

**THE EFFECT OF MACRO ECONOMIC VARIABLES ON THE
DEVELOPMENT OF HOUSING IN KENYA**

By

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DECLARATION

This research project is my original work and has not been submitted for examination to any other university.

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This research project has been submitted for examination with my approval as the University of Nairobi Supervisor

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DEDICATION

To my parents Mr. and Mrs. Konana whose foresight in education and constant encouragement drove me to this level of education.

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ABSTRACT

Over the past few years, the world real estate industry has been undergoing drastic reforms due to the liberalization of financial markets, the drastic fall of interest rates, the obsolescence of the existing stock of housing, and a change in consumer norms on housing uses. According to Deutsche Bank Research (2008) the major macro indicators for the housing development are Gross Domestic Product (GDP) growth trend, GDP per capita, population, median age, population growth, financial market development, legal system and average inflation. Research from Liow et al. (2006) analyze macroeconomics influences on worldwide property market and finds that GDP, inflation and interest rate are the most relevant macroeconomic indicators to examine. The mortgage interest rate is a very important variable that influences the decisions of individuals on whether or not to buy a house in developing countries Kenya included. When the mortgage rate increases, people are prevented from buying houses; therefore, the demand for housing decreases. This study sought to answer the following question; what are the effects of macro-economic variables on the development of housing in Kenya over the period 2004–2013? The research design of this research was a descriptive survey research. The study used secondary data collected from the Central Bank of Kenya for interest rates and inflation rate and Kenya National Bureau of Statistics for aggregate number of house units built annually and Gross Domestic Product. The time period that this study covered was 10 years, (2004-2013). The data obtained was analyzed using multiple linear regression technique. From the regression model, the study found out that there were macro-economic variables influencing the development of housing in Kenya, which are interest rate, inflation rate and Gross Domestic Product growth (GDP). The two variables in the study (inflation rates (- 0.105) and interest rates (-0.264)) were negatively correlated with the number of house units built while the third variable GDP (0.417) was positively correlated with the number of house units built. The study found out that the intercept was 0.481 for all years. The three independent variables that were studied, explain only 94.9% of the number of house units built as represented by the adjusted R^2 . This therefore means the three variables contribute to 94.9% of the number of house units built, while other factors not studied in this research contributes 5.1% of the number of house units built. The study recommends that a similar study should also be carried out on the effect of micro-economic variables on the development of housing in Kenya.

LIST OF ABBREVIATIONS

CPI	Consumer Price Index
DCF	Dynamic Coherence Function
EPZ	Export Processing Zone
FOMC	Federal Open Market Committee
GDP	Gross Domestic Product
GOK	Government of Kenya
MRSP	Metropolitan Region of Sao Paulo
REIT	Real Estate Investment Trust
UK	United Kingdom
UN	United Nations
UNFPA	United Nation Population Fund
US	United States
VAR	Vector Autoregressive-Model

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Housing is a basic need. In both rural and urban areas, housing provides people with necessary protection from the elements and attack from wild animals or fellow human beings. It is where fundamental functions of life – eating and sleeping – take place and women carry out their roles of reproduction (child bearing, child rearing), production (work down for payment, home production) and household and community management (activities undertaken at household and community levels). It provides a location from which people can access employment opportunities as well as engage in income generating activities.¹The importance of housing in society can hardly be overstated. Housing is typically the largest single item in the household budget, and thus has fundamental implications for household consumption. But housing does not only have financial consequences. The composition of the housing stock impacts not only on lifestyles but also on overall urban form. The social organization of housing, particularly in terms of tenure and dwelling type, can thus affect society in highly significant ways (Kemeny, 1992).

Houses for human beings address their need to be protected from adverse climatic weather conditions. The search for an appropriate shelter form went on for hundreds of years in every part of the world where people wandered and settled as evidenced from the ways houses have evolved over the years. United Nations Population Fund (UNFPA,

2007) predicted that in 2008, the world was expected to reach an invisible but momentous milestone; for the first time in history, more than half its human population of 3.3 billion people would be living in urban areas. By 2030, according to UNFPA (2007) this figure is expected to increase to almost 5 billion. Many of the new urbanites will be poor. Their future, the future of cities in developing countries, the future of humanity itself, all depend very much on decisions made at present in preparation for this growth. Between 2000 and 2030, UNFPA (2007) estimates that Asia's urban population will increase from 1.36 billion to 2.64 billion, Africa's from 294 million to 742 million, and that of Latin America and the Caribbean from 394 million to 609 million. One of the issues to be addressed is how the population will be housed.

1.1.1 Macro Economic Variables

According to Deutsche Bank Research (2008) the major macro indicators for the housing development are Gross Domestic Product (GDP) growth trend, GDP per capita, population, median age, population growth, financial market development, legal system and average inflation. Besides, Ducoulombier (2007) mentions other sources of systematic risk as Employment, Interest rates and unexpected inflation. The latter examples, with the enumeration In general, when economists try to figure out the set of influential macro-economic variables, they almost all agree on the use or on a variant of GDP, interest rate, tax rates, real wage and rate of employment. Going even further, the research from Liow et al. (2006) analyze macroeconomics influences on worldwide property market and finds that GDP, inflation and interest rate are the most relevant macroeconomic indicators to examine. Based on the previous literature, we choose to use

GDP, inflation and interest rate as macro-factors in this study. GDP is the first important macroeconomics measure. It measures the total value of domestic production for the entire domestic economy.

