	Female	Married	Certificate	4	2	2	Clerical	No	125,000/=	.21
17	50	Male	Widowed	Diploma	3	2	1	Technician	No	95,000/=	.010

18	47	Male	Married	First degree	3	2	1	Management	No	190,000/=	.23
19	40	Male	Married	First degree	4	1	3	professional	No	125,000/=	.54
20	59	Female	Married	Diploma	6	1	4	Managing own business	yes	95,000/=	.52
21	53	Male	Married	First degree	5	3	1	Professional	No	200,000/=	.22
22	47	Female	Married	Diploma	4	2	1	Technician	No	120,000/=	.09
23	45	Male	Married	Diploma	3	1	1	Technician	No	90,000/=	.26
24	34	Female	Single	First degree	2	1	1	Professional	No	140,000/=	.19
25	47	Male	Widowed	First degree	2	1	1	Professional	No	240,000/=	.15
26	37	Female	Single	First degree	2	1	1	Professional	No	235,000/=	.09
27	60	Male	Married	Diploma	6	1	2	Self-employed	No	200,000/=	.36

28	47	Male	Married	First degree	4	2	1	Professional	No	200,000/=	.16
29	54	Female	Married	Diploma	5	3	1	Technician	Yes (Retired)	200,000/=	.22
30	47	Male	Married	Diploma	2	1	3	Technician	No	120,000/=	.31
31	35	Female	Single	First degree				Management	No	140,000/=	.05
32	49	Male	Married	First degree	5	1	4	Professional	No	165,000/=	.68
33	37	Male	Married	Masters	6	1	4	Management	No	175,000/=	.90
34	53	Male	Married	First degree	5	3	2	Management	No	185,000/=	.35
35	48	Male	Married	First degree	3	2	1	Management	No	150,000/=	.13
36	42	Female	Single	Diploma	2	1	1	Management	No	150,000/=	.31
37	57	Female	Married	Diploma	4	3	1	Management	No	90,000/=	.23
38	46	Female	Married	First degree	5	2	2	Management	No	120,000/=	.32

39	48	Male	Married	First degree	6	2	2	Professional	No	325,000/=	.66
40	48	Male	Married	First degree	5	2	2	Manager	No	200,000/=	.40
41	55	Male	Married	First degree	6	1	4	Professional	No	220,000/=	.79
42	55	Male	Married	Diploma	6	1	2	Management	Yes (Self employed)	185,000/=	.50
43	38	Male	Single	First degree	1	1	3	Professional	No	200,000/=	.40
44	48	Male	Married	Diploma	4	2	1	Technician	No	105,000/=	.21
45	35	Female	Married	First degree	2	1	1	Management	No	210,000/=	.22
46	68	Female	Married	Certificate	4	1	3	Management	Yes (Self employer)	385,000/=	.62
47	45	Female	Married	Diploma	4	2	1	Technician	No	105,000/=	.10
48	39	Male	Married	Diploma	3	2	2	Management	No	115,000/=	.21

49	48	Female	Married	Diploma	3	2	1	Management	No	95,000/=	.17
50	43	Male	Married	First degree	5	1	4	Management	No	105,000/=	.86
51	55	Male	Married	First degree	4	2	2	Professional	No	145,000/=	.47
52	40	Female	Single	Masters	3	1	1	Professional	No	195,000/=	.32
53	48	Female	Single	First degree	3	1	1	Professional	No	200,000/=	.35
54	41	Male	Married	Diploma	4	1	2	Technician	No	95,000/=	.62
55	44	Male	Single	First degree	1	1	1	Management	No	195000/=	.13
56	41	Male	Married	First degree	3	2	1	Professional	No	200,000/=	.32
57	50	Male	Widower	Diploma	4	3	1	Technician	No	175,000/=	.09
58	50	Male	Married	First degree	6	1	4	Management	Yes	370,000/=	.70
59	38	Male	Married	Diploma	4	1	2	Technician	No	180,000/=	.41

60	55	Male	Married	First degree	5	3	2	Manager	No	180,000/=	.28
61	59	Male	Married	Masters	5	1	2	Professional (Self employed)	yes	350,000/=	.59
62	46	Male	Married	First degree	4	2	1	Management	No	175,000/=	.06
63	45	Male	Married	Diploma	4	2	1	Manager	No	150,000/=	.21
64	38	Male	Single	First degree	1	1	2	Technician	No	185,000/=	.36
65	40	Male	Married	First degree	4	2	1	Professional	No	220,000/=	.54
66	59	Male	Widowed	Doctorate	5	2	2	Management	No	185,000/=	.40
67	44	Male	Married	First degree	5	2	2	Professional	No	350,000/=	.53
68	42	Male	Single	Diploma	1	1	1	Technician	No	175,000/=	.16
69	51	Male	Married	Diploma	3	2	1	Technician	No	75,000/=	.07

70	40	Male	Married	Diploma	3	2	1	Technical	No	185,000/=	.15
71	41	Female	Married	First degree	5	2	2	Professional	No	155,000/=	.60
72	54	Male	Married	First degree	6	2	2	Management	No	175,000/=	.40
73	47	Male	Married	Masters	4	1	3	Professional	No	280,000/=	.60
74	52	Female	Married	First degree	5	2	1	Professional	No	380,000/=	.29
75	39	Male	Married	First degree	3	2	1	Manager	No	150,000/=	.18
76	47	Male	Married	First degree	4	2	1	Professional	No	185,000/=	.28
77	43	Female	Other	First degree	3	1	1	Manager	No	200,000/=	.39
78	62	Male	Married	Doctorate	6	2	3	Professional-lecturer	No	275,000/=	.40
79	47	Female	Married	Diploma	3	2	2	Management	No	175,000/=	.22

80	54	Male	Married	First degree	5	2	2	Management	No	375,000/=	.49
81	48	Female	Married	Masters	5	2	3	Professional	No	255,000/=	.32
82	52	Male	Married	First degree	5	2	3	Management	No	195,000/=	.32
83	46	Male	Married	First degree	6	1	3	Professional	No	185,000/=	.62
84	33	Female	Single	Diploma	2	1	1	Technical	No	135,000/=	.13
85	39	Male	Married	Diploma	3	2	1	Technical	No	125,000/=	.26
86	51	Male	Married	First degree	6	1	3	Professional	No	285,000/=	.70
87	50	Male	Widowed	Diploma	4	2	1	Technical	No	130,000/=	.29
88	48	Male	Married	First degree	4	2	1	Professional	No	325,000/=	.21
89	54	Female	Widowed	Diploma	5	2	1	Middle level Management	No	120,000/=	.18
90	41	Male	Married	First	4	2	2	Management	No	205,000/=	.55

				degree							
91	56	Female	Other	Diploma	4	2	1	Technical	No	135,000/=	.10
92	60	Male	Married	First degree	5	1	2	Professional	No	175,000/=	.24
93	55	Male	Married	Diploma	3	3	1	Technical	No	145,000/=	.09
94	60	Male	Married	First degree	5	2	2	Management	No	155,000/=	.50
95	48	Male	Married	First degree	6	3	1	Management	No	170,000/=	.32
96	53	Male	Married	Masters	5	2	2	Professional Tutor	No	350,000/=	.39
97	51	Male	Married	First degree	5	1	2	Professional	No	200,000/=	.50
98	49	Female	Single	Masters	3	1	1	Management	No	210,000/=	.52
99	52	Male	Married	First degree	6	2	2	Professional	No	380,000/=	.51
100	51	Male	Married	First	5	1	2	Professional	No	250,000/=	.41

				degree							
101	39	Male	Male	First degree	3	2	1	Professional	No	235,000/=	.24
102	51	Male	Male	Diploma	5	2	2	Technical	No	265,000/=	.29
103	50	Male	Separated	First degree	4	1	1	Professional	No	300,000/=	.40
104	47	Male	Married	Diploma	4	2	1	Technical	No	155,000/	.32
105	57	Male	Married	Certificate	5	2	1	Technical	Yes	135,000/=	.27
106	51	Male	Married	Masters	6	1	4	Professional	No	455,000/=	.93
107	57	Male	Married	First degree	4	2	2	Management	No	125,000/=	.37
108	48	Male	Single	First degree	3	1	1	Management	No	225,000/=	.43
109	48	Male	Married	Diploma	3	2	1	Technical	No	85,000/=	.13
110	32	Female	Single	Diploma	2	1	1	Technical	No	115,000/=	.23
111	34	Female	Single	Diploma	2	1	1	Secretarial/ Clerical	No	120,000/=	.22

112	59	Male	Married	Diploma	6	1	2	Technical	No	175,000/=	.30
113	49	Male	Other widower	First degree	4	2	1	Management	No	225,000/=	.26
114	71	Male	Married	Certificate	5	2	1	Managing own Business	Yes	105,000/=	.31
115	50	Female	Married	First degree	5	2	2	Manager	No	135,000/=	.46
116	60	Female	Married	Certificate	6	1	4	Manager own business	Yes	130,000/=	.51
117	40	Female	Married	First degree	4	2	1	Professional	No	220,000/=	.39
118	50	Female	Widow/ separated	Certificate	5	3	2	Secretarial/own business	No	150,000/=	.04
119	48	Male	Married	First degree	4	2	1	Management	No	200,000/=	.27
120	39	Male	Married	First degree	4	2	2	Professional	No	200,000/=	.34

121	49	Male	Married	Masters	4	2	3	Professional	No	285,000/=	.44
122	45	Male	Married	First degree	4	2	3	Professional	No	275,000/=	.41
123	37	Female	Married	First degree	4	2	3	Management	No	150,000/=	.48
124	41	Male	Married	Diploma	4	1	2	Technical	No	185,000/=	.20
125	35	Female	Married	Diploma	3	2	1	Technical	No	200,000/=	.20
126	53	Male	Married	Diploma	4	2	2	Professional	No	185,000/=	.35
127	48	Male	Married	Diploma	3	2	1	Technical	No	175,000/=	.09
128	56	Female	Single	First degree	4	1	2	Professional	No	180,000/=	.43
129	48	Male	Married	First degree	4	2	2	Management	No	145,000/=	.26
130	64	Male	Married	First degree	7	4	2	Managing own business	Yes	220,000/=	.30
131	47	Female	Single	First degree	2	1	1	Manager	No	250,000/=	.35

132	64	Male	Married	Diploma	7	3	3	Technical	Yes	285,000/=	.13
133	55	Male	Married	Certificate	5	1	4	Managing own business	Yes	175,000/=	.50
134	34	Female	Married	Diploma	4	2	1	Technical	No	165,000/=	.24
135	48	Female	Married	Masters	3	2	2	Professional	No	280,000/=	.24
136	42	Female	Single	Diploma	2	1	1	Hostess	No	200,000/=	.18
137	62	Male	Married	Masters	5	2	3	Professional	No	250,000/=	.28
138	45	Female	Married	Diploma	4	2	2	Technical	No	150,000/=	.18
139	57	Male	Married	First degree	6	1	3	Managing own business	Yes	175,000/=	.08
140	57	Male	Married	Masters	5	1	2	Management	No	320,000/=	.40
141	45	Male	Married	First degree	4	2	1	Management	No	220,000/=	.30
142	50	Male	Married	First degree	5	2	3	Professional	No	220,000/=	.47
143	46	Male	Married	Diploma	3	2	1	Technical	No	150,000/=	.19

144	45	Female	Married	Diploma	4	2	2	Technical	No	220,000/=	.20
145	63	Male	Married	Certificate	4	2	1	Managing own business	Yes	115,000/=	.12
146	37	Male	Married	Diploma	4	2	1	Technical	No	165,000/=	.23
147	51	Male	Married	Certificate	5	1	2	Clerical	No	75,000/=	.05
148	47	Male	Other	Masters	4	2	2	Professional	No	250,000/=	.41
149	44	Female	Single	First degree	2	1	1	Management	No	180,000/=	.20
150	58	Male	Married	Masters	6	2	3	Professional	No	380,000/=	.30
151	52	Female	Married	First degree	5	1	4	Management	No	320,000/=	.80
152	40	Male	Single	First degree	2	1	1	Professional	No	200000/=	.28
153	44	Male	Married	First degree	4	1	3	Professional	No	495,000/=	.50
154	49	Male	Married	Diploma	4	2	2	Technical	No	85,000/=	.66
155	47	Male	Married	Diploma	3	2	1	Technical	No	185,000/=	.17

