# THE RELATIONSHIP BETWEEN SELECTED MACRO ECONOMIC VARIABLES AND RESIDENTIAL HOUSING PROPERTY RETURNS IN KENYA

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## A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS OF SCIENCE IN FINANCE, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

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# DECLARATION

I the undersigned declare that this research project is my original work and has not been presented for examination at any other University.


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**D63/68623/2011**


This research project has been submitted for examination with my approval as the university supervisor.


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## ACKNOWLEDGEMENTS

# DEDICATION

This study is dedicated to almighty God for helping me reach this far and to my wife Everline and our children Brian, Joan and Russell whose prayers, encouragement and patience enabled me to complete the course.

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# LIST OF ABBREVIATIONS

ANOVA      Analysis of Variance

CBK        Central Bank of Kenya

GDP        Gross domestic product

KNBS       Kenya National Bureau of Statistics

NSE        Nairobi Securities Exchange

REI        Real Estate Investment

REIT       Real Estate Investment Trust

SPSS       Statistical Package for Social Sciences

# ABSTRACT

This study examines the impact of selected macroeconomic variables on the performance of residential housing properties in Kenya using quarterly data from 2000 Q1 to 2010 Q4. Prices of newly constructed residential houses are analyzed against gross domestic product, domestic interest rates, inflation, Kenya shilling US dollar exchange rate, rental income, money supply and public debt. Multiple linear regression model is used to determine causation and relationships.

To achieve the objective of the study, secondary data on the selected macroeconomic variables was collected and analysed using house prices as the dependent variable. Three main issues were empirically tested to determine any linkages between the selected variables and housing property markets in Kenya. Firstly, the study dealt with the determination of any relationship between the selected variables and property returns in Kenya. Secondly, the study examined to what extent changes in the selected variables affected house prices. Thirdly, the study examined what proportion of changes in house prices have been caused by changes in the selected macroeconomic variables within the study period.

The results reveal that the performance of the housing sector in Kenya is influenced significantly by changes in macroeconomic variables used in this study. Specifically changes in gross domestic product, money supply and public debt positively impact on the house price returns whereas changes in domestic interest rates, Kenya shilling US dollar exchange rate, inflation, and rental income negatively affect house price returns.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Study

Housing property is a multidimensional commodity that can exert profound influence on socio- economic and psychological well being of individuals, communities and the nation as a whole. For example the nature, quality and quantity of residential property in any territory are considered as a yardstick to benchmark the level of social and economic development. Across the globe, housing property holdings forms the bulk of any individual and national stock of wealth.

Globally the commercial and housing property markets have significantly changed for the last fifty years. A study by Du Toit indicates that the housing property market has been in a boom worldwide since the year 2000 and is perhaps the largest financial boom experienced so far. This is attributed to the fact that property market indicators such as the real house price and rental levels have recorded the highest growths in Europe, Asia, Africa, North and South America respectively.

In the last decade, rapid economic growth and development has resulted in increased demand for residential housing in urban areas in Kenya. Reviewing house prices in Kenya, reveals that prices have appreciated dramatically whether in major or smaller

towns. According to Hass Consult, Kenya's premier real property managers, Kenyans continue to be unfazed by economic cycles and are optimistic about the housing market.

In general, the residential property market performance depends on a number of macroeconomic and microeconomic factors. The influences at microeconomic level are for example changing demographics like income, age, and number of households in an area. At the macroeconomic level, factors such as GDP, interest rates, and employment levels affect expected returns in real estate and residential house prices in general. For instance, the slackened economic growth experienced between 1990 to 2001 and 2008 to 2012 respectively, lead to soaring unemployment, stagnated business growth and new opportunities, high inflation, low business confidence and spending power. The period 2008 to 2012 also witnessed declines in selling prices of real estate properties according to Hass Consult.

Compared to and in line with the global real estate property markets, the Kenyan housing property market has experienced for the last decade what is called a boom. According to Hass Consult, real estate property returns have performed extremely well with average returns of 25% to 30% on development and 8% for rentals. The three major cities, Nairobi, Mombasa and Kisumu are not only witnessing increased residential property prices but also increased growth in luxury houses with Nairobi leading the pack. A study by Knight Frank on international rental rate indicates that the global rent closed 2013 with a return of 4.8%, with Nairobi leading the pack and Dubai in second place. These upward price movements can be explained by the expanding economy, middle class,

relatively stable political climate, and innovations in real estate financing, relatively safer business environment and increased foreign direct investments as well as diaspora inflows.

The other factors influencing this growth rate are devolved government functions creating additional cities, creation of universities in a majority of the counties, construction of new roads and the new land laws. Kenya is also a host to many international organizations with employees who need high end housing. These high end housing units are within reach to town, have good public services, shopping centers, communication facilities, utilities and financial services.

Despite this sterling nature of the real estate property sector, the market is highly deficient in terms of pricing and valuation mechanism for all classes of real estate property. In this kind of environment, investors and buyers are operating with little knowledge of the dynamics in the sector. It is from this background that a study of what macroeconomic factors impact residential property returns in Kenya is based.

### 1.1.1 Macroeconomic Variables

The relationship between real estate property returns and macro economy is important to investor strategies. Whereas economic growth, consumer involvements and financial markets vary within and across countries, the general macro economic variables remain constant. These include GDP, inflation, unemployment, and interest rates. Globally, changes in these variables have close relationship with changes in real estate sector, including residential property prices. Understanding key real estate relationships in

respect to these variables is therefore a strategic decision on real estate investment decision making and portfolio management (Lu and Tang 2014).

Empirical studies indicate that changes in real estate sector mirrors the wider changes taking place in the economy at any point in time. Most of these studies put emphasis in explaining how macroeconomic variables are responsible for short and long run variations in residential property prices. According to Schmitz and Brett (2001) the economic strength of a place can be demonstrated by its macroeconomic conditions, which includes interest rates, inflation, job security, industrial productivity and stock market stability. In another study in Hong Kong, Ervi (2002), found out that the rate of return in property markets is linked to economic activities while demand for retail space is sensitive to changes in employment and local output. The author also recognizes that macroeconomic variables include unemployment, inflation rates, GDP, interest rates, balances of payments and foreign exchange rates.

 A study done in the US by Case, Goetzmann, and Rouwenhorst (2000), on the global real estate property returns found out that there was a significant relationship between the returns and fundamental macroeconomic variables such as GDP, inflation and economic growth. On the same note Ling and Naranjo, (1997, 1998) identified growth in consumption, real interest rates, term structure of interest rates, and unexpected inflation as the systematic determinants of real estate returns.

**1.1.2 House Prices**

Housing prices refers to the actual cash amounts payable on the acquisition of residential property. In Kenya, housing is more than often divided in between formal and informal built types. Our focus is the formal type which refers to housing units built by developers, on serviced land, with property title deeds. The acquisition of residential property is via cash purchase and mortgages. Due to the initial capital outlay involved, mortgage purchase forms the majority of purchase.

A baseline survey by the Centre for Affordable Housing Finance in Africa puts the cheapest newly built house at USD 22,350 in 2012, with prices being much higher in Nairobi, Kisumu and Mombasa. Continent- wise, the same study found that a newly built house costs USD 10,000 in Mali, USD 100,000 in Gambia and over 200,000 USD in Kinshasha. In Kenya the average selling prices is very high when compared to GDP per capita of 1.25 USD per day.

Despite the high returns, which are theoretically expected to encourage many investors to tap into this sector, Kenya is facing critical housing supply. As of 2011, the ministry of housing estimated that the formal supply of housing reached 50,000 against annual demands of 200,000 units creating a deficit of 156,000.This means that there is a lot of money chasing few house leading to continuous price increase. Secondly many informal settlements develop fast as a cheaper alternative.

### 1.1.3 Macroeconomic Variables and Residential House Prices

The housing market can be defined based on the theory of demand and supply as one where housing products and services are allocated by the mechanisms of demand and supply. The housing market has a unique characteristic in that it differs from other goods and services since the housing supply is inelastic. Housing services are one of the most expensive household expenditures. Changing housing prices is therefore a concern to both governments and individuals because they influence the socio economic conditions with additional impact on the national economic conditions. According to Selim (2009) future expectations of capital gains from housing investments affect housing prices because of the increased demand which also leads to price volatility. This will cause an increase in housing prices noting that supply is inelastic and cannot adjust in the short run.

Supposing that the demand and supply theory assumptions hold for the real estate sector. We expect that housing market equilibrium will exist in which demand for real estate products equals the quantity supplied, everything else constant. It is equally assumed that at this point, buyers of houses and sellers would be willing to pay and accept the prevailing market prices.

