

**“DETERMINANTS OF INVESTMENT FOR AFFORDABLE
URBAN HOUSING IN KENYA, (IN THE PERIOD; 1982 – 2009)”**

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**A RESEARCH PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS OF ARTS
IN ECONOMICS OF THE UNIVERSITY OF NAIROBI**

2012

DECLARATION

This is my original work. It has not been presented anywhere for any academic award. All secondary sources of data used in the study have been duly acknowledged for the ideas borrowed from other scholars and authors in its compilation.

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DEDICATION

My dedication is to all those who live in deprived urban neighborhoods with reduced life chances due to the status of their dwellings. I know how much your energies get debilitated as you struggle to access decent and affordable shelter for your families.

ACKNOWLEDGEMENTS

First and foremost I would like to acknowledge the almighty God for the gift of life and ability to pursue my aspirations without any interruptions, the gift of a sober mind, health and resources throughout the study.

This work could not have been achieved without the supervisors' generous time dedication and expertise to better my research work. Thank you for persevering with me in this process despite my feeble attempts and seeing me through the whole research period. I am grateful.

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ABBREVIATIONS

ADB	-African Development Bank
ADF	-Augmented Dickey – Fuller
CBOs	-Community Based Organizations
DFID	-Department for International Development
EADB	-East African Development Bank
FBOs	-Faith Based Organizations
HFCK	-Housing Finance Company of Kenya
NEMA	-National Environmental Management Authority
NHC	-National Housing Corporation
NGOs	-Non Governmental Organizations
OECD	-Organization for Economic cooperation and development
OLS	-Ordinary Least Squares
PMIs	-Primary Mortgage Institutions
SIDA	-Swedish International Development Agency
SMI	-Secondary Mortgage Institution
UN	-United Nations
UNEP	-United Nations Environmental Programme
USA	-United States of America

ABSTRACT

This paper empirically investigates the determinants of investments in affordable urban housing in Kenya from 1982 to 2009. The supply of housing units and the demand for the same have consistently failed to show an equilibrium behavior overtime. This has resulted to shortages in the expected annual production of houses to ensure that all Kenyan households are decently and adequately provided with one of humanity's basic need, a house. Manifestations of the shortages are clearly evident in the exponential growth of slum and squatter settlements. This has serious consequences on the environment and the social fabric of the society. The current policy framework has not addressed the housing shortage.

The study adopts the theoretical framework of neoclassical investment model developed by Jorgenson (1963) and applied in several investment studies. A linear investment function was developed and multiple regression conducted using the ordinary least squares method (OLS). The independent variables included urban population, gross public investments, gross domestic savings, inflation rates, lending rates, credit allocation to the housing sector, unemployment rates, gross housing investments in units lagged three years, gross capital stock of houses in the country lagged one year and a dummy variable representing political uncertainty in the country at every electioneering period after 5 years. The dependent variable was gross housing investments in units. The data used is secondary and was obtained from official publications of government agencies and international bodies.

The regression results after first difference, using the OLS methodology, showed that gross public investments, gross domestic savings, inflation rates, lending rates, credit allocation to the housing sector, gross housing investment lagged three years, gross capital stock of urban houses in the country lagged one year and political uncertainty were all statistically significant at 5 per cent. The urban population and unemployment rate were statistically insignificant. These variables explained seventy four per cent of the variations in gross

housing investments in units in the country. The lending rates and unemployment rates negatively influence gross housing investments in the country.

The conclusion was that the independent variables highlighted above are key determinants necessary to guide housing investments decisions in Kenya so as to achieve affordable urban housing as a policy approach of the government.

CHAPTER ONE

1.0 INTRODUCTION

Housing is a basic need for human beings. A house is a place which provides shelter, comfort, security, dignity and the physical framework in which human, social, economic and cultural resources are realized, enriched and integrated. Therefore, affordable housing¹ represents a basic human right due to the fundamental role it plays in the life of an individual and a nation.

A general review of housing as an investment good shows that, in the productive life of a person, it takes a significant proportion of average incomes. Being a sizeable lifetime investment, housing investment has significant impact on the standard of living of a nation's populace anywhere in the world, in both macro and micro terms. In Kenya where there is uneven distribution of income and wealth, those with fewer resources are greatly disadvantaged in accessing decent and quality housing. The population growth keeps stretching the housing dream of many individuals and so does the access of credit from local financial institutions. The existing building technologies have not made things any easy either, since they are difficult to deploy for the low income earning.

According to Kenya's ministry for housing, the housing sector in Kenya is characterized by inadequate affordable and decent housing, low-level urban home ownership estimated at 16 per cent and expansive slums and informal settlement. Out of a total of 150,000 housing units required annually in urban areas, only 35,000 units are produced (Strategic plan 2008 – 2013: Ministry of housing, p. 19).

¹ A judgment on whether a household's housing situation is affordable is usually based on the proportion of income that is taken up in housing costs. Housing becomes unaffordable if it takes up too much of a household's budget, such that not enough money is left to buy other things, National Housing Strategy 1991, *The affordability of Australian Housing*, Issue Paper No.2, AGPS, Canberra.

The government's current housing policy objectives on affordable urban housing investments are stated in the 2008 – 2013 Ministry of housing Development Plan. These are outlined as follows

- a) Up scaling slum upgrading and prevention initiatives to increase affordable urban home ownership.
- b) Mobilization of financial resources to implement programmes and projects that increase affordable urban housing productivity.
- c) Enhancing partnership with development partners and stakeholders, especially private sector interested in planning, developing and financing affordable urban housing.

Private sector participation is expected to play a crucial role in the housing delivery process given its comparative advantage in resource mobilization to provide affordable urban housing and complement government initiatives.

1.2 BRIEF HISTORY - THE GENERAL SHELTER SITUATION

Since the inception of life, man has always made efforts to obtain food, clothing and shelter. The struggle for these basic needs has increased progressively as the human race advances in numbers and cultural diversity.

A number of international declarations relating to human settlements have elaborated on the importance of housing. The Universal Declaration of Human rights of 1948, article 25, recognizes the right to adequate housing as an important component of the right to adequate standards of living .This has been further reaffirmed by subsequent international instruments including 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 in the New Millennium. In all these instruments, housing is understood in

the broader context of the Shelter fabric with the living environment (Strategic plan 2008 – 2013: Ministry of housing, p. 1).

Locally, Kenya's ministry of housing admits that the provision of urban housing in Kenya has been increasing but in a skewed proportion in favour of high cost housing. Yet the shelter situation in Kenya, just like in most developing countries is such that housing demand far outstrips supply, particularly in urban areas. The shortage in affordable housing is manifested by overcrowding and spread of slums and squatter settlements in urban areas.

1.3 THE HOUSING POLICY ENVIRONMENT IN KENYA

The recognition of provision of affordable housing is enshrined in the recently promulgated constitution for the republic of Kenya. Under chapter four, of the bill of rights, section forty three (43'b') of economic and social rights states that 'Every person has a right to accessible and adequate housing, and to reasonable standards of sanitation'. This is a guarantee to one of the basic needs by the supreme document of the republic, the constitution (Constitution of Kenya 2010).

Additionally, Kenya's vision 2030 recognizes affordable housing as a key performance indicator of achieving the status of an industrializing middle level economy by the year 2030 given the demographic trends in the country where more than half of the population is likely to be urbanized. It provides a medium term blueprint (by 2012) on how affordable and adequate housing are to be realized, given the housing demand – supply gap already in the country, as follows

- *The metropolitan and investment plans initiative:* This requires preparation of metropolitan investment plans for eleven (11) specific urban regions complimented by strategic development and investment plans for special and border towns and for all the other municipal councils in the country.

- *The housing development initiative:* This calls for an increase in annual productivity of adequate housing with an emphasis on equity in access, beginning with low income housing.
- *The mortgage financing initiative:* Advocates for establishment of a secondary mortgage finance corporation as well as a national housing fund while also introducing housing and infrastructure bonds.
- *Enactment of the new housing bill 2006.*

The long term goal of the blue print is to enhance housing accessibility to the entire population, enhance adequate accessibility to affordable finance by developers and buyers, target to key reforms to unlock the potential of housing sector through private public partnerships and a rapid buildup of the urban planning and implementation capacity (Kenya's vision 2030).

However, to date, the housing sector policy framework has undergone tremendous evolution since Kenya became an independent state. The first comprehensive housing policy for Kenya was developed in 1966/67 as a Sessional paper No.5. Kenya's population then was over 9 million growing at a rate of 3 per cent annually. The annual housing demand was estimated at 7,600 units in urban areas. The policy directed government to provide adequate housing at the lowest cost possible. However the policy advocated for slum clearance and did not clearly define the role of the private sector investments in the housing sector leading to demand for housing outstripping supply.

The International Year of Shelter for the Homeless In 1987 informed formulation of the National Shelter Strategy, as a policy, operational up to the year 2000. This strategy advocated for a policy change where government facilitated other actors to invest in housing.

In 1990, the process towards housing policy review was initiated by the government to provide a guide for Kenya, along with other members of the international community, implement the Habitat Agenda and the National Plan of Action on Shelter and Human Settlements to the year 2020. This led to the formulation of Sessional Paper No. 4 of 2004 on the National Housing Policy, whose objective was to arrest the deteriorating housing conditions and bridge the shortfall in housing stock. This is the current national housing policy in Kenya.²

1.4 THE KEY STAKEHOLDER'S IN KENYA'S HOUSING SECTOR

1.4.1 The National Housing Corporation (NHC)

This is a semi autonomous government agency in the ministry of housing that plays a central role in housing provision particularly for low and middle income housing .It formulates programmes that culminate in to appropriate and affordable rental and owner-occupier housing ,stabilizes rent levels by providing suitable and adequate rental houses ,offer rural and peri-urban housing loans to individuals to boost housing development, forms and facilitates strategic partnerships with the private investors to enhance housing development and encourages local investment in housing by Kenyans in the diaspora and spearheads adoption and use of modern technological methods for faster housing delivery.

1.4.2 Development Partners and International Organizations.

They assist in the implementation of housing programmes to supplement government initiatives. These partners include; UN-Habitat, European Investment Bank, World Bank, United Nations Environmental Programme(UNEP), Shelter Afrique, Swedish International Development Agency(SIDA), KfW(*Kreditanstalt Fur Wiederaufbau*, German Bank for

² Strategic plan 2008–2013, Ministry of housing clearly outlines the need for enactment of a new housing bill to govern the housing sector as the current housing policy is unable to effectively govern the housing market.

Reconstruction), DFID, African Development Bank(ADB) and East African Development Bank(EADB). The above organizations do contribute in various ways in the development of the housing sector, for example lending to local institutions for onward transmission to the retail residential real estate market, land and infrastructure development, mortgage finance, contractor support services, trade finance for building material and social housing. In addition, some of the International financial institutions listed above provide grants and concessionary funding to local financial institutions that then are required to direct the same to housing investment and development.

1.4.3 Non State Agencies

They are involved in community mobilization, planning, implementation and monitoring and evaluation of housing programmes and activities .These include Non Governmental Organizations (NGOs), Community Based Organizations (CBOs), Faith Based Organizations (FBOs) and other special interest groups. Largely these are not the mainstream actors in housing delivery but their contribution cannot be ignored .These include housing by Private corporate organizations with a particular target group, church groups engaging in housing development for mission work within urban centers , institutional housing schemes for their staff e.t.c

Prominent Examples include Jamii bora and Nachu. Generally, these non state agencies have been unable to scale up their operations due to limited funding.