The aggregate integrates consumers, governments and investors spending money within the nation, and also includes the net exports (exportations– importations). As GDP is an indicator of the health of the economy, a high GDP is synonym of a favourable economic condition value and that should positively drive investments in SIICs. Consumers spend their money in renting or owning houses, investors in new constructions and governments in infrastructures. Real GDP contrary to nominal GDP allows to erase the inflation effect and to compare the measure over our timeline consideration of five years. Inversely, when unfavourable economic conditions occur, that should negatively affect investments. Inflation is also commonly accepting as a main macroeconomic factor by academics. By definition, it is the rate at which prices rise for goods and services. Nevertheless, economists preferred to use Consumer Price Index (CPI) as a proxy for any calculation related to inflation risk (Chen et al., 1986; Ling and Naranjo, 1997). The CPI is the official instrument for measuring inflation and allows appreciating the movements in prices of products on a constant basis. Brueggman and Fisher (2008) compared the housing sector performance with the CPI and found that real estate returns from each category exceed the growth rate of inflation. They also noticed that the correlation between real estate returns and inflation is not relevant enough as they got two opposite values. However, they emphasize “that a positive correlation with inflation is desirable because it indicates that the asset is an inflation hedge”.

1.1.2 Development of Housing

In the view of Atilola (2000), the form of houses is one of the most important indices of human development. From caves, huts and simple dwelling places to high-rise buildings, human beings have strived to make their habitat as comfortable as possible in order to enhance their social well-being, and also to ensure their psychological and sociological wellness. Therefore, it is imperative for nations that intend to assure wholesome development and maximum productivity of the populace to pay optimum attention to the housing needs of their citizens. Social-Housing Professionals (2001) emphasize that housing is a prerequisite for exercising other rights such as health, insurance, education, employment, citizenship, culture and leisure. In addition, decent housing helps to reduce violence, insecurity, drug use, vandalism and crime. Indeed, failure to provide housing ends up costing more than investing in proper dwellings for those in need.

Around the world, most nations cannot claim to have solved the housing problem of their people as shown by various authors reporting on housing situations. The following examples illustrate the housing shortages that prevail: In Ethiopia, the Ministry of Works and Housing (2008) states that various studies conducted in the last five years concluded that a housing shortage of between 900,000 -1,000,000 exists in urban centres. Only 30% of the existing urban housing stock is in good or fair condition. For the Metropolitan Region of Sao Paulo (MRSP), the urban housing deficit is approximately 611,936 units (UN-Habitat, 2010). The housing shortage in Nigeria is estimated to affect between 14 and 16 million people (UN-Habitat, 2008a). Mabogunje (cited by Kabir and Bustani, 2009) indicates that R600billion (N12trillion i.e. Nigerian Naira) will be required to

finance the housing deficit. For Pakistan, in 2008, the yearly estimated housing demand was 570,000 units. Actual supply was 300,000 units, leaving a shortfall of 270,000 units every year. The consequence of this situation is that almost half of the total urban population now lives in squatter or informal settlements (ICA, 2009a).

In the year 2007, the housing deficit in India was estimated to be 24.7 million houses in urban areas and 15.95 million houses in rural areas, totalling 40.65 million units (ICA, 2009b). In the United Kingdom (UK), the housing market has been put under pressure in the wake of the global financial crisis. New housing statistics have fallen to the lowest ever, with just 86,000 new home registrations in comparison to a government target of 246,000 (ICA). Bellal (2009) emphasizes that the burden of the cumulated housing shortage in Algeria is still high. It is expected to reach nearly 2 million houses by 2025, but the shortage was estimated at 763,176 in 2009 in a country with a population of 34.9 million. In Mexico, Centro de Investigacion Documentacion de la Casa (CIDOC) and Sociedad Hipotecaria Federal (SHF) (2006) establish that 1.8 million new houses and 2.7 million housing improvements are needed in a country with a population of 103.3 million people. In Uganda, Byaruhanga (2001) puts the deficit at 270,000 houses with a population of 21.6 million people. In Kenya, Government of Kenya GoK (Alder and Munene, 2001) reveals that the country has a deficit of 127,700 houses in urban and 303,600 in rural areas.

1.1.3 Effects of Macro Economic Variables on Housing development

Housing supply depends on both input and production. Input factors such as land, finance, infrastructure, labour and materials are combined with production actors as

developers and builders to produce new houses. When the market mechanism, i.e. the forces of supply and demand functions properly, relative prices will inform producers of housing services about whether the quantity should increase or decrease, and the input suppliers about providing more or fewer inputs. Conversely, with an inefficient housing delivery system, the relative prices become distorted and do not reflect the actual demand on the market.

It is essential that all parts of the housing delivery system work well in order to ensure a functioning property market, as it has effects on both supply and demand side of housing provision, i.e. the availability of housing is governed by supply and demand factors. Housing demand is rather predictable as it mostly varies with income and the availability of mortgage finance in each country (Warnock & Warnock, 2007). Housing supply, on the other hand, tends to be idiosyncratic, both due to the structure of the input and production sector, but also due to the housing sector's regulatory environment. This is especially the case in terms of land use policies and building regulations (World Bank, 1993). The market for house production is competitive in most countries, due to large economies of scale and few barriers to entry (Hoek-Smith, 2006).

Conversely, the market for inputs is various reasons, not competitive. For example, ownership in input markets can be so concentrated that owners can fix prices, as in some land markets. Further, large economies of scale make the production of some inputs a natural monopoly, as in some types of infrastructure. Moreover, competitive allocation of inputs as finance and serviced land can be restricted due to government regulations. Problems in property markets are often caused by deficiencies in supply, specifically in

input markets. Hence, obstacles to input markets must be removed in order to ensure an efficient delivery of housing (Malpezzi, 1990). For example, without new land and new housing, improvements in housing finance would only generate price effects. Countries who have experienced housing finance system expansion due to macroeconomic stability and lower interest rates, while for example input factors as the supply of serviced land and developer finance have remained stagnant, have also experienced negative property market outcome. Hence, increased access to credit is not sufficient for the development of a property market, an efficient housing delivery system is also necessary (Hoek-Smith, 2006).

Public sector actions to provide infrastructure, to regulate the housing sector, and to a limited extent, to direct production of public housing are factors that both affect the cost of housing production and the responsiveness of housing supply. Most housing markets are not completely driven by market mechanism, especially in developing countries. However, inappropriate regulatory regimes related to land development, construction and management further slows down the expansion of new housing construction. Regulation for subdivision of land, infrastructure requirements and building standards tend to be unnecessarily rigid and not in line with household incomes. Further, obtaining permits for development and construction of residential construction often require excessive time and costs, and are fraught with uncertainty (Hoek-Smit, 2006). Restrictions on transferability are often introduced by the government by concerns for social tension. Yet these are commonly circumvented as the potential gain provides incentives from both sides of the transaction to complete the transfer (Brandão & Feder, 1996).