### 1.1.4 Macroeconomic Variables and House Prices in Kenya

Kenya has experienced increasing but uneven economic growth since 1964.The economy experienced the worst growth  rate of 0.12% in 2001 but recovered to a high of 7% in 2007.On average the economy is expanding which means there are more job opportunities, increased industrial production, consumer spending, generally increasing inflation, and construction activities.

The real estate sector forms part of the wider economic environment and is therefore subject to changes happening in the economy. In comparison to the global housing property markets, we expect that changes in key economic variables such as employment, crime rates, business confidence, motor vehicle sales, exchange rates, GDP, and interest rates to affect the selling price of residential property in Kenya.

## 1.2 Research Problem

Real estate sector is very important to the development of any nation. House prices in particular follow the changes happening to macroeconomic factors (GDP, interest rates, inflation and unemployment). Standish (2005) observed that housing prices is positively related to GDP and inflation but is negatively related to unemployment and interest rate movements in a study for South African real estate sector. Most studies done on how macroeconomic variables affect house prices have been done in developed markets. In Kenya, the demand for housing units is higher than supply resulting into continued rise in prices over the last decade. According to Hass Consult, the average sales prices of residential property scored a high rate of about 10% in year 2013 in places like Thika road, Mombasa road and Eastland's. On the other hand, high end class estates like Muthaiga, Runda, and Kileleshwa recorded very low buying prices.

Globally real estate returns have posted mix results for the last four decades. It is these changes in property returns across various jurisdictions that have attracted a lot of interest in studying the influence of macroeconomic factors in the property markets. Studies by Ling and Naranjo (1997), Chan *et al*., (1990), McCue and Kling (1994), and Brooks and Tsolacos (1999) have produced mixed results. The common finding of these studies is

that selected macroeconomic variables namely real Treasury bill rates, the term structure of interest rates and inflation have systematic influences on property market returns. However, Brooks and Tsolacos (1999) produce different results using UK data and Vector Auto Regressive (VAR) model. They conclude that unemployment; interest rates, the interest rate spread, unanticipated inflation and dividend yield do not significantly influence the variation of the filtered property returns.

In line with global property returns, the Kenyan property market has performed extremely well. This trend has attracted various researchers interested in understanding the factors responsible for this sterling performance. Muthee (2012) studied the relationship between economic growth and real estate prices in Kenya. He found out that there is a significant correlation between real estate prices and economic growth. Adongo (2012) studied the relationship between mortgage financing and financial performance of commercial banks in Kenya, findings showed that that there is a strong and positive relationship between mortgage financing and financial performance of the commercial banks. In another study, Omolo (2013) found that an increase in mortgage size of commercial banks leads to a marginal increase in the stock performance of commercial banks. Nzalu (2013) found out that population growth, interest rates and inflation are negatively correlated to real estate prices, whereas the relationship with GDP is positive.

While the above research findings forms the foundation for understanding the nature and characteristics of the residential property sector in Kenya and this study, a gap exist that needs to be filled in that not all economic variables have been used in previous studies to

determine their impacts on house prices. Secondly most studies on the Kenyan property markets have used only terms annual data, this study will use relatively frequency data (quarterly).Further more a large number of studies in most countries have used quarterly data, which means the findings of this study will be comparable to existing studies.

Thirdly most of the previous studies in the Kenyan property markets have used a single variable to determine movement's in house prices. This study will use seven variables considered crucial in capturing economic movements. Fourthly due to the development that have occurred in the macroeconomy, the findings of previous studies may be affected which necessitates this study as it is more up to date and will reflect changes in the economy.

In line with past research and our research topic, this study intends to provide answers to the following question; are movements in macroeconomic variables such as GDP, interest rates, public debt, money supply, exchange rate and rental income responsible for variations in residential house prices in Kenya?

## 1.3 Objective of the study
The objective of this study is to establish the impact of selected macroeconomic variables (GDP, interest rates, inflation, foreign exchange rates, public debt, rental income and money supply) on the performance of residential property in Kenya.

## 1.4 Value of the study
The results of this study will help property investors including house buyers to make wise investment decisions. Insight into how macro economic factors affect property returns

and prices will help investors derive proper valuations for their investments bearing in mind the price drivers. The study findings will also help commercial banks and other real estate financing institutions in the structuring of their products to meet market needs. These institutions having insight into the role of these macroeconomic variables on property prices and returns will develop appropriate pricing mechanism and factor in any risks inherent in real estate property financing.

This study is expected to add to the general field of knowledge in real estate finance and also the broader finance field. Various theories about factors influencing pricing of real estate properties have been established and this study although only a fraction of the contribution, is a significant contribution. This study will help the national and county governments of Kenya to understand the impact of macroeconomic factors to property prices and in so doing, come up with appropriate policy mechanisms for the growth and development of real estate sector.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter presents a review of the related literature on the subject under study presented by various researchers, scholars, analysts and authors. The researcher derived materials from several sources which are closely related to the theme and the objective of the study.

## 2.2 Review of theories

### 2.2.1 Asset Pricing Theory

This theory is concerned with explaining the price of financial assets in an uncertain world. Ideally it seeks to answer the questions as to why certain assets have higher expected returns than others and what causes variations in the expected returns at different points in time (Post *et al* 2005). Real estate forms a sub set of the collective portfolio of any individual or corporate investor just like equities do. Currently real estate market competes with other asset classes for the available capital. There is need therefore for correct valuations to be carried on real estate like any other asset class so that current financial values and estimated future cash flows are determined with certainty.

### 2.2.2 Structural Form Theory

This theory was formulated by Pottow in the year 2007.It documents the evolution of mortgage financing in the Sub Saharan Africa to determine what steps need to be taken to extend it to middle class, to enable them to address their housing needs on affordability index. The theory revealed that macroeconomic instability, weaker legal system and

regulatory environments, inefficient collaterization of housing assets, a poor record of public sector banks, building societies and specialist lender affect housing sector.

The need to address these historical problems is a revival of mortgage lending in a number of poor countries. There are equally an increased number of real estate consultants working in African countries and documenting the specific problems of each country and making recommendations on how to address them. Development agents, in particular are also putting forward recommendations on what is required to ensure financial market development and capital market investments to entice the private sector into financing and delivery of housing residential housing projects.

### 2.2.3 The Efficient Market Hypothesis

The efficient market hypothesis posits that when markets are efficient, information about the pricing and value of items traded in those markets content wise is fully and immediately reflected in the market prices (Sharpe, Alexander, & Bailey (2010). Investors trading in efficient market investors should expect to make only normal profits by earning a normal rate of return on their investments.

An efficient market thus can exhibit three different characteristics namely weak- form efficient, semi- strong efficient and strong form efficient. A market would be described as being weak-form efficient if it is impossible to make abnormal profits (other than by chance) by using past prices to formulate buying and selling decisions. Similarly a market is said to be semi strong-form efficient if investors are able to make abnormal profits by using publicly available information to formulate buying and selling decisions. On the

other, a market would be described as being in strong-form efficient if it is possible for investors to extract market information and use this information to make abnormal profits by manipulating buying and selling decision. The real estate sector in Kenya may be considered to be on strong form because of the above average growth and returns attributed to financing challenges, land and legal issues, and lack of national pricing criteria.

### 2.2.4 Portfolio Theory

This theory was originated by Harry Markowitz(1952) .It states that investors form portfolio classes in such a way that reduces risks with little or no impact to expected returns. Investors can achieve this by selecting those investments that do not move together, that is, do not share the same risk characteristics. In the estate sector, an investor can diversify into commercial and residential properties to spread risks. Likewise real estate equity investments can be diversified in respect to property type, geographic location and lease terms. In real estate lending, risk can be diversified by holding mortgage backed securities and government guarantees. It is impossible to diversify away from systematic risks such as interest rates, however, it is possible to seek pools that are less subject to the same risk.

In practice, the value of a firm value is increased by picking the right mix of debt and equity. Firms therefore must use leverage in a way that maximizes value (Modigliani and Miller 1961).Real estate investments at individual and corporate levels involve huge capital outlays often backed by borrowing funds. The cost of borrowed funds and expected returns must therefore be reflected into investment choices of real estate developers and buyers.