1.4.4 The Commercial banks

The central bank of Kenya reports that there are forty three registered banks and one mortgage institution in the country forming the core of the banking sector. With regard to housing investments, commercial banks offer credit facilities to individual builders or developers. Majority of banks within the economy have engaged in building and construction finance oriented activities. Many of commercial banks have become increasingly equipped to

operate various types of mortgages, housing finance projects, as well as investments and savings accounts tailored to helping customers realize their housing needs. Examples include the recent development of a merger between Kenya Commercial Bank and Savings and loan mortgages limited to form a mortgage division, the Barclays bank Mortgage division, the Standard Chartered Bank Mortgage division e.t.c. These are relatively new developments in the market that enhance the access to housing ownership.

Commercial banks mainly focus on home loans to salaried and business people by providing loans to buy already built houses for both owner occupation and rental or sale, construction loans for housing units such as residential flats and apartments or estate development, special staff mortgage facilities for companies and cooperative societies or any type of organized group.

However commercial banks have been criticized for their stiff lending conditions which tend to exclude a large number of people wishing to own affordable houses.

1.4.5 Housing Finance Company of Kenya (H.F.C.K)

This is the single largest progressive mortgage housing concern in Kenya. It is largely associated with middle income housing needs. It offers loans up to 90 per cent of cost meaning it co finances home ownership with the customer, in this case a homeowner, a housing developer, or Kenyans in the diaspora. Incorporated on the 8th November 1965 as per the banking act, the company has been providing access to mortgage finance and by enabling their customers to save money as they endeavor to build in the future and own their own homes. The housing finance bank, in its mission, focuses on availing new housing opportunities to home owners and meeting the growing housing challenges of the nation. To realize its mission, the housing bank has developed strategic partnerships with several investors, including commercial banks such as the Equity Bank of Kenya. In a nutshell, it

provides integrated financial solutions, with a focus on both commercial and residential property and both the demand and supply side to meet the housing needs.

1.4.6 Housing Cooperatives

This comprises one of the informal ways of raising finance for affordable housing .Housing cooperatives mainly cater for the salaried people and low income informal groups. However they are largely underutilized organizations in Kenya to realize their full potential, although a few have been successful in the provision of affordable urban housing for their members e.g. Kenya medical Association Housing Scheme, Kenya Ports Authority Housing Society.

For each stakeholder and partner named above, performance has lagged behind planned targets resulting in a shortfall in the provision of affordable housing as evidenced by the housing demand – supply gap. Housing development in most urban areas in Kenya has been dominated by private sector developers and contractors over the years, with the government playing more of a facilitative role. The private sector being a profit making sector has over concentrated its effort in provision of housing units for the high and middle income earners and those meant for the low income earners are never affordable for the targeted group.

1.5 THE ROLE OF AFFORDABLE HOUSING IN KENYA’S ECONOMY

The effects of affordable housing investment on the economy are extensively discussed in the Kenya’s ministry of housing’s strategic plan 2008 – 2013.It points out that affordable housing is one of the principal sectors that spur economic growth. Investment in affordable housing and related infrastructure facilities and services has a multiplier effect on the national income through increased investments in production and marketing of building materials, employment generation and wealth creation.

1.6 STATEMENT OF THE PROBLEM

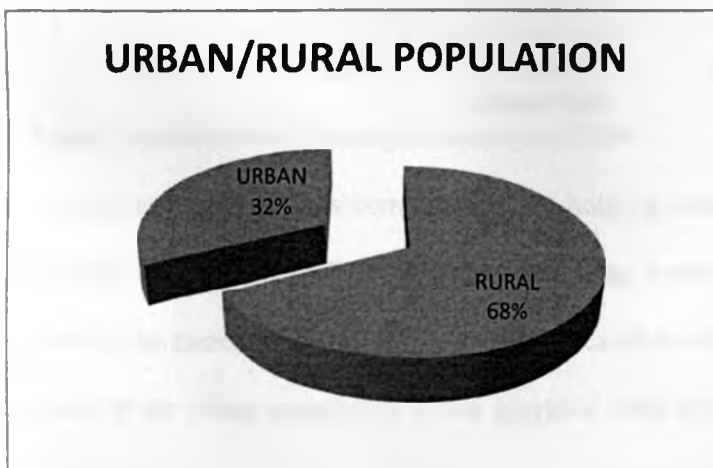
The strategic plan for the Kenya's Ministry of Housing notes that, in spite of the notable investments committed to housing, there is still a challenge in this sector as acute shortages in housing exist as evidenced by the annual housing demand-supply gap in the economy. The economic survey 2011 report on completion of new buildings in selected main towns, 2006 – 2010, shows that the annual housing demand is far from being met.

Table 1: Reported Completions of new Public Buildings in Selected Main Towns, 2006 -2010

Year	Number			Estimated Cost (Kshs Million)		
	Residential	Non Residential	Total	Residential	Non Residential	Total
2006	20	13	33	30.0	20.6	50.6
2007	309	7	316	507.7	16.1	523.8
2008	88	73	161	210.2	232.3	443.0
2009	116	24	140	938.5	108.5	1,047.0
2010	390	0	390	1,041.0	0	1,041.0

Source: Local authorities, National Housing Corporation & Ministry of Public Works.

According to the Kenya Population and Housing census report 2009, 32.3 per cent of Kenya's population was living in urban areas.



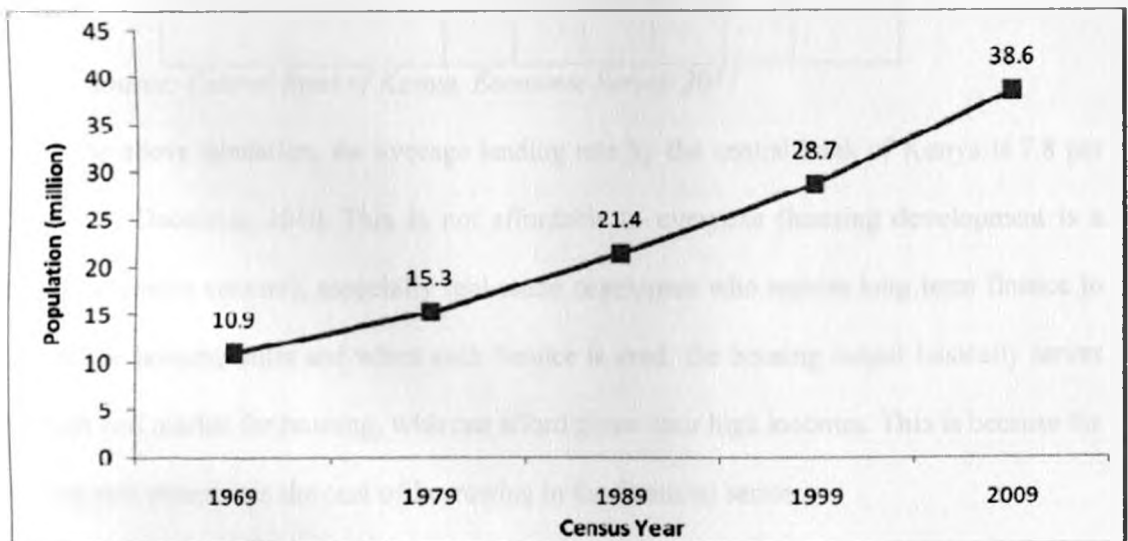
Source: Kenya Population and Housing census report, 2009

In addition, Kenya's vision 2030 projects the urban population by the year 2030 to be at 60 per cent of the population.

Official housing output report from the ministry of housing, Kenya, show that out of the 150,000 housing units required currently on an annual basis in urban areas, only 35,000 units are produced .The records clearly indicate that currently there is a demand –supply gap in housing of 115,000 units. These translate to households without access to housing facilities.

Despite the demand - supply gap in housing provision, the population has been increasing at an increasing rate both from the national perspective and urban perspective, at 4 per cent growth rate nationally with 32 percent of the entire population residing in urban areas (Kenya population and Housing Census report, 2009).

Fig.1. POPULATION, 1969 - 2009



Source: Kenya Population and Housing census report, 2009

In spite of the notable investments committed to the housing sector, the above statistics of population show that there is still a challenge in housing provision given the population dynamics amidst the current demand-supply gap as indicated by official figures. Therefore it is evident that if the urban population is not provided with affordable housing, then the

problem of overcrowding and spread of slums and squatter settlements in urban areas and peri-urban areas is likely to persist both in the present and the future.

Table 2: Principal Interest Rates, 2006 – 2010(in per cent)

	2006	2007	2008	2009	2010 June	2010 December
CENTRAL BANK OF KENYA						
Average Interest Rate for 91 day						
Treasury Bills	5.73	6.87	8.59	6.82	2.98	2.28
Central Bank Rate	10.00	8.75	8.5	7.00	6.75	6.00
Repo/Inverse Repo Rate	6.34	7.13	6.36	-	-	-
Inter-bank rate	6.34	7.05	6.67	2.95	1.15	1.18
COMMERCIAL BANKS						
Average deposits	4.11	4.32	4.89	4.84	4.45	3.59
Saving Deposit	1.36	1.67	1.65	1.73	1.75	1.45
Loan and Advances	13.74	13.32	14.87	14.76	14.39	13.87
Overdraft	13.91	12.96	14.40	14.13	14.23	13.69

Source: Central Bank of Kenya, Economic Survey 2011

From the above tabulation, the average lending rate by the central bank of Kenya is 7.8 per cent as at December 2010. This is not affordable to everyone (housing development is a capital intensive venture), especially real estate developers who require long term finance to deliver the housing units and when such finance is used, the housing output basically serves the high end market for housing, who can afford given their high incomes. This is because the lending rate determines the cost of borrowing in the financial sector.

When the lending rate is high, it is difficult to borrow for a long period of time due to the high cost involved to service the loans obtained from the financial institutions which are regulated by the central bank. The difficulty of obtaining finance in the market generates a three-tier structure of housing market. At the top of the income scale can be found a small, well financed upper- income market entirely supplied by the private sector, which is profit driven. In the middle of the housing market strata is a narrow subsidized market composed of

middle class salaried workers and government civil servants who are the main beneficiaries of public finance housing investment initiatives within urban areas. Lastly, there is a large and private incremental housing market which has no access to formal financing services, thus unable to afford decent housing as all financial arrangements leading to home ownership are made by an individual. This is the group in dire need of affordable housing so as to prevent slum and squatter settlement development in urban areas.

Thus, a radical departure from the earlier ineffective policies regarding the development of housing units for public consumption lies in the realization that government housing budget alone cannot meet all the affordable housing needs to bridge the current housing demand-supply gap with the current policy framework in place.

There is need for new investment policies informed by the key drivers that determine the adequate investment flows to the housing sector, so as to meet both current and future housing need of the country's growing population. This can be based on the comparative advantage of the public sector, which lies in institutional and regulatory support as well as the actual investment through the relevant parastatals and arms of government investment and of private sector, which lies in the massive production of affordable housing through mobilization of enough financial resources.

The above informs the need to develop an investment framework that incorporates all the key drivers of affordable housing in Kenya such as demographics, real interest rates, house prices, inflation, and housing stocks.