1.2 Research Problem

Over the past few years, the world real estate industry has been undergoing drastic reforms due to the liberalization of financial markets, the drastic fall of interest rates, the obsolescence of the existing stock of housing, and a change in consumer norms on housing uses. In addition, the housing sector has been a target of government fiscal and monetary policy aimed at achieving low inflation, low unemployment, and balanced growth. According to Baffoe-Bonnie, (1998) a sudden increase in the money supply reduces interest rates, and with everything else being equal, the user costs of housing services fall, while the quantity demanded of housing services increases. The real prices of housing units increase as well, since housing services are linked one-to-one to housing units (Baffoe-Bonnie, 1998).

According to Harris (2001) interest rates affect both housing prices and the construction of new housing. With regard to the impact of inflation on the housing sector, Kearn (2009) indicated that increasing inflation serves to reduce people's incentive to invest in real estate, which in turn lowers housing demand. On the other hand, Manchester (2007), argued that inflation causes nominal housing payments to rise, which implies a lower housing demand. Finally, Giussani, et al. (2002) found a significant impact of GDP changes on housing development.

The mortgage interest rate is a very important variable that influences the decisions of individuals on whether or not to buy a house in developing countries Kenya included. When the mortgage rate increases, people are prevented from buying houses; therefore, the demand for housing decreases. Kariuki (2011) argued that significant interest rate

affects consumer expenditure through housing wealth, especially in systems characterized by the importance of the collateral role of houses. Earlier studies, which analysed the effect of macroeconomic aggregates on the housing sector (i.e. Macharia, 2004; Yegon, 2003), have not allowed for the fact that these macroeconomic variables are themselves influenced by demand and supply shocks in the housing sector. Among recent relevant studies, Kahuria (2008) developed a vector autoregressive (VAR) model, which took into account the full interaction of the housing sector with the rest of the economy.

Several studies have been done in relation to housing development. In his study Nzuve (2012) on the relationship between house prices and real estate finance in Kenya focused on house price fluctuations which have been witnessed by the several booms and busts have led to financial instability differs among countries because of the important differences in countries housing systems and the role that the government plays. Wahome (2010) studied the changing home mortgage market and unique financing requirements have brought about the widespread home ownership have caused a continuing evolution in mortgage lending practice. The study sought to establish the effects of mortgage financing on performance of the firms

These studies however did not study the effect of macro-economic variables on the development of houses in Kenya. In order to address this dearth of empirical research, this study sought to answer the following question; what are the effects of macro-economic variables on the development of housing in Kenya over the period 2004–2013?

1.3 Objectives of the Study

The study sought to determine the effect of macro-economic variables on the development of houses in Kenya

1.4 Value of the Study

This study is both theoretically and geographically significant in many respects. In attempting to develop more reliable and responsive housing affordability indices, it is hoped that this study would contribute to the process of developing better housing affordability measures that would more readily reflect the housing realities of households as shaped by prevailing housing market as well as their particular household circumstances. Given, the need to develop better methods of measuring the affordability concept, the study would attempt to bring together the current different perspectives on how affordability is measured with the view to developing a more realistic composite way of measuring housing affordability of households.

The study would aspire to improve our capacity to accurately assess the accessibility of any given housing market and by extension the suitability of policies that shape such markets within any particular national context. It is hoped that the study meaningfully would contribute towards a better understanding of the impacts of household income, non-housing expenditure, housing expenditure and household size on housing affordability across the socio-economic groups, housing tenure groups and States in the study area. These would hopefully contribute towards appreciating actual housing

conditions in Kenya, allowing improved housing delivery strategies that are effective in improving adequate housing delivery.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Literature review chapter summarizes the background and context for the research problem. Works and results from other researchers who have carried out their research in the same field of study are presented here. The specific areas covered in this chapter are; the theoretical framework, determinants of development of affordable housing, empirical literature and literature gaps in theories and on empirical review.

2.2 Theoretical Review

Several theories explain the significance of effect of macro-economic variables on the development of housing. This section discusses theories relevant to macro-economic variables of housing development.

2.2.1 Public Interest Economic Regulation Theory

Public interest economic regulation theory sometimes referred to as the normative theory of market-failure is one of the group of economic regulation theories. Its distinct characteristics is that it is based on the idea of an existence of common interest (public interest) of which governments are more suited to provide and protect through regulation. Regulation in this discourse refers to legislative and administrative restraints on market actors' behaviours to influence prices, production, and market entry including government intervention in form of quotas, tariffs, subsidies and taxes. Public interest

here represents conditions and processes that guarantee best allocations of scarce resources for individual and common goods in the society.

Theoretically, it could be shown that under certain conditions (perfect competition) the market mechanism ensures the optimal allocation of resources. This fact is evident in the theorem that if there is a competitive market for all resources used in production and for all commodities valued by individuals, the economic outcome will be efficient (Arrow and Debreu, 1954; Marlow, 1995). However, in practice this is usually not so. Many forces in the real world often influence the market to allocate resources less efficiently than the ideal competitive market and thus provide the justification for exploring other alternative resource allocation methods. Thus, this public interest regulation theory is essentially built around contentions on competitive market conditions and deviations from socially efficient use of scarce resources, in an attempt to set a scientific foundation for social engineering.