## 2.3 Determinants of house prices

The empirical literature on real estate property markets suggests that there are several key determinants that probably affect the performance of the housing property markets by their effects on house prices. According to Standish *et al*. (2005:41) such variables include nominal and real interest rates, real GDP, the nominal and real exchange rate, the changes in stock markets, and the cost of construction. Clarke and Daniel (2006) also add business confidence, motor vehicle sales, gold and oil prices, and transfer costs as determinants of house prices. In other studies, Brooks and Tsolacos (1999:141) also include variables such as unemployment, the yield spread, actual inflation, unexpected inflation and the dividend yield. The expected impact of these variables on house prices and property returns is explained below:

### 2.3.1 GDP

GDP is the measure of overall economic activity in a territory. A change in real GDP has ripple effects in real economic growth which is expected to affect housing property market. Supposing that there is a growth in GDP which results in high business confidence by investors and consumers. It is expected that a rise in economic growth will lead to a rise in the demand for residential house property. This will lead to a rise in house prices and thus housing property returns, ceteris paribus. Clarke and Daniel (2006) in a study to determine the drivers of residential house prices in South Africa established that changes in GDP and housing property returns are positively related.

## 2.3.2 Inflation

Inflation is the general increase in price level in the economy or territory as opposed to deflation which means the opposite. During periods of continued upward movement of prices, the cost of building and management of residential property will follow suit. Investors and sellers of real estate property will therefore factor inflation into the selling prices. It is therefore expected that changes in inflation and house prices are positively related, *ceteris paribus*. However, where the inflation is a targeting framework in which the authorities are managing money supply via interest rate increases, this will lead to a higher cost of borrowing which decreases housing demand and house prices, everything else remaining constant. Brooks and Tsolacos (1999) state that inflation effects are examined using different elements of inflation namely the actual and unexpected inflation.

According to Hoesli (1994) real estate provides a better hedging against inflation than common stocks. Likewise, Glascock and Davidson (1995) contends that returns of individual real estate common stocks typically outperform inflation rate, but do not perform as well in a value –weighted market portfolio. According to Copley and Hark (1996) leverage improves the return of real estate, even during inflation. Quan and Titman (1999) found out that commercial real estate provides long term inflation hedge in the long term than in the short term.

Studies using commercial real estate in Ireland (Stevenson and Murray, 1999) and residential apartments in Turkey (Onder, 2000) find that there is no evidence that real estate offers a hedge against inflation. Using real and financial assets in Hong Kong, Ganesan and Chiang (1998) get mixed results. While commercial and residential property provides a complete hedge against inflation, office and industrial properties only offer a hedge against unexpected inflation and provide a perverse hedge against expected inflation. Liu, Hartzel and Hoesli (1997) examine data from seven countries and find that in some countries common stocks provide a better hedge against inflation while in other countries these two asset classes performed the same.

### 2.3.3 Interest Rates

Interest rate both domestic and international has profound impacts on residential house prices (Barksenius and Rundell, 2012).Previous studies have investigated four types of interest rates; treasury bill rate, real interest rates, mortgage rates and long term interest rates.Brooks and Tsolacos (1999) suggest that the interest rates (nominal and real) usually reflect the status of current and future business environment and investment opportunities.

In the UK, Barot and Yang (2002) found out that there is a strong negative relationship between real interest rates and house prices. In Sweden, these researchers find that house prices are more sensitive to real interest rates than in the UK. Real interest rates is an indicator of the cost of financing investments implying that both demand and supply of houses will be depressed when interest rate is high.

### 2.3.4 Exchange Rates

The nominal and real exchange rates have both direct and indirect effects on real estate property markets. A weak or depreciating Kenyan currency will encourage foreign investors to look for opportunities locally including real estate property market. Supposing these are buyers and noting within the short run housing units supply is fixed, housing prices will in turn move upwards due to excess demand. According to Clarke and Daniel (2006) the stability or instability of the local currency will also contribute to the level of business confidence which in turn affects is expected to affect residential house prices.

### 2.3.5 Money Supply

Money supply refers to the entire stock of currency and other liquid instruments in a country's economy as of a particular time. The money supply can include cash, coins and balances held in checking and savings accounts. Economists analyze the money supply and develop policies revolving around it through controlling interest rates and increasing or decreasing the amount of money flowing in the economy. An increase in the supply of money typically lowers interest rates, which in turns generates more investment and puts more money in the hands of consumers, thereby stimulating spending. Businesses in the real estate sector therefore respond by constructing more houses. The opposite can occur if the money supply falls or when its growth rate declines.

Studies on the relationship between money supply and residential house prices are mixed. Lu and Tang (2014) find a negative relationship between money supply and house prices for the UK market. Whereas Barksenius and Rundell (2012) and Lastrapes (2002) finds a positive relationship between money supply and housing price returns in Sweden and the UK. Money supply affects both the demand and supply side of house prices. Increased

money supply on the demand side will increase house prices whereas on the supply side increased money supply will cause a fall in house prices.

### 2.3.6 Public Debt

This is the amount of money that any government owes to individuals, businesses, and even other nations. Public debt is one of the ways of the government getting more funds by offering attractive and secure returns. When used correctly, public debt improves the standard of living in a country. That's because it allows the government to build new roads and bridges, improve education and job training, and provide pensions, the sum of which contributes to job creation.

In competitive goods market including real estate products, there is stiff competition between different sectors in attracting funds. It is therefore expected that investors will be split between investing in real estate and government papers based on returns and security. Effectively an increased government borrowing via attractive returns will lock out real estate investors from the available funds. The supply of residential houses will thus be constrained often leading to upward movements of selling prices. Theoretically we expect a positive relationship between public debt and house prices in Kenya.

A study by Standish et al. (2005) to establish the determinants of residential house prices in South Africa based on a national model and using eleven variables (interest rates, gross national income, housed hold debt to income ratio, net migration, capitalization of JSE, nominal exchange rate, tourism, real effective exchange rate and foreign direct investment found that house prices are sensitive to changes in these variables.

### 2.3.7 Rental Income

Rental income is the amount of income earned on real estate properties by owners for rented house. Previous studies have delved into the relationship between rental income and commercial property markets. Dobson and Goddard (1992) developed a theoretical model of price and rent determination in the commercial property sector for four regions in Britain from 1992-1987. Using variables such as employment, interest rate and real residential property prices on real prices and rents of offices, retail and industrial spaces, they find that prices and rents are sensitive to changes in these variables.

According to Heckman(1985) using GNP, employment, and vacancy rates for fourteen US cities, finds that office rents adjust in response to local and international economic conditions. Likewise Ng (1998) finds that rental rates in Hong Kong between 1980-1996 adjusted negatively to changes in inflation, interest rate and vacancy rates. Most previous research has concentrated on rental income for commercial properties and is skewed towards developed countries. The researcher did not find any work concerning the relationship between rental income and residential property prices for Kenya and developing countries in general.

### 2.4 Review of Empirical Studies

Globally researchers have been interested to understand what drives returns in real estate property prices. This is because of the perceived impacts of economic changes on real estate returns and the impacts these changes have on the economy. The quality of housing supply is equally an indicator of the level of development and lifestyles. Real estate investments form the largest stock of any individual's life time investment and for the

nation collectively. Like any other asset class, researchers contend that changes in macroeconomic and financial variables are responsible for the movements in real estate property returns.

Nzalu (2013) conducted a study to determine the factors responsible for the growth of real estate investment in Kenya. The study used population growth, interest rates, gross domestic product and inflation as the independent variables. He found out that real estate growth is affected majorly by changes in GDP, inflation and interest rates whereas population growth was negatively related to real estate growth. In another study, Kirungu (2013) investigated the relationship between interest rates volatility and real estate returns in Kenya. She found out that there exists an inverse relationship between real estate returns and interest rates.

Muthee (2012) did a study to establish the relationship between economic growth and real estate prices in Kenya. He found out that a continued decline in selling prices of real estate dampens investor's efforts. In addition there is spiral effect to activities associated with real estate development and the economy in general. In another study, Ngumo (2012) investigated the effect of interest rates on financial performance of firms offering mortgages in Kenya. The study found a positive relationship between financial performance and the amount of mortgage loans advanced by lending institutions.

Aguko (2012) analyzed the factors influencing mortgage financing in Kenya, using housing finance as the case study. He found out that interest rate setting on mortgage debt, government instruments and fiscal measures are the major policies that govern mortgage financing. Whereas Muguchia (2012) in another study found out that flexible interest rates moved in opposite directions with mortgage financing in Kenya. According to Omengo (2012), high interest rates in Kenya are hurting real estate investment. The cost of borrowing is factored into supply of houses by developers which mean that as interest rates rises the cost of servicing loans and future loan advances increases. High interests will in turn affect ongoing projects as the costs of materials and labour increases. This effect of interest was more profound when the CBK increased the base lending rate (BR) from 7% to 18% in 2011 to tame inflation and depreciating Kenya shilling. Consequently commercial banks increased their lending rates from a low of 11% to about 25% causing loan defaults and decreased borrowing.