1.7 OBJECTIVES OF THE STUDY

This study focused mainly on urban areas because this is where the problem of affordable housing is the greatest. It is in urban areas where the problem of slum development, overcrowding and squatter settlements recur most compared to rural areas. Again, this is where housing investments motivate investors through high returns. The main objective was

to establish the determinants of investment in affordable urban housing in Kenya guided by the following specific objectives;

- 1) To establish the factors affecting investment in affordable urban housing in Kenya.
- 2) To formulate and estimate an investment function for affordable urban housing in Kenya
- 3) To find the relative importance of the factors that determine the allocation of investment flows into affordable urban housing and the responsiveness of the government, investors and key stakeholders of the housing sector to these determinants.
- 4) Based on the findings from above, to suggest policy recommendations that would assist in having more meaningful resource allocation to the housing sector to reduce the demand – supply gap within the economy.

1.8 MOTIVATION AND SIGNIFICANCE OF THE STUDY

1.8.1 Motivation of the Study

The urban economy, even in the least developed economy, is the major source of the national output. The problem of enough and affordable housing is therefore largely an urban problem due to the possible environmental and social consequences generated by lack of the same, due to the high population within urban areas that result from rural urban migration among other causes.

The motivation to research on the determinants of investments in affordable urban housing was informed by the fact that different stakeholders in the housing sector approach the housing finance problem differently. From a household perspective, the challenge is how to meet the stringent requirements of obtaining a house loan or the necessary funds for

construction. To the government ministry and parastatals concerned with housing, the challenge is lack of adequate resources to carry out affordable public housing programmes and having an effective regulatory framework to facilitate the development of effective and efficient housing sector. The ministry of finance and by extension the central bank must focus on the prevention of financial instability and nurture confidence in the financial environment as major housing investment programmes are implemented due to the capital intensity required financially. The financial institutions and capital markets are interested in expanding their scope of financial services while mitigating on all possible and potential risks into housing related investments through the loaning process and the raising of bonds respectively. The international financial organizations seek to develop sustainable financing programmes to alleviate poverty generated by lack of shelter as they seek to fulfill their unique mandates related to housing provision in the economic environments they operate in.

It is therefore evident that research needed to be done on how to engage all the stakeholders to participate in the investment of shelter developments so as to bridge this continual gap of housing demand and supply in Kenya's housing sector by coming up with an investment framework that is self adjusting given the various determinants of the same.

1.8.2 Significance of the Study

As earlier indicated above, affordable urban housing is one of the key sectors that can spur economic growth. While 32 per cent of the population resided in urban areas in 2009, it is projected to reach 60 per cent by 2030. In addition; the population growth rate in Kenya has a direct impact on basic needs, housing included, and employment.

Kenya's ministry of housing admits without reservation that, investment in urban housing has been minimal and sporadic due to lack of an enabling environment for the private sector participation in affordable urban housing delivery process, the low government funding, lack

of serviced land, poverty , high cost of construction finance and limited research on affordable housing delivery within the local research institutions such as the Housing and Building Research Institute of the University of Nairobi which ceased its research activities in 1996 due to funding problems. This is evidenced by the housing demand and supply gap in Kenya's urban sector.

The housing sector is also a leading indicator of aggregate demand, partly because it is has been found to be sensitive to monetary policy. In fact, it can be an important sector of the economy through which monetary policy channels operate, if the sector is well established. Therefore, the central bank needs to have a good understanding of how this financially capital intensive housing sector evolves and to be able to accurately predict housing expenditures within a given monetary policy framework by setting favorable lending rates.

Given the existing urban housing shortage, the considerable importance of affordable housing to the urban and national economy contrasts sharply with housing conditions and official policies and efforts that exist in Kenya's housing sector. For a majority of Kenyans with an exception of the small well to do population, housing is usually costly in relation to income and the quality of dwellings available. The National Environmental Management Authority (NEMA) and the urban municipals' stringent requirements on standards of applicable building technologies and designs for urban houses only serve to alienate the low income earning group. Cramped, crowded, unsanitary and squatter settlements are the lot of low-income households, conditions that debilitate their energy, reduce national productivity, and the general living standards of the majority of the population and affect the environment.

This study intended to contribute to the discussions of housing policy options for the policymakers in Kenya's housing sector with regard to having an effective and efficient investment framework that guides investments in the housing sector for all the stakeholders. The principal intention is to achieve a better understanding of the effects of the determinants

of investments in affordable urban housing, especially since it affects low-income households, so as to bring about an improved use of the resources already available for housing and to allow new resources to be used effectively guided by the key drivers of housing demand in Kenya's urban areas.

1.9 OUTLINE OF THE RESEARCH PAPER

The rest of the study is organized as follows; Chapter two reviews literature and provides a theoretical basis of the hypothesis, previous empirical studies and an overview of the literature. Chapter three outlines the methods and procedures by specifying an empirical model and the hypothesis tested, the data sources and types and measurement of variables used in the study. Chapter four gives an outline of the data analysis and empirical results that were obtained. Chapter five outlines the summary of the findings, conclusions and the policy recommendations.

CHAPTER TWO

2.0.0 LITERATURE REVIEW

INTRODUCTION

The study of investment determinants has its origins from the maximizing firm, which chooses investments whose return over costs of the investment exceeds the marginal cost of raising the required investments.

The context of the above in this study is to provide a flow of housing services through analyzing the related investment determinants to meet the present and future housing needs while maximizing value for the participating stakeholders. This consideration relates to investment decisions. This guides the theoretical and empirical literature review.

2.1.0 THEORETICAL LITERATURE REVIEW

To develop a theory of investment behavior a number of investment theories and production functions are evaluated.

2.1.1 Accelerator Investment Theory

The demand or income within an economy increases when the level of investments made by firms are increased. When the demand is high, firms have been found to have two choices

- a) Raise prices to cause demand to drop or
- b) Increase investment to match the demand

It has been found that, firms increase their investments so as to realize better returns (Knox 1952, Jorgenson 1963). The resulting growth attracts more investors, which in return

accelerates growth. The theory³ concluded that, given a certain amount of capital that is necessary to support a given level of economic activity, it is easy to understand the investment behavior when the determinants of income or equilibrium level of expenditure are analyzed.

2.1.2 Keynes Investment Theory

The supply price of an investment increases if the level of investment for any period when investors are active in a particular sector. It has been observed (Hanson 1986, Keynes 1936) that the prospective yield of the investment output in the future decreases with the level of investment overtime. When prices are sufficiently flexible to clear the goods market, investment in the production of goods in an economy is determined such that the price of investment goods equals the discounted sum of the prospective yields for marginal investment.

2.1.3 Neoclassical theory of investment

Investments have been determined to be a decreasing function of interest rate within an economy due to the reverse relationship. Interest rates always increase the financial cost of any investments. This observation has been researched by several authors (Hanson1986, Lerner 1944, Clower 1954, Wijkman 1965, Goodwin 1951, Chenery 1952, Koyck 1954, Lucas1967, Treadway1969). However, the conclusions reached were noted to include exogenous prices for output and non durable inputs, making their conclusions only relevant to a single firm and not to an industry or better still a larger part of an economy where investments are being channeled.

An alternative conclusion within the neoclassical theories of investment is that investments relate market value of shares of a company to the replacements cost of the assets of the

³ See capital theory and investment behavior ,1963,American Economic Review, vol. 53:p 247 - 259

company. Studies have described⁴ how the management of an investment portfolio seeks to maximize present net worth of the firm and the firm's market value of outstanding common shares. The observation was that investors of any investment project in an economic set up should only be willing to undertake it if it increases the value of shares of the investing firm. To increase the value of shares, the rate of investment-speed at which investors wish to increase the capital stock, should be related, if anything, to q , which represents the value of capital used for investment purposes relative to its replacement cost (Tobin and Brainard, 1968). This makes it possible for an industry behavior to be derived from the behavior of dynamically optimizing firms with rational price expectations i.e. Investments are determined as part of a dynamic optimization problem that specifies the entire path for capital.

2.1.4 The Cobb-Douglas production function

Most economic studies represent the relationship between output and inputs⁵ for an investment venture in a production function. This has been a highly adopted approach for production purposes of any type of units of a particular good within an economy. The Cobb-Douglas function (Cobb and Douglas 1928) as shown below has been deployed to help analyze production of different types of goods in an economy. It is given as follows,

$$Q = AL^{\alpha}K^{\beta},$$

Where

- Q = represents total production or output of any type of units in the economy
- L = represents labor services available for the production in the economy
- K = represents capital input available for the production in the economy

⁴ Elaborations and qualifications of the theory can be found in page 1-28 section 1 of the Tobin and Brainard.

⁵ See details in Cobb, C. W.; Douglas, P. H. (1928). "A Theory of Production". *American Economic Review* (Supplement): pp139–165.

- A = represents total factor productivity (applicable technology for production in the economy).
- α and β are the output elasticities of labor and capital, respectively. These values are constants determined by available technology for the particular output. The Output elasticity measures the responsiveness of output to a change in levels of either labor or capital used in production, ceteris paribus.

For investment studies and analyses, the production function is of constant returns to scale. For a firm in an equilibrium state, it pays to increase the capital stock for expected increases in demand for the output of a firm. In the study of economic analysis of an urban housing market, researchers have used the above production function to estimate the elasticity of substitution in housing⁶.

2.2.0 EMPIRICAL LITERATURE REVIEW

Housing consumers utilize housing up to the point where marginal product is equal to the rental cost. For housing investment determinants, the rental cost is used to define the user cost of capital. The user cost of capital has been found to be composed of parameters such as the purchase price for a house, opportunity cost of funds, depreciation, various government fees and taxes relating to homeownership. The conclusion was that, as long as the marginal product exceeds the user cost of capital, investors in the housing sector should continue to invest and only stop when the two are equal (Jorgenson 1963).

Studies on the efficiency of assets market and pricing rules with regard to houses in Finland, published in a paper⁷ directly tested the Q theory as a determinant of housing investment in a study of the housing investment. The rate of investment should be related to q , the value of capital for the investing firm relative to its replacement cost. The Q ratio was found to be a

⁶ See details in Mc Donald, J.F (1979) Economic analysis of an urban housing market Academic press Newyork p. 76.

⁷ 'Housing Investment in Finland,' *Finish Economic Papers*, 3 (1). Spring 1990, pp. 41-53.

significant predictor of housing investment in Finland, but only for periods after 1980 (Takala and Tuomala 1990, James Tobin 1969).

An analysis of the affordability of housing in Sydney, Melbourne, and Adelaide in June 2005⁸ in Australia found that low income tenants had extremely limited affordable housing choices in all the three cities studied. For many households, housing that was both affordable and appropriate was even more limited in the economy due to factors such as population and house prices (Berry and Hall 2001).

A microanalysis of housing markets in Germany observed that given housing's special characteristics as a good, there seems to be no universally accepted concept of either housing market behavior or an appropriate model for determining residential investments. It is also noted that majority of the empirical literature available on investment in housing, only offer investments equations and aggregate housing models which employ a wide range of specifications, simplifying assumptions and explanatory variable such as population, income, interest rates, depreciation, taxes and credit rationing as the determinants of housing investments at aggregate level and not at microanalysis level (Stahl 1985).

In North America, research on mortgage credit availability and residential construction, concluded that the fundamental choices for modelers of housing investments are whether to model the stock of houses, the existing capital stock of houses or the flow of new investment and how underlying market process is assumed to influence aggregate dynamic behavior within an economy. It was observed that housing supply is modeled by the flow of new investment rather than the stock of dwellings⁹. When demand for housing is analyzed, there is a corresponding – though less pronounced tendency to use stock approach or at least to take

⁸ See Berry M. and Hall J. (2001), Policy options for stimulating private sector investment in affordable housing across Australia: Stage1, Report prepared for the Affordable Housing National Research Consortium.