Although, it is difficult to trace the origin of this theory to specific authors, the theory was ironically consolidated by some of its ardent critics such as George Stigler and Richard Posner who conceive regulation as seeking to protect and benefit the public at large (Hantke-Domas, 2003). A major breakthrough was provided by Vilfredo Pareto (1848-1923) who developed two criteria for measuring or verifying public interest, Pareto optimality and Pareto Superiority. Pareto reasoned that since it is difficult to compare the individual utilities, one can only be sure that a given change would increase social welfare if at least one person is made better off by that change without anybody being made worse off (Bator, 1957; Greenwald and Stiglitz, 1986). Thus, any change cannot be

certainly taken to be in the public interest if it made some people better off while it made others worse off. According to this view, a situation is optimal if no one can be made better off without making somebody worse-off. Thus, it is generally accepted that most appropriate resource allocation mechanism is the system that guarantees Pareto efficiency or optimality where no individual can be made better-off without another being made worse off.

Pareto efficiency was later complemented by the Kaldor-Hicks criterion that postulates that an outcome is more efficient if those that are made better off could in theory compensate those that are made worse off and still be better off, which would result in a Pareto optimal outcome. It is thus assumed that Pareto optimality would occur when both productive efficiency and allocative efficiency are simultaneously achieved (a change in which gains would exceed losses). However, given the fundamental requirement of ideal competitive market, it is recognized that any Pareto efficient allocation of resources can only be achieved as a competitive equilibrium with an appropriate initial distribution of factor endowments. Thus, the free market system can achieve Pareto efficiency under the following set of conditions: a) that there are complete set of markets for all possible goods; b) all markets are in full equilibrium; c) markets are perfectly competitive; d) transaction costs are negligible; e) there must be no externalities; and f) market participants must have perfect information; g) no problems of enforcing contracts (Arrow and Debreu, 1954; Mookherjee, 2003; Kleiman and Teles, 2006). While Greenwald and Stiglitz (1986) have demonstrated that outcomes will always be Pareto inefficient in the absence of perfect competition or complete markets, it should however be noted that

Pareto optimality can also be achieved outside a perfect competitive market in systems that replicate the outcomes of such markets such as ‘perfect’ central planning or ‘market socialism’.

It is however evident that in the real world, most markets rarely operate within such ideal conditions. This leads to inefficiency in the allocation of goods and resources due to ‘market failures’ in the form of for example natural monopoly, incomplete markets, externalities, public goods and imperfect information. In taking market failure as a point of departure, the public interest regulation theory argues that market failure is principally caused by self-seeking behaviour of agents and lack of incentives to act co-operatively or take account of social costs of their actions within market process. This situation justifies a third party (usually government) coercive enforcement or intervention to mediate, remedy or enhance cooperative behaviour among agents within the society (Hägg, 1997; Mackaay, 1999; Hertog, 2003). The theory predicts that regulation will be instituted to improve economic efficiency and protect social values by correcting market imperfections. If the benefits of government regulation outweigh their costs, then the allocation of resources here would be considered as efficient. Thus, the affirmative view of governments’ and other public agencies’ ability to ameliorate identified market failures at low cost, or adjust inequitable market practices by means of regulatory techniques, has been coined the public interest theory (Hägg, 1997).

Underlying the theory is the implicit presumption of the existence of “the public interest”, that the government officials act in accordance of public interest and that the separation of policy making and policy implementation has no effect on maximizing efficiency

(Hertog,2003) Applying this theory to housing would mean that governments are indeed expected to ameliorate housing market failures and indeed moderate such markets through appropriate intervention that delivers adequate housing to its citizens. Under this theory, intervention in the housing market will be considered as economically efficient if the benefits of providing such housing outweighs the costs of such intervention. In this light, government regulation could be seen as an efficient instrument to correct imperfect competition, unbalanced market operation, missing markets and undesirable market results (Hertog, 2003). Thus, regulation/intervention is seen within this theory as a corrective interference to socially inefficient market mechanisms.

2.3 Determinants in Development of Housing

The research conducted by Tse (1999) states that the fluctuation in the housing price has significant impacts on the economic conditions of the population and society. Moreover, the demand for housing is increasing in the market. So, the housing price is expected to rise due to the imbalance between buyers and sellers. Therefore, when there are more buyers than sellers, the housing price will increase. This can cause a self-fulfilling speculative price bubble (Levin and Wright, 1997).

2.3.1 Gross Domestic Product

The gross domestic product (GDP) is one of the most popular indicators in macroeconomics used by researchers to represent economic conditions (MacLennan and Pryce, 1996). The GDP is considered a popular indicator because of the relationship between the macroeconomic activity and the housing price (Wheeler and Chowdhury, 1993). The gross domestic product (GDP) is the total market value overall for all final

goods and services produced in a country in a particular year. The formula for the GDP is equal to the total consumer, investment and government spending, plus the value of exports minus the value of imports. Base on Hii, Latif and Nasir (1999), fluctuations in the GDP are significantly related to the number of terraced, semi-detached and long houses constructed in Sarawak. According to them, terraces increase when the GDP is growing. Detached housing is found not to have any significant lead relation. That means buyers are not influenced by the GDP when making their buying decision. Conversely, the demand for houses generates housing industry investment and helps the recovery of the GDP growth rate (Qing, 2010). This result is understandable, because housing investment is part of the GDP. An increase in a part will increase the whole.

2.3.2 Interest Rate

Bank lending may affect the housing price through various liquidity effects. The housing price is just like the price of any asset. It can be determined by the discounted expected future stream of cash flows. If the financial banks increase the availability of credit, it means that the bank will provide lower lending rates and encourage current and future economic activity.

Basically, the better availability of credit will cause the demand for housing to increase when the households are borrowing constrained (Barakova, 2003). The growth in demand will then be reflected in higher housing prices. The relationship between housing prices and household borrowing is two-sided. That is, housing prices may significantly influence household borrowing through various wealth effects. When the housing finance interest rate is low, citizens will be enabled to make some investments, such as buying

more houses. The credit cycles have matched the housing price cycles in a number of countries (International Monetary Fund, 2000; Bank for International Settlements, 2001).