In another study, Adongo (2012) found that commercial banks offer mortgage financing to increase market penetration, enhanced cross-selling potential, high profitability and as a competitive strategy. Based on the findings, the study recommended policies that would encourage commercial banks to adopt mortgage financing to enhance their profitability, market penetration and as a competitive strategy. The improved profitability of commercial banks is driven by the high interest rates pegged on mortgages.

Murira (2010) studied the Relationship between loan portfolio composition and financial performance of commercial banks in Kenya. The study found that there exists a relationship between loan portfolio and financial performance of commercial banks in Kenya. The study also recommends that banks should strive to have the best loans mix to improve on profitability. The study further recommends that for commercial banks to remain profitable they should have good portfolio management which will help in making decisions about investment mix and policy, matching investments to objectives, asset allocation for individuals and institutions, and balancing risk against performance.

Ndirangu (2003) examined the proportion of mortgages issued to total assets held by mortgage companies in Kenya as well as the relationship between the types of mortgage held and the financial performance of the mortgage companies using data for the period 1993-2002. The study found out that exists a significant relationship between the types of mortgage and earnings of the individual institutions. In addition, the study findings revealed that earnings were greatly influenced by fixed rate mortgage, income property mortgage and interest only mortgage.

In South Africa, Standish (2005) conducted a study to establish how changes in real interest rates, gross national income, and household debt to income ratio, net migration, crime, and capitalization of JSE, nominal exchange rate, tourism, real effective rate and foreign direct investment affected real estate markets property returns. The study found that changes in these variables were responsible for housing property growth and returns in South Africa.

In another study by Clark and Daniel (2006) to forecast housing property returns for the South African market using lagged values of JSE All share index, prime rate, building plans, business confidence, motor vehicle sales, house debt to disposable income, gross domestic product, and dollar exchange rates, gold and oil and transfer costs found that these variables explain the movements in house prices. The integrated model was also good predictor of the trend in the house prices for 2005, excluding the first quarter for 2005 and 2006 respectively.

Lu and Tang (2014) examined the determinants of UK house prices applying a cointegration model and its error correction approach using quarterly data from 1971 Q1 to 2012 Q4.The cointegration test concludes that construction cost, credit, GDP, interest rates and unemployment rate have a positive impact on house prices, while disposable income and money supply are negatively correlated with house prices. The error correction model also indicates that the growth of house prices is affected by construction costs, credit, interest rate and disposable income in the short run, among which the interest rate is the most significant determinant. In another study for the UK by Brooks and Tsolacos (1999) using vector auto regressive model finds that unemployment rate, nominal short term interest rates and the dividend yield do not have any effect on house property returns. However, the interest rate spread and unanticipated inflation depict a contemporary influence on property returns.

Otrok and Terrones (2005) examined international house prices, interest rates and macro macroeconomic fluctuations. The study found out that co-movement's in house price, interest rates and macroeconomic factors is very high. Using vector autoregressive models they establish that a shock in the US will affect house prices in the rest of the world. Additionally they found out that a housing price shock of almost 1% will reduce GDP growth by around 0.2% in the US. The same study found out that a monetary shock in the US and the rest of the world has similarities and differences. The effects of the shock on long term interest rates is nearly identical internationally whereas on house prices reaches its peak faster in the US than other markets. For stocks a shock produces quicker and dramatic response but no impact on GDP by a monetary shock.

Other studies theorize the appropriate theory or model for explaining return variation. Webb, Chau and Li (1997) find that more information is obtained from real estate returns when the returns are separated according to initial yield, growth in net operating income and price movements. Various approaches have been directed towards understanding the effect of a diversified portfolio. Webb and Rubens (1995) examine the effect of unbundling asset returns. They find that unbundling of asset returns by income and appreciation is important to help understand the risk and return features of different investment asset classes.

Bilozor and Wisniewski (2012) examined the impact of selected macroeconomic factors on residential property prices in Europe with particular attention to Poland and Italy using the committee of artificial neural networks and rough set theory. The study used GDP,

unemployment, interest rates, inflation, actual rentals, population growth, general government debt, long term loans and housing service quality. The study found out that unemployment rate and population growth are significant variables for Poland in determining demand for real estate and its price. In Italy ,the study found out that demand for real estate is driven variables such consumption expenditure, household consumption expenditure and housing expenses. This is because in Italy basic needs have been met hence the demand for housing is generated for the purpose of prestige.

In China, Sze (2004) conducted a study to establish how changes in GDP, retail sales, mortgage rate, income, unemployment, stock market performance, and visitors affect retail rentals in Hong Kong. He found out that changes in these variables affect retail rental prices in Hong Kong. In another study by Hui and Yue (2006) to investigate whether a housing price bubble existed in 2003 in shanghai and Beijing. The presence of the bubble was inferred from the irregular relationship between the selected key market factors and house prices. They used Granger causality tests, the reduced form of house price determinants and generalized impulse response analysis as the econometric techniques. The variables used as an input in the study are urban households' disposable income, GDP, stock price index and the stock of new vacant units for Beijing, Shanghai and Hong Kong. In relation to the influence of the selected market fundamentals on the housing market, the study concludes that house prices and the selected market determinants are integrated and that abnormal interactions exist (Hui and Yue, 2006). This conforms to the findings of the studies on the influence of macroeconomic variables on house prices in other countries such as the US.

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Lean and Smyth (2010) examine the dynamic linkages between house prices and stock prices for the Malaysian market using cointegration and Granger causality tests. For Malaysia as a whole, the study found out that house prices, stock prices and interest rates are not cointegrated. However, for Kuala Lumpur, Penang and Selangor house prices, stock prices and interest rates are cointegrated for 40 per cent of the house price indices. When there is evidence of cointegration in these regions, the study established that stock prices lead house prices. While there are alternative potential reasons for this finding, such as slow adjustment of house prices in response to a shock in the fundamentals, it is consistent with a wealth effect. A likely explanation for this result is that in these states, compared with the Malaysian average, housing is expensive, income is high and real estate is used much more as an investment vehicle by both wealthy Malaysians and foreigners leveraging of the share market.

Unlike research studies on the housing property markets in the developed countries, research on real estate in Kenya is at the infancy stages but growing rapidly due to the changes in this sector. Most studies have only focused on establishing the relationship between a single variable and real estate property returns. The economy being a complex mixture of many operating factors, the use of single variables causes problems with result quality and validity of the results noting that even past housing prices have effects on current and future housing prices.

## 2.5 Summary of Literature Review

In this chapter a theoretical and empirical review of housing property market was provided. The theoretical analysis mainly focused on macro economic variables affecting house prices in Kenya. A number of factors are suggested to influence the housing market. These include inflation, GDP, business confidence, motor vehicles sales, nominal and real exchange rates, unemployment rate, visitors, and crime rate

The empirical literature regarding the influence of selected variables on the housing market was reviewed based on the following categories: Kenya, developing countries, and developed countries. For the developed countries the studies were grouped into those using real estate returns as a proxy for the housing property markets and those that used house prices. In contrast to developed countries, very few studies in developing countries have focused on the relationship between macroeconomic factors and the housing property markets. This scenario makes it difficult to compare the results of the influence of macroeconomic factors on the housing markets in developing and developed countries. Furthermore, the studies on Kenyan housing property market are extremely scanty with especially with respect to the relationship between selected variables and the housing property market.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter details the process used to carry out the research. This study entailed a descriptive survey design, the population that was the Kenya real estate property market, sample design, data collection and analysis.

## 3.2 Research Design

Kothari (2004) defines research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. It is the conceptual framework within which the research is conducted and it constitutes the blue print for collection, measurement and analysis of data. As such the design includes steps of the research from hypothesis writing and its operational implications to final analysis of data.

The research adopted causal study as its research design with a major emphasis on determining the cause and effect relationship between the variations in house prices and changes in GDP, domestic interest rates, and inflation, Kenya shilling dollar exchange rate, rental income, money supply and public debt in Kenya.

## 3.3 Population

Population is defined as the entire group of individuals, events or objects having common characteristics that conform to a given specification (Mugenda & Mugenda, 2003).The population of this study comprised all real estate properties in Kenya: commercial office

buildings, religious buildings, learning institutions, ranches, malls and supermarkets, sports and recreational facilities and residential properties such as standalone house, bungalows, cottages, villas, town houses, massionates and apartments. We used the Hass Property Index to get relevant information on prices of these residential units.

## 3.4 Sample

Groves (2010) defines sampling as the process of selecting a sufficient number of the right elements from the population. The sample comprised data and information on residential housing properties such as stand alone house, bungalows, cottages, villas, town houses, massionates and apartments. This study adopted a census of all residential houses for sale in the Hass Consult property Index. Efficiency was improved in a census in that more information was obtained via this approach.