⁹ Although the existing stock of houses may be included, for instance as a scaling factor for other explanatory variables in the supply equation, see Jaffee and Rosen, 1979

the existing stock of houses directly into consideration. The main idea was that before investments in housing are conducted, consideration of the existing capital stock is necessary so as to correctly determine the demand gap within an economy. Additionally, research on tax subsidies to owner-occupied housing and time-series model of housing investment in the United States of America U.S.A, respectively, also observe that the long run production possibility frontier between houses and other goods is not flat on a comparative basis, because some production factors in the construction industry are in limited supply and due to the capital intensity of housing development (Jaffee and Rosen 1979, Poterba 1984, Rosen and Topel 1986).

For housing investments within the major OECD countries, studies on fix price equilibria in rental housing market and their impact of credit rationing, respectively, have found the inability of prices to rapidly clear the housing market in the short run due to various factors in an economy. The prices of houses are rigid. To incorporate price rigidity, the fix price equilibria approach is used to describe the housing investment market in the short run. Goodwin has developed an aggregate empirical macroeconomic two-market (housing and credit) model that clearly shows rationing and spillover effects across markets (Wiesmeth 1985, Goodwin 1986, Benassy 1975, Dreze 1975, Egebo and Lienert 1988).

The analysis of whether cost of capital in housing is really affected by real interest rates or whether mortgage markets in an economy are by any chance segmented was researched by De Rosa(1978), Hendershott(1980) and Behring and Goldrian(1985), who in their analysis of mortgage rationing, residential investment, real user costs and the demand for single-family housing and housing market models, where they observed that credit rationing caused short run housing market to be in disequilibrium. This was due to concern of whether credit availability causes or aggravates the housing investment cycle as commonly held by government officials and a majority of economists.

Given the special characteristics of housing as a commodity i.e. of durability, spatial fixity and heterogeneity coupled with extensive involvement of governments in housing and all related input markets, in a research on developments in economic models of housing markets in the American economy, it was found that many of the concluded models focus on only the demand side of the housing market because supply of housing is perfectly price inelastic in the long run. This is because it has proved impossible to include both demand and supply side factors in one model of the housing market (Smith et al.1988)

The economic implications of changing population trends in the American economy indentified housing investments as being the most sensitive to changes in population trends and positive income trends especially during the baby boom years and affected the house prices significantly (Burch et al 1986).

Due to the financial liberalization of the mortgage markets in both the U.S.A and United Kingdom, it had been expected that there will be a sudden shift in house price behavior. The shifts that took place in wealth, real interest rates and income expectations became important for housing investment modeling. However, the presence of transaction costs explains the non linearity of housing price dynamics. Focusing on household formation and home ownership, the impacts of demographics and taxes and the demographics of housing demand, the growth of owner occupation, it was observed that demographic factors have been one major source of changes in housing demand. The need for houses is closely linked to the number of households within an economy, which in turn can be explained by the size of the population, its age distribution and age-specific headship rates¹⁰ (Hendershott 1987, Dicks (1988).

¹⁰ , The ratio of heads of households to population by age group. Changes in headship rates are influenced by changing social patterns, but most investigators find that economic explanations dominate.

The importance of other factors, other than demographic factors, in housing investment analysis was observed in an opposing study on the changing income levels of individuals overtime and as carriers advance or through increased business activities by individuals by Haurin et al (1987) while conducting an econometric investigation on home ownership rates among married couples. It was found that gradual increases in income and wealth over the life cycle of the couples explains a large part of the observed rise in home ownership rates with increased age. Thus making it a bit difficult to establish how demographic trends on their own, at unchanged income levels, influence the real value of housing demand at aggregate level within an economy .The conclusion was that, in addition to demographic factors, other factors have to be explored to determine the causes of variation in housing investments in an economy.

The economic activities of households largely determine their ability to own houses in an economic set up. It has been found that those with multiple and independent sources of income tend to have an easy ability to own houses than those with single source of income as concluded in a research by Brainard and Tobin (1968) who analyzed housing as an investment good using the portfolio balance sheet approach. Asset demand is expressed as a function of both household wealth and the rates of return on assets and liabilities in the household balance sheet of an ordinary household, housing as an asset included.

When analyzing determinants of investments in housing using the portfolio approach, wealth variables are not commonly included in empirical studies or in the housing sector models of investment due to data availability. Instead, real disposable income of the household is used as a key variable to explain demand for houses. This is done by treating real income variable in a distributed lag form, so as to be a proxy for permanent income or wealth; however changes in income have also been used to explain the short term cyclical swings. When this is done i.e. incorporation of a permanent income term in a housing investment model, it

embodies long run elasticities with respect to permanent household income or income per capita in the vicinity of unity (De Rosa 1978).

With inflation as a persistent variable in economic environment, housing as a good is an effective tool of storing wealth for many individuals. Analysis of house prices have found that increase in house prices relative to those of other goods, in theory, should induce substitution away from houses, hence lowering demand. However, empirically, it is observed that anticipated house price inflation increases the demand for houses purely as an investment good for hedging purposes of monetary wealth. Both of these channels of influence are captured by the measures of user cost of housing. Important to note is that the two effects are often separated by the splitting of user cost into relative price and real interest rate terms. Due to heterogeneity of houses, the correct measurement of unit prices poses a problem and is often the reason of not including house price indices since in the long run when modeling housing investment; house price indices only reflect construction costs of the housing units. Accordingly, this makes house price indices to be replaced by the more supply oriented investment deflators, but prices are often included only through the real as opposed to nominal interest rates operational in the economy modeling the housing investments. Inflation has been found to reduce the effective cost of home ownership and subsequently raises the tax subsidy to owner occupation as studied in the U.S.A economy. Persistent high inflation rates have been found to lead to increased in stock of owner occupied housing. Interest payments are normally tax-deductible and capital gains are normally untaxed, so that inflation reduces the effective cost of home ownership independently of real interest rates. Higher inflation substantially raises housing investments in an economy. Thus inflation is an important determinant in housing investment variation (Rosen 1984, Poterba 1984).

However, within an existing structure for financing housing acquisition in an economy, it is found that there are elements which make inflation inherently non neutral even if correctly

anticipated. Research on Inflation, mortgages and housing has contrasted this by hypothesizing that constant payment mortgages leads to distortions in the housing market in the face of anticipated inflation, noting that a problem arises because the higher inflation and nominal mortgage interest rate increase the initial real burden of debt service for a mortgage with fixed nominal repayments. It is observed that only future higher income reduces the debt burden to homeowners who use the mortgage facility (Kearl 1979).

The generally observed product prices and the specific characteristics associated with each good define a set of implicit or hedonic prices, where hedonic prices are defined as the implicit prices of attributes and are revealed to economic agents from observed prices of differentiated products and with specific characteristics associated with them. In the studies of hedonic prices and implicit markets with product differentiation in pure competition, it is found that individuals observing past price increases may increase their subjective uncertainty concerning future price developments. There is evidence that by increasing the user cost to risk averse consumers, price uncertainty may discourage people from becoming house owners. The hedonic hypothesis is that goods are valued for their utility bearing attributes or characteristics (Rosen 1984).

While modeling housing investment for seven major OECD (Organization for Economic cooperation and development) countries (U.S.A, Japan, Germany, France, Italy, United Kingdom and Canada), housing services were observed to be flows proportional to the stock of houses available in an economy. With the initial stock of houses, time paths for housing stock and market clearing prices within the economies can be developed, where equilibrium depends on exogenous supply and demand factors, the rate of interest and depreciation. Most analyst of the aggregate housing sector behavior use this type of framework in a variety of ways, notably the inclusion of individual supply and demand side elements, the modeling of

flows of investment as opposed to stock of houses and the treatment of price information (Egebo and Lienert 1988).

In Africa, housing investment is quite a complex process which revolves around housing markets and housing policies, land markets and land policies, finance and finance policies in the different countries. Investment in affordable housing depends on prices of building materials, availability of land and the skilled labour in construction, and availability of serviced land as well as a functional regulatory framework and a well established financial sector. (Africa Housing Finance Year book 2010).

In Nigeria, the most populous country in Africa, housing finance for investment is provided by the existing 24 commercial banks, the primary mortgage institutions (PMI) – institutions specifically established for the purpose of providing mortgages and includes government owned Federal Mortgage Finance Ltd, and institutional employers. Other contributing factors to housing investments are savings, remittances and small loans. Long term finance for housing investment is a major problem in the Nigerian market. Lately there has been increased use of capital markets to raise funds for housing investments in the country. There is also scope for pensions to be used to fund housing investments (2010 Year Book, Housing finance in Africa).

In 2006, the ministry of Housing and Urban Development of Nigeria declared that Nigeria needed about ten million units before all Nigerians could be sheltered. The level of production of housing in a developing country like Nigeria is only 2 dwelling units per thousand people, compared to the required rate of about 8-10 dwelling units per 1,000 population as recommended by the United Nations(Ademiluyi 2010).

In South Africa, housing supply and investment in the country is dominated by a government subsidized delivery programme. The housing investment and finance policies have paid explicit attention to housing affordability since 1994, thus guiding investments in the sector. Understanding that most of the population could not afford housing, the government undertook an ambitious and far reaching national housing subsidy programme to guide investments in the housing sector. The annual housing provision target is 350,000 units per year but this has never been achieved. (2010 Year Book, Housing finance in Africa).

The Kenyan housing market has had the mortgage industry growing and becoming highly competitive, largely dominated by commercial banks and the HFCK as the only highly specialized mortgage finance institution. However, this mortgage industry is only accessible to formal sector employees who have a reliable salary stream. Despite the increased mortgage activity, the vast majority cannot afford it. The housing supply cannot meet demand, the land prices are prohibitive, there are fluctuating interest rates, existence of unserviced lands in urban areas, low capacity of the local councils to ensure affordable urban housing, highly speculative property market, which have all driven Kenya's residential property price inflation steadily over the years (2010 Year Book, Housing finance in Africa).

Very few studies have been conducted with regard to causes of housing investment variability in Kenya. An economic study of the urban housing in Kenya examined the housing market in Nairobi and concluded that the greatest obstacle to new residential investments is the availability of sufficient credit finance that would alter the level of housing stock for the populace and at a price that would facilitate long term investments that housing needs. The conclusions also advocated for mortgage facilities to enhance the affordability of houses for the low income earning households. The studies only concentrated on pricing and credit availability only (Adala 1978).

While researching on population pressures on urban housing in Nairobi, Kenya, it was observed that certain demographic and development variables are highly linked to the persistent housing problem. The findings were that geographic location and socio-economic status contributed to housing shortage for certain groups in the society (Opinya 1982).

Studies on the determinants of investments in housing in Kenya have found that income changes, construction costs, previous investments in housing and credit allocation are statistically significant in causing the variability of housing investment (Chesang 1991).

2.3.0 OVERVIEW OF THE LITERATURE

From the economic theory of investment and production it is evident that there is no single approach that can be said to be conclusive in analyzing the housing sector market behavior due to the special characteristics of the product involved. Most aggregate studies of housing sectors of economies focus on one side of the market and do not make effort to model the simultaneous influence of the demand and supply of housing stock and house prices. The exclusion of the supply side is usually based on the assumption that the supply of houses in the long run adopts to demand in a perfectly elastic manner. While in the short run price changes are assumed to adjust the demand side, with supply of housing assumed to be price inelastic contrasting the long run where prices are assumed to reflect construction costs of urban housing units.