According to Goodhart and Hofmann (2007), mutually reinforcing boom–bust cycles in housing and credit markets may occur, which enhance the probability of a future financial crisis. However, the two researchers cited suggest that the standards of both house prices and credit from their long-run trends are useful indicators for future investors. Moreover, Goodhart and Hofmann (2007) mention three different ways to influence households' credit demand through housing wealth. Firstly, households may be facing borrowing constrictions due to the financial market imperfections. As a result, if the instructors can offer more securities in the house, households will wish to borrow more; in other words, the households borrow basically according to the capacity of their securities' net worth. Since the securities value of housing is quite high, an increase in housing wealth opens up the borrowing constraints faced by households. Second, households' recognized lifetime assets may have a significant influence as a result of changes in housing wealth. An increase in the recognized lifetime assets induces households to spend more today, which will mean smooth consumption over the overall life cycle. Therefore, it will increase the demand for credit. Lastly, the value of bank capital will also have an impact on housing price movements on credit supply. That is, housing estimation increases the value of the dwellings owned by the bank. Besides that, the values of loans are secured by housing loans. Therefore, a fluctuation in the housing price will affect the risk-taking capacity of banks. So, banks are willing to lend more to the public.

In the nutshell, for homeowners, focus on changing interest rates because they have a direct influence on real estate prices. However, interest rates also affect the availability of capital and the demand for investment. These capital flows influence the supply and demand for property and, as a result, they affect property prices.

2.3.3 Inflation Rate

Zhu (2004) showed the strong and long-lasting link between inflation and housing price. During inflation, most things in the economy will increase their price. However, the cost of the raw material for building a house will increase. According to Kearn (1979), an increase in inflation front loads real payments on a long-term fixed-rate mortgage, and thus reduces the quantity of housing. It must be noted due to the global scenario that increasing money supply causes inflation and house prices to increase.

2.4 Empirical Literature

2.4.1 International Evidence

In McCue and Kling (1994), it is shown that macroeconomic variables explain approximately 60 % of the variation in the real estate returns, whereof the nominal short-term interest rate (the three-month Treasury bill rate) accounts for 36 %. The output (Federal Reserve's Industrial Production Index) and investment (McGraw Hill Construction Contract Index) variables explain a very small part of the variations in the real estate markets.

Ling and Naranjo (1997) address the question whether the same systematic risk factors are priced in the commercial real estate market in the US as for the stock and bond

markets ex ante. The main findings suggest that the real estate markets are affected by real per capita growth of personal consumption expenditures for nondurable goods and services and the real Treasury bill rate. Also the term structure of interest rates, measured as the difference in yield of a 10-year Treasury bond and a three-month Treasury bill, and unexpected inflation have significant impact in the real estate markets. Unexpected inflation is here defined as the difference between realized inflation in the end of a certain time period and the expected inflation rate in the beginning of that same period.

Brooks and Tsolakos (1998) examined the UK real estate market returns. A filtered FTSE Property Total Return Index is constructed to more reliably reflect the actual returns in the real estate markets. One important observation is that results from different studies indicate that influences from macroeconomic variables are not totally comparable internationally. Aspects like time span return series and methodology complicate research on property markets. Furthermore, the results on the UK market are not sufficiently strong to deduce any univocal conclusions. However, there is an indication that interest rate term structure and unexpected inflation have a more significant effect on property returns.

Ewing and Payne (2003) use a generalized impulse response method to investigate the impact of macroeconomic shocks on the equity REIT returns in the US. It can be concluded that unanticipated changes in monetary policy and real output, estimated with the federal fund rate and the coincident index respectively, likewise as shocks in aggregate price level, have a negative effect on real estate stock returns. On the contrary, an unexpected rise in default risk premium, which is defined as the spread between low-

grade corporate bond (Baa) and 10-year government Treasury bond rates, gives an increase in the property returns.

It is pointed out by Bredin et al (2007) that the behaviors of REIT returns do not necessarily correspond to the overall stock market. This is here defined as unanticipated announcements by the FOMC (Federal Open Market Committee) to change the interest rates. The results show that both returns and volatility significantly respond to unanticipated rate changes. Furthermore, no evidence is put forward of a “calm before the storm”, a change of relative volatility prior and after an announcement.

Bouchouicha and Ftiti (2012) contribute by jointly examining the macroeconomic environments of the securitized market, the commercial market and the residential market in the US and the UK. It is demonstrated that there exists synchronization between the real estate markets and macroeconomic variables in the two separate countries. There is a long-term (10 years) co-movement in the US and the UK with the long-term interest rate, inflation and employment growth. On the other hand, there is a desynchronization in the short (two quarters) and long-run between the real estate markets and the macroeconomic environments with economic growth, money supply and the short-term interest rate. Moreover, the returns of the different asset categories are also different.

2.4.2 Local Evidence

Kariuki (2011) did a study on Constraints to acquisition and ownership of residential houses in Kenya: a study of residents of Kasarani estate, Nairobi. The main purpose of this study was to investigate the financial constraints that affect the acquisition of houses

by middle income groups in Nairobi, by specifically investigating the factors that affect affordability. It was shown that the major impediments to obtaining financial support from financial institution were largely a function of the individual perception of the cost of the funds.

Mogaka, (2012) did a study aimed at determining the effect of level of income, interest rates, lack of a collateral, information asymmetry and requirement for a predetermined deposit on access to housing finance. The study revealed that lack of security was a factor denying respondents access to finance. Majority of the respondents would not raise the high pre-determined down payment hence could not access housing finance. Therefore, the housing finance providers need to restructure the monthly repayments so that they are affordable to the low income earners.

Owoko (2013) undertook a study on determinants of successful delivery of housing construction Projects in the Ministry of Housing in Nairobi, Kenya. The main aim of this research project was therefore to identify rank and analyze the interrelationships between the most influential factors affecting the successful delivery of housing construction projects in the Ministry of Housing in Nairobi, Kenya. The study established that funding is a critical factor for public projects, therefore implementing organizations must have clear funding structures for the projects to succeed.