## 3.5 Data Collection

According to Flick (2009) data collection is the gathering of empirical evidence with the objective of gaining new insights about the situation and to answer the questions that initiated the research. The study used published secondary data on GDP, inflation, interest rates, money supply, exchange rates, public debt and rental income all of which are readily available from Central Bank of Kenya, Kenya National Bureau of Statistic and Hass Consult Property Index.

## 3.6 Data Processing

The data gathered was checked for accuracy, completeness and analyzed using statistical package for social sciences (SPSS) version 20.A multiple linear regression model analysis was used. The regression model is good at explaining the magnitude and direction of relationship between the variables of the study through the use of coefficients

like the correlation, coefficient of determination and the level of significance. Analysis of data using regression model has been used previously by Aduda (2011) in a study which investigated the relationship between executive compensation and firm performance in the Kenyan banking sector. Also Ngugi (2001) used regression analysis in a study on the empirical analysis of interest rates spread in Kenya while Khawaja and Mulesh (2007) used regression analysis to identify the determinants of interest rates spread in Pakistan.

The population regression model is in the form of equation (1) below. The basis of the model is to test data validity, compute descriptive statistics, and conduct empirical analysis by regressing house prices on the selected macroeconomic variables. For each variable, the computed coefficient of determination will indicate to what extent changes in the independent variables causes movement on the dependent variable. Results and conclusion will be made accordingly depending on the regression results.

$$Y = \beta_0 + \beta_1 X_1 + B_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_{6+} + \beta_7 X_7 + \varepsilon i \qquad \text{............................ (1)}$$

Where;

Y – Residential House prices.

$X_1$-$X_6$ represents gross domestic product, interest rates, inflation rate, Kenya shillings dollar exchange rate, money supply, public debt and rental income respectively.

$\beta_i$ -Determines the relationship between the independent variables $X_i$ and the dependent variable y.

$\beta_0$ -The constant term

$\varepsilon_i$ -the error term

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**3.7 Meaning and Measurement of Variables**

The following measures and definitions were adopted for the selected macroeconomic

factors used in assessing how they affected house price in Kenya.

**Table 3.7 Measurement and definitions**

| Independent Variable | Measurement | Definition |
|---|---|---|
| GDP | Real GDP Rate | Growth rate compared to previous quarterly values |
| Inflation | Consumer Price Index | Quarterly changes in consumer Prices |
| Public Debt | Real figures | Quarterly figures |
| Interest Rates (INTR) | Banks lending rates | Interest rate percent per quarter |
| Exchange Rate (EXR) | USD/KES | Quarterly average of Kes to USD |
| Rental Income (REI) | Real figures | Quarterly figures. Adjusted |
| Money Supply | Real figures | Quarterly figures. Adjusted |

| **Dependent Variable** | | |
|---|---|---|
| Housing Prices | Hass Prices Index | Cost of buying a residential house |

Source: Researcher for this study.

# CHAPTER FOUR

# DATA ANALYSIS, RESULTS AND DISCUSSION

## 4.1 Introduction

This chapter presents data analysis, results and discussion of the findings. The objective of the study was to establish the effect of changes in GDP, interest rates, inflation, exchange rate, money supply and public debt on residential house prices in Kenya. The population of the study consisted of all properties–Commercial office buildings, Religious properties, sporting and recreational facilities, and all residential houses newly constructed and are for sale. The sample size consisted of standalone house/bungalows/cottages/villas, town houses/marionettes and apartment constituted in the Hass Property Index. Secondary data was obtained from Central Bank of Kenya, Kenya National Bureau of Statistics, and Hass Property Index.

## 4.2 Descriptive Results

Results in table 4.1 give the summary statistics of the main variables that have been included in the model including: minimum, maximum, mean, and standard deviation. The analysis shows the mean selling price of a newly constructed house in Kenya was Kenya shillings.30 million. Interest rates had a mean of 15.55 which is in line with the marketing lending rates within the study period.

The result show that inflation had a mean of 8.82 which on average reflects that the cost of living has been on the rise. The US dollar and rental income averages indicate a general increase over the study period. On the other hand gross domestic product, rental

income, money supply and public debt had standard deviations less than one indicating little variations. Domestic interest rate, Kenya shilling dollar exchange rate, and inflation had the largest variations and agrees with observations within the study period. These variations indicates that the economic and financial environment had challenges due to political climate, global financial crisis and increased security concerns.

**Table 4.1: Descriptive Statistics**

|  | House price | gdp | Interest rate | Inflation | Kes/USD rate | Rental income | Public debt | Money supply |
|---|---|---|---|---|---|---|---|---|
| N    Valid | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
|       Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | 30.7139 | 26.4148 | 15.55 | 8.82 | 75.41 | 23.5313 | 27.3991 | 28.1695 |
| Median | 30.7342 | 26.4069 | 14.00 | 8.00 | 77.00 | 23.5233 | 27.3421 | 28.0906 |
| Std. Deviation | .24609 | .13991 | 3.365 | 4.065 | 4.520 | .11492 | .29900 | .40661 |
| Minimum | 30.34 | 26.21 | 11 | 1 | 63 | 23.37 | 27.11 | 27.66 |
| Maximum | 31.08 | 26.66 | 25 | 17 | 81 | 23.84 | 28.71 | 28.96 |

## 4.3 Correlation Analysis

To be able to quantify and define the relationship between the variables, the study used Pearson's correlation coefficient of correlation. Correlation matrix is an important indicator of a linear association of the explanatory variables and helped in determining the strengths of association in the model, that is, which variable best explained the relationship between house price returns and its determinants and is denoted by r.

The Pearson correlation coefficient (r) can take a range of + 1 to -1.A value of 0 indicates that there is no association between the variables. A value greater than 0 indicates a positive association implying that as the value of one variable increases so does the value of the other decreases. The results are represented in table 4.2 below.

**Table 4.2 Pearson's Correlations Coefficient Matrix**

|  | House price | gdp | Interest rate | Inflation | Kes/USD rate | Rental income | Money supply | Public debt |
|---|---|---|---|---|---|---|---|---|
| House price | 1.000 | .974 |  |  |  |  |  |  |
| gdp | .974 | 1.000 |  |  |  |  |  |  |
| Interest rate | -.641 |  | 1.000 |  |  |  |  |  |
| Inflation | -.047 |  |  | 1.000 |  |  |  |  |
| Kes/USD rate | -.230 |  |  |  | 1.000 |  |  |  |
| Rental income | .905 |  |  |  |  | 1.000 |  |  |
| Money supply | .984 |  |  |  |  |  | 1.000 |  |
| Public debt | .976 |  |  |  |  |  |  | 1.000 |

a. Dependent Variable: house price

\*. Correlation is significant at the 0.05 level (2-tailed).

From table 4.2, it can be deduced that there was a positive correlation between house prices and GDP (0.974), Rental Income (0.905), Money Supply (0.984) and public debt (0.976). However, there was a negative relationship between house prices and Interest rate (-0.641), Inflation (-0.047), and Kes/US Dollar rate (-0.230).

## 4.4 Regression Analysis

This is the statistical techniques that identifies the relationship between two or more quantitative variables, that is, the dependent variable whose value is predicted and the predictor(s) or the independent variable(s) whose knowledge is available. Regression analysis is often used to understand the relation between the variables. Relationship between variables can be presented graphically or in equation form.

The following econometric model specified in chapter three was estimated using secondary data on the selected variables.

$$Y = \beta_0 + \beta_1 X_1 + B_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_{6+} + \beta_7 X_7 + \dot{\varepsilon i}$$

Where ;

Y - House prices.

$X_1$-$X_7$ represents are gross domestic product, interest rates, inflation rate, real exchange rates, rental income, money supply and public debt.

$\beta_i$ and $\beta_0$   -Determines the relationship between  the independent variables $X_i$  and the dependent variable y.

$\beta_0$ -The constant term

$\varepsilon_i$ -the error term

### 4.4.1 Model Summary Results

The results in table 4.3 below, shows the multiple linear regression summary and overall fit statistics. We find that the adjusted $R^2$ of our model is 0.969. This means that 96.9% of the variations in house prices are explained by changes in gdp, interest rates, exchange rates, rental income, inflation, exchange rate and public debt.

The Durbin Watson d = 1.686 which is between the critical values of 1.5 and 2.5(1.5<d<2.5) shows that there is no first order linear autocorrelation in our multiple linear regression data meaning that most of the variations in house prices are directly caused by changes in each variable holding other constant.