In Kenya very few studies have been done to ascertain the exact causes of the variability of investments in housing sector. The studies, as highlighted above, have tended to concentrate on the change of single family units to flats in the leafy suburbs, eradication and upgrading of slums and squatter settlements within the urban areas and use of appropriate technologies for social housing without concentrating on the general investment framework that guides

housing sector investments for the different levels of demand of housing units to be met by the existing households and future ones.

Due to the complexities associated with housing markets, the majority of the studies conducted have used a continuum of applicable macroeconomic approaches. However, broad findings have been arrived at. Firstly, the supply of housing fully adjusts to the long run housing demand and that any abnormal profits are realized only in the short run, meaning that, with appropriate formulation, there exists an investment path that can close in the demand supply gap for housing units' development. Second is that demographic trends and income per capita are key variable of the housing demand .Thirdly, is that the housing investment is highly correlated to developments in the financial sector due to the capital intensity nature of the investments and that all studies must include variables from the sector in order to convincingly analyze the housing market behavior and understand the dynamics of investment in the housing sector that can close in the demand supply gap in the economy, for all households to be decently and adequately housed.

There is need to have a predictable investment framework that guides all the key stakeholders in the housing market. With the housing investment determinants known, all stakeholders are able to play a timely role, either on the policy front, the facilitation front and the implementation front. This study is focused on establishing a policy framework that integrates the various determinants of urban housing investments in Kenya that can help reduce the housing shortage problem. The aim is to be able guide all stakeholders (the public sector, the financial sector and the private sector) in decision making about housing investments in the country by observing the trend of the determinants to make timely investment decisions. This will help in reducing the increasing housing shortages and conserve the environment and spur economic growth.

CHAPTER THREE

3.0.0 THE RESEARCH METHODOLOGY

This chapter outlines the theoretical framework, model specification and data types and sources. It also defines and discusses the variables studied and the expected trend.

3.1.0 THEORETICAL FRAMEWORK

Jorgenson (1963) of the University of California developed an investment theory based on the neoclassical theory of optimal accumulation of capital where a production plan for the firm is chosen so as to maximize utility over time. Under certain well known conditions, this leads to maximization of the net worth of the enterprise as the criterion for optimal capital accumulation.

To summarize the theory, Jorgenson had let output at any particular time be defined by a production function of labor employed (**N**) and existing capital stock (**K**) as summarized below,

$$Y = F (N, K) \dots\dots\dots (1)$$

The Gross investment (**I**) for an enterprise was defined as:

$$I = dK/dt + dK \dots\dots\dots (2)$$

Where

dK/dt ; is change in capital stock over a given period of time.

dK : was the existing capital stock before the investment.

With initial capital stock, a firm reaches an equilibrium level of capital stock when the value of the marginal value product of capital is equal to its implicit rental rate (real user cost). The real user cost implies that, the rent on a unit of capital must cover the opportunity cost of lending it out, i.e. depreciation per unit minus the expected capital gains. With a production function, then the optimal capital stock K^* could be determined easily as shown below

$$K^* = f(Y, p, c) \dots \dots \dots (3)$$

Where;

Y is income

P is price of output

C is real user cost of capital

K^* depends positively on Y and p and negatively on c.

Jorgensen defined investment as an instantaneous change in the optimal stock of capital. This means that, there is no investment unless there is some reason to change the optimal stock of capital by imposing exogenous factors such as inflation rate, increase in urban population, changes in lending rates, e.t.c. Then moving to continuous time from any given K, investment is given as

$$I = dK^* + dK, \text{ thus we have,}$$

$$I = f(dY, dp, dc) + dK \dots \dots \dots (4)$$

Hence investment is a function of changes in the real user cost of capital (dc), changes in output (dY), changes in the price of output (dp) and the *level* of capital (K).

3.2.0 EMPIRICAL MODEL

This study adopted the theoretical framework of neoclassical investment model developed by Jorgenson (1963) and applied in several investment studies. Investment in housing, just like any other investment within an economy, is any guided by optimization expectations on the part of the investor and concerned stakeholders. This is in addition to any other determinants that affect such decisions. The model has been chosen taking into consideration the availability of data relevant to the housing sector in Kenya and the time series nature of the data to be modeled.

The model evaluated how affordable urban housing in Kenya is determined by urban population (P_h), Gross national Public investments(GI_h),Gross domestic savings(GS_h), inflation, lending rates (Inf_h), credit allocation to housing sector (C_h), unemployment rates (U_h) investment in previous three year period ($I_{h(t-3)}$), housing capital stock lagged one year ($K_{h(t-1)}$) and political uncertainty on a cobb Douglas production function with regard to output and input at constant returns to scale.

3.2.1 Model Specification

The following linear investment function in its structural form was outlined below for multiple regression using the ordinary least square method (OLS).

$$I_h = f\{P_h^{\alpha 1} GI_h^{\alpha 2} GS_h^{\alpha 3} INF_h^{\alpha 4} i_h^{\alpha 5} C_h^{\alpha 6} U_h^{\alpha 7} I_{h(t-3)}^{\alpha 8} K_{h(t-1)}^{\alpha 9} PU_h^{\alpha 10} U^*\}$$

Where;

I_h is Gross housing investment (in units).

P_h is urban population (in numbers).

GI_h is Gross public investment rate.

GS_h is Gross domestic savings rate

Inf_h is Inflation rate.

Γ_h^* is Lending rates.

C_h is Credit allocation to housing sector in millions of Kenya shillings.

U_h is unemployment rate.

$I_{h(t-3)}$ is Gross housing investment (in units) lagged three years.

$K_{h(t-1)}$ is Gross housing capital stock (in units) lagged one year.

PU_h is a dummy variable representing political uncertainty.

U^* is an error term which captures all the other key explanatory variables that influence the variations of housing sector investments and are not included as independent explanatory variables.

To make the linear investment function in its structural form less sensitive to extreme observations when the ordinary least squares estimation parameters are applied and ensure normality of the residuals, logarithms were used to transform the function as shown below.

Transformation of the dependent variable reduces heteroscedasticity in the data. It also

reduces multicollinearity, which would otherwise make estimation of the slopes of the coefficients difficult to estimate in a precise manner.

The specific linear investment model to be estimated took the following functional form

$$\begin{aligned} \ln I_h = & \alpha_0 + \alpha_1 \ln P_h + \alpha_2 \ln GI_h + \alpha_3 \ln GS_h + \alpha_5 \ln i_h \\ & + \alpha_6 \ln inf_h + \alpha_7 \ln C_h + \alpha_8 \ln U_h + \alpha_{19} \ln I_{h(t-3)} + \alpha_{10} \ln K_{h(t-1)} \\ & + \alpha_{11} \ln PU_h + U \end{aligned}$$

Each of the coefficients was tested for statistical significance at a predetermined level of significance of five per cent. Since the housing production function was assumed to have constant returns to scale, the coefficients summation is one as shown below.

$$\sum_{i=1} \alpha_i = 1$$

The constant term α_0 represents the prediction of the dependent variable when all the independent variables are zero. The parameters $\alpha_1, \dots, \alpha_{12}$ represent the elasticity that each of the respective independent variables highlighted above have on the dependent variable, the Gross housing investment.

3.3.0 THE CHOICE OF THE VARIABLES

a) Gross housing investments (in units)

Gross housing investment was taken as the dependent variable since the data on annualized depreciation rate for the housing sectors is not readily available. This makes data on net housing investments to be a problem. There is a no universally agreed standard rate of depreciation for housing stocks. Practically, urban housing investments do not depreciate but

instead appreciate, thus the problem is not essentially a big concern for purposes of this study.

b) Urban Population (in numbers).

Generally demographic factors constitute a key determinant of housing demand within any economy, both in the short run and long run. The need for housing units is closely linked with the number of households, which can be explained by the size of the population living within urban areas. The urban population was included as a basic demographic factor determining the long term trends in housing demand in urban areas. It was expected to have a positive sign since an increase in the urban population should, ceteris paribus, lead to an increase in the housing units within urban areas.

c) Gross Public Investment rate

Gross investment in the public sector encompasses investment in infrastructure made by the national government and the respective local authorities in the country. These include provision of roads, water, electricity, railway e.t.c. The ultimate impact of the physical infrastructural investments is that they open up and increase the value of land thus resulting in housing development where such public investments have been made. This was expected to have a positive sign because investors are able to develop housing units within such serviced lands in the urban areas, thus increasing the number of habitable housing units within urban areas.

d) Gross Domestic Saving rate

The levels of savings in the economy greatly affect the level of participation by the populace in housing investments. Ordinarily investment in housing requires the potential house owner to raise a down payment amount to secure borrowing from a financial institution. The higher the savings rate by the populace, the higher the housing investments within the economy,

since investors are able to raise the minimum threshold of required savings. This was expected to have a positive sign. This is because massive development of housing units requires investors to save for financial institutions to extend their support.

e) Inflation

The increase in house prices relative to the prices of the other goods should in economic theory induce substitution away from houses, thereby lowering demand for houses.

Anticipated house price inflation affects demand for houses as an investment good.

Due to interest payments that are normally tax deductible and capital gains that are normally untaxed, inflation is supposed to reduce the effective cost of home ownership independently of lending rates. High inflation is hence expected to raise housing investment within the economy. Either positive or negative sign was expected depending on whether inflationary pressures are positive or negative, since the pressures can create uncertainties in macroeconomic environment.

f) Lending rates

Housing investments are acknowledged to be lending rate sensitive due to the high financial capital intensity which is mainly in the form of borrowing from the financial institutions to fund housing projects in urban areas. Lending rates affect both the demand side, given the long term perspective of house purchase decision by a prospective home owner and the supply side since short term lending rates affect the borrowing capacity of developers who roll out massive housing projects in urban areas. There was no predetermined sign since the lending rates can be increasing or decreasing intermittently at any given time. Thereby positively or negatively affecting investment in housing sector

g) Credit allocation

The key determinant of housing developments programmes is the investment flows to the housing sector. This is partly determined by the credit allocated to this sector, by both public

and private sectors, at the prevailing costs of acquiring the credit. Holding the cost of finance constant, it is expected that if adequate credit is made available to the housing sector then it will affect housing investment variations in the economy positively i.e. as the level of credit increases, so is the housing investment. A positive sign was expected since credit allocation to the housing sector has been increasing every year since independence.

h) Unemployment rates

The underlying rationale of including this variable is that changes in unemployment helps to capture the consumer confidence within the urban population or uncertainty effects and therefore expected to influence the demand for houses negatively. A negative sign was thus expected. This is because the unemployment rates have been increasing through the years especially in the 1990s after the introduction of structural adjustment programmes by the international monetary fund (IMF).

i) Gross housing investment(in units) lagged three years

The variable is included because sector analysis that we expect three years or more before the impact of an investment decision in the housing sector meaningfully contributes to the housing sector investment variations of the existing housing stock within the economy. This is because it takes time for an investment in housing project to be completed, minimum three years. Hence if the impact is positive, investments variation will also be positive as sales or rental income is reinvested back for production of more housing units. The lagged value of investment expenditure represents the delayed effects of change in income by developers who intend to reinvest again in the housing sector from the realized returns of their previous housing investments. There was no predetermined sign because it is not automatic that the proceeds will be reinvested back by the investors for production of more housing units in urban areas or channeled to other uses.

j) Gross capital stock lagged one year (in units)

Capital stock denotes the already existing stock of houses within urban areas in the economy. Investment happens when there is a change in the capital stock (in our case urban houses) available. The reviewed investment theory and empirical studies, which insist on gradual adjustment of the capital stock to a desired level, depends on lagged capital stock for which a positive relationship is expected. A positive value was expected. This is because by analyzing the existing stock, policy makers are able to decide the number of housing units available, and the number of housing units needed to reduce the demand gap for houses in urban areas. More resources are allocated to the housing sector since the existing stock is the benchmark for any decision making. This takes place annually and since urban population is only increasing, a positive sign was expected.

k) Political uncertainty

Kenya has consistently had uncertain political conditions towards, during and after an electioneering period. Tribal clashes that have been the hall mark of every election period cause uncertainties within the economy. This slows down investment process within the economy during this period. Housing sector suffers just like any other sector in the economy. The variable was included as a dummy variable due to the impact it can have on housing investments. This was expected to have a negative sign. This is because when there is political uncertainty; investors hold back their resources for fear of loss.