156	45	Male	Married	Masters	4	2	2	Professional	No	385,000/=	.27
157	63	Male	Married	Doctorate	6	1	3	Professional	No	150,000/=	.33
158	38	Male	Married	Diploma	3	2	2	Managing own business	Yes	315,000/=	.28
159	44	Male	Married	Diploma	4	2	1	Technical	No	135,000/=	.15
160	47	Female	Married	First degree	4	1	2	Management	No	275,000/=	.32
161	48	Male	Married	First degree	4	2	3	Professional	No	250,000/=	.41
162	48	Female	Single	First degree	3	1	4	Management	No	105,000/=	.83
163	54	Male	Married	First degree	4	3	1	Management	No	275,000/=	.24
164	37	Female	Married	First degree	4	2	2	Professional	No	475,000/=	.32
165	54	Male	Married	Doctorate	4	2	2	Professional	No	275,000/=	.26
166	52	Female	Other	First	3	3	1	Management	No	245,000/=	.19

				degree							
167	46	Male	Married	First degree	4	2	2	Management	No	165,000/=	.35
168	40	Male	Married	First degree	4	2	2	Professional	No	285,000/=	.36
169	63	Female	Married	Diploma	6	3	1	Managing own business	Yes	220,000/=	.12
170	46	Male	Married	Diploma	4	2	1	Technical	No	175,000/=	.24
171	44	Female	Single	Diploma	2	1	1	Managing own business	Yes	135,000/=	.25
172	59	Female		Diploma	4	1	2	Technical	No	75,000/=	.40
173	58	Male	Married	First degree	6	2	3	Professional	No	250,000/=	.54
174	41	Male	Married	Diploma	3	2	1	Technical	No	220,000/=	.09
175	58	Male	Married	First degree	7	1	4	Professional	No	330,000/=	.99
176	62	Male	Married	Diploma	5	3	1	Technical	Yes	175,000/=	.17

177	32	Female	Single	Diploma	2	1	1	Technical	No	145,000/=	.03
178	48	Female	Married	Masters	4	2	2	Professional	No	195,000/=	.27
179	48	Female	Single	First degree	5	1	2	Professional	No	350,000/=	.51
180	53	Male	Married	First degree	4	2	2	Professional	No	325,000/=	.35
181	46	Female	Married	First degree	5	1	3	Management	No	85,000/=	.70
182	43	Male	Married	First degree	4	2	1	Professional	No	285,000/=	.37
183	53	Male	Married	Certificate	3	2	1	Managing own business	Yes	165,000/=	.36
184	52	Male	Married	Diploma	4	3	2	Technical	No	285,000/=	.22
185	37	Male	Married	Diploma	3	2	1	Managing own business	No	250,000/=	.10
186	57	Male	Married	Diploma	5	1	2	Technical	No	145,000/=	.24
187	40	Male	Married	First	4	2	2	Professional	No	250,000/=	.31

				degree							
188	57	Male	Married	First degree	6	4	1	Management	No	285,000/=	.24
189	48	Male	Married	Masters	4	2	2	Professional	No	300,000/=	.33
190	66	Male	Married	Diploma	6	1	3	Managing own business	Yes	230,000/=	.38
191	47	Male	Married	Diploma	4	2	2	Technical	No	135,000/=	.38
192	40	Female	Female	Masters	4	2	2	Professional	No	275,000/=	.44
193	50	Female	Separated	First degree	4	1	1	Professional	No	295,000/=	.48
194	37	Male	Single	First degree	1	1	2	Professional	No	200,000/=	.43
195	41	Female	Single	Masters	2	1	2	Professional	Yes	280,000=	.39
196	44	Male	Married	First degree	4	2	3	Professional	No	350,000/=	.75
197	55	Male	Married	Diploma	4	3	1	Technical	No	85,000/=	.12
198	46	Male	Married	Diploma				Technical	No	230,000/=	

199	41	Male	Married	First degree	5	1	1	Managing own business	Yes	250,000/=	.30
200	46	Female	Single	Diploma	2	1	1	Technical	No	175,000/=	.18
201	47	Female	Single	Masters	3	1	2	Professional	No	295,000/=	.53
202	35	Male	Married	Diploma	3	1	1	Technical	No	200,000/=	.42
203	41	Male	Married	Diploma	4	1	2	Technical	No	125,000/=	.15
204	60	Female	Other	Diploma	3	2	1	Managing own business	Yes-retired	265,000/=	.15
205	53	Female	Single	Diploma	3	2	1	Technical	No	285,000/=	.33
206	43	Male	Married	Masters	5	2	2	Professional	No	250,000/=	.62
207	42	Female	Single	Doctorate	3	1	1	Professional	No	275,000/=	.40
208	68	Male	Married	Diploma	5	3	2	Managing own business	Yes-retired	295,000/=	.38
209	44	Male	Married	First degree	4	1	3	Managing own business	Yes	450,000/=	.73
210	46	Male	Married	First degree	4	2	3	Management	No	150,000/=	.78

211	44	Male	Married	First degree	4	2	2	Professional	No	275,000/=	.36
212	49	Female	Married	First degree	5	2	1	Professional	No	295,000/=	.35
213	45	Female	Single	First degree	3	1	1	Professional	No	195,000/=	.32
214	48	Female	Married	Diploma	2	1	1	Technical	No	175,000/=	.40
215	36	Male	Married	Diploma	3	2	1	Professional	No	285,000/=	.32
216	55	Male	Widowed	Masters	6	1	3	Professional	No	675,000/=	.85
217	40	Female	Single	First degree	2	1	1	Professional	No	265,000/=	.23
218	47	Female	Single	First degree	3	1	2	Managing own business	Yes	165,000/=	.61
219	40	Male	Married	Diploma	4	2	1	Technical	No	125,000/=	.31
220	39	Female	Single	First degree	3	1	2	Professional	No	235,000/=	.53
221	56	Male	Married	Diploma	4	3	1	Technical	No	165,000/=	.18

222	42	Male	Married	First degree	5	1	3	Managing own business	No	220,000/=	.78
223	34	Male	Single	Diploma	1	1	1	Technical	No	175,000/=	.20
224	63	Male	Married		4	3	1	Managing own business	Yes-retired	135,000/=	.10
225	45	male	married	First degree	6	2	1	Management	No	285,000/=	.40
226	54	Male	Married	First degree	6	1	2	Professional	No	300,000/=	.58
227	54	Female	Married	Diploma	4	2	1	Managing own business	Yes	195,000/=	.13
228	42	Male	Married	Diploma	5	2	2	Technical	No	155,000/=	.38
229	45	Female	Single	First degree	3	1	2	professional	No	285,000/=	.45
230	46	Male	Married	Masters	5	1	2	Professional	No	315,000/=	.54
231	42	Male	Married	First degree	4	2	1	Professional	No	385,000/=	.78

232	45	Male	Married	First degree	5	2	1	Professional	No	155,000/=	.33
233	54	Male	Married	Diploma	5	2	1	Technical	No	165,000/=	.34
234	45	Female	Married	Diploma	5	2	1	Management	No	185,000/=	.34
235	53	Female	Married	First degree	5	2	2	Management	No	250,000/=	.41
236	37	Female	Single	First degree	2	1	1	Management	No	220,000/=	.21
237	51	Male	Married	Certificate	4	2	1	Managing own business	Yes	195,000/=	.27
238	61	Male	Married	Certificate	5	1	2	Managing own business	Yes	145,000/=	.63
239	43	Male	Married	First degree	4	2	2	Professional	No	220,000/=	.33
240	36	Male	Single	First degree	1	1	1	Professional	No	85,000/=	
241	45	Male	Married	First degree	3	2	1	Professional	No	220,000/=	.25

242	40	Male	Single	Diploma	1	1	1	Technical	No	75,000/=	.11
243	35	Female	Single	First degree	2	1	2	Management	No	225,000/=	.44
244	43	male	Married	First degree	4	2	1	Professional	No	220,000/=	.52
245	44	male	Married	Masters	5	1	2	Management	No	400,000/=	.64
246	55	male	Married	Diploma	5	1	2	Technical	No	85,000/=	.66
247	58	male	Married	First degree	7	2	2	Management	No	285,000/=	.39
248	44	male	Married	Certificate	3	2	1	Managing own business	Yes	255,000/=	.17
249	54	male	Married	Diploma	4	3	1	Technical	No	80,000/=	.24
250	58	male	Married	First degree	5	2	2	Technical	Yes	220,000/=	.40
251	38	Female	Married	First degree	4	2	2	Professional	No	265,000/=	.81
252	47	Female	Married	First	4	2	2	Professional	No	165,000/=	.40

				degree							
253	35	Female	Married	First degree	4	2	2	Professional	No	285,000/=	.55
254	42	Female	Married	First degree	4	2	2	Management	No	175,000/=	.38
255	57	male	Married	First degree	4	3	1	Management	No	250,000/=	.12
256	53	male	Married	Certificate	5	1	2	Management	No	145,000/=	.27
257	64	male	Other	Diploma	6	2	1	Managing own business	Yes-retired	185,000/=	.11
258	47	Female	Married	First degree	5	2	2	Managing own business	Yes	315,000/=	.56
259	37	male	Single	Diploma	1	1	1	Technical	No	170,000/=	.20
260	42	male	Married	Masters				Management	No		
261	49	Female	Single	First degree	2	1	1	Professional	No	250,000/=	.36
262	47	Female	Married	First	5	1	3	Managing	Yes	450,000/=	.70

				degree				own business			
263	53	Female	Married	First degree	4	1	2	Professional	No	300,000/=	.33
264	37	Female	Single	Diploma	2	1	1	Technical	No	115,000/=	.26
265	55	Female	Married	Diploma	4	3	1	Technical	No	275,000/=	.24
266	42	male	Married	Diploma	5	2	1	Technical	No	125,000/=	.38
267	45	male	Married	First degree	5	1	2	Professional	No	335,000/=	.55
268	50	male	Married	First degree	5	1	2	Professional	No	135,000/=	.61
269	48	male	Married	Diploma	4	2	2	Technical	No	115,000/=	.36
270	51	Female	Separated	Diploma	4	1	2	Technical	No	85,000/=	.43
271	40	male	Married	First degree	4	2	1	Management	No	250,000/=	.39
272	53	Female	Single	First degree	4	2	1	Management	No	265,000/=	.42
273	35	male	Married	Diploma	4	1	2	Managing	Yes	385,000/=	.65

								own business			
274	45	male	Married	Diploma	5	2	2	Professional	No	315,000/=	.50
275	36	Female	Married	First degree	4	2	2	Management	No	200,000/=	.47
276	36	male	Single	First degree	1	1	2	Management	No	145,000/=	.44
277	44	male	Married	Masters	5	2	1	Management	No	275,000/=	.32
278	50	Female	Married	Masters	5	1	2	Professional	No	375,000/=	.47
279	39	male	Married	Diploma	3	2	1	Technical	No	155,000/=	.08
280	43	male	married	First degree	4	1	2	Professional	No	245,000/=	.60
281	36	male	Married	Diploma	3	1	2	Technical	No	75,000/=	.57
282	49	male	Married	First degree	4	2	2	Management	No	165,000/=	.38
283	32	male	Married	Masters	3	1	1	Professional	No	235,000/=	.45
284	40	male	Married	Masters	4	2	1	Management	No	275,000/=	.70

285	38	Female	Married	First degree	4	1	3	Professional	No	300,000/=	.67
286	44	Female	Married	First degree	4	1	3	Professional	No	275,000/=	.57
287	42	Female	Single	First degree	3	1	2	Management	No	250,000/=	.38
288	41	Female	Married	Masters	4	2	1	Professional	No	255,000/=	.60
289	40	Female	Single	First degree	2	1	2	Management	No	260,000/=	.40
290	40	male	Married	First degree	3	2	1	Managing own business	No	145,000/=	.13
291	55	Female	Other	First degree	3	2	1	Management	No	255,000/=	.21
292	83	male	Married	Certificate	4	2	1	Managing own business	Yes	135,000/=	.26
293	44	Female	Single	First degree	4	1	2	Professional	No	250,000/=	.72
294	45	Female	Single	First	4	1	2	Professional	No	48,5000/=	.78

				degree							
295	39	male	Single	Diploma	1	1	2	Technical	No	85,000/=	.61
296	37	male	Single	First degree	1	1	2	Professional	No	265,000/=	.37
297	64	male	Widow/Divorced	Diploma	4	2	1	Managing own business	No	350,000/=	.24
298	48	male	Married	Certificate	3	2	1	Managing own business	Yes	135,000/=	.19
299	65	male	married	Diploma	7	3	1	Managing own business	Yes	95,000/=	.18
300	63	male	Other	Certificate	6	1	4	Managing own business	Yes	425,000/=	.92
301	56	male	Married	First degree	4	2	1	Professional	No	175,000/=	.11
302	44	male	Married	Masters	3	1	2	Professional	No	220,000/=	.50
303	54	male	Married	Diploma	4	3	1	Technical	No	145,000/=	.15
304	44	male	Married	Masters	3	2	1	Professional	No	245,000/=	.29

								(journalist)			
305	57	male	Married	First degree	6	2	2	Professional	No	295,000/=	.59
306	38	male	Married	Diploma	3	2	1	Managing own business	Yes	135,000/=	.12
307	58	male	Married	Diploma	5	1	2	Managing own business	Yes	105,000/=	.58
308	48	male	Married	First degree	4	2	1	Professional	No	300,000/=	.34
309	49	male	Married	Diploma	3	2	1	Technical	No	95,000/=	.06
310	51	Female	Married	Diploma	5	1	3	Managing own business	Yes	125,000/=	.20
311	50	male	Married	Doctorate	5	2	1	Professional	No	315,000/=	.28
312	51	male	Married	First degree				Professional	No		
313	46	male	Married	Diploma	3	2	1	Technical	No	75,000/=	.15
314	38	male	Married	First	3	2	1	Management	No	185,000/=	.10

				degree							
315	44	male	Married	Masters	4	1	2	Professional (Journalist)	No	155,000/=	.51
316	48	male	Married	Diploma	3	2	1	Technical	No	125,000/=	.16
317	50	male	Married	Diploma	4	1	1	Technical	No	135,000/=	.09
318	53	male	Married	Diploma	5	1	3	Technical	No	185,000/=	.20
319	51	Female	Married	Masters	4	2	2	Professional (Doctor)	No	350,000/=	.28
320	47	male	Married	First degree	4	1		Management	No	165,000/=	.37
321	43	male	Married	Diploma	4	2	1	Technical	No	200,000/=	.06
322	40	male	Married	Diploma	3	1	1	Management	No	275,000/=	.18
323	55	Female	Married	First degree	6	2	1	Management	No	185,000/=	.10
324	47	male	Married	Diploma	4	2	2	Technical	No	245,000/=	.11
325	44	male	Married	Masters	3	2	1	Management	No	265,000/=	.23