### Table 4.3 Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|------|----------|-------------------|---------------------------|---------------|
| 1 | .987[a] | .974 | .969 | .04319 | 1.686 |

a. Predictors: (Constant), public debt, Kes/USD rate, Inflation, Interest rate, rental income, money supply, gdp

b. Dependent Variable: house price

### 4.4.2 Analysis of Variance (ANOVA)

Table 4.4 below represents the F test or ANOVA. The F-Test is the test of significance of multiple linear regressions. The F test has the null hypothesis that there is no relationship between the variables or in other words $R^2$=0. The significance shows that the estimated model fully explains variations in house prices.

**Table 4.4 ANOVA**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| | Regression | 2.537 | 7 | .362 | 194.293 | .000[b] |
| 1 | Residual | .067 | 36 | .002 | | |
| | Total | 2.604 | 43 | | | |

a. Dependent Variable: house price

b. Predictors: (Constant), public debt, Kes/USD rate, Inflation, Interest rate, rental income, money supply, gdp

### 4.4.3 Coefficients of Determination

Table 4.5 below shows the multiple linear relationship coefficient estimates including the

intercept and the significance levels.

**Table 4.5 : Coefficients of Determination**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 15.737 | 6.847 | | 2.298 | .027 |
| gdp | .145 | .368 | .083 | .395 | .695 |
| Interest rate | -.016 | .003 | -.219 | -5.352 | .000 |
| Inflation | -.001 | .002 | -.024 | -.816 | .420 |
| Kes/USD rate | -.006 | .002 | -.106 | -2.594 | .014 |
| Rental income | -.051 | .116 | -.024 | -.439 | .663 |
| Money Supply | .417 | .115 | .689 | 3.639 | .001 |
| Public debt | .047 | .044 | .057 | 1.073 | .291 |

## 4.5 Regression Equation

Based on the regression coefficients results, the estimated model equation can be written as follows;

HOUSE PRICE  =  15.74 + 0.145*GDP - 0.016*INTR - 0.001*INF -  0.006*EXCR -

0.051*REI + 0.417*MS+ 0.047*PUBDEBT

Regression analysis reveals that for every additional unit increase in GDP, Money supply and Public debt, house prices increase by 0.145, 0.417 and 0.047 respectively. On the hand every additional unit increase in interest rates, inflation, exchange rate and rental income leads to negative returns in house prices by -0.016, -0.001, -0.006 and -0.051 respectively.

## 4.6 Summary and Interpretation of Findings

This section focuses on addressing the objective of the study by providing the summary and interpretation of the results obtained from econometric modeling. The secondary data on GDP, interest rates, inflation, exchange rate to the US dollar, money supply and public debt was analyzed. Determination of relationships and model viability was done by SPSS version 20.

The findings of a positive effect of GDP on house prices imply that increasing GDP encourages the consumptions of durables including housing property goods. As the economy grows many Kenyans are able to afford the purchase of residential houses. It

also signifies that the number of middle class Kenyans who constitutes the largest portion of home buyers is expanding with GDP growth.

The results indicate that domestic interest rates have a negative effect on house price returns. An increase on interest rates by 1% will cause a contraction of 1.6% in house prices. This implies that rising domestic interest rates discourage consumption of durable goods which includes purchase of housing since it is a durable asset. An increase in the domestic interest rates also leads to increased cost of borrowing, high mortgage repayments which in turns lowers the affordability and demand for residential house prices. Furthermore the results may imply that the housing market is in competition with other financial markets in the attraction of funds. For instance if a rise in interest rates makes other investment vehicles to post superior returns in the short and medium term, investors will prefer those markets against the housing markets. Another implication is that the Central Bank had within the period of study pursued tight monetary policy such that rising interest rates made mortgage repayments out of reach. Most home buyers either defaulted or opted to sell houses in order to pay back the principal. This finding is comparable and conforms to the findings of Kirungu (2013) using interest rate volatility and house prices in Kenya and that of Barot and Yang (2002) in the UK. The findings however contradicts that of Lu and Tang (2014) which established that interest rates are positively related to house prices in the UK.

The Kenyan shilling dollar exchange rate negatively impacts on house prices at -0.001.This means that as the Kenyan shillings gains strength against other currencies, foreign investors are discouraged from investing in the Kenyan market including real

estate sector. The other implication is that a strong Kenyan shilling affects local business opportunities in that exports become expensive and imports affordable. The Kenyan consumers respond by buying durable goods mostly electronics and cars in the process causing a fall in house prices. The results of a negative influence of real effective exchange rate on the housing property market agree with that done by Clarke and Daniel (2006) and Standish *et al.* (2005) in South Africa.

Changes in money supply impacts positively variations of house prices in Kenya. This imply that as more money is in circulation and hands of the public, house prices will rise due to increased demand. This finding conforms to a study by Barksenius and Rundell (2012) and Lastrapes (2002) for the Swedish and UK housing markets. The finds however contradicts that of Lu and Tang 2014 on the determinants of UK house prices which found a negative relationship between money supply and house price variations. Policy wise money supply management is important because of its effects on interest rates and inflation. The central bank monetary policy should adopt and execute money supply policies that optimize returns on investments in real estate sector.

The study finding indicates that as inflation rises, residential house price takes a dip or a negative relationship. This finding differs significantly with the discussions in literature review and past research results. Past research cited in this study confirms that real estate has better edging capabilities against inflation. This finding underpins the fact in Kenyan basic necessities such as food items still take a bigger portion of personal incomes. The findings of this study agree with that of Tse and Yee (2013) and Sze (2004) for Malaysian and Hong Kong markets respectively.

The findings of this study show that rental income and house prices are negatively related. This outcome is rather surprising, because it is expected that investors in real estate sector seek value maximization via periodical rent receipts. This findings are supported by the fact most Kenyans buying homes for the first time for own personal use and not renting business. Theoretically an increase in rental income should indicate good returns in the real estate and thus upward movement's in house prices. Sze (2004) in a study on determinants of retail rents in Hong Kong found that income is one of the major determinants of changes in retail rent prices. It rather surprising that investment in residential property housing do not should cause more investment in the real estate.

The study established that public debt is positively related to residential house prices. This result differs significantly from literature review noting that increased government borrowing crowds out other investors. The outcome suggests that most of the funds borrowed by the Kenyan government are used in infrastructure development, which contributes highly to variations in house prices.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents summary of findings, conclusion, policy recommendations, limitations of the study and recommendations for further research. The aim of the study was to examine whether variations in residential house prices in Kenya are determined by changes in gross domestic product (GDP), domestic interest rates, inflation, Kenya shilling US dollar exchange rates, rental income, money supply, and public debt.

## 5.2 Summary

This study examined the impacts of selected macroeconomic variables on housing property returns in Kenya using quarterly data for the period 2000 Q1 to 2010 Q4. Three main issues were analyzed in relation to how changes in gross domestic product, domestic interest rates, inflation, Kenya Shilling US dollar exchange rates, rental income, money supply and public debt are related to variations in the selling price of residential house prices in Kenya.

The first part examined the relationship between the selected macroeconomic and financial factors on property returns. Secondly, the study examined to what extent a unit shock on these variables had on the selling prices of houses and therefore profitability. Lastly, the proportion of property returns that resulted from changes in the selected macroeconomic variables was examined. A multiple linear regression model was therefore adopted to empirically analyse the three stated aspects.

From the analysis of data, the findings show that variations in residential house prices in Kenya are significantly determined by changes in GDP, interest rates, inflation, exchange rate, money supply and public debt. The study found that GDP, money supply, and public debt are positively related to residential house prices in Kenya. Furthermore, the results show that interest rates, inflation, exchange rate and rental income are negatively related to residential house prices. A multiple linear regression model was adopted to determine the relationship between the selected macroeconomic factors and house prices.

It is the opinion of the researcher that relevant authorities manage various macroeconomic factors to promote continued growth in the real estate sector. Interest rates changes should be closely monitored to avoid a repeat of hyperflation (2009 to 2012) when attempts by Central Bank to tame continued depreciation of the Kenyan shilling adversely affected the economy.

## 5.3 Conclusion

The objective of this study was to examine the effects of selected macroeconomic variables on house prices in Kenya. The study concludes that for the last ten years, house prices in Kenya have been on the upward trend. These changes can be alluded to the fact the Kenyan economy has expanded within the same period. Selling prices doubled of newly constructed residential house have doubled for the last ten years. A report by Hass Consult and Knight Frank Property managers on international property prices indicates that the Kenyan real estate sector is one of the best performing globally. The study also noted that most variations in house prices follow development of roads, public facilities, supply of electricity and water.

The results show that GDP, public debt, and money supply are positively related with returns in house prices in Kenya. As expected there is a negative relationship between rental income, inflation, exchange rate and interest rates and house prices. The weak explanatory power of the variables suggests that real estate returns may be explained by property market-related factors such as capitalization rates, population changes, new motor vehicle registration, unemployment rates, diaspora remittances, tourism, security and foreign investments.