3.4.0 TYPE AND SOURCE OF DATA

Time series data covering 1982 – 2009 was used to estimate the investment function. The basic data under analysis are the gross investment in housing, Urban Population, gross national public investments, gross domestic savings, inflation, lending rates, credit allocation to the housing sector, unemployment rates, gross investment in previous three year period in

the housing sector, available gross stock of houses in the country and a dummy variable, political uncertainty.

The data was obtained from secondary sources i.e. official reports from various institutions in the different concerned sectors within the economy. Data for gross investment in housing, gross housing stock were obtained from various issues of economic surveys by Kenya national bureau of statistics (statistical abstracts).Data for inflation rates and credit allocation to the housing sector was obtained from the central bank of Kenya annual reports. Data on unemployment rates was obtained from the records compiled by International Labour Organization. The data on urban population, lending rates, gross public investments and gross domestic savings was compiled from World Bank online data center.

3.5.0 PRE ESTIMATION TESTS

The regression results were based on time series data for a period of 28 years for Kenya (1982 – 2009). Estimation was done using the ordinary least squares method (OLS).This method is adopted because it gives the best unbiased estimates of the parameters, is widely used and is easy to apply to the kind of data to be collected for the study.

3.5.1 Descriptive Statistics

Although OLS does require the error term to be normally distributed, it is important for it to be normally distributed for purposes of statistical inference. This is usually checked by applying a suitable normality test such as Jarque–Bera (JB) test of normality which compares the skewness and kurtosis of coefficients of the variables. For a normally distributed variable, skewness is zero and kurtosis is three. When these happens, the JB statistic is expected to be zero from the following formula,

$$JB = n \left[\frac{S^2}{6} + \frac{(K - 3)^2}{24} \right]$$

Where n =sample size, s=skewness coefficient and k= kurtosis coefficient (Gujarat, 1995)

Under null hypothesis, the variables are normally distributed against the alternative hypothesis of non normality i.e.

$H_0 = 0$ (Normality)

$H_1 \neq 0$ (Non Normality)

Additionally the mean, the median and standard deviations statistics were evaluated to further check on the normal distributions of the variables.

3.5.2 Unit root test

Since time series data is mostly non-stationary, Augmented Dickey – Fuller (ADF) tests was carried out to ascertain whether the data contains unit roots. This guarded against spurious regression results. A stationary series has no unit root and does not require differencing, hence it is integrated of order zero i.e. $I(0)$ and has no estimation problems. Should the series have unit roots, or simply be non stationary and ordinary least squares method (OLS) is used to estimate the long run investment function, this can lead to mistaken adoption of spurious relationships which have no policy implications for the housing sector. The non stationary series was differenced to make it stationary before the estimation was done. This avoided the earlier mentioned problem.

The unit root test was based on the null hypothesis of non stationary/existence of unit root against the alternative hypothesis of stationary/no unit root, all tested by running the ADF tests.

3.5.3 Cointegration analysis

The non stationarity of the time series data led to differencing. The process of differencing the variables leads to loss of long run properties, since the model will become short run in nature. To solve this, an error correcting model (ECM) was introduced to reconcile the short run behavior of the variables with their long run behavior.

This study used Granger and Engel test to examine the residuals from the co integrating regression equation to test the null hypothesis that residual series has unit root/non co integration against an alternative hypothesis that the series is stationary/co integration.

i.e. $H_0 = 0$ (no co integration)

$H_1 \neq 0$ (co integration)

This test is analogous with the above unit root tests only that it was applied on the residuals only.

3.5.4 Diagnostic Tests

To check whether the regression model is correctly specified, whether errors exist e.g. omitting a relevant variable or including an irrelevant variable, using a wrong functional form, or errors of measurement bias and incorrect specification of the functional form e.t.c which can lead to over fitting or under fitting the model, diagnostic test were carried out so as to ensure that the model specification is sound and can be used for policy analysis.

3.5.5 The Durbin Watson d statistic

Since the data collected was of time series nature, there was a possibility of correlation in the observed variables. The presence of autocorrelation makes the OLS methodology lose its efficiency properties. To check against this, we used the above Watson d statistic test to test the hypothesis of non existence of autocorrelation. The alternative was expected to be the existence of autocorrelation.

CHAPTER FOUR

4.0.0 DATA ANALYSIS AND INTERPRETATION OF RESULTS

4.1.0 INTRODUCTION

This section of the study gives a summary of the findings and the results of the regression analysis carried out on the collected data. Due to the time series nature of the data, analyses were carried out to test various properties required of time series of data. This was to help make meaningful policy suggestions from the regression results.

4.2.0 DESCRIPTIVE STATISTICS

The descriptive statistics analyzed include; mean, median, standard deviation, skewness and kurtosis. It was also important, as mentioned at the methodology stage, to test for normality of the error term for purposes of statistical inference.

The mean measured the central tendency i.e. the location of the distribution of the variables. This is the sum of all observations divided by the number of observations in the data sample. However, the mean is usually highly affected by extreme values in a data set. While the median, the middle value of the data in either ascending or descending order, is less sensitive to the extreme values in a data set. These two are the most common measures of the central tendency.

Skewness measured the symmetry of a distribution about its mean and should range between (-2) and (+2). Kurtosis measured the peakedness of a distribution and should range between (-3) and (+3).

The data analysis found that the variables; gross housing investment(I_h), urban population (P_h), gross public investments (PI_h), gross domestic savings(S_h) inflation rate(inf_h), lending rates(i_h^*), credit allocation to housing sector (c_h), unemployment rate(u_h), gross housing investment lagged three years($I_{h(t-3)}$), gross housing capital stock lagged one year($K_{h(t-1)}$) and a

dummy variable, political certainty, are normally distributed. A tabulation of the descriptive statistics is outlined below

Table 4.1 Descriptive Statistics Results

variables	LNI _h	LNP _h	LNGI _h	LNGS _h	LNInF _h	Lni _h	LNC _h	LNU _h	LNI _{h-3}	LNK _{h-1}	LNPU _h
Mean	7.17	1.17	6.95	2.50	2.27	2.89	9.89	3.33	7.10	8.40	0.21
Min	6.35	.14	6.57	1.63	.47	2.51	8.45	3.03	6.35	6.9	0
Max	7.96	1.69	7.37	3.12	3.83	3.67	10.5	3.55	7.76	9.22	1
Std. Dev	0.37	0.31	0.22	0.45	0.75	0.31	0.37	0.16	0.36	0.48	0.42
Skewness	0.93	0.01	0.79	0.63	0.33	0.04	0.00	0.54	0.35	0.01	0.003
Kurtosis	0.67	0.01	0.57	0.002	0.290	0.99	0.00	0.01	0.78	0.04	0.66

Source; Regression results, Stata 10

The correlation of variables was tested by analyzing the correlation matrix to help identify the power of the variables in the model so as to know which variables to drop from the specified model. The correlation matrix is shown below

Table 4.2 Correlation Matrix

Var	LNI _h	LNP _h	LNGI _h	LNGS _h	LNInF _h	Lni _h	LNC _h	LNU _h	LNI _{h-3}	LNK _{h-1}	LNPU _h
LNI _h	1										
LNP _h	0.076	1									
LNGI _h	0.6445	0.248	1								
LNGS _h	0.497	0.1525	0.782	1							
LNInF _h	0.0834	0.2600	0.251	-0.397	1						
Lni _h	-0.1590	-0.278	-0.093	0.0426	0.0069	1					
LNC _h	0.0812	0.163	0.7647	0.419	0.214	-0.066	1				
LNU _h	0.0693	0.296	0.0372	-0.796	-0.353	-0.030	0.079	1			
LNI _{h-3}	0.1624	0.199	0.4486	0.424	0.088	-0.054	0.3936	0.3578	1		
LNK _{h-1}	0.4500	0.317	0.9064	0.654	0.215	-0.1418	0.8369	0.8675	0.5506	1	
LNPU _h	-0.2142	0.2710	-0.056	-0.039	-0.033	-0.058	-0.241	-0.080	-0.323	-0.186	1

Source; Regression results, Stata 10

From the above, it was found that, urban population is highly positively correlated with gross housing investments; credit allocation to housing sector is highly positively correlated to

gross public investments while the unemployment rate is highly negatively correlated with gross domestic savings and the gross capital housing stock lagged one year; political uncertainty had a high correlation with urban population. This brought about the problem of multi co linearity. To solve the problem, the variables were lagged once to make them stationary.

4.3.0 THE DURBIN WATSON d STATISTIC

Due to the time series nature of the data, it was necessary to check for the possibility of correlation between the observed variables. This is because the presence of autocorrelation would make the estimated model lose its efficiency properties. The results of the Durbin Watson statistic were found to be; Durbin-Watson d-statistic (13, 27) = 2.16369, showing that there is no positive autocorrelation between the dependant variable and the residuals when compared against the critical values of the d statistic from the statistical tables. Thus the residuals become eligible as the error correction term since they have a mean of zero and constant variance.

4.4.0 UNIT ROOTS

To make meaningful policy suggestions, the error term must be time invariant. The Augmented Dickey fuller (ADF) test is an important test of ascertaining whether the time series data contains unit root. This will guard against spurious significant results. The table below shows the results for unit root test at zero lag length

Table 4.3 Results for unit root test (lag length = 0)

Variable	Test Statistic	1% critical value	5% critical value	10% critical value	Stationarity
LNI _t	-1.813	-3.736	-2.994	-2.628	Non stationary
LNP _t	-4.718	-3.736	-2.994	-2.628	Stationary
LNGI _t	0.082	-3.736	-2.994	-2.628	Non stationary
LNGS _t	-1.193	-3.736	-2.994	-2.628	Non stationary
LNlnF _t	-3.732	-3.736	-2.994	-2.628	stationary
Lni _t	-2.635	-3.736	-2.994	-2.628	Non stationary

LNC _t	-5.974	-3.736	-2.994	-2.628	Stationary
LNU _t	-3.515	-3.736	-2.994	-2.628	Stationary
LNI _{t-3}	-2.110	-3.736	-2.994	-2.628	Non stationary
LNK _{t-1}	0.169	-3.736	-2.994	-2.628	Non stationary

Source; Regression results, Stata 10

The results above indicated that only urban population and credit allocation to the housing sector are stationary at 1%, 5% and 10% critical values. The inflation rates are stationary at 5% and 10% critical values but non stationary at 1% critical value. The lending rates are stationary at 10% critical value but non stationary at 5% and 1% critical values. The unemployment rates are stationary at 5% and 10% critical values but non stationary at 1% critical value. The gross public investment, gross domestic savings, and gross housing capital stock lagged one year are non stationary at all critical values.

