THE RELATIONSHIP BETWEEN MONETARY POLICY AND GROWTH OF REAL ESTATE IN KENYA

BY

ANTONY MUCHENE

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DECLARATION

I declare that this research project is my original work and has not been submitted for a degree in any other university.

Signed: ……... Date: ……..

Antony Muchene

D61/72608/2012

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

Signed: ……..… Date: ……

Mr. Cyrus Iraya

Department of Finance and Accounting

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DEDICATION

This project is dedicated to my mum Rosemary Waringa, my dad Kamau Muchene and my Fiance Virginia Kiguru.

ABSTRACT

The study was conducted on the relationship between monetary policy and growth of real estate in Kenya. The objective of this study was to establish the relationship between central bankôs monetary policy and real estate growth in Kenya. The study used a descriptive research design, by examining the relationship between CBR policy and growth in real estate. The data points ranged between January 2004 to December 2013 by taking the monthly data for the research which had 10 data points. Data was analyzed using a multiple regression model was used to analyze the data. The regression results revealed that the relationship between the variables was found to be direct apart from the rate of inflation which showed that there was an in inverse relationship with real estate growth. This is because its p-value=.069 which was more than 5% meaning that the model was statistically insignificant. This study therefore recommends that central bank to design and develop proper measures for to regulate monetary policies to ensure that there exists a proper balance between interest rates and circulation of money in the economy this will create a stable environment for investment in real estate and growth of the economy. A comparative study can be carried out to establish whether investment in real estate in other countries is able to impact the economic development. Thus enabling comparison with the Kenyan experience and provide concrete facts upon which reliable conclusions can be made. The present study can further be investigated over a larger time period say twenty years this could have given the data more validity since it would have been for a wider scope and also could have also generated different results. The sample size should also be increased to get a more representative sample and make better conclusions. The limitation of this study was that the secondary data was collected from KNBS, CBK and World Bankôs World Development Indicators. The limitation of this study was that Central Bank of Kenya works under very strict confidentiality in order to secure any unauthorized access to information pertaining to the study variables. Due to time limit and financial constraints, it was not possible to carry out comprehensive research pertaining to the scope of the study. The study was therefore limited basically to the central Bank of Kenya located in Nairobi Region and not the entire sub-Saharan countries.

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LIST OF ABBREVIATIONS

ARDL	Autoregressive Distributed Lag
ARM	Adjustable Rate Mortgage
BoE	Bank of England
CBD	Central Business District
CBK	Central Bank of Kenya
CBR	Central Bank Rate
CRE	Commercial Real Estate
DSTI	Debt-service-to-income Ratio
EBIT	Earnings before Interest and Tax
FAVAR	Factor-augmented vector auto regression
FRM	Fixed Rate Mortgage
GDP	Gross Domestic Product
GIS	Geographic information system
GOK	Government of Kenya
KBA	Kenya Bankers Association
KNBS	Kenya National Bureau of Statistics
MPC	Monetary Policy Committee
MoL	Ministry of Land
MPT	Modern Portfolio Theory
OMO	Open Market Operations
USA	United States of America
VRM	Variable Rate Mortgage
T-Bills	Treasury Bills

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The Central Bank objective is the formulation and implementation of the monetary policy directed at achieving and maintaining stability in the financial market. The aim is to achieve low inflation and to sustain the value of the Kenyan shilling (Wadeya, 2013).

According to CBK monthly issue (December 2014), The Central Bank formulates a policy to expand or contract money supply in the economy after detailed analysis and estimation of the demand for money in the economy. The following instruments are used to conduct monetary policy in Kenya, Reserve Requirement, Open Market Operations (OMO), and Lending by the Central Bank, Moral Suasion.

By changing the interest rate policy, the central bank always aims at certain goals, this goal may be either to encourage spending (discourage hording) or encourages saving and discourage consumption. The central bank interest rate policy impacts on the monetary situation of an economy, the shifting upwards or downwards of interest rates are reflected on demand and supply for funds used in development of an economy.

Central Bank Rate is meant to change the cost of the money and hence influence the commercial bank interest rates in the market. Interest rates will influence the target variables through other intermediate targets including credit (loans), exchange rates and inflation forecasts (Wadeya2013).

1.1.1The Central Bank Rate Policy

Central Bank Rate (CBR) is the price at which the CBK lends money overnight to commercial banks. It also serves as a signaling instrument for monetary policy (Central bank of Kenya, 2013). The Monetary Policy Committee (MPC) sets the short-term interest rate at which the CBK deals with the money markets. Decisions about that official interest rate affect economic activity and inflation through several channels, which are known collectively as the ótransmission mechanismô of monetary policy (Bank of England, 2010).

The predominant goal of monetary policy and its principal contribution to economic welfare largely through the promotion of price stability. This is enforced through the interest rate policy; an important part of monetary policy is the monetary transmission mechanism, the process by which monetary policy actions influence the economy. While the transmission mechanism involves a number of channels, including exchange rates, bank credit, and asset prices, most economists consider interest rates to be the principal avenue by which monetary policy affects economic activity (Mboto, 2006).