2.5 Summary of Literature Review

The changes in public or social housing policy are blamed on shortages of rental stock for low incomes and consequently increased homelessness, have been criticized in Germany,

UK and USA. The reduction in the provision of public or social housing has been seen as the main reason for these shortages. In Germany for instance, the provision of new social housing virtually ceased in the 1980's resulting in severe shortage of housing in 1990s giving rise to considerable homelessness problem (Federal Republic of Germany 1988). On the other hand, UK attributed the shortages as being consequent upon the influx of refugees from Eastern Europe in the 1980's. Kenya like other developing countries has put emphasis on providing decent and affordable housing for the low and medium income groups (GOK, 1989-1993).

However, in the last two decades, the urban housing scene has deteriorated as a result of Kenya's poor economic performance, resulting in serious housing deficit. This deficit has led to the proliferation of informal settlements, poor standards of construction of housing units, construction of unauthorized extension in existing estates, and increasing conflicts between tenants and landlords especially in low-income areas (GOK, 2006-2011). While in the 1980's the housing shortfall was about 60,000 units per year, the number has increased to about 150,000 Units per year (GOK, 2004). The government of Kenya's Housing Policy aims at provision of descent and affordable housing for the medium income groups. This is evident in the succeeding development plans including one of the years, 1997-2001, all of which supports the development of low-cost housing. But there is no evidence of formal physical development on low-cost housing units in the last twenty or so years. Much of the housing supply gap has been left to the initiative of the private sector that have been active, mainly in the peri-urban areas , ranging in providing from high cost mansionette to low-cost rooms. Housing in the peri-urban areas in some

cases share communal facilities, but in others the facilities are non-existent. Based on the above review, there exists a literature gap on the effect of macro-economic variables on the development of affordable housing. This study intended to fill this gap by examining the effect of macro-economic variables on the development of affordable housing in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter sets out the procedure that will be followed in completing the study. It gives an outline of the collection, measurement and analysis of data. Specifically the following subsections are included; research design, data collection and finally data analysis.

3.2 Research Design

The research design of this research was a descriptive survey research. A descriptive survey research seeks to obtain information that describes existing phenomena by asking individuals about their perceptions, attitude, behaviour or values (Mugenda and Mugenda 2003). A descriptive study design is deemed the best design to the objectives of the study. A research design is the general plan of how one goes about answering the research question (Saunders, Lewis and Thornhill, 2000). This design was considered appropriate for the type of objective of this study as it enabled the researcher to describe the state of affairs as they exist without manipulation of variables which was the aim of the study.

3.3 Data Collection

According to Ngechu (2004), there are many methods of data collection. The choice of a tool and instrument depends mainly on the attributes of the subjects, research topic, problem question, objectives, design, expected data and results. This is because each tool and instrument collects specific data. The study used secondary data collected from

the Central Bank of Kenya for interest rates and inflation rate and Kenya National Bureau of Statistics for aggregate number of house units built annually and Gross Domestic Product. The time period that this study covered was 10 years, (2004-2013) which is quite a long time period for value relevance studies.

3.5 Data Analysis

The data obtained was analyzed using multiple linear regression technique.

$$\text{Log}Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \mu$$

Y= is the dependent variable representing aggregate number of house units built annually

β_0 is a constant, the value of Y when all Xs are zero

X_1 is the interest rate measured by changes in interest rates (absolute value of annual changes in interest rates)

X_2 is the inflation rate measured by the Consumer Price Index (CPI)

X_3 is the Gross Domestic Product growth (GDP) as provided by the Kenya National

Bureau of Statistics where $X_3 = \frac{Y_1 - Y_0}{Y_0}$

$\beta_1 - \beta_3$ are the regression co-efficient or change introduced in Y by each X

μ is the random error term accounting for the of all other variables that affect development of housing but not captured in the model

3.6 Diagnostic Tests

F-test was tested for joint significance of all coefficients and t-test for significance of individual coefficients. In order to find out the value relevance of earnings, the results of the study must also be significant. Results are said to be statistically significant within the 0.05 level, which means that the significance value must be smaller than 0.05. The significance was determined by the t values of the respective variable, which indicates how many standard error means the sample diverges from the tested value.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the information processed from the data collected during the study on the effect of macro-economic variables on the development of housing in Kenya. The time period that the study covered was 10 years, (2004-2013).

4.2 Descriptive Statistics

Table 4.1: Descriptive statistics for aggregate number of house units built

Year	Number of house units built	Log
2004	1543	3.188365926
2005	1688	3.227372442
2006	1934	3.28645647
2007	2402	3.380573003
2008	2456	3.390228362
2009	3660	3.563481085
2010	5136	3.710625015
2011	5437	3.735359333
2012	5655	3.752432609
2013	6463	3.810434156

The study findings indicates an upward increase in number of house units built over the 10 year study period, with the highest being 6463 in 2013 while 2004 recorded the lowest number of house units built with 1543 units.

Table 4.2: Descriptive statistics for Interest Rates

Year	Interest Rate
2004	12.44
2005	13.16
2006	13.91
2007	13.32
2008	14.87
2009	14.76
2010	13.87
2011	20.04
2012	18.15
2013	16.99

From the results, the lowest interest rate value was 12.44 in 2004 while the highest was 20.04 in 2011. The unpredictability in interest rates is an evidence of instability in financial markets as these rates are determined by the central bank.

Table 4.3: Descriptive statistics Inflation Rate

Year	Inflation Rate
2004	11.6
2005	10.3
2006	14.6
2007	9.8
2008	26.2
2009	10.5
2010	4.1
2011	14.0
2012	9.4
2013	5.7

From the findings, it can be noted that the year 2010 recorded the lowest value for inflation rate at 4.1 while the year 2008 recorded the highest value for inflation rate at 26.2.