The country is currently faced with a critical supply of residential housing units. The deficit is 156,000 units annually with an accumulated deficit of 2 million units. Due to the high demand for houses, the property market in Kenya will continue to be strong. The property market is considered a good store of value and also a great source of rental income in addition to capital gains.

The sector however has experienced many challenges that have scared investors. Country wide, land corruption is rampant. The demolitions of houses in Syokimau and other arrears in Nairobi are factors that fuel suspicions on land dealings. It is common to have a parcel of land being claimed by more parties. In this environment, investor confidence is lost, and the cost of land acquisition is very high .The sum of this complications often lead to delays in supplying of housing units.

The study concludes that the government should draft policies that encourage supply of affordable housing units. Interest rates, exchange rates, and inflation should be managed to spur growth in this sector. Developers should adopt cost efficient strategies to reduce the cost of acquiring completed house. There is need to develop real estate products that meets the needs of majority of low and middle income brackets.

## 5.4 Policy recommendations

From the discussion in this study, certain policy implications arise. The first implication of the study is that changes in macroeconomic and financial variables affect the general performance of the housing property market in Kenya. Therefore, trends and developments in the macroeconomic environment must be continuously and closely monitored to determine how such developments affect the property market in terms of property prices and returns.

The study recommends that the Kenyan government put in place wider economic policies to spur growth in all sectors of the economy. Noting that gross domestic product and money supply are determinants of returns in real estate sector, there is need to ensure that sustainable growths in GDP are realized year on year.

Secondly, the result that the domestic interest rates significantly and negatively impacts on the housing property market implies that monetary policy stance (expansionary or Contractionary) will impact significantly on the housing market. It is therefore recommended that an appropriate level of interest rates is called for since interest rates that are too high will not be favorable for the development of the housing property

market while interest rates that are too low may lead to house prices rising to levels that may cause a bubble in the housing market which could have a negative impact on the property market and the economy if it bursts.

Thirdly, exchange rate stability must be ensured as this will attract more investors into the property market which will lead to its continued and sustainable development. Finally, managing inflation so that expectations are not high is important. Therefore, efforts of the Monetary Policy Committee to keep inflation expectations in check are a step in the right direction.

Furthermore, maintaining an appropriate balance of the interest rates is necessary as this will cause the interest rate spread to be positive which will contribute to the development of the housing property market. The knowledge of this underlying relationship between the macroeconomic variables and the housing market will help investors to monitor effectively the developments in the macroeconomic environment and the implications thereof for property prices and returns. This will further assist investors in investment decision-making.

## 5.5 Limitations of this study

This study had several limitations. First, it is possible that the nature of data used impacted on the findings in an unexpected manner. This therefore limited the powers of the model to establish the full strength of association between house prices and GDP, interest rates, inflation, exchange rate, money supply and public debt. This may have

been created by variation of statistical figures illustrating the key variables of measurements.

The study did not isolate other factors influencing house prices. For example variables such as security, land policies, population growth, creation of county governments, treasury bills, foreign interest rates and tourism that could have played significantly in house prices. The researcher however used diagnostics in SPSS to minimize these effects. The use of control variables is generally done to check observed relationship between two variables if a direct one or indirect with intervening. The study did not use control variable specifications as specified by Richardson et al (2002). It is thus possible that lack of inclusion, cause alterations in interpretation. Correlations among the variables may be causing unanticipated results despite the efforts at identifying potential multi collinearity problems.

The sample and period of this study might have been small and limited. There are possibilities that the sample was not representative of the population of study. The time period of ten years is also not long enough because most policy decisions can take years to make meaningful changes in the economy. However, the researcher selected the period 2000 to 2010 because it is the period in which the real estate sector has grown tremendously.

Finally, this study was limited by the unavailability of quarterly data for property market-related variables such as capitalisation rates, unemployment rates, and rental rates that might have a significant influence on the housing property market, especially the real estate returns. The inclusion of these variables may possibly improve the findings of this study. Therefore, future research could be done using property market-related factors rather than macroeconomic or financial factors. This may call for lower frequency time series as opposed to the monthly series.

## 5.6 Recommendations for Further Research

The time limit for this study did not allow in-depth analysis of many of the factors that could be responsible for variations in house prices in Kenya. At the same time, the findings were based on a relatively small sample that may have influenced the nature of results that were obtained. There is need therefore to expand on the sample size and carry out similar research for the Kenyan residential housing market.

 The researcher specifically focused on the Kenyan housing property market, it is suggested that similar studies be undertaken but focusing on other developing countries within the region and the results compared with those of this study. This is because research of this nature is very in limited in the case of developing countries. In addition, research could be done on what causes property returns to respond to their own shocks.

The researcher recommends that studies be undertaken on the determinants of commercial property retail rents for malls and supermarkets chains. Issues concerning anchor tenancies and riding tenants need to be investigated to shed more light on the

operations of these markets. The growing market for residential apartments also requires attention.  In Kenya most of the office complexes are owned by major companies. To date very little research has been done on why these companies invest in real estate.

Research work done to date on real estate properties have only focused on linear regression models. These models do have deficiencies in handling high frequency data such as monthly time series and lack of forecasting power. There is a need to examine these relationships using advance econometric techniques such as ARIMA models, Vector Autoregressive models, neural networks, co integration approach and state spatial models which have better forecasting capabilities.

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# APPENDICES

## Appendix I: Summary of literature review

| Author(s) | Nation/ Country | Period | Model | Measure of House returns | Summary of Results |
|---|---|---|---|---|---|
| Brooks C.& Tsolacos | UK | 1999 | VAR | Real estate returns | Mixed results. Economic and financial factors explain little of changes in property returns. |
| McCue and Kling | UK | 1994 | VAR | Equity REITs | Mixed results. Macroeconomic variables such as interest rates explain 60% of the returns in real estate prices. |
| Ling & Naranjo | USA | 1997 | Multifactor Asset pricing Model | Commercial real estate | The selected macroeconomic variables systematically impacts on real estate returns. |
| Chan et al. | USA | 1990 | Multifactor Arbitrage | Thirty equity reits traded on NYSE,AMEX and NSDAQ | Mixed results. Equity REITs and NYSE are significantly positively related to the risk and term structure return factors. The indexes are also systematically negatively related to unexpected inflation. |
| Clark and Daniel | South Africa | 2005 | Linear Regression | House Price Index | Lags of stock market returns, real GDP, interest rates, the rand/dollar exchange rate and transfer costs are the key drivers of the south African housing and property markets. |
| Standish et al. | South Africa | 2005 | National housing price model | House price index | Real exchange rate, housholdebt/disposable income ration and JSE capitalization had negative coefficients. Foreign direct investments and real price of gold had positive coefficients. |
| Adongo | Kenya | 2012 | Linear Regression | Financing Sources | Financing source of real estate projects had positive coefficient |
| Aguko | Kenya | 2012 | Linear Regression | Financing sources | Positive relationship between real estate returns and financing sources |
| Muguchia | Kenya | 2012 | Linear | Interest Rates | Negatively related to real estate returns |

| | | | | | |
|---|---|---|---|---|---|
| | | | Regression | | |
| **Muthee** | Kenya | 2012 | Linear Regression | Economic Growth | Positively related to real estate returns |
| **Naomi** | Kenya | 2013 | Linear Regression | Interest Rates | Negatively related to real estate returns |
| **Ngumo** | Kenya | 2012 | Linear Regression | Interest Rates | Negatively related to real estate returns |

## Appendix II: Gross domestic Product

|    | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|----|------|------|------|------|------|------|------|------|------|------|------|
| Q1 | 243430 | 248880 | 261146 | 258567 | 277728 | 284612 | 303112 | 325082 | 329389 | 347341 | 362080 |
| Q2 | 242026 | 259939 | 256814 | 259350 | 272447 | 292281 | 309889 | 334841 | 342518 | 345673 | 362544 |
| Q3 | 243697 | 258558 | 251648 | 267179 | 274349 | 295749 | 318421 | 337289 | 345551 | 347093 | 368668 |
| Q4 | 246909 | 252726 | 255660 | 269434 | 284014 | 301549 | 317443 | 339608 | 340325 | 352715 | 376819 |