326	67	male	Married	Diploma	5	3	2	Managing own business	Yes-Retired	305,000/=	.34
327	56	male	Married	Diploma	4	3	1	Technical	No	255,000/=	.03
328	39	Female	Single	Masters	2	1	1	Management	No	250,000/=	.32
329	42	Female	Married	Masters	4	2	1	Professional	No	255,000/=	.28
330	56	male	Married	First degree	5	1	2	Managing own business	Yes	295,000/=	.58
331	50	Female	Widowed	First degree				Professional	No	220,000/=	
332	50	male	Married	First degree	5	2	1	Professional	No	225,000/=	.30
333	58	male	Married	Diploma	4	3	1	Managing own business	Yes	265,000/=	.29
334	51	male	Married	First degree	5	2	2	Management	No	285,000/=	.38
335	45	male	Married	Diploma	4	2	1	Technical	No	150,000/=	.26

336	40	Female	Married	Masters	3	2	1	Professional	No	255,000/=	.20
337	41	male	Married	Diploma	3	2	1	Technical	No	125,000/=	.16
338	41	Female	Single	Masters	4	2	1	Professional	No	265,000/=	.34
339	52	Female	Other	Diploma	6	2	3	Technical	No	145,000/=	.43
340	49	male	Other	Diploma	1	1	2	Technical	No	155,000/=	.13
341	57	Female	Married	First degree	5	2	2	Management	No	360,000/=	.34
342	55	male	Married	First degree	5	3	1	management	No	225,000/=	.27
343	48	Female	Married	First degree	4	2	1	Technical	No	225,000/=	.16
344	49	male	Married	First degree	4	2	1	Management	No	165,000/=	.21
345	67	Female	Single	certificate	6	1	2	Managing own business	Yes	195,000/=	.20
346	51	male	Married	First degree	5	1	2	Management	No	245,000/=	.50

347	57	male	Married	Diploma	5	1	2	Managing own business	Yes	135,000/=	.37
348	42	Female	Married	First degree	4	2	1	Professional	No	250,000/=	.15
349	44	male	Married	Masters	3	2	1	Professional	No	275,000/=	.30
350	47	male	Married	Diploma	3	2	1	Technical	No	75,000/=	.23
351	48	male	Married	First degree	4	1	2	Management	No	145,000/=	.12
352	53	male	Married	Diploma	5	1	2	Managing own business	yes	155,000/=	.32
353	55	male	married	Diploma	5	2	3	Technical	No	185,000/=	.21

APPENDIX C: HOUSE HOLDS MORTGAGE DATA

Case No.	Year of loan origination	Loan amount (kshs)	Loan- to-value(LTV) ratio	Loan term (years)	Monthly interest on loan (kshs)	Type of mortgage instrument (ARM/ FRM)	Mode of loan re payment	Monthly installment at loan contract date (kshs.)	Current monthly installment (kshs)	Affordability ratio
1	2006	6,463,596.25	83.94	20	87243.5	ARM	Redu. bal	79,416	90856.5	.52
2	2006	4,500,000	75	11	7632.75	ARM	Redu. bal	66,160	22606.25	.12
3	2006	650,000	43	15	5970.7	ARM	Redu. bal	8,525	8467.55	.11
4	2006	3,145,000	85	11	201083.40	ARM	Redu. bal	46,238	46380.25	.21
5	2006	900,000	90	11	4450.30	ARM	Redu. bal	13,232	11126.95	.15
6	2006	3,400,000	85	11	16248.30	ARM	Redu. bal	49,987	40485.8	.30
7	2006	2,800,000	74	11	17381.05	ARM	Redu. bal	41,166	41640.8	.35
8	2006	2,972,782.35	90	9	14743.70	ARM	Redu. bal	48,475	61913.55	.50
9	2006	5,000,000	59	11	29635.35	ARM	Redu. bal	73,511	69425.3	.36
10	2011	3,500,000	33	16	46977.40	ARM	Redu. bal	60,881	54354.8	.39

11	2006	6,524,406.05	87	11	24594.15	ARM	Redu. bal	95,564	60291.05	.27
12	2005	5,310,000	41	21	53467.90	ARM	Redu. bal	62,216	65211.6	.30
13	2004	800,000	52	11	5853.70	ARM	Redu. bal	11,061	13.588.65	.18
14	2006	2,550,000	60	11	15569.15	ARM	Redu. bal	37,490	37.095.35	.27
15	2006	7,586,429.1	61	13	85583.25	ARM	Redu. bal	104,560	141551.7	.58
16	2006	1,600,000	80	14	17593	ARM	Redu. bal	21,452	26668.95	.21
17	2006	1,190,000	85	13	333.45	ARM	Redu. bal	16,509	918.6	.010
18	2004	4,300,000	72	16	31198.50	ARM	Redu. bal	51,176	44095.35	.23
19	2004	1,050,000	23	16	10791.90	ARM	Redu. bal	12,496	14071.3	.54
20	2004	2233750.85	93	12	11105.95	ARM	Redu. bal	28,685	49084.45	.52
21	2004	4,500,000	75	11	19067.20	ARM	Redu. bal	62,218	44010.95	.22
22	2003	2,200,000	32	22	8442.95	ARM	Redu. bal	26,112	11029.35	.09
23	2003	1,400,000	70	11	10791.9	ARM	Redu. bal	20,411	23150.05	.26
24	2003	4,250,000	85	11	11105.95	ARM	Redu. bal	61,964	26867.45	.19
25	2003	6,000,000	75	11	16511.50	ARM	Redu. bal	87,479	36.346.65	.15

26	2003	5,000,000	56	13	10882.20	ARM	Redu. bal	68,149	22165.9	.09
27	2003	4,000,000	57	11	32648.50	ARM	Redu. bal	58,319	72024.8	.36
28	2003	5,270,000	85	11	13700.45	ARM	Redu. bal	76,835	32853.4	.16
29	2003	3,000,000	50	10	16477.45	ARM	Redu. bal	45,682	44605.15	.22
30	2003	2,400,000	80	16	28098.05	ARM	Redu. bal	30,568	36970.8	.31
31	2003	2,960,000	78	11	2253.05	ARM	Redu. bal	43,739	6379.3	.05
32	2003	6,195,613.6	83	13	67616	ARM	Redu. bal	84,445	111556.2	.68
33	2003	9,122,649,.2	84	13	94921.45	ARM	Redu. bal	124,340	156755.7	.90
34	2003	3,825,000	85	11	30730.95	ARM	Redu. bal	55,768	65123.1	.35
35	2003	4,449,245.15	49	16	7291.20	ARM	Redu. bal	56,668	18955.85	.13
36	2003	3,480,000	77	16	35372.90	ARM	Redu. bal	44,323	46717.2	.31
37	2003	1,500,000	75	11	8644.80	ARM	Redu. Bal	21,869	21279.65	.23
38	2003	2,295,000	70	16	29738.10	ARM	Redu. bal	29,230	39397.25	.32
39	2003	11,900,865.4 5	53	19	166455.60	ARM	Redu. bal	145,215	213573.7	.66

40	2003	4,685,329.5	20	16	62988.35	ARM	Redu. bal	59,675	79460.15	.40
41	2006	10,656,752.1 5	89	19	138901.20	ARM	Redu. bal	131,550	173196.8	.79
42	2006	5,500,000	69	11	45510.05	ARM	Redu. bal	80,862	93.587.95	.50
43	2003	4,800,000	74	11	40184	ARM	Redu. bal	69,983	79284.0	.40
44	2003	1,650,000	75	16	17,079	ARM	Redu. bal	21,015	22557.65	.21
45	2003	3,000,000	51	12	22895.95	ARM	Redu. bal	40,889	45297.25	.22
46	2002	13,831,503	66	15	176188.50	ARM	Redu. bal	225,737	241892.80	.62
47	2002	1,350,000	56	17	11240.90	ARM	Redu. bal	21,571	10.771.3	.10
48	2004	1,500,000	44	16	18937.15	ARM	Redu. bal	17,852	24419.65	.21
49	2004	2,010,800	80	16	10720.85	ARM	Redu. bal	23,931	16202.3	.17
50	2004	5,188,.963	86	15	69809.85	ARM	Redu. bal	63,113	89932.9	.86
51	2004	3,500,000	88	11	31984.20	ARM	Redu. bal	48,391	67633.25	.47
52	2004	6,300,000	88	16	44440.10	ARM	Redu. bal	74,979	62596.5	.32
53	2004	6,750,000	68	14	43640.60	ARM	Redu. bal	84,189	71509	.35

54	2004	2,700,000	62	21	45848.90	ARM	Redu. bal	29,873	58913.6	.62
55	2004	5,281,545.75	106	23	18950.40	ARM	Redu. bal	57,394	25323.3	.13
56	2004	3,800,000	59	16	48609.60	ARM	Redu. bal	45,225	63.012.5	.32
57	2004	1,000,000	25	11	7712.2	ARM	Redu. Bal	13,826	15683.1	.09
58	2004	14,746,412.8 5	45	11	138398.00	ARM	Redu. bal	203,887	257819.00	.70
59	2004	4,762,247.55	100	12	44850.20	ARM	Redu. bal	63,271	75850.5	.41
60	2004	3,000,000	55	11	25285.5	ARM	Redu. bal	41,478	50379.3	.28
61	2004	11,393,276.8	57	17	163586	ARM	Redu. bal	133,064	208073	.59
62	2004	4,800,000	81	21	6704.30	ARM	Redu. bal	53,107	10822.6	.06
63	2004	2,000,000	83	21	27779.10	ARM	Redu. bal	22,128	31720.1	.21
64	2005	3,960,000	80	11	35464.60	ARM	Redu. bal	56,916	66.462.3	.36
65	2005	3,600,000	72	11	30805.7	ARM	Redu. bal	51,742	56900.7	.54
66	2005	6,700,000	74	11	62763.50	ARM	Redu. bal	96,298	118487	.40
67	2005	12,600,000	84	16	138013	ARM	Redu. bal	157,591	185264	.53

68	2005	2,992,415.55	66	16	19522.70	ARM	Redu. bal	37,426	28537.2	.16
69	2005	1,098,000	92	10	1623.20	ARM	Redu. bal	16,498	5410	.07
70	2005	3,500,000	64	16	15301.70	ARM	Redu. bal	43,775	26850	.15
71	2005	5,400,000	45	11	47900	ARM	Redu. bal	77,614	92809.5	.60
72	2005	3,960,000	81	13	43782.30	ARM	Redu. bal	53,117	70408.7	.40
73	2005	18,950,369.2 5	126	18	113200	ARM	Redu. bal	229,589	169551	.60
74	2005	6,000,000	43	11	50122.60	ARM	Redu. bal	86,237	109926	.29
75	2005	2,880,000	51	19	23231.50	ARM	Redu. bal	34,449	27071.4	.18
76	2005	3,800,000	84	9	19292.4	ARM	Redu. bal	60,213	51811.9	.28
77	2005	4,643,818.3	42	19	66016.6	ARM	Redu. Bal	55,547	78253.1	.39
78	2005	5,737,500	82	11	51341.7	ARM	Redu. bal	82,464	110061	.40
79	2005	2,200,000	49	11	20846.5	ARM	Redu. bal	31,620	39.211.00	.22
80	2005	10,000,000	80	11	95853	ARM	Redu. bal	143,729	183.938.00	.49
81	2005	6,700,000	34	13	52406.10	ARM	Redu. bal	89,870	80912.7	.32

82	2005	5000000	71	16	44830.3	ARM	Redu. bal	62,536	61.485.00	.32
83	2005	7664452.68	128	18	110972	ARM	Redu. bal	92,857	115490.00	.62
84	2005	1.500.000	60	16	16597.7	ARM	Redu. bal	18,760	17569.7	.13
85	2005	2.000.000	80	16	30592.80	ARM	Redu. bal	25,014	31.884.3	.26
86	2005	8,000,000	84	10	90003.60	ARM	Redu. bal	120,204	200.306.00	.70
87	2006	2.147.882	54	11	19490.30	ARM	Redu. bal	31,578	37.205.3	.29
88	2006	9.000.000	56	11	35628.30	ARM	Redu. bal	132,320	68057	.21
89	2006	1.300.000	24	16	15973.30	ARM	Redu. bal	16,734	21.273.3	.18
90	2006	6.400.000	80	11	61724.80	ARM	Redu. bal	94,094	112.524.00	.55
91	2006	700.000	18	11	6881.8	ARM	Redu. bal	10,291	13.483	.10
92	2006	2.000.000	12	7	4358.25	ARM	Redu. bal	37,149	41.957.7	.24
93	2007	1.000.000	20	15	3027.90	ARM	Redu. bal	12,850	12892.1	.09
94	2007	4.349.785.68	79	12	48842.30	ARM	Redu. bal	60,603	77442	.50
95	2007	2.786.075.5	73	16	38973.40	ARM	Redu. bal	35,108	54082	.32
96	2007	8.000.000	67	11	74064.80	ARM	Redu. bal	115,663	137887	.39