Table 4.4: Descriptive statistics Gross Domestic Product (GDP)

Year	GDP (millions)
2004	1,107,700
2005	1,172,100
2006	1,248,833
2007	1,335,763
2008	1,360,626
2009	1,393,174
2010	1,475,302
2011	1,540,520
2012	1,610,653
2013	1,686,149

Source: Kenya National Bureau of Statistics

From the findings presented above, the study established that Economic Growth had been on continuous increase over the study period. The 2004 financial year recorded an economic growth of 1,107,700 million shillings. This increased to the end of the study period where GDP amounted to Ksh. 1,686,149 million. This implied that the economic growth of Kenya had been increasing over the study period however the study the growth was gradual as evidenced by the findings of this study. This study however notes that the economic growth was very slow in 2007/2009 financial year as evidenced by the findings of this study.

4.3 Regression Results

The study conducted a linear regression model to establish the effect of macro-economic variables on the development of housing in Kenya. Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (number of house units built) that is explained by all the three independent variables (interest rate, inflation rate and Gross Domestic Product growth (GDP)).

Table 4.5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.983 ^a	.966	.949	0.1076

a. Predictors: (Constant), GDP, inflation rates, interest rates

The three independent variables that were studied, explain only 94.9% of the number of house units built as represented by the adjusted R^2 . This therefore means the three variables contribute to 94.9% of the number of house units built, while other factors not studied in this research contributes 5.1% of the number of house units built. Therefore, further research should be conducted to investigate the other (5.1%) factors influencing the development of housing in Kenya.

Table 4.6: Summary of One-Way ANOVA results of the regression analysis between the number of house units built and predictor variables

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.421	3	0.855	19.973	.000 ^b
	Residual	1.67	6	0.043		
	Total	5.091	9			

a. Dependent Variable: housing unit

b. Predictors: (Constant), GDP, inflation rates, interest rates

From the ANOVA statistics in table 4.6, the processed data, which are the population parameters, had a significance level of 0.000^b which shows that the data is ideal for making a conclusion on the population's parameter. The F calculated at 5% Level of significance was 19.973. Since F calculated is greater than the F critical (value = 2.77),

this shows that the overall model was significant i.e. there is a significant relationship between macro-economic variables and the development of housing.

Table 4.7: Regression coefficients of the effect of macro-economic variables on the development of housing in Kenya

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.481	0.409		2.003	.001
1 interest rates	-0.264	0.028	-0.207	-0.175	.045
inflation rates	-0.105	0.211	-0.239	-0.107	.034
GDP	0.417	0.041	0.725	0.108	.002

a. Dependent Variable: housing unit

The coefficient of regression in Table 4.7 above was used in coming up with the model below:

$$\mathbf{HU = 0.481 - 0.264IR - 0.105I + 0.417 GDP}$$

Where HU is House Units, IR is interest rates, I is inflation rates and GDP is Gross Domestic Product. According to the model, all the variables were significant as their significance value was less than 0.05. The two variables in the study (inflation rates (-0.105) and interest rates (-0.264)) were negatively correlated with the number of house units built while the third variable GDP (0.417) was positively correlated with the number of house units built. From the model, taking all factors (interest rate, inflation rate and Gross Domestic Product growth (GDP)) constant at zero, the number of house units built was 0.481. The data findings analyzed also shows that taking all other

independent variables at zero, a unit increase in interest rates will lead to a 0.264 decrease in the number of house units built, a unit increase in inflation rates will lead to a 0.105 decrease in the number of house units built while a unit increase in GDP will lead to a 0.417 increase in the number of house units built. This deduces that GDP has the greatest positive effect on the development of housing in Kenya.

4.4 Summary and Interpretation of Findings

From the above regression model, the study found out that there were macro-economic variables influencing the development of housing in Kenya. The two variables in the study (inflation rates (- 0.105) and interest rates (-0.264)) were negatively correlated with the number of house units built while the third variable GDP (0.417) was positively correlated with the number of house units built. The study found out that the intercept was 0.481 for all years.

The three independent variables that were studied, explain only 94.9% of the number of house units built as represented by the adjusted R^2 . This therefore means the three variables contribute to 94.9% of the number of house units built, while other factors not studied in this research contributes 5.1% of the number of house units built. Therefore, further research should be conducted to investigate the other (5.1%) factors influencing the development of housing in Kenya.

The study established that the coefficient for interest rates was (-0.264) meaning that it is negatively correlated with the number of house units built. This is in line with Barakova, (2003) who noted that the relationship between housing prices and household borrowing

is two-sided. That is, housing prices may significantly influence household borrowing through various wealth effects. When the housing finance interest rate is low, citizens will be enabled to make some investments, such as buying more houses. The credit cycles have matched the housing price cycles in a number of countries (International Monetary Fund, 2000; Bank for International Settlements, 2001).

According to Goodhart and Hofmann (2007), mutually reinforcing boom–bust cycles in housing and credit markets may occur, which enhance the probability of a future financial crisis. However, the two researchers cited suggest that the standards of both house prices and credit from their long-run trends are useful indicators for future investors. Moreover, Goodhart and Hofmann (2007) mention three different ways to influence households' credit demand through housing wealth. Firstly, households may be facing borrowing constrictions due to the financial market imperfections. As a result, if the instructors can offer more securities in the house, households will wish to borrow more; in other words, the households borrow basically according to the capacity of their securities' net worth. Since the securities value of housing is quite high, an increase in housing wealth opens up the borrowing constraints faced by households. Second, households' recognized lifetime assets may have a significant influence as a result of changes in housing wealth. An increase in the recognized lifetime assets induces households to spend more today, which will mean smooth consumption over the overall life cycle. Therefore, it will increase the demand for credit. Lastly, the value of bank capital will also have an impact on housing price movements on credit supply. That is, housing estimation increases the value of the dwellings owned by the bank. Besides that, the values of loans are secured by housing

loans. Therefore, a fluctuation in the housing price will affect the risk-taking capacity of banks. So, banks are willing to lend more to the public.

The study also deduced that the coefficient for inflation rates was (-0.105) negatively correlated with the number of house units built. This is in line with Zhu (2004) who showed the strong and long-lasting link between inflation and housing price. During inflation, most things in the economy will increase their price. However, the cost of the raw material for building a house will increase. According to Kearn (1979), an increase in inflation front loads real payments on a long-term fixed-rate mortgage, and thus reduces the quantity of housing. It must be noted due to the global scenario that increasing money supply causes inflation and house prices to increase.