The above non Stationarity can lead to spurious regression results which will lead to meaningless policy suggestions. The data was differenced at lag length (1) and rechecked whether the problem still exists. The results are shown below

Table 4.4 Results for unit root test (lag length = 1)

Variable	Test Statistic	1% critical value	5% critical value	10% critical value	Stationarity
LNI _t	-5.398	-3.736	-2.994	-2.628	Stationary
LNP _t	-9.437	-3.736	-2.994	-2.628	Stationary
LNGI _t	-4.693	-3.736	-2.994	-2.628	Stationary
LNGS _t	-5.286	-3.736	-2.994	-2.628	Stationary
LNlnF _t	-6.628	-3.736	-2.994	-2.628	Stationary
Lni _t	-11.432	-3.736	-2.994	-2.628	Stationary
LNC _t	-6.490	-3.736	-2.994	-2.628	Stationary
LNU _t	-4.837	-3.736	-2.994	-2.628	Stationary
LNI _{t-3}	-6.011	-3.736	-2.994	-2.628	Stationary
LNK _{t-1}	-9.732	-3.736	-2.994	-2.628	Stationary
LNPU _t	-6.245	-3.736	-2.994	-2.628	Stationary

Source; Regression results, Stata 10

The unit root problem was resolved as shown in the above results. The multicollinearity problem was equally solved as shown below by analyzing the correlation of the variables

Table 4.5 Correlation matrix

Var	LNI _h	LNP _h	LNGI _h	LNGS _h	LNInF _h	Lni _h	LNC _h	LNU _h	LNI _{h-3}	LNK _{h-1}	LNP _h
LNI _h	1										
LNP _h	0.0425	1									
LNGI _h	0.1035	0.228	1								
LNGS _h	0.071	0.097	0.080	1							
LNInF _h	0.0017	0.2732	0.084	-0.135	1						
Lni _h	-0.143	0.0113	-0.082	-0.0737	-0.147	1					
LNC _h	0.414	0.0840	0.2436	0.2540	-0.098	-0.031	1				
LNU _h	-0.029	0.126	-0.201	0.083	0.120	-0.091	0.3581	1			
LNI _{h-3}	0.361	0.028	0.1175	0.018	0.089	0.273	0.4169	0.0100	1		
LNK _{h-1}	0.246	0.019	0.1723	-0.024	-0.142	0.0115	0.5376	0.0200	0.0521	1	
LNP _h	0.1462	0.1336	-0.2134	0.0303	0.002	0.195	0.156	0.088	-0.089	-0.128	1

Source; Regression results, Stata 10

The above table shows that the problem of multicollinearity was reduced for purposes of the study.

4.5.0 COINTEGRATION ANALYSIS

In the presence of non stationary, i.e. presence of unit roots, differencing became necessary to eliminate the autoregressive component in the regression. This makes a model lose its long run properties. The deviations from the long run properties should be included as an explanatory variable in the error correcting model (ECM) so as to reconcile the short run behavior with the long run behavior. The results of the Granger and Engel test are shown below,

Source	SS	df	MS	Number of obs = 25		
Model	1.06251916	2	.831209578	F(2, 23)	=	14.28
Residual	1.45025767	23	.054402508	Prob > F	=	0.0001
				R-squared	=	0.7706
				Adj R-squared	=	0.7232
Total	2.91367683	25	.116547073	Root MSE	=	.13804

D. ehat	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ehat						
L1.	-0.914996	.2042403	-4.48	0.000	-1.796529	-.6618941
LD.	.0936664	.1029302	0.91	0.374	-.2240709	.5741543

Source; Regression results, Stata 10

The t computed of -4.48 is less than the critical value obtained from the tables of -2.048, the 5% critical value for a co integrating regression .Thus the null hypothesis that the least squares residuals are non stationary is rejected; the residuals are stationary. The ADF test on the residuals is statistically significant as shown below

Dickey-Fuller test for unit root Number of obs = 26

Test Statistic	----- 1% Critical value	Interpolated Dickey-Fuller 5% Critical Value	----- 10% Critical Value
z(t)	-3.743	-2.997	-2.629

Mackinnon approximate p-value for z(t) = 0.0000

Source; Regression results, Stata 10

This implies cointegration. The relationship between the dependent variable and independent variables is not spurious. The residuals became the error correction term to facilitate the adoption of the error correction model to generate a generalized estimation model for the study.

The error correction model is achieved by regressing the change in the variables of the study including the lagged residuals at their levels. The results of the regression after error correction term are shown below

Table 4.6 Generalized Estimated Model regression results

REGRESSION RESULTS	coefficient	t Statistic
Urban Population	1.162489	0.13
Gross Investment, Public Sector(% of GDP)	1.218557	3.75***
Gross Domestic Savings(% of GDP)	0.933819	2.66**
Inflation rates	0.240000	3.11***
Lending rates	-2.413145	-4.06***
Credit allocation to housing sector	1.006407	2.80**
Unemployment rate	-7.832840	-1.39
Gross housing investment lagged three years	0.566078	2.63**
Gross housing capital stock lagged one year	2.83119	3.65***
Political uncertainty	-0.313799	-2.62**

Note:

- * 10% level of significance (90% confidence interval)
- ** 5% level of significance (95% confidence interval)
- *** 1% level of significance (99% confidence interval)

R Squared 74.63

F statistic 1.10

Adj R Squared 70.03

No. of Observations 27

Source; Regression results, Stata 10

4.6.0 DIAGNOSTIC TESTS

There was need to check whether the model is correctly specified and whether errors exist such as omission of relevant variables, inclusion of unnecessary variables, adopting the wrong functional form, errors of measurement and incorrect specification of the stochastic error term. The consequences could either be an over fitting or under fitting model. We carried out the tests of significance. To check for unnecessary variables in the model, we used the *F* test and *t* test. The overall fitness of the model is tested with R^2 . The results are shown below

Source	SS	df	MS	
Model	.458974994	11	.041724999	Number of obs = 27
Residual	.56932132	15	.037954755	F(11, 15) = 1.10
				Prob > F = 0.4227
				R-squared = 0.7463
				Adj R-squared = 0.7003
				Root MSE = .19482
Total	1.02829631	26	.039549858	

Source; Regression results, Stata 10

The *F test* which is a measure of the overall significance of the estimated regression is 1.10. It is also a test of significance of the R^2 , which has a P value of 0.4227. The *p* value of the *F* obtained is sufficiently low, thus we reject the null hypothesis that all slope coefficients are simultaneously zero. These two tests show that the model is correctly specified and is strong enough to draw policy suggestions about housing investments.

The *t test* shows that gross public investments, gross domestic savings, inflation rates, lending rates, credit allocation to the housing sector, gross housing investment lagged three years, existing gross capital stock lagged one year and political uncertainty are all statistically significant. Urban population and unemployment rate were not significant in explaining variations in housing investments.

4.6.1 The interpretation of the coefficients

The size of the coefficient for each of the independent variable gives the size of the effect that variable is having on the dependent variable, gross housing investment, and the sign on the coefficient (positive or negative) gives the direction of the effect. The coefficient tells how much the dependent variable is expected to increase or decrease when that independent variable increases or decreases by one, holding all the other independent variables constant.

From the above results, the coefficients are compatible with the hypothesized values. The coefficients of the following independent variables significantly and positively cause an increase in gross housing investments whenever each independent variable changes by one holding all the other independent variables constant; gross public investment rate, gross domestic saving rate, inflation rates, credit allocation to housing sector, gross housing investment lagged three years and gross housing capital stock lagged one year. The change and sign effect for all the independent variables are all shown in the table above. The urban

population coefficient does not significantly cause a change in gross housing investments, although it's positive.

Coefficients of the independent variables lending rates, unemployment rate and political uncertainty negatively and significantly cause a decrease in gross housing investments whenever each of the independent variables changes by one unit holding the change in all other independent variables constant.

The constant coefficient shown in the table above shows the change in gross housing investment that is independent of the influence of the independent variables.

4.7.0 REGRESSION RESULTS AND THE ESTIMATED MODEL

The regression results from which the estimated model is derived are shown below

REGRESSION RESULTS	coefficient	t Statistic
Urban Population	1.162489	0.13
Gross Investment, Public Sector(% of GDP)	1.218557	3.75***
Gross Domestic Savings(% of GDP)	0.933819	2.66**
Inflation rates	0.240000	3.11***
Lending rates	-2.413145	-4.06***
Credit allocation to housing sector	1.006407	2.80**
Unemployment rate	-7.832840	-1.39
Gross housing investment lagged three years	0.566078	2.63**
Gross housing capital stock lagged one year	2.83119	3.65***
Political uncertainty	-0.313799	-2.62**

Note:

- 10% level of significance (90% confidence interval)
- ** 5% level of significance (95% confidence interval)
- *** 1% level of significance (99% confidence interval)

R Squared 74.63

F statistic 1.10

Adj R Squared 70.03

No. of Observations 27

Source; *Regression results, Stata 10*

The empirical model from which the policy suggestions are made was specified below shown. The d denotes the relative change on the dependent variable caused by a unitary change in the independent variable

$$\begin{aligned}
 dLnI_h = & 1.215657 + 1.162489 dLnP_h + 1.218557 dLnGI_h + 0.933819 dLnGDS \\
 & + 0.240000 dLninf_h - 2.413145 dLnI_h^* + 1.006407 dLnC_h - 7.83284 dLnU_h \\
 & + 0.5660788 dLnI_{h(t-3)} + 2.831190 dLnK_{h(t-1)} + -0.3137992 dLnPU_h - .0501856 dLaggedres
 \end{aligned}$$

CHAPTER FIVE

5.0.0 SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS.

5.1.0 INTRODUCTION.

In this section, a summary of the study, conclusions, policy recommendations drawn from the analyzed results and areas of further research are outlined.

5.2.0 SUMMARY

The study analyzed the determinants of investments for affordable urban housing in Kenya. An historical perspective of housing policy evolution, stakeholders and the future of the sector was also analyzed. The housing sector is very demanding in terms of government involvement, the interaction with the financial sector, the production of building materials and land management in any given country. There is need for an effective investment policy framework to govern the housing sector. This was the basis of the study.

5.3.0 CONCLUSION

The study estimated an investment function for the urban housing sector in Kenya .The significant variables were, gross public investments, gross domestic savings, inflation rates, lending rates, credit allocation to the housing sector, gross housing investment lagged three years. gross capital stock lagged one year and political uncertainty. The urban population unemployment rates were not statistically significant.

The model was found to be stable as evidenced by the F statistic and was good in explaining total variation in urban housing investment as indicated by the R squared .The model is also free from the econometric problems as shown by the unit root test and co integration analysis.

Policy recommendations that would enhance the performance of the urban housing sector in Kenya given the critical role it plays in the general economic environment were drawn and explained in detail in the following section.

5.4.0 POLICY RECOMMENDATIONS

The study suggests policy recommendations from the variables analyzed with regard to urban housing investments.