97	2007	5.440.879.2	64	13	65070.20	ARM	Redu. bal	73,464	99163.9	.50
98	2007	6.959.552.89	89	21	96963.10	ARM	Redu. bal	82,249	109.600.00	.52
99	2007	15.2000.000	95	11	103782	ARM	Redu. bal	219,761	193362	.51
100	2007	5.525.5000	85	11	54928.60	ARM	Redu. bal	79,887	101261	.41
101	2007	4.440.000	34	11	30420.40	ARM	Redu. bal	64,193	55629.1	.24
102	2007	4.678.178.5	78	21	68027.70	ARM	Redu. bal	4879.6	77766.7	.29
103	2007	8.000.000	89	16	93230.90	ARM	Redu. bal	100,812	119538	.40
104	2007	2.850.000	154	11	28152.70	ARM	Redu. bal	41,205	50712.2	.32
105	2007	1.885.374.75	25	15	24591.50	ARM	Redu. bal	24,227	37014.2	.27
106	2007	22.505.291	75	16	313455	ARM	Redu. bal	283,601	425103	.93
107	2007	2.714.374.14	76	26	32608.80	ARM	Redu. bal	31,081	46372	.37
108	2007	6.300.000	84	11	47954.9	ARM	Redu. bal	91,081	95811.8	.43
109	2007	900.000	49	13	7243.85	ARM	Redu. bal	12,152	11305.9	.13
110	2007	2.470.000	91	21	25322.30	ARM	Redu. bal	29,191	26471.3	.23
111	2007	2.250.000	90	21	21582.10	ARM	Redu. bal	26,591	26594.4	.22

112	2007	3.500.000	67	18	39764.40	ARM	Redu. bal	42,744	51732	.30
113	2007	5.500.000	73	13	3002.5	ARM	Redu. bal	74,263	57475.4	.26
114	2007	1.600.000	76	7	3740.55	ARM	Redu. bal	29,368	32794.2	.31
115	2007	3.300.000	87	11	33218.1	ARM	Redu. bal	47,711	61434.20	.46
116	2007	4.087.905.5	117	19	58695	ARM	Redu. bal	49,301	65882.3	.51
117	2007	4.668.928.15	69	11	47201.30	ARM	Redu. bal	67,503	85864.8	.39
118	2007	2.998.928.7	60	11	1185.40	ARM	Redu. bal	43,358	6693.65	.04
119	2007	3.000.000	46	11	28947.90	ARM	Redu. bal	43,373	53266.7	.27
120	2007	6.412.000	61	11	57105.30	ARM	Redu. bal	92,704	68401.3	.34
121	2007	7.500.000	10	14	85474.80	ARM	Redu. bal	98,601	126087	.44
122	2008	6.300.000	84	11	64092.40	ARM	Redu. bal	97,312	113516	.41
123	2008	5.225.000	95	11	67483.60	ARM	Redu. bal	80,707	71270.5	.48
124	2008	2.900.000	56	11	20122.20	ARM	Redu. bal	44,794	36613.1	.20
125	2008	2,543,364.65	32	24	37121.60	ARM	Redu. bal	32,510	40339.8	.20
126	2008	4000000	73	11	36545.30	ARM	Redu. bal	61,785	65158.9	.35

127	2008	3000000	65	13	8365.9	ARM	Redu. bal	43,611	16520.5	.09
128	2008	4.400.000	80	11	42440.6	ARM	Redu. bal	67,964	77398.2	.40
129	2008	2.400.000	71	16	30337.3	ARM	Redu. bal	32,875	38056.8	.26
130	2008	3.400.000	72	11	35219	ARM	Redu. bal	52,517	65811.60	.30
131	2008	5.500.000	73	16	70621.6	ARM	Redu. bal	75,339	88766.5	.35
132	2008	1.800.000	28	12	18906.4	ARM	Redu. bal	26,900	35702.2	.13
133	2008	4.018.855.7	57	12	48265.40	ARM	Redu. bal	60,059	85862.5	.50
134	2008	2.500.000	83	22	34248.3	ARM	Redu. bal	32,283	39696.8	.25
135	2008	4.000.000	75	16	53290.6	ARM	Redu. bal	54,792	66015	.24
136	2008	3.500.000	92	12	22655.4	ARM	Redu. bal	52,305	36308.8	.18
137	2008	2.741.375.25	65	6	6510.15	ARM	Redu. bal	57,817	70039.6	.28
138	2008	2.500.000	92	21	23092.80	ARM	Redu. bal	32,491	26541.5	.18
139	2008	800.000	16	13	9503.2	ARM	Redu. bal	11,629	14608.85	.08
140	2008	7000000	35	14	88746.40	ARM	Redu. bal	99,422	127664.00	.40
141	2008	400,000	80	16	53147.5	ARM	Redu. bal	5,479	67323	.30

142	2008	10,000,000	77	16	68038.80	ARM	Redu. bal	136,980	102518	.47
143	2008	1.948.097.8	34	11	17052.3	ARM	Redu. bal	30,091	28655.2	.19
144	2008	3.500.000	50	16	34410.9	ARM	Redu. bal	47,943	43159.55	.20
145	2008	600.000	17	9	5064.25	ARM	Redu. bal	10,118	14129	.12
146	2008	3.520.000	80	16	31396.10	ARM	Redu. bal	48,217	37416.6	.23
147	2008	800.000	47	10	864.65	ARM	Redu. bal	12,857	3402	.05
148	2008	6,773,084.7	85	25	94937.80	ARM	Redu. bal	86,226	102698	.41
149	2008	2.125.000	79	17	30534.20	ARM	Redu. bal	28,700	36467.6	.20
150	2008	7,000,000	23	11	54472.50	ARM	Redu. bal	108,124	109348	.30
151	2008	16,636,530	76	16	219102	ARM	Redu. bal	227,887	248207	.80
152	2008	3,500,000	90	21	49933.70	ARM	Redu. bal	45,487	53208.00	.28
153	2008	16.972.150	94	17	159955	ARM	Redu. bal	229,229	215850.00	.50
154	2008	3,303,306.95	97	16	43901.70	ARM	Redu. bal	45,248	56383.6	.66
155	2008	3,500,000	70	18	26241.60	ARM	Redu. bal	46,707	31730.10	.17
156	2009	7,464,696.95	43	21	92310.3	ARM	Redu. bal	96,458	104426.00	.27

157	2009	2.600.000	47	12	30024.20	ARM	Redu. bal	38,688	48805.9	.33
158	2009	5.500.000	38	16	68471.10	ARM	Redu. bal	74,956	88801.00	.28
159	2009	1.215.145	61	16	13009.50	ARM	Redu. bal	16,560	17429.6	.15
160	2009	6.375.000	75	20	74829	ARM	Redu. bal	83,004	87603.4	.32
161	2009	6.035.000	80	20	86331.80	ARM	Redu. bal	78,577	102858.00	.41
162	2009	3.230.000	95	11	33023.40	ARM	Redu. bal	49,689	52301.2	.83
163	2009	400.000	36	11	38592.3	ARM	Redu. bal	6,153	65643.2	.24
164	2009	25.800.000	92	21	140427	ARM	Redu. bal	333,385	155724.00	.32
165	2009	5.000.000	81	12	46609.2	ARM	Redu. bal	74,401	71788.7	.26
166	2009	2.500.000	43	11	27524.90	ARM	Redu. bal	38,459	45483.5	.19
167	2009	3.420.000	53	21	48908.10	ARM	Redu. bal	44,192	57218.4	.35
168	2009	6.580.000	78	21	93935	ARM	Redu. bal	85,026	102939.00	.36
169	2009	1,266,193.95	23	11	14759.9	ARM	Redu. bal	19,478	25740.9	.12
170	2009	2.450.000	70	15	32787.7	ARM	Redu. bal	33,954	41375.9	.24
171	2009	4.300.000	80	13	19982.3	ARM	Redu. bal	62,227	34176.1	.25

172	2009	1.620.000	81	11	17545.6	ARM	Redu. bal	24,921	30290.1	.40
173	2009	7.000.000	90	11	78841.10	ARM	Redu. bal	107,686	134419.00	.54
174	2009	1.500.000	27	16	15595.7	ARM	Redu. bal	20,442	20646.9	.09
175	2009	17.687.383.8 5	71	13	231309	ARM	Redu. bal	255,962	327187	.99
176	2009	1.400.000	37	6	3761.3	ARM	Redu. bal	29,451	30131.3	.17
177	2009	500.000	10	6	570.15	ARM	Redu. bal	10,518	4794.6	.03
178	2009	2.960.000	80	13	37096.70	ARM	Redu. bal	42,835	52175.00	.27
179	2009	12.500.000	69	22	156411	ARM	Redu. bal	160,476	177188.00	.51
180	2009	6.506.774.45	22	15	88439.3	ARM	Redu. bal	90,178	113475	.35
181	2009	3,420,000	90	16	46211	ARM	Redu. bal	46,609	59304	.70
182	2009	8000000	57	21	93047.70	ARM	Redu. bal	103,375	101070	.37
183	2009	4,500,000	94	11	37017.6	ARM	Redu. bal	69,226	59670	.36
184	2009	5.850.000	78	16	50098.8	ARM	Redu. bal	79,726	64064.2	.22
185	2009	6.755.806.95	84	23	19556.8	ARM	Redu. bal	86,248	24044.00	.10

186	2009	2.500.000	78	11	18071.30	ARM	Redu. bal	38,459	35342.6	.24
187	2009	5.000.000	69	21	68956.70	ARM	Redu. bal	64,609	77798.2	.31
188	2009	5.800.000	50	12	34305.40	ARM	Redu. bal	86,305	67996.3	.24
189	2009	6.000.000	80	17	79963.2	ARM	Redu. bal	80,613	99828.4	.33
190	2009	5.454.766.2	86	15	63819.10	ARM	Redu. bal	75,598	88446.4	.38
191	2009	3.000.000		12	28360.30	ARM	Redu. bal	44,640	51871.9	.38
192	2009	7.500.000	68	21	108440	ARM	Redu. bal	96,914	119947.00	.44
193	2009	9.350.000	85	21	124799	ARM	Redu. bal	120,819	141253	.48
194	2010	5.510.000	92	21	79204.6	ARM	Redu. bal	67,531	85779.6	.43
195	2010	8.721.624.65	65	17	95174.1	ARM	Redu. bal	111,682	110263	.39
196	2010	21.185.000	92	16	194829	ARM	Redu. bal	275,588	264616	.75
197	2010	1.300.000	50	11	4268.85	ARM	Redu. bal	19,272	10117.3	.12
198	2010	2.000.000	29	11	21721.6	ARM	Redu. bal	29,650	33542.9	.15
199	2010	4.500.000	67	16	62345.8	ARM	Redu. bal	58,538	73857.8	.30
200	2010	2.700.000	82	18	26561.6	ARM	Redu. bal	34,109	30932.60	.18

201	2010	10.200.000	68	16	135173	ARM	Redu. bal	13,268	157659	.53
202	2010	5.225.000	95	16	73942.2	ARM	Redu. bal	67,970	84787.3	.42
203	2010	2.000.000	57	21	11683.5	ARM	Redu. bal	24,512	14961.3	.15
204	2010	2.100.000	29	13	27974.6	ARM	Redu. bal	29,161	38632.4	.15
205	2010	6.000.000	71	13	70663.1	ARM	Redu. bal	83,319	92825.2	.33
206	2010	9.211.393.3	88	16	134366	ARM	Redu. bal	119,827	154530.00	.62
207	2010	7.000.000	82	21	101707	ARM	Redu. bal	85,793	110412.00	.40
208	2010	6.700.000	67	8	50607.7	ARM	Redu. bal	116,008	111573	.38
209	2010	20,000,000	50	16	286256	ARM	Redu. bal	260,173	327990	.73
210	2010	7430000	87	16	112531	ARM	Redu. bal	96,654	116800	.78
211	2010	7.650.000	61	16	80014.6	ARM	Redu. bal	99,516	98738.5	.36
212	2010	7.600.000	37	15	92111.7	ARM	Redu. bal	100,702	96882.65	.35
213	2010	4.600.000	92	19	55972.1	ARM	Redu. bal	57,440	63007.8	.32
214	2010	4.500.000	64	16	27147.6	ARM	Redu. bal	58,538	69620.3	.40
215	2010	5.760.000	58	16	79028.8	ARM	Redu. bal	74,929	90858.3	.32