Source: Kenya National Bureau of Statistics

# Appendix III: Interest Rates

|  | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN | 25.14 | 20.27 | 19.3 | 19.02 | 13.48 | 12.12 | 13.2 | 13.78 | 13.78 | 14.78 | 14.98 |
| FEB | 25.39 | 20.13 | 19.18 | 18.83 | 13.01 | 12.35 | 13.27 | 13.64 | 13.84 | 14.67 | 14.98 |
| MAR | 23.76 | 20.19 | 18.86 | 18.49 | 13.12 | 12.84 | 13.33 | 13.56 | 14.06 | 14.87 | 14.8 |
| APR | 23.44 | 19.56 | 18.69 | 18.57 | 12.67 | 13.12 | 13.51 | 13.33 | 13.91 | 14.71 | 14.58 |
| MAY | 23.4 | 19.2 | 18.54 | 18.52 | 12.55 | 13.11 | 13.95 | 13.38 | 14.01 | 14.85 | 14.46 |
| JUN | 23.11 | 19.26 | 18.38 | 15.73 | 12.17 | 13.09 | 13.79 | 13.14 | 14.06 | 15.09 | 14.39 |
| JUL | 22.39 | 19.71 | 18.12 | 15.3 | 12.31 | 13.09 | 13.72 | 13.29 | 13.9 | 14.79 | 14.29 |
| AUG | 21.23 | 19.54 | 18.12 | 14.81 | 12.19 | 13.03 | 13.64 | 13.04 | 13.66 | 14.76 | 14.18 |
| SEP | 20.57 | 19.44 | 18.14 | 14.82 | 12.27 | 12.83 | 13.54 | 12.87 | 13.66 | 14.74 | 13.98 |
| OCT | 20.22 | 19.77 | 18.34 | 14.75 | 12.39 | 12.97 | 14.01 | 13.24 | 14.12 | 14.78 | 13.85 |
| NOV | 19.79 | 19.44 | 18.05 | 14.07 | 11.97 | 12.93 | 13.93 | 13.39 | 14.33 | 14.85 | 13.95 |
| DEC | 19.6 | 19.49 | 18.34 | 13.47 | 12.25 | 13.16 | 13.74 | 13.32 | 14.87 | 14.76 | 13.87 |

Source: Central Bank of Kenya

# Appendix IV: Money Supply

|       | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009    | 2010    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| JAN   | 344646 | 360609 | 360407 | 405509 | 451272 | 508512 | 560504 | 657262 | 801247 | 895397  | 1067271 |
| FEB   | 342918 | 355149 | 366013 | 404452 | 452311 | 510928 | 569590 | 659949 | 810206 | 900031  | 1084345 |
| MAR   | 344070 | 357899 | 365508 | 407147 | 459270 | 517970 | 578706 | 677349 | 811214 | 906067  | 1107896 |
| APR   | 352724 | 363111 | 370986 | 404459 | 462294 | 516724 | 596935 | 682168 | 864105 | 928824  | 1122790 |
| MAY   | 346717 | 355737 | 372868 | 408165 | 468861 | 518733 | 595931 | 690543 | 839239 | 928604  | 1159595 |
| JUN   | 347728 | 354254 | 378128 | 415784 | 473793 | 523716 | 605238 | 708392 | 840679 | 950239  | 1198930 |
| JUL   | 354470 | 354362 | 380981 | 423285 | 476969 | 530453 | 619259 | 713613 | 850943 | 973623  | 1213212 |
| AUG   | 352024 | 351347 | 389540 | 422648 | 484123 | 539203 | 620994 | 730511 | 854952 | 984036  | 1216829 |
| SEP   | 351254 | 357444 | 387366 | 424271 | 488290 | 538231 | 630379 | 733329 | 859328 | 986901  | 1243601 |
| OCT   | 350443 | 362024 | 387732 | 435258 | 500219 | 548849 | 640273 | 739663 | 883456 | 1006009 | 1254488 |
| NOV   | 355862 | 361066 | 396914 | 441293 | 502979 | 553550 | 646844 | 745268 | 890200 | 1022424 | 1258812 |
| DEC   | 359647 | 368135 | 404805 | 451172 | 511425 | 558164 | 653036 | 777596 | 901055 | 1045657 | 1271638 |

Source: Central Bank of Kenya

# Appendix V: RENTAL INCOME

|     | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Q1  | 14309 | 14486 | 15581 | 15353 | 15693 | 16059 | 16888 | 17092 | 17418 | 18971 | 19654 |
| Q2  | 14158 | 15119 | 14663 | 15952 | 16403 | 16695 | 16889 | 17783 | 19941 | 22409 | 22592 |
| Q3  | 14199 | 14731 | 14961 | 14964 | 15566 | 16639 | 16744 | 18296 | 19439 | 18149 | 18896 |
| Q4  | 14426 | 14331 | 15247 | 15594 | 16077 | 16489 | 17925 | 17689 | 16706 | 16146 | 16948 |

Source: Kenya National Bureau of Statistics

# Appendix V: EXCHANGE RATE

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN | 70.681 | 78.606 | 78.597 | 77.718 | 76.295 | 77.93 | 72.214 | 69.885 | 68.081 | 78.95 | 75.8 |
| FEB | 73.219 | 78.25 | 78.25 | 76.841 | 76.39 | 76.938 | 71.804 | 69.616 | 70.624 | 79.533 | 76.7 |
| MAR | 74.431 | 77.753 | 78.057 | 76.583 | 77.262 | 74.803 | 72.281 | 69.293 | 64.924 | 80.261 | 76.9 |
| APR | 74.363 | 77.499 | 78.274 | 75.656 | 77.91 | 76.146 | 71.304 | 68.577 | 62.256 | 79.626 | 77.3 |
| MAY | 75.97 | 78.54 | 78.315 | 71.607 | 79.243 | 76.397 | 71.764 | 67.191 | 61.899 | 77.861 | 78.5 |
| JUN | 77.545 | 78.62 | 78.663 | 73.722 | 79.27 | 76.681 | 73.405 | 66.575 | 63.783 | 77.851 | 81 |
| JUL | 76.406 | 79.018 | 78.797 | 74.747 | 79.991 | 76.234 | 73.657 | 67.068 | 66.704 | 76.751 | 81.4 |
| AUG | 76.448 | 78.914 | 78.574 | 75.96 | 80.826 | 75.809 | 72.87 | 66.946 | 67.679 | 76.372 | 80.4 |
| SEP | 78.197 | 78.946 | 78.807 | 77.904 | 80.721 | 74.103 | 72.866 | 67.024 | 71.409 | 75.605 | 80.9 |
| OCT | 79.257 | 78.967 | 79.324 | 77.765 | 81.202 | 73.709 | 72.289 | 66.845 | 76.657 | 75.244 | 80.7 |
| NOV | 78.857 | 78.959 | 79.565 | 76.738 | 81.204 | 74.738 | 71.127 | 65.49 | 78.176 | 74.739 | 80.5 |
| DEC | 78.733 | 78.686 | 79.534 | 76.019 | 79.774 | 73.107 | 69.627 | 63.303 | 78.04 | 75.431 | 80.6 |

# Appendix VI: PUBLIC DEBT

|  | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **JAN** | 598263 | 596979 | 605014 | 633037 | 708860 | 737449 | 741495 | 795595 | 856389 | 966742 | 1105658 |
| **FEB** | 598263 | 602093 | 609078 | 631663 | 708326 | 737772 | 745746 | 802335 | 860598 | 993532 | 1132859 |
| **MAR** | 598263 | 603996 | 609336 | 635621 | 714060 | 721187 | 753068 | 795343 | 869823 | 988373 | 1177838 |
| **APR** | 601821 | 612890 | 611625 | 639689 | 711128 | 731506 | 754752 | 810757 | 863864 | 1009432 | 1190808 |
| **MAY** | 601821 | 610982 | 610367 | 642660 | 707895 | 728452 | 755984 | 810539 | 872329 | 1007163 | 1192239 |
| **JUN** | 601821 | 605791 | 613739 | 696430 | 749392 | 749548 | 789076 | 801270 | 870579 | 1053490 | 1225720 |
| **JUL** | 597029 | 598503 | 618815 | 690810 | 748073 | 759427 | 795504 | 820742 | 860957 | 1062545 | 1230745 |
| **AUG** | 592294 | 607103 | 624037 | 693486 | 746139 | 760231 | 799059 | 824981 | 867160 | 1077258 | 1264214 |
| **SEP** | 595319 | 611218 | 625843 | 714319 | 754184 | 747660 | 794239 | 835502 | 882288 | 1075596 | 1298926 |
| **OCT** | 595767 | 615228 | 624337 | 711279 | 756081 | 751143 | 799938 | 838227 | 889174 | 1091025 | 1294213 |
| **NOV** | 596620 | 604496 | 626527 | 710141 | 757208 | 751399 | 805968 | 850306 | 901640 | 1084159 | 1310700 |
| **DEC** | 598021 | 606287 | 629558 | 711340 | 735367 | 743604 | 792864 | 844982 | 972899 | 1177901 | 1320138 |

Source: Kenya National Bureau of Statistics