The study further deduced that the coefficient for GDP (0.417) was positively correlated with the number of house units built. This correlates with Hii, Latif and Nasir (1999), who noted that fluctuations in the GDP are significantly related to the number of terraced, semi-detached and long houses constructed in Sarawak. According to them, terraces increase when the GDP is growing. Detached housing is found not to have any significant lead relation. That means buyers are not influenced by the GDP when making their buying decision. Conversely, the demand for houses generates housing industry investment and helps the recovery of the GDP growth rate (Qing, 2010). This result is understandable, because housing investment is part of the GDP. An increase in a part will increase the whole.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary, conclusion and recommendations of the main findings on the effect of macro-economic variables on the development of housing in Kenya. The chapter presents the discussions drawn from the data findings analyzed and presented in chapter four. The study was conducted by use of secondary sources such as published reports. The chapter is structured into discussions, conclusions, recommendations and areas for further research.

5.2 Summary of Findings

The study sought to establish the effect of macro-economic variables on the development of housing in Kenya. This study adopted a descriptive survey design. According to Schindler (2003), a descriptive research design is appropriate where the study seeks to describe the characteristics of certain groups, estimate the proportion of people who have certain characteristics and make predictions. The study used secondary data collected from the Central Bank of Kenya for interest rates and inflation rate and Kenya National Bureau of Statistics for aggregate number of house units built annually and Gross Domestic Product. The time period that the study covered was 10 years, (2004-2013). The linear regression model was used to establish the effect of macro-economic variables on the development of housing in Kenya. From the regression model, the study found out

that there were macro-economic variables influencing the development of housing in Kenya, which are interest rate, inflation rate and Gross Domestic Product growth (GDP). The two variables in the study (inflation rates (- 0.105) and interest rates (-0.264)) were negatively correlated with the number of house units built while the third variable GDP (0.417) was positively correlated with the number of house units built. The study found out that the intercept was 0.481 for all years.

The three independent variables that were studied, explain only 94.9% of the number of house units built as represented by the adjusted R^2 . This therefore means the three variables contribute to 94.9% of the number of house units built, while other factors not studied in this research contributes 5.1% of the number of house units built. Therefore, further research should be conducted to investigate the other (5.1%) factors influencing the development of housing in Kenya.

5.3 Conclusions

The three independent variables that were studied, explain only 94.9% of the number of house units built as represented by the adjusted R^2 . This therefore means the three variables contribute to 94.9% of the number of house units built, while other factors not studied in this research contributes 5.1% of the number of house units built. The study established that the coefficient for interest rates was (-0.264) meaning that it is negatively correlated with the number of house units built. This is in line with Barakova, (2003) who noted that the relationship between housing prices and household borrowing is two-sided. That is, housing prices may significantly influence household borrowing through various wealth effects. When the housing finance interest rate is low, citizens will be enabled to

make some investments, such as buying more houses. The credit cycles have matched the housing price cycles in a number of countries (International Monetary Fund, 2000; Bank for International Settlements, 2001).

The study also deduced that the coefficient for inflation rates was (-0.105) negatively correlated with the number of house units built. This is in line with Zhu (2004) who showed the strong and long-lasting link between inflation and housing price. During inflation, most things in the economy will increase their price. However, the cost of the raw material for building a house will increase.

The study further deduced that the coefficient for GDP (0.417) was positively correlated with the number of house units built. This correlates with Hii, Latif and Nasir (1999), who noted that fluctuations in the GDP are significantly related to the number of terraced, semi-detached and long houses constructed. GDP affects the price of housing through various aspects and factors and a large degree, thus becoming one of the main factors affecting house development. In Kenya, the main factors affecting housing development have its own characteristics driven by economic and financial. However, other factors can't be denied, their affecting degree is only a relatively lesser extent, these factors affect each other, this co-constitute a systems and structures for factors affecting housing development. According to the model results, it shows that housing development are inversely related with loan interest rates, and have a positive relationship with GDP, and both of these two factors have a great impact on housing development. Therefore, the government can control housing development in the formulation of regulatory policy, and

they can take the financial means to raise lending rates in order to reduce the price of raw materials.

The study concludes that a positive macroeconomic environment will lead to more attractive investments for potential investors in the Kenya real estate market, and more attractive opportunities for potential users of real estate credit. At the same time, increased competition in the banking sector, will generate attractive mortgage interest rates, is expected to enhance the customer base among the banking institutions, and will very likely, under prudent credit policies, increase their expected profits.

5.4 Limitations of the Study

The researcher encountered quite a number of challenges related to the research and most particularly during the process of data collection. Due to inadequate resources, the researcher conducted this research under constraints of finances. Another limitation was developing a model which would enable the researcher to study the relationship between the various variables. When developing this model, there was a great need to define the dependent variables and independent variables. If the model was not correct, the process of analysis would not have given the right results. In this case, multiple linear regression was used since there were multiple variables which required to be studied.

Time allocated for the study was insufficient while holding a full time job and studying part time. This was encountered during the collection of material as well as the data to see the study success. However the researcher tried to conduct the study within the time frame as specified. The other limitation is that this study used only three measures of

macro-economic variables and this does not mean they are the only macro-economic variables affecting housing development and hence there is need to carry out the study with other different factors in order to be able establish which are the other major variables that affect housing development.

5.5 Suggestions for Further Research

Arising from this study, the following directions for future research are recommended as follows. A similar study should also be carried out on the effect of micro-economic variables on the development of housing in Kenya. The study also noted that land prices are rising year by year and recommends that future research be conducted on the effects of land prices on the development of housing in Kenya.

The study also recommends that a study be done on factors affecting both supply and demand of developed housing units in Kenya and other developing nations. The study also recommends that a study needs to be conducted to investigate to what extent macroeconomic factors influence real estate stock prices before and after the outbreak of the financial crisis in 2007/2008 in developing countries.

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