216	2010	34.200.000	90	11	427806	ARM	Redu. bal	509,017	572335.00	.85
217	2010	3.800.000	80	21	56620.9	ARM	Redu. bal	46,573	61403.30	.23
218	2010	6.500.000	93	21	90461.1	ARM	Redu. bal	79,665	99882.00	.61
219	2010	2.375.000	68	21	35041.30	ARM	Redu. bal	29,108	38211.00	.31
220	2010	7.350.000	67	13	99625.6	ARM	Redu. bal	102,066	123634.00	.53
221	2010	1.270.000	22	8	14860.7	ARM	Redu. bal	21,989	29315.00	.18
222	2010	10.200.000	20	13	141172	ARM	Redu. bal	141,642	171087.00	.78
223	2010	2.200.000	55	21	32361.40	ARM	Redu. bal	26,963	35104.80	.20
224	2010	650.000	16	10	8370.2	ARM	Redu. bal	10,053	13850.7	.10
225	2010	6.460.000	62	13	85932.9	ARM	Redu. bal	89,707	112641.00	.40
226	2010	10.000.000	73	11	107574	ARM	Redu. bal	148,250	173018.00	.58
227	2010	1.000.000	10	6	7298.8	ARM	Redu. bal	20,552	25986.2	.13
228	2010	5.200.000	69	21	51247.7	ARM	Redu. bal	63,732	59128.2	.38
229	2010	7.500.000	58	16	107908	ARM	Redu. bal	97,564	128505	.45
230	2011	10.000.000	67	16	143827	ARM	Redu. bal	173,946	169796.00	.54

231	2011	21.496.899.2	83	21	214,909	ARM	Redu. bal	363,931	300203.25	.78
232	2011	5,004,000	87	21	42704.4	ARM	Redu. bal	84,715	51225.2	.33
233	2011	3.000.000	40	12	40698.2	ARM	Redu. bal	55,098	56027.6	.34
234	2011	6.000.000	77	21	55594.3	ARM	Redu. bal	101,576	63798.6	.34
235	2011	7.000.000	84	11	77867.6	ARM	Redu. bal	131,504	102210.00	.41
236	2011	3.825.000	85	16	44792.9	ARM	Redu. bal	66,534	47166.8	.21
237	2011	4.000.000	89	21	46312.2	ARM	Redu. bal	67,717	53525.10	.27
238	2011	4.675.000	85	11	63393.1	ARM	Redu. bal	87,826	90836.2	.63
239	2011	5.100.000	85	22	64610.1	ARM	Redu. bal	86,096	72280.20	.33
240	2011	5.900.000	51	17	87876.4	ARM	Redu. bal	101,828	27886.6	.30
241	2011	4.300.00	57	16	46094	ARM	Redu. bal	74,797	54303.4	.25
242	2011	1.665.000	83	21	4106	ARM	Redu. bal	28,187	7939.15	.11
243	2011	6.373.000	80	21	97176.5	ARM	Redu. bal	107,891	115966.00	.44
244	2011	7.200.000	76	16	102016	ARM	Redu. bal	125,241	257970.40	.52
245	2011	15.989.333.7	40	20	190,116	ARM	Redu. bal	271,630	56328.8	.64

246	2011	2.600.000	65	8	33129.2	ARM	Redu. bal	54,478	110428.00	.66
247	2011	6.000.000	56	19	88199.9	ARM	Redu. bal	102,362	42483.3	.39
248	2011	2.300.000	26	11	31606.9	ARM	Redu. bal	43,208	19019.70	.17
249	2011	1.000.000	29	9	12454.2	ARM	Redu. bal	20,026	85949.20	.24
250	2011	5.000.000	50	16	70139.2	ARM	Redu. bal	86,973	215590.00	.40
251	2011	14.250.000	89	21	198900	ARM	Redu. bal	241,245	66558.1	.81
252	2011	4,144,000	60	21	60654.8	ARM	Redu. bal	70,155	156574.00	.40
253	2011	11.390.71.25	91	21	140233	ARM	Redu. bal	192,826	67230.00	.55
254	2011	4.480.000	77	16	57609.4	ARM	Redu. bal	77,928	30262.90	.38
255	2011	1.700.000	17	16	24000.4	ARM	Redu. bal	29,570	39654.40	.12
256	2011	2.125.000	82	16	30901.5	ARM	Redu. bal	36,963	21112.10	.7
257	2011	1.000.000	3	11	14567.1	ARM	Redu. bal	18,786	176596.00	.11
258	2011	12.000.000	80	21	157900	ARM	Redu. bal	203,153	34557.7	.56
259	2011	4.140.000	86	21	31163.8	ARM	Redu. bal	70,088	143405.00	.20
260	2011	9.000.000	72	16	125788	ARM	Redu. bal	156,551	89693.1	.40

261	2011	8.375.217.65	80	17	81805.6	ARM	Redu. bal	144,548	316888	.3
262	2011	18.350.000	46	16	265116	ARM	Redu. bal	319,192	99407.20	.70
263	2011	5.400.000	36	11	73363.2	ARM	Redu. bal	101,446	29782.60	.33
264	2011	2.000.000	80	16	25426.7	ARM	Redu. bal	34,789	66542.80	.26
265	2012	2,810,121	40	7	35852.6	ARM	Redu. bal	59,062	46969.4	.24
266	2012	2,500,000	38	11	35198.9	ARM	Redu. bal	43,610	182593.30	.38
267	2012	10,000,000	54	11	140906	ARM	Redu. bal	174,441	82143.5	.55
268	2012	6,400,000		16	65413.9	ARM	Redu. bal	101,840	40913.1	.61
269	2012	2,125,000	76	11	29942	ARM	Redu. bal	37,068	36578.3	.36
270	2012	1,400,000	54	6	17210	ARM	Redu. bal	31,930	98526.7	.43
271	2012	6.000.000	15	16	85434.1	ARM	Redu. bal	95,475	111714.00	.39
272	2012	6,000,000	44	11	82862.1	ARM	Redu. bal	104,665		.42
273	2012	14.985.747.8 5	11	16	245188	ARM	Redu. bal	238,461	249289.00	.65

273	2012	9.682.600	28	21	141033	ARM	Redu. bal	147,194	158653.60	.50
274	2012	5.937.500	95	21	85697.5	ARM	Redu. bal	91,203	93341.6	.47
276	2012	4.680.000	85	21	58661.4	ARM	Redu. bal	71,887	63309.9	.44
277	2012	9.000.000	60	11	63497.8	ARM	Redu. bal	156,997	87461.6	.32
278	2012	11.750.000	38	15	166084	ARM	Redu. bal	189,224	176653.00	.47
279	2012	700.000	12	18	10071.9	ARM	Redu. bal	10,938	11799.70	.08
280	2012	9.400.000	82	19	135556	ARM	Redu. bal	145,895	148832.00	.60
281	2012	2.525.000	84	21	39169.9	ARM	Redu. bal	38,785	42523.7	.57
282	2012	3.500.000	35	19	51155	ARM	Redu. bal	54,322	62534.5	.38
283	2012	6.039.391	90	17	100545	ARM	Redu. bal	95,155	106780	.45
284	2012	12.000.000	86	22	178431	ARM	Redu. bal	183,604	191662.00	.70
285	2012	12.600.000	90	17	187014	ARM	Redu. bal	198,522	202446.00	.67
286	2012	8.800.000	73	11	128288	ARM	Redu. bal	153,508	155997	.57
287	2012	5.000.000	77	11	77177.6	ARM	Redu. bal	87,220	96046.10	.38
288	2012	9.000.000	69	21	134432	ARM	Redu. bal	138,244	150114.00	.60

289	2012	6.000.000	20	11	87837	ARM	Redu. bal	104,665	105987.00	.40
290	2012	1.200.000	18	21	17954.6	ARM	Redu. bal	18,432	19557.9	.13
291	2012	4.000.000	11%	6	7049	ARM	Redu. bal	91,231	54443.25	.21
292	2012	1.500.000	25	7	5250	ARM	Redu. bal	31,526	35517.95	.26
293	2012	10.000.000	69	12	35,000	ARM	Redu. bal	169,911	179230.95	.72
294	2012	22.500.000	83	16	78,750	ARM	Redu. bal	358,032	375935.10	.78
295	2012	2.000.000	57	6	7000	ARM	Redu. bal	45,615	51778.70	.61
296	2012	6.000.000	75	16	21,000	ARM	Redu. bal	95,475	99359.60	.37
297	2012	3.000.000	6	7	33,000	ARM	Redu. bal	63,053	84232.40	.24
298	2012	1.500.000	27	17	16500	ARM	Redu. bal	23,633	26305.35	.19
299	2012	700.000	12	9	7700	ARM	Redu. bal	13,129	16950.40	.18
300	2012	24,000,000	40	18	264,000	ARM	Redu. bal	375,045	392319.55	.92
301	2000	2,380,000	63	10	1989.95	ARM	Redu. bal	45,365	19148.35	.11
302	2000	7,197,341.75	76	15	63758.75	ARM	Redu. bal	124,284	108518.8	.50
303	2000	1.600.000.00	68	17	14048.85	ARM	Redu. bal	27,128	21119.95	.15

304	2000	5568789.00	76	15	41598.55	ARM	Redu. bal	96,162	70148.00	.29
305	2000	9272565.00	120	17	116692.10	ARM	Redu. bal	157,221	173825.80	.59
306	2001	2.100.000.00	71	11	4444.55	ARM	Redu. bal	38,7387	15890.10	.12
307	2000	3.694286.00	130	14	33500.65	ARM	Redu. bal	64,586	60898.55	.58
308	2000	6.261.054.00	90	16	69677.05	ARM	Redu. bal	107,034	102440.20	.34
309	2000	740917.60	63	16	1947.50	ARM	Redu. bal	12,666	5861.65	.06
310	2000	1.600.000	53	16	17050.30	ARM	Redu. bal	27,352	25921.2	.20
311	2000	6.000.000	50	16	56064.05	ARM	Redu. bal	102,571	87557.10	.28
312	2000	4.375.966.30	80	20	54376.30	ARM	Redu. bal	72,968	63718.5	.22
313	2002	650.000	65	11	3437.35	ARM	Redu. bal	11,467	10906.4	.15
314	2002	2.500.000	63	16	11549.70	ARM	Redu. bal	40,331	17626.00	.10
315	2002	4.292.323.6	148	16	57368.45	ARM	Redu. bal	69,245	78496.95	.51
316	2002	2.550.000	85	16	12456.35	ARM	Redu. bal	41,137	19500.55	.16
317	2003	2.502.205.2	70	17	6041.85	ARM	Redu. bal	31,349	12384.2	.09
318	2003	2.018.725	70	9	1918.50	ARM	Redu. bal	32,385	32914.35	.20

319	2002	6.040.010.8	81	17	72914.85	ARM	Redu. bal	96,512	96944.45	.28
320	2002	3.825.000	70	9	42455.75	ARM	Redu. bal	53,519	61428.35	.37
321	2002	2.880.000	80	16	4660.2	ARM	Redu. bal	46,461	12768.20	.06
322	2002	4.500.000	33	16	32049.90	ARM	Redu. bal	72,595	48352.05	.18
323	2003	1.160.000	39	10	6594	ARM	Redu. bal	17,663	19197.5	.10
324	2001	2.500.000	32	15	8837.35	ARM	Redu. bal	42,986	27322.45	.11
325	2001	6.064.740	40	20	45544.60	ARM	Redu. bal	100,654	59875.5	.23
326	2001	4.920.972.75	77	15	35865.40	ARM	Redu. bal	84,614	104464.70	.34
327	2001	2000000	57	15	1830.65	ARM	Redu. bal	34,389	7154.9	.03
328	2001	4727.030	56	16	59203.10	ARM	Redu. bal	80,457	81029.85	.32
329	2001	3,500.000	54	19	5489.80	ARM	Redu. bal	58,353	72400.4	.28
330	2001	9750.000	75	12	74443.70	ARM	Redu. bal	175,681	170437.5	.58
331	2001	3,429,938.1	69	13	19064.45	ARM	Redu. bal	60,642	35642.25	.16
332	2001	4,250.000	85	16	49838.55	ARM	Redu. bal	72,337	68335.30	.30
333	2001	4,171,215.5	72	13	38997.30	ARM	Redu. bal	73,747	76104.9	.29

334	2001	5,873,691	59	11	38305.55	ARM	Redu. bal	108,352	109228.00	.38
335	2001	2,400,000	80	16	27780.90	ARM	Redu. bal	40,849	38696.20	.26
336	2001	4,740,000	79	15	34681.05	ARM	Redu. bal	81,502	51671.35	.20
337	2001	1,350,000	84	16	14670.65	ARM	Redu. bal	22,977	19975.55	.16
338	2001	6,484,963.65	81	28	85500.60	ARM	Redu. bal	105,851	90435.05	.34
339	2001	3,665,794.45	64	17	28462.55	ARM	Redu. bal	61,878	62609.55	.43
340	2001	1,625,000	54	9	3012.55	ARM	Redu. bal	32,021	20804.10	.13
341	2000	7,200,000	55	16	82667.35	ARM	Redu. bal	123,086	121758.60	.34
342	2000	4,250,000	85	15	35385	ARM	Redu. bal	73,389	61107.90	.27
343	2000	2,800,000	80	11	13363.10	ARM	Redu. bal	51,841	36235.15	.16
344	2000	3600,000	80	16	14417.45	ARM	Redu. bal	61,543	34900.55	.21
345	2000	2,850,000	75	9	6530.55	ARM	Redu. bal	56,343	39857.50	.20
346	2000	6721684.20	42	19	89064.80	ARM	Redu. bal	112,588	117479.20	.50
347	2000	3,040,000	80	17	35693.70	ARM	Redu. bal	51,544	49560.65	.37
348	2003	5,7637,500	85	16	23620.55	ARM	Redu. bal	73,076	33906.25	.15