Firstly, there is a positive correlation between credit allocated to urban housing sector and the urban housing investments. The caveat on this positive correlation is that majority of finance institutions have for quite a while placed first legal charge on residential property developments as collateral for any credit advanced. This was based on the sanctity of land title deeds. However, the sanctity of land title deeds has been questioned with various previously approved urban housing developments being earmarked and actually demolished by the same government. This has led to massive losses to financial institutions advancing credit for urban residential housing developments. This has scared potential investors as they try to manage their risks. The government needs to adopt a policy of guaranteeing the sanctity of a title deed issued under its seal. Additionally the credit allocated for housing construction turns out to be very expensive due to the high lending rates currently charged as a result of the monetary policy of the country's central bank compared to the lending rates of other economies. The government needs to adopt a policy that gives subsidized interest rates for first time home owners who seek funding from the financial institutions and to approved developers of urban housing units to cushion them from the high lending rates set by the central bank. To complement the implementation of the ambitious policy spearheaded by the ministry of housing in its strategic plan, the government has to adopt a policy of incremental allocation of government budget and lending to the housing sector to compliment the private sector initiatives. This will ensure that even the low income earning population can access funding for real estate development, unlike the current status where only the small well to do population controls the investments in urban housing.

The gross housing investment lagged three years has a significant relationship with the housing investment. This is explained by investors who are able to reap high returns from the previous investments in urban housing developments either as a result the proceeds of sales or rental the same. At policy level, due to shortages in urban housing, the government needs to give all forms of incentives to such investors which can include tax incentives on construction costs, finance costs, housing subsidy on completed units by way of funds transfer for completed registered housing units, research on low cost social housing technologies that will necessitate on mass urban housing production and facilitation of capacity building for small scale urban residential developers. This is because the biggest challenge in Kenya is the profile of the private housing estate developers. They are few and with limited financial and technical resources. This translates to small urban housing projects which lack economies of scale to alleviate the existing urban housing shortage. This occasions the current shortage of affordable urban housing units.

There is need to enhance the saving culture for housing investments among Kenyans. This will complement the positive relationship between housing investments and savings. There is need to develop products that motivate the work force to save for construction of homes. The best approach for the government is to use tax incentives for those saving towards the acquisition of a residential house in urban areas.

The government needs to take steps in developing a single lending rate for the mortgage loans, which is the common way to a majority of financing house ownership, to mitigate the negative correlation with housing development. In addition, a secondary mortgage institution (SMI) should be created. This will give more incentives to the financial institutions to lend to developers and individuals knowing that they can refinance the loans from the SMI at a reasonable rate. At the beginning, public money is needed to promote the SMIs to address market failure in affordable urban housing. This is where government policy on housing

needs to support such. After a while the public money will be divested and the market forces allowed dominate. This will help in nurturing housing development finance i.e. government takes early risks and prepares to hand over to the market forces the activities after a preparation of the ground especially on the regulation of profitability and competition. The capital markets will need to deepen to accommodate urban housing development bonds which are better than in terms associated finance costs compared to financial institutions. This will encourage financial institutions to innovate housing development finance products that attract existing and potential real estate developers. This will lead to mass production of housing units in urban areas, in the end reducing the existing shortage.

Although the government has done well in investment in public infrastructure such as roads, water provision, electricity provision in urban areas, there is need to increase the pace. The potential of such to open up once undesirable lands cannot be over emphasized. This will help decrease the housing shortage in the country as shown by the positive correlation. Other complimentary factors such as land reforms stimulate the required investments in modern housing programmes.

Urban population has a positive sign explaining the positive correlation between housing development and the increasing number of households, meaning that as households increase, urban housing investments need to be increased to produce more housing units to avoid the development of slums and squatter settlements in urban areas, as is the case now. From the past urban population data, it's evident that urban population increases on an annual basis. The urban population from the last census report of 2009 showed that 32 per cent of the population lives the urban areas, Kenya's vision 2030 projects that by the year 2030, 60 per cent of the country's population will be living in the urban areas. The government needs a housing policy that caters for the existing gaps and the projected urban population. This will be achieved through social housing initiatives and use of appropriate technologies which take

shorter time to deliver habitable housing units. The Ministry of housing strategic plan needs to align its mandate with the urban population projections to reduce the urban housing shortage gap. The government should adopt a policy of funding and encouraging private investors to increase the supply of complete housing units. This can only be achieved through government sponsored initiatives such as tax holidays for developers producing a given number of urban housing units per year, subsidies both on technical and financial needs of the developers.

The government should put in place income distribution mechanisms to the populace through creation of employment in the various sectors. This will promote decent urban housing developments as people will seek decent shelter when empowered economically and due to the high returns associated with housing developments investments. It will also improve their credit advance qualification with the financial institutions if they choose to develop by debt.

General inflation rates have a positive relationship with investments in affordable housing. This is due to the hedging features of real estate developments against general inflationary tendencies. The government, through central bank, should adopt tolerable inflation levels to balance off the growth needs within the economy, urban housing development included. Housing, being part of real estate, is one of the few profitable ways of hedging against inflation within the economy.

Lastly, the unemployment rates have to be maintained at low levels due to the negative relationship with housing investments. High unemployment rate erodes consumer confidence in acquiring or making housing investments. If kept low, this will facilitate the investment in affordable urban housing by a majority of the urban population. This needs to be pursued vigorously through the various economic stimulus programmes as well as other initiatives that create effective demand for basic needs, housing being only next to the food need. The

shortage in urban housing units shows that consumer confidence levels affect investors' decisions to invest in real estate. Equally, the gross capital stock of available housing units lagged one year should help policy maker decide on the most feasible production plan for affordable urban houses. The urban housing demand supply gap simply requires more output of urban housing units to cater for the ever increasing needs of housing provision. This can only be known if the existing gross capital stock of urban houses is evaluated frequently and compared to the increasing urban population.

The above policy suggestions will help in mitigating the current housing provision gap that has led to slum development and squatter settlements in urban areas.

5.5.0 LIMITATIONS OF THE STUDY

The Jorgenson investment model is criticized for being more of optimal capital rather than about investment. The demand for capital is not demand for investment. The model also faces the problem of autocorrelation due to the delivery lags later incorporated into the model i.e. the lagged investment delivery process.

There is complexity of modeling housing investments variations due to a number of reasons. Firstly, the heterogeneity of housing units makes house price indices to pose a problem¹¹ and thus making it difficult to include them in the model formulation.

Secondly, the dynamics of housing investment and possible purchase decisions do give rise to information costs such as marketing costs, legal costs, government stamp duties and relocation costs. The same information costs apply to private housing developments i.e. building one's own house. These have not been factored in the model formulation due to the complexity of formulating the model.

¹¹ One approach is to estimate prices of housing characteristics in the so called 'hedonic' prices to generate house price indices (Rosen, 1984). There is some uncertainty, however, on the content and the correctness of such measures for purposes of modeling housing investment variations.

Thirdly, institutional arrangements to provide concessionary finance for the purchase of houses by employees constraints the supply of mortgage credit, partly explaining the inability of the mortgage interest rate not clearing the market. Thus the availability of the mortgage credit was omitted as an explanatory variable in the model formulation.

Lastly, the government does exert a direct influence of the housing market in many ways such as tax concessions granted to income earning employees on mortgage interest payments, house deposits with institution for first time buyers, subsidization of construction and control of rent and land prices. In addition, building codes and zoning laws and government owned building provided to civil servants and availability of serviced lands influence variations in housing markets.

The data availability and complexity of modeling such key factors has necessitated their omission as housing investment variations explanatory variables. This is likely to constraint the accuracy of the results to be obtained from this Study.

5.6.0 AREAS OF FURTHER RESEARCH

The suggested future areas of research should include the role of urban land reforms, variable house prices, information costs associated with housing acquisition and how individual investment decisions in housing are affected by the same.

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ANNEXURES

1) The collected data set

Year	Gross Housing Investment (In units)	Urban Population(Numbers)	Gross Investments, public sector (% of GDP)	Gross domestic savings (% of GDP)	Inflation Rate (%)	Lending Rate (%)
1982	2,087	2,770,814	8.57	16.96	22.30	14.50
1983	988	2,896,277	6.89	18.66	14.50	15.83
1984	638	3,026,250	6.47	14.51	9.10	14.42
1985	573	3,160,358	6.62	20.48	10.70	14.00
1986	1,083	3,305,417	8.10	17.72	5.70	14.00
1987	1,042	3,454,756	7.13	19.20	8.70	14.00
1988	1,466	3,608,223	8.43	20.22	12.30	15.00
1989	1,302	3,765,683	8.15	17.77	13.30	17.25
1990	1,147	3,926,933	9.74	18.53	15.80	18.75
1991	851	4,133,181	8.54	19.46	19.60	19.00
1992	1,559	4,345,846	7.39	16.51	27.50	21.07
1993	1,305	4,563,705	7.31	22.56	-46.00	29.99
1994	1,062	4,785,063	9.01	22.11	28.80	36.24
1995	1,289	5,008,759	7.88	15.26	1.6	28.80
1996	1,434	5,240,480	6.59	8.09	9.0	33.79
1997	1,449	5,474,789	6.56	6.46	11.20	30.25
1998	1,446	5,713,708	7.19	8.13	6.60	29.49
1999	1,113	5,960,286	7.67	8.99	3.50	22.38
2000	1,017	6,216,986	9.24	7.28	6.20	22.34
2001	941	6,494,979	10.51	8.71	5.80	19.67
2002	1,040	6,784,852	9.55	9.76	2.00	18.45
2003	1,142	7,086,200	8.02	10.52	9.8	16.57
2004	1,704	7,397,949	4.27	10.71	11.6	12.53
2005	1,815	7,719,459	2.49	9.45	10.3	12.88
2006	1,903	8,058,814	3.05	7.23	7.3	13.64
2007	2,350	8,409,215	3.90	8.11	5.6	13.34
2008	2,401	8,772,681	4.37	5.09	17.8	14.02
2009	2,851	9,151,992	5.34	6.94	8.0	14.80

Credit allocation(in Millions of Shillings.)	Unemployment Rate (%)	Gross Housing Investment Lagged three years(in units)	Gross Capital stock lagged one year (in units)	Political Uncertainty
93,880	20.75	-	2,391	1.00
216,220	21.995	1,938	2,509	0.00
248,140	22.41	2,087	2,253	0.00
342,900	22.825	988	2,542	0.00
425,560	23.24	638	2,622	0.00
382,880	23.655	573	3,432	1.00
421,260	24.07	1,083	3,817	0.00
441,240	24.485	1,042	4,242	0.00
421,260	24.90	1,466	4,638	0.00
415,480	25.60	1,302	5,258	0.00
370,722	26.30	1,147	4,926	1.00
406,378	26.90	851	4,594	0.00
433,240	27.60	1,559	5,336	0.00
360,294	28.30	1,305	5,738	0.00
394,422	29.00	1,062	5,192	0.00
358,631	29.70	1,289	5,451	1.00
408,460	30.40	1,434	5,528	0.00
450,120	31.10	1,449	5,220	0.00
415,160	31.70	1,446	5,268	0.00
402,720	32.40	1,113	5,360	0.00
400,680	33.10	1,017	5,280	1.00
388,780	33.70	941	5,725	0.00
401,500	34.20	1,040	5,840	0.00
535,620	34.70	1,142	6,687	0.00
688,260	34.50	1,704	7,591	0.00
729,440	34.20	1,815	8,743	1.00
584,940	33.80	1,903	10,051	0.00
608,280	33.50	2,350	11,689	0.00