349	2003	5800,000	68	16	61300	ARM	Redu. bal	73,872	81525.35	.30
350	2004	1,000,000	67	16	11719.20	ARM	Redu. bal	11,901	17573.95	.23
351	2000	2,189,112	78	27	10078.05	ARM	Redu. bal	35,944	17,357	.12
352	2000	3,120,000	69	15	24209.05	ARM	Redu. bal	53,876	50,173	.32
353	2000	2,018,118	53	15	44732	ARM	Redu. bal	34,849	38,270	.21

APPENDIX D: HOUSEHOLDS PROPERTY DATA

Case No.	Location	Plot size(m²)	Land value (kshs)	Type of house	House size (ft²)	Construction cost(kshs)	Property transfer cost	Developer's profit (kshs)	Profit in %
1	Uhuru Gardens- Langata	184	3,900,000	Maisonatte	1375	4,000,000	575,000	3,600,000	45%
2	Kilimani	150	6,500,000	Apartment	1620	4,000,000	700,000	3,500,000	30%
3	Kamarock estate	177	2,100,000	Bungalow	680	960,000	200,000	940,000	30%
4	Upper Hill	148	7,200,000	Flat	1600	4,000,000	750,000	3,800,000	35%
5	Komarock	49	790,000	Flat	530	795,000	130,000	1,000,000	60%
6	Friends Court South C	136	3,600,000	Maisonatte	1208	4600000	550,000	3,800,000	50%
7	Simba Court Kariakor	218	4,700,000	Maisonatte	1452	4,400,000	500,000	900,000	10%
8	Donholm	111	1,400,000	Maisonatte	1335	3,700,000	325,000	1,400,000	30%
9	Kileleshwa	237	10,200,000	Town House	2558	10,200,000	1,400,000	750,0000	40%
10	Park Side Villa-msa road	139	3,000,000	Maisonette	1246	4,400,000	700,000	6,600,000	90%
11	Denis prit kilimani	288	12,400,000	Maisonette	1553	7,000,000	1,400,000	8,600,000	45%
12	maziwa gardens, ngong road	144	6,200,000	Apartment	1548	4,900,000	750,000	490,0000	50%
13	Komarock	177	2,300,000	Bungalow	624	1,560,000	225,000	640,000	20%
14	Ngumo Estate	192	4,100,000	Maisonatte	1190	4,600,000	600,000	4,300,000	50%
15	Thomson Estate	171	7,400,000	Apartment	1840	4,600,000	825,000	4,500,000	40%

16	Buruburu Estate	142	2,300,000	Bungalow	1026	4,100,000	325,000	1,100,000	20%
17	Kamarock Phase IV	105	1,400,000	Maisonatte	680	2,700,000	235,000	1,600,000	50%
18	Rose Avenue Kilimani	108	6,800,000	Flat	1710	4,300,000	750,000	390,0000	35%
19	Imara Daima Estate	131	2,100,000	Bungalow	800	3,500,000	287,000	165,000	40%
20	Saika Estate	147	1,700,000	Bungalow	818	3,000,000	225,000	1,000,000	30%
21	Willow Court, Kilimani	154	6,600,000	Flat	1662	4,200,000	700,000	3,200,000	30%
22	Buruburu	176	2,800,000	Bungalow	1220	3,700,000	375,000	1,000,000	15%
23	Saika Estate	147	1,700,000	Bungalow	818	2,800,000	225,000	1,000,000	30%
24	Plains view Estate	233	5,000,000	Bungalow	1185	4,600,000	500,000	1,400,000	20%
25	Kilimani	299	9,800,000	Maisonatte, (Terraced)	1760	7,000,000	1,300,000	9,000,000	50%
26	Kileleshwa	283	11,000,000	Maisonette	1894	8,000,000	1,150,,000	4,000,000	20%
27	Kilimani	152	6,500,000	Flat	1638	4,100,000	750,000	4,400,000	40%
28	Airport View Langata	179	3,800,000	Maisonette	950	4,000,000	650,000	6,200,000	90%
29	Westlands- telposta	107	6,000,000	Maisonette	1155	5,200,000	900,000	6,800,000	60%
30	Buruburu	158	2,500,000	Bungalow	1280	3,800,000	375,000	1,200,000	20%
31	kileleshwa	173	6,500,000	Flat	1858	4,600,000	825,000	5,400,000	50%
32	Langata	150	3,200,000	Maisonette	1114	4,300,000	525,000	4,000,000	60%
33	Ngumo estate	192	4,100,000	Maisonette	1190	4,600,000	600,000	4,300,000	60%

34	Lavington west	312	12,000,000	maisonatte	1356	5,400,000	1,050,000	3,600,000	20%
35	Fedha estate	564	4,500,000	Maisonatte	1315	4,200,000	700,000	5,300,000	60%
36	Lavington west	323	12,000,000	maisonette	1496	5,400,000	1,050,000	3,600,000	20%
37	Komarock estate	123	1,600,000	maisonette	1076	2,700,000	250,000	700,000	20%
38	Moi Estate- Langata	240	5,200,000	Maisonette	1296	4,000,000	650,000	3,800,000	40%
39	Lavington-jipe close	385	15,000,000	Town house	3400	13,600,000	1,750,000	640,0000	20%
40	Westland's	480	26,000,000	Maisonette	1580	7,300,000	2,250,000	12,700,000	40%
41	Langata	298	6,400,000	Maisonette	1262	4,800,000	700,000	3,800,000	40%
42	Mountain view estate	1021	10,000,000	Bungalow	2342	9,000,000	1,300,000	7,000,000	40%
43	Ridgeways Estate	2000	20,000,000	Bungalow	3776	15,000,000	2,250,000	10,000,000	30%
44	Imara daima	124	2,100,000	Bungalow	800	3,000,000	287,000	1,650,000	40%
45	Thompson estate	152	6,500,000	Apartment	1638	4,100,000	725,000	3,900,000	40%
46	Thome Estate	1000	8,000,000	Town House	3270	15,000,000	2,150,000	20,000,000	85%
47	Savannah estate- Donholm	143	1,800,000	Bungalow	1022	3,100,000	275,000	600,000	10%
48	Buruburu	154	2,800,000	Maisonette	1220	3,7,00000	325,000	1,000,000	15%
49	Saika estate	200	1,700,000	Bungalow	818	1,800,000	225,000	1,000,000	30%
50	Komarock estate	123	1,500,000	Maisonette	1076	2,700,000	300,000	1,800,000	40%
51	South B	233	5,000,000	bungalow	1185	4,600,000	600,000	340,0000	40%
52	Kileleshwa	158	6,800,000	Flat	1710	4,300,000	800,000	4,900,000	45%

53	Gitanga road	148	6,400,000	Flat	1600	4,000,000	775,000	5,100,000	50%
54	Komarock	135	1,600,000	Bungalow	978	2,400,000	140,000	800,000	20%
55	Lavington	98	4,700,000	Flat	1055	3,600,000	500,000	2,700000	40%
56	kandara road	152	6,500,000	Flat	1640	4,100,000	700,000	3,400,000	30%
57	Langata	160	3,400,000	Maisonette	1049	4,100,000	525,000	4,000,000	60%
58	Green wood villas, Lavington	288	12,400,000	Town House	3100	12,400,000	2,250,000	20,200,000	80%
59	Five star estate	140	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
60	Ngumo Estate	192	4,100,000	Maisonette	1190	3,600,000	600,000	4,300,000	60%
61	Lavington	296	12,700,000	Bungalow	2560	10,200,000	2000000	17100000	75%
62	Five star estate	140	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
63	Imara Daima	131	2,100,000	Bungalow	800	3000000	287,000	165,0000	40%
64	Five star estate	142	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
65	Five star estate	140	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
66	Five star estate	140	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
67	Loresho Estate	2210	15,000,000	Bungalow	2652	12,000,000	2,000,000	13,000,000	50%
68	Five star estate	140	3,000,000	Semi- detached Maisonette	1765	5,300,000	650,000	4,700,000	60%
69	Komarock	100	1,200,000	Bungalow	698	2,700,000	200,000	1,100000	40%

70	Five star estate	140	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
71	Fedha estate	516	4,500,000	Maisonette	1400	4,200,000	700,000	5,300,000	60%
72	Five star estate	140	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
73	Westlands – mahiga mairu road	167	8,000,000	Apartment	1800	4,500,000	1,000,000	7,500,000	60
74	Westlands	357	15,000,000	Town house	3360	15,000,000	2,000,000	10,000,000	30%
75	Buruburu	154	2,500,000	Maisonette	1050	4,100,000	375,000	1,900,000	35%
76	Mbugani estate- south c	140	3,000,000	Maisonette	1250	3,800,000	600,000	5,200,000	75%
77	Kapiti estate- south B	211	4,500,000	Maisonette	1900	5,700,000	700,000	3,800,000	40%
78	Siaya rd, kileleshwa	232	10,000,000	Flat	2500	6,300,000	1,000,000	3,700,000	25%
79	Five star estate	142	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
80	Runda estate	2040	20,000,000	Maisonette	3000	13,500,000	2,650,000	19,500,000	60%
81	Kilimani	229	9,900,000	Maisonatte	1958	7,800000	1,550,000	13,300,000	75%
82	Kilimani	156	6,700,000	Flat	1680	4,200,000	700,000	3,100,000	30%
83	Jamhuri Estate	188	4,000,000	Maisonette	1320	4,000,000	600,000	4,000,000	50%
84	Imara Daima	210	3,400,000	Bungalow	1078	3,200,000	375,000	900000	15%
85	Imara Daima estate	126	2000000	Bungalow	1078	3200000	325000	1300000	25%
86	Emerald Court	169	7,300,000	Apartment	1820	4,600,000	750,000	3,000,000	25%
87	Buruburu	144	2,300,000	Maisonette	1020	3,000,000	340,000	1,500,000	30%

88	Westlands	349	15,000,000	Town house	2390	10,000,000	1,750,000	10,000,000	40%
89	Donholm estate	198	2,600,000	Bungalow	1360	3,500,000	375,000	1,400,000	25%
90	Sun valley estate- langata	200	4,000,000	Maisonette	1248	3,700,000	550,000	3,300,000	40%
91	Juja Road- ushirika estate	182	2,900,000	maisonette	1168	4,100,000	500,000	2,600,000	35%
92	Mtama road parklands	89	4,800,000	Town House	1015	3,500000	600,000	4,700,000	60%
93	Buruburu phase 5	147	2,400,000	Maisonette	1090	3,800,000	350,000	1,300,000	25%
94	Buruburu phase 5	156	2,400,000	Maisonette	1280	3,800,000	375,000	1,300,000	25%
95	Ngumo estate	192	4,100,000	Maisonette	1190	4,600000	575,000	4,300,000	60%
96	Mountain view estate	1000	10,000,000	Bungalow	2100	9,000,000	1,000,000	700,000	40%
97	Dam estate- Lang'ata	139	3,000,000	Maisonette	1160	4,500000	600,000	550,0000	85%
98	Lang'ata estate	180	3,900,000	Maisonette	1050	4,200,000	500,000	2,900,000	40%
99	Karen/ langata	2000	18,000,000	Town House	4378	20,000,000	2,500,000	12,000,000	30%
100	Venice Court	125	5,400,000	Flat	1350	3,400,000	650,000	4,200000	50%
101	Lavington	181	7,800,000	Flat	1950	4,900,000	900,000	5,300,000	40%
102	Park side villas, msa rd	195	4,200,000	Maisonette	1500	4,500,000	650,000	4,300,000	50%
103	Thompson estate	283	12,000,000	Maisonette	1872	7,500,000	1,300,000	6,500,000	35%

104	Imara Daima	210	3,400,000	Bungalow	1078	3,200,000	375,000	900,000	15%
105	Donholm- Green fields	147	1,900,000	Maisonette	1335	3,800,000	375,000	1,800,000	30%
106	Lavington	693	20,000,000	Town House	3707	15,000,000	2,250,000	10,000,000	30%
107	Donholm-Savannah	163	2,100,000	Bungalow.	840	2,400,000	275,000	1,000,000	20%
108	Apartment	128	5,500,000	Apartment	1380	3,500,000	675,000	4,500,000	50%
109	Komarock	112	1,300,000	Bungalow	624	1,600,000	175,000	600,000	20%
110	Imara Daima	124	2,000,000	Bungalow	800	2,400,000	287,500	1,600,000	40%
111	Sun Rise park- Mombasa road	70	1,700,000	Flat	750	1,125,000	275,000	2,700,000	95%
112	Five star estate	140	3,000,000	Maisonette	1765	5,300,000	550,000	4,700,000	60%
113	Orchard court	130	5,600,000	Flat	1400	3,500,000	700,000	4,900,000	55%
114	Komarock	135	1,600,000	Bungalow	1078	2700000	300000	1700000	40%
115	Buruburu	154	2,500,000	Maisonette	1050	3,000,000	350,000	1,500,000	30%
116	Buruburu	154	2,500,000	Maisonette	1050	3,000,000	350,000	1,500,000	30%
117	Kileleshwa	175	7,500,000	Flat	1880	4,700,000	750,000	2,800,000	25%
118	Mugoya south C	147	3,200,000	Maisonette	1400	4,200,000	700,000	6,600000	90%
119	High View	137	5,900,000	Flat	1483	3,700,000	650,000	3,400,000	35%
120	Park side villas- msa rd	217	4,700,000	Maisonette	1500	4,500,000	700,000	4,800,000	50%

121	Rosslyn estate	1986	20,000,000	Town House	5595	25,000,000	4,250,000	40,000,000	85%
122	Apartment	150	6,500,000	Apartment	1620	4,100,000	700,000	3,400,000	30%
123	Buruburu	144	2,300,000	Maisonette	848	2,500,000	325,000	1,800,000	40%
124	Kileleshwa	177	7,600,000	Maisonette	1650	6,600,000	1,050,000	6,800,000	50
125	Langata	180	3,900,000	Maisonette	1049	3,200,000	500,000	2,900,000	40%
126	Upper hill, posta flats	145	6,200,000	Flat	1558	3,900,000	700,000	3,900,000	40%
127	Simba Villas	88	1,200,000	Maisonette	950	1,400,000	275,000	2,900,000	110%
128	Mombasa Road	120	3,700,000	Maisonette	1050	500,000	500,000	2,500,000	40%
129	Buruburu	144	2,300,000	Maisonette	912	2,700,000	325,000	1,500,000	30%
130	Dam estate	139	3,000,000	Maisonette	1160	3,500,000	600,000	5,500,000	85%
131	Apartment	175	7,500,000	Apartment	1892	4,700,000	750,000	2,800,000	25%
132	Maisonette	260	11,000,000	Maisonette	1260	5,000,000	1,050,000	5,000,000	30%
133	Jacaranda donholm	238	3,000,000	Maisonette	1265	4,900,000	600,000	4,100,000	50%
134	Greenfields	132	1,700,000	Maisonette	1318	3,700,000	325,000	1,100,000	20%
135	Kilimani	250	11000000	Maisonette	1368	5500000	1050000	4500000	27%
136	Jacaranda Donholm	231	3,000,000	Maisonette	1625	4,900,000	650,000	4,100,000	50%
137	Santack estate	149	3,200,000	Bungalow	603	2,800,000	325,000	1,500,000	30%
138	Imara Daima	123	2,000,000	Bungalow	808	2,400,000	287,500	1,350,000	30%
139	Baraka estate	180	2,300,000	Maisonette	1628	4,500,000	375,000	700,000	10%
140	River side drive	304	13,000,000	Maisonette	1408	5,600,000	1,750,000	16,400,000	85%

141	South C	140	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
142	Umoja	43	500,000	Flat	458	690,000	110,000	810,000	70%
143	Prudential	154	2,500,000	Bungalow	1039	2,900,000	350,000	1,600,000	30%
144	Astra close	156	7,000,000	Apartment	1680	4,200,000	675,000	2,300,000	20%
145	Tena estate	200	2,200,000	Bungalow	943	2,600,000	300,000	1,200,000	25%
146	Honey suckle	171	2,000,000	Maisonette	1382	4,000,000	400,000	2,000,000	35%
147	Komarock	177	1,900,000	Bungalow	820	2,100,000	215,000	300,000	10%
148	Eagle plains estate- south c	220	4,700,000	Maisonette	1800	5,400,000	750,000	4,900,000	50%
149	south B	99	2,100,000	Flat	1065	1,800,000	300,000	2,100,000	55%
150	lavington Amboseli estate	533	17,000,000	Town House	2422	9,600,000	2,250,000	18,400,000	70%
151	Karen/langata- kufunga rd	1912	20,000,000	Town House	3900	15,600,000	2,650,000	17,400,000	50%
152	Lang'ata	190	4,000,000	Maisonette	1800	5,400,000	500,000	600,000	6%
153	Lavington	693	25,000,000	Town House	3707	15,000,000	2,500,000	10,000,000	25%
154	Moi estate langata	240	5,000,000	Bungalow	1296	3,900,000	600,000	3,100,000	35%
155	Villa franca estate	192	3,100,000	Maisonette	1380	3,900,000	425,000	1,500,000	20%
156	Karen	1993	18,000,000	Bungalow	2848	11,000,000	2,300,000	17,000,000	60%
157	Donholm	147	1,900,000	Bungalow	1360	3,800,000	350,000	1,300,000	25%

158	Kilimani	229	9,000,000	Town House	2588	10,300,000	1,300,000	6,700,000	35%
159	Old donholm	600	5,000,000	Bungalow	871	2,400,000	500,000	2,600,000	35%
160	Tarino court-	154	6,500,000	Apartment	1662	4,200,000	700,000	3,300,000	30%
161	Hurlingham	130	5,500,000	Flat	1400	3,500,000	700,000	5,000,000	55%
162	Komarock	135	1,600,000	Maisonette	1076	2,700,000	250,000	700,000	15%
163	Vogueville	181	8,000,000	Flat	1950	5,000,000	750,000	2,000,000	15%
164	New Muthaiga	2687	20,000,000	Bungalow	3257	13,000,000	2,300,000	13,000,000	40%
165	Wado Apartments	148	6,000,000	Flat	1600	4,000,000	675,000	3,500,000	35%
166	kirichwa road	156	7,000,000	Flat	1680	4,000,000	675,000	2,500,000	25%
167	Buruburu	144	2,300,000	Maisonette	848	2,500,000	350,000	2,200,000	50%
168	Balozi estate	353	9,000,000	Maisonette	2665	9,000,000	1,050,000	3,000,000	15%
169	Nairobi west	125	2,700,000	Maisonette	928	3,800,000	500,000	4,500,000	80%
170	Madaraka estate	135	3,000,000	Flat	1453	3,000,000	325,000	500,000	10%
171	United housing estate south c	162	3,500,000	Maisonette	1190	4,600,000	500,000	2,900,000	40%
172	Makadara	72	1,200,000	Flat	720	1,000,000	175,000	1,300,000	60%
173	Waterfront Gardens	171	7,000,000	Maisonette	1747	7,000,000	850,000	3,000,000	20%
174	South B	159	3,500,000	Maisonette	1030	3,100,000	500,000	3,400,000	50%
175	Karen-Banda lane	2024	18,000,000	Bungalow	4225	17,000,000	3,000,000	25,000,000	70%
176	Ushirika estate	165	3,900,000	Maisonette	1168	3,500,000	500,000	2,600,000	35%

177	Unique estates, embakasi	88	1,100,000	Flat	950	1,400,000	275,000	3,000,000	120%
178	Kileleshwa- telposta	83	3,500,000	Flat	889	2,200,000	400,000	2,300,000	40%
179	Thomson estate	326	14,000,000	Town House	2958	12,000,000	2,250,000	19,000,000	70%
180	Westlands	473	18,000,000	Maisonette	3360	13,000,000	2,250,000	14,000,000	45%
181	Komarock	144	1,700,000	Maisonette	1549	3,200,000	300,000	1,100,000	20%
182	Kilimani	204	9,000,000	Flat	2200	5,500,000	1,100,000	7,500,000	50%
183	Race course	219	4,500,000	Maisonette	1452	4,000,000	500,000	1,500,000	20%
184	Kilimani estate	361	13,000,000	Maisonette	2558	10,000,000	1,300,000	3,000,000	15%
185	Ring Road. Riverside	102	4,000,000	Flat	1100	3,700,000	600,000	5,300,000	80%
186	Unique estates	88	1,100,000	Flat	950	1,400,000	275,000	3,000,000	120%
187	Upper Hill	151	6,500,000	Flat	1620	4,000,000	700,000	3,500,000	30%
188	Mac Apartments	156	6,500,000	Apartment	1680	4,000,000	700,000	3,500,000	30%
189	kita Gardens- kileleshwa	158	7,000,000	Flat	1710	4,200,000	750,000	3,800,000	35%
190	Riverside Drive	2211	15,000,000	Bungalow	3300	12,000,000	1,750,000	8,000,000	30%
191	Kimathi Estate	223	3,600,000	Bungalow	759	2,100,000	375,000	1,800,000	30%
192	Thompson Estate	171	7,000,000	Flat	1840	4,600,000	800,000	4,400,000	40%
193	Thompson Estate	171	7,000,000	Flat	1840	4,600,000	800,000	440,0000	40%
194	Honey suckle	170	2,000,000	Maisonette	1382	4,000,000	440,000	2,000,000	35%

195	Thomson Estate	198	8500000	Flat	2136	5,300,000	900,000	4,200,000	30%
196	Langata- jambo valley	236	5,000,000	Maisonatte	2306	6,500,000	700,000	2,500,000	20%
197	Kamarock- Phase 11	135	1,500,000	Bungalow	1070	2,700,000	250,000	800,000	20%
198	Ruby estate	168	3,500,000	Maisonette	1500	4,500,000	700,000	6,000,000	75%
199	Avenue Park Estate	243	3,500,000	Maisonette	1496	4,500,000	700,000	6,000,000	75%
200	Unique Estate Embakasi	88	1,100,000	Flat	950	1,400,000	275,000	3,000,000	120%
201	Kileleshwa	169	7,000,000	Flat	1820	4,500,000	850,000	5,500,000	45%
202	Baraka estate-Phase 2	180	2,300,000	Maisonette	1628	4,500,000	375,000	700,000	10%
203	Sunrise park estate	70	1,100,000	Flat	750	1,100,000	275,000	3,300,000	150%
204	Dam estate-langata	140	3,000,000	Maisonette	1160	3,500,000	600,000	5,500,000	85%
205	Graceland terraces, Kileleshwa	134	6,000,000	Flat	1438	4,600,000	675,000	3,900,000	40%
206	Bandari villas, South C	180	3,800,000	Maisonette	1500	4,500,000	700,000	5,200,000	60%
207	Kileleshwa	134	6,000,000	Flat	1438	4,600,000	675,000	3,900,000	40%
208	Kileleshwa	138	6,000,000	Flat	1489	4,600,000	700,000	3,900,000	40%
209	Spring villas- spring valley	588	12,000,000	Town House	3840	15,000,000	2,250,000	18,000,000	65%
210	Savannah estate	143	1,800,000	Maisonette	987	2,700,000	325,000	2,000,000	45%

	Donholm								
211	Graceland apts- kileleshwa	134	6,000,000	Flat	1438	4,600,000	675,000	3,900,000	40%
212	perl Villas, Lavington	349	12,000,000	Maisonette	3088	12,000,000	1,500,000	6,000,000	25%
213	Cinnamon court South C	99	2,000,000	Flat	1065	2,100,000	300,000	1,900,000	45%
214	Ushirika estate- Eastleigh	182	3,000,000	maisonette	710	2,100,000	500,000	4,100,000	80%
215	Lavington	156	7,000,000	Flat	1678	4,200,000	700,000	2,800,000	25%
216	Kitisuru	2481	20,000,000	Town House	4218	17,000,000	2,150,000	6,000,000	20%
217	Ainsworth flats westlands	119	5,000,000	Flat	1280	3,200,000	550,000	2,800,000	35%
218	Donholm estate	198	2,500,000	Bungalow	1368	3,800,000	375,000	1,200,000	20%
219	Elgon court Thika road	83	900,000	Flat	898	1,300,000	275,000	2,800,000	125%
220	Ngong road	169	7,000,000	Flat	1820	4,500,000	700,000	2,500,000	20%
221	Buruburu	180	3,000,000	Maisonette	1221	3,400,000	350,000	600,000	10%
222	Jamhuri estate-	183	3,500,000	Maisonette	1800	5,400,000	525,000	1,600,000	20%
223	Mombasa road	106	1,300,000	Flat	1148	1,700,000	275,000	2,500,000	80%
224	Tana estate	200	2,000,000	Maisonette	1555	3,000,000	275,000	1,000,000	20%
225	The Gables, Kilimani	339	10,000,000	Bungalow	2390	8,000,000	1,050,000	3,000,000	20%

226	kilimani	175	7,500,000	Flat	1892	4,700,000	750,000	2,800,000	25%
227	Lang'ata-KMA Estate	225	4,800,000	Maisonette	1775	5,300,000	700,000	3,900,000	40%
228	Donholm	147	2,000,000	Maisonette	1776	5,300,000	500,000	2,700,000	35%
229	Tamarind Court	181	8,000,000	Flat	1950	4,800,000	750,000	2,200,000	20%
230	Akilla estate	143	3,000,000	Maisaonatte	1500	4,500,000	825,000	9,000,000	120%
231	Karen plains	2023	18,000,000	Town House	3654	15,000,000	2,000,000	7,000,000	20%
232	Donholm	116	1,500,000	Flat	1250	2,500,000	340,000	2,800,000	70%
233	Kasarani	400	2,100,000	Maisonette	1918	5,000,000	500,000	2,900,000	40%
234	Donholm	147	2,000,000	maisonette	1776	5,300,000	500,000	2,700,000	35%
235	Apartment	116	5,000,000	Flat	1250	3,100,000	500,000	1,900,000	25%
236	Park west flats- Nairobi west	91	2,000,000	Flat	976	2,000,000	275,000	1,500,000	40%
237	Lavington	153	6,500,000	Flat	1642	4,100,000	625,000	1,900,000	20%
238	Githurai 44	200	1,000,000	Maisonette	1876	3,200,000	375,000	3,300,000	80%
239	Platinum phase II	186	4,000,000	maisonette	1275	3,800,000	650,000	5,200,000	70%
240	Komarock phase iv	153	1,800,000	Bungalow	600	1,500,000	215,000	1,000,000	30%
241	Masai estate-Langata	168	3,500,000	Maisonette	1099	3,300,000	500,000	3,200,000	50%
242	Maringo estate	72	900,000	Duplex	720	2,000,000	150,000	100,000	5%
243	south c	153	3,200,000	Flat	1648	4,300,000	500,000	3,500,000	50%

244	Akiba estate southB	169	3,500,000	Maisonette	1180	4,500,000	650,000	6,000,000	85%
245	Runda estate	2257	20,000,000	Town House	3036	12,000,000	2,500,000	18,000,000	55%
246	Komarock	130	1,500,000	Bungalow	680	1,700,000	215,000	1,100,000	35%
247	Kilimani	155	6,500,000	Flat	1668	4,200,000	650,000	2,300,000	20%
248	Mugoya south C	136	3,000,000	Maisonette	1208	3,600,000	650,000	6,400,000	95%
249	Komarock	135	1,500,000	Bungalow	1076	2,600,000	225,000	400,000	10%
250	Five star estate	149	3,000,000	Maisonette	1765	5,300,000	650,000	4,700,000	60%
251	Kileleshwa	158	5,000,000	Town House	1200	4,200,000	900,000	8,800,000	95%
252	Buruburu	154	2,500,000	Maisonette	1050	3,000,000	375000	2,000,000	35%
253	Hurlingham	163	7,000,000	Flat	1760	4,400,000	675,000	2,100,000	20%
254	Donholm	116	1,500,000	Flat	1250	2,500,000	340,000	2,800,000	70%
255	Thompson	152	6,500,000	Flat	1638	4,100,000	650,000	2,400,000	25%
256	Kahawa	67	500,000	Flat	720	1,000,000	200,000	2,500,000	150%
257	Nyari	1975	20,000,000	Bungalow	3772	15,000,000	2,250,000	10,000,000	30%
258	Thompson estate	204	9,000,000	Flat	2200	5,500,000	800,000	1,500,000	10%
259	Donholm	116	1,500,000	Flat	1250	2,500,000	340,000	2,800,000	70%
260	Kilimani	156	6,500,000	Flat	1680	4,200,000	650,000	2,300,000	20%
261	Thompson	139	6,000,000	Flat	1500	3,700,000	600,000	2,300,000	20%
262	Lavington	430	14,000,000	Town House	3128	13,000,000	2,250,000	18,000,000	65%
263	Balozi	180	3,800,000	Maisonette	1500	4,500,000	825,000	8,200,000	95%

264	Kahawa west	67	500,000	Flat	720	1,000,000	200,000	2,500,000	150%
265	Kilimani	139	6,000,000	Flat	1498	3,700,000	600,000	2,500,000	25%
266	Donholm	175	2,200,000	Maisonette	1398	3,800,000	325,000	500,000	10%
267	Karen	1940	18,000,000	Bungalow	3300	13,000,000	2,000,000	9,000,000	30%
268	Kasarani	200	1,800,000	Maisonette	1762	4,400,000	375,000	1,300,000	20%
269	Kahawa	91	900,000	Flat	980	1,300,000	200,000	2,800,000	125%
270	Komarock	49	500,000	Flat	530	795,000	130,000	1,300,000	100%
271	Nyari estate	2061	20,000,000	Town House	4772	19,000,000	2,250,000	6,000,000	15%
272	Treeline	158	7,000,000	Flat	1700	4,200,000	700,000	2,800,000	25%
273	Muthaiga	400	120,000,000	d/storey	4859	20,000,000	8,500,000	30,000,000	20%
274	Muthaiga north	2023	20,000,000	Town House	4035	16,000,000	2,250,000	9,000,000	25%
275	South C	149	3,200,000	Maisonette	1700	5,100,000	625,000	4,200,000	50%
276	Nairobi west	56	1,200,000	Flat	1065	2,100,000	275,000	2,200,000	65%
277	Kilimani	213	9,000,000	Flat	2300	5,800,000	850,000	2,200,000	15%
278	Kilimani	329	12,000,000	Town House	3210	13,000,000	1,750,000	10,000,000	40%
279	Buruburu	154	2,500,000	Maisonette	1050	3,000,000	350,000	1,500,000	30%
280	kileleshwa	143	6,000,000	Flat	1540	4,000,000	650,000	3,000,000	30%
281	Kariobangi south	228	1,500,000	Maisonette	897	1,800,000	650,000	700,000	20%
282	Ngumo estate	192	4,000,000	Maisonette	1190	3,600,000	600,000	4,400,000	60%
283	Jacaranda	119	1,500,000	Flat	1280	2,600,000	350,000	2,900,000	70%

284	South C	162	3,500,000	Maisonette	1190	3,600,000	700,000	6,900,000	95%
285	Kilimani	171	7,000,000	Flat	1850	4,600,000	700,000	2,400,000	20%
286	kilimani	139	6,000,000	Flat	1500	3,800,000	600,000	2,200,000	20%
287	kilimani	68	3,000,000	Flat	736	2,000,000	325,000	1,500,000	30%
288	South B	173	3,800,000	Maisonette	1495	4,500,000	650,000	4,700,000	55%
289	South B	240	5,000,000	maisonette	1798	5,000,000	750,000	5,000,000	50%
290	Buruburu	154	2,500,000	Maisonette	1050	3,000,000	350,000	1,500,000	30%
291	Garden estate	1990	15,000,000	Bungalow	2000	12,000,000	1,750,000	8,000,000	30%
292	Old Race Course estate	156	3,000,000	Bungalow	905	2,500,000	300,000	500,000	10%
293	Mombasa road	226	5,000,000	Maisonette	1810	5,000,000	725,000	4,500,000	45%
294	Kilimani	250	8,000,000	Maisonette	2590	10,000,000	1,350,000	9,000,000	50%
295	komarock	112	1,300,000	Bungalow	624	1,600,000	1,750,000	600,000	20%
296	Kilimani	145	6,000,000	Flat	1558	4,000,000	600,000	2,000,000	20%
297	Runda estate	2257	20,000,000	Town House	3036	12,000,000	2,500,000	18,000,000	55%
298	Buruburu	176	3,000,000	Bungalow	914	2,600,000	325,000	900,000	15%
299	Komarock	244	2,000,000	Maisonette	1549	2,800,000	300,000	1,200,000	25%
300	kilimani	479	20,000,000	Bungalow	2588	12,000,000	3,000,000	28,000,000	85%
301	South B	211	4,000,000	Maisonette	1185	3,600,000	625,000	4,900,000	65%
302	Five star estate	140	3,000,000	Bungalow	1765	5,300,000	650,000	4,700,000	60%

303	Villa franca	149	3,000,000	Bungalow	1380	3,900,000	375,000	1,500,000	20%
304	Kilimani	152	6,500,000	Flat	1638	4,000,000	700,000	4,200,000	40%
305	Lavington	143	6,000,000	Flat	1540	3,800,000	700,000	4,200,000	40%
306	Nairobi west	56	1,200,000	Flat	600	1,200,000	275,000	3,100,000	120%
307	komarock	123	1,400,000	Bungalow	978	2,400,000	250,000	1,200,000	30%
308	Loresho	2210	15,000,000	Bungalow	2652	12,000,000	2,000,000	13,000,000	50%
309	Komarock	135	1,500,000	Bungalow	1076	2,500,000	250,000	1,000,000	25%
310	South c	136	3,000,000	Maisonette	1600	4,800,000	550,000	3,200,000	40%
311	Lavington	287	9,000,000	Maisonette	2358	9,000,000	1,100,000	4,000,000	20%
312	Avenue park	270	3,500,000	Maisonette	1909	4,500,000	675,000	6,000,000	75%
313	Komarock	100	1,100,000	Bungalow	680	1,700,000	175,000	700,000	25%
314	Lavington west	210	9,000,000	Maisonette	1496	6,000,000	900,000	3,000,000	20%
315	Rabai Road	130	1,500,000	Bungalow	860	2,400,000	275,000	1,600,000	40%
316	Ushirika estate	165	3,000,000	Maisonette	710	2,100,000	500,000	4,100,000	80%
317	Buruburu	154	2,500,000	Maisonette	1320	3,500,000	350,000	1,000,000	15%
318	United Housing estate	162	3,500,000	Maisonette	1190	3,600,000	500,000	2,900,000	40%
319	Spring valley	2089	20,000,000	Bungalow	1627	7,000,000	2,000,000	13,000,000	50%
320	Avenue park	243	3,500,000	Maisonette	1496	4,500,000	675,000	6,000,000	75%
321	Kilimani	111	5,000,000	Flat	1200	3,000,000	625,000	4,500,000	55%
322	Gitanga rd	136	6,000,000	Flat	1466	3,700,000	700,000	3,300,000	35%

323	kilimani	210	3,000,000	Maisonette	1078	3,000,000	425,000	2,500,000	40%
324	Akiba estate south B	200	4,000,000	Maisonette	1404	4,200,000	600,000	3,800,000	45%
325	kilimani	250	9,000,000	Maisonette	1952	8,000,000	1,100,000	5,000,000	30%
326	loresho	1990	15,000,000	Maisonette	2000	12,000,000	2,000,000	1,300,0000	50%
327	South B	186	4,000,000	Maisonette	1244	3,700,000	600,000	4,300,000	55%
328	Lower hill	154	7,000,000	Duplex apartment	1660	4,200,000	750,000	3,800,000	35%
329	Lavington west	210	9,000,000	Maisonette	1496	6,000,000	625,000	3,000,000	20%
330	Thomson estate	214	9,000,000	Apartment	2300	5,500,000	850,000	2,500,000	20%
331	Airport view estate	179	3,800,000	Bungalow	950	3,000,000	550,000	4,200,000	60%
332	Lang'ata	225	4,500,000	Maisonette	1548	4,600,000	550,000	1,900,000	20%
333	kilimani	175	7,500,000	Flat	1892	4,700,000	800,000	3,800,000	30%
334	Mountain view	1088	10,000,000	Town House	2900	9,000,000	1,000,000	7,000,000	35%
335	Mombasa road	192	3,000,000	Maisonette	1380	3,800,000	425,000	1,700,000	25%
336	Ngong road	156	6,500,000	Flat	1678	4,200,000	700,000	3,300,000	30%
337	Kahawa west	209	2,200,000	Bungalow	1124	3,000,000	325,000	1,300,000	25%
338	Muringa court	158	7,000,000	Flat	1700	4,200,000	750,000	3,800,000	35%
339	Buruburu	147	2,300,000	Maisonette	1280	3,500,000	350,000	1,200,000	20%
340	Near Dam estate	139	3,000,000	Maisonette	1160	3,200,000	600,000	5,800,000	90%
341	Lavington- chalbi	539	15,000,000	Town house	4800	19,000,000	2,250,000	11,000,000	30%

	dive								
342	Santack estate	149	5,000,000	Bungalow	603	2,000,000	625,000	5,500,000	75%
343	Lang'ata	160	3,500,000	Maisonette	1049	3,000,000	500,000	3,500,000	55%
344	Fedha estate	468	4,500,000	Bungalow	1400	4,200,000	675,000	5,300,000	60%
345	Jamhuri estate	190	4,000,000	Maisonette	871	3,000,000	425,000	1,500,000	20%
346	Sunview Estate	175	3,800,000	Maisonette	1600	4,800,000	650,000	4,400,000	50%
347	Donholm	163	2,000,000	Bungalow	1022	3,000,000	325,000	1,500,000	30%
348	Avenue park	234	3,500,000	Maisonette	1496	4,500,000	675,000	6,000,000	75%
349	Loresho	200	15,000,000	Bungalow	2250	12,000,000	1,750,000	1,300,000	50%
350	Komarock estate	177	1,500,000	Bungalow	820	2,000,000	215,000	800,000	20%
351	Baraka estate	187	2,300,000	Maisonette	1628	4,500,000	375,000	700,000	10%
352	Fedha estate	480	4,500,000	Bungalow	1400	4,200,000	675,000	5,300,000	60%
353	Park estate lang'ata	130	3,000,000	Maisonette	1175	5,300,000	600,000	3,700,000	45%

APPENDIX E: MACRO-ECONOMIC INDICATORS 2000-2013

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Interest Rate	19.6	19.5	18.3	13.5	12.25	13.16	13.70	13.30	14.90	14.76	13.87	20.04	18.15	16.89
Inflation Rate for Nairobi	8.3	3.7	1.8	9.6	13.2	11.4	17.3	4	16.7	11.2	4.2	14.1	9	5.5
Real GDP per capita	33,280	33,743	32,905	32,846	33,288	33,442	34,573	37,316	36,933	36,962	38,346	38,925	39,607	40,345
Exchange Rate (kshs. to US dollar)	78.04	78.60	77.07	76.14	77.34	72.37	69.40	62.68	77.71	75.82	78.03	85.07	86.03	-
NSE 20 Share Index	1913	1355	1363	2738	2946	3973	5646	5445	3521	3247	4433	3205	4133	-

Source: Kenya National Bureau of Statistics (KNBS)