The Central Bank Rate determines the rate that commercial banks are charged when loans are initiated and this is directly related to the interest rate determined by the countryôs Federal Banking System. Higher rates are put in place to discourage lending in overheated economies, while low rates are given when an economy is viewed as being in need of stimulus measures (traderôs laboratory, 2014).At the same time, policy actions and announcements affect expectations about the future course of the

economy and the confidence with which these expectations are held, as well as affecting asset prices and the exchange rate (Bank of England, 2010).

Recently, the Monetary Policy Committee (MPC) of the Central Bank of Kenya announced the much awaited debut benchmark lending rate christened the Kenya Bank Reference Rate (KBRR).For the next six months until its next review in January 2015, the rate will serve as the base rate for commercial banksô lending activities. The implementation of this policy will impact on cost funding and transparency. The quantitative effect of a change in the official rate on other interest rates and on financial markets in general, will depend on the extent to which the policy change was anticipated and how the change affects expectations of future policy (Bank of England, 2010).

1.1.2 Real Estate Growth

According to Brueggeman and Fisher (2005) and Pagourtzi, Assimakopoulous, Hatzichristos and French (2003) real estate refers to land and anything fixed, immovable or permanently attached to it such as buildings and fences. Title to real estate normally includes title to air rights, mineral rights, and surface rights which can be bought, leased, sold, or transferred together or separately. Real estate growth refers to percentage change in total real estate investment uptake.

The impact of real estate investment on economy is significant, from the jobs it creates to the revenue it generates. Real estateôs multiplier effect in terms of job creation is significant, as this study demonstrates. The same time, ownership of real property, and particularly homeownership, does more than meet essential needs. It is a key factor in sustaining neighborhood and community stability. This is indeed an extraordinary value.

In any economy, long-term finance is one of the key drivers of economic growth. Ndungôu (2010) talked of Long-term finance allowing for the provision of affordable and adequate housing which is a major thrust of Kenyaôs Vision 2030.

The Kenya real estate boom has arisen because many investors have switched their savings from the low-yield treasury bills to the hugely profitable property market. This has been complemented by banks introducing and aggressively marketing various mortgage products. The comparatively low Kenya property prices are indicative of a strong capital growth potential and reasonable rental yields. There are a variety of real estate investment possibilities when buying Rentals including commercial, multi-family, and single-family homes.

1.1.3 CBK Rate Policy and Growth in Real Estate

Cummings (1997) adds that Real Estate Finance and Investment is a branch of finance, which deals with investing money or wealth in real estate. Real estate finance deals with the allocation, generation and use of monetary resources over time, which is invested in the real estate business. Like any other aspect of finance, real estate finance also has risks associated with it and the effective management of assets, which will maintain or increase in value over time for example the investment yield of the project (Muthaura, 2012).

Real estate is an industry that is very intertwined with the monetary markets, due high cost investment required in real estate ,developers and home owners turn to banks to source for funding. Thus, growth in real estate very dependent on availability of funds and the cost of funds from the banks. The cost of funds is determined by the interest rates set by the central bank which is transmitted to the borrowers by commercial banks after

adding a spread to cover the commercial banks operation cost. Banks charge an interest rate for lending their funds depending on the length of the loan and security or otherwise referred to as collateral. The interest rate charged to the borrower is based on the Central Bank Base Rate (CBR), which the Central bank uses to control interest rates.

Nguyen (2011) in his research found out that Interest rates have a major impact on the real estate markets. Changes in interest rates can greatly influence a person's ability to purchase a residential property. That is because as the interest rates fall, the cost to obtain a mortgage to buy a home decreases, which creates a higher demand for real estate, which pushes prices up. According to Fisher (1930), there is a positive relationship between future price increases and nominal interest. He argues that when prices are rising, the rate of interest also tends to be high and vice versa. Furthermore, he points out that over long periods, interest rates follow the price movement and not the other way round. This is supported by Larock (2012), who observed that increases in mortgage rates did not trigger a decrease in houses prices but more often than not the reverse was true.

According to Kuttner (2012), the relationship between interest rates and property prices has come under intense scrutiny since the housing boom of the mid-2000s, and the ensuing financial crisis of 2007ï 09. When interest rates are down, credit affordability is up, increasing demand for houses, pushing house prices up and when interest rates are high, credit becomes expensive, demand lowers and house prices fall. Wenzel (2012) seems to contradict this view by stating that there is no direct correlation between interest rate and housing prices. He argues that what is important is the rate of interest relative to price inflation meaning the rate of interest should be looked at in real terms. Another contradictory view is held by Abel, Bernanke, and Croushore (2008) who argue that the

price of a nonmonetary asset and its nominal and real interest rate are negatively related (Muthaura, 2012).

A study by Wong, Hui and Seabrook (2003) revealed that housing prices displayed a moderately high correlation with interest rates in deflationary periods. However, the results showed that interest rates do not have a causal effect on housing prices (Otwoma, 2013).Two views have emerged from this experience. One is that monetary policy should respond more proactively to asset price rises, and especially to excesses in the property markets. According to this view, by ñleaning against the windò central banks can prevent or attenuate asset price bubbles, and thus promote financial stability (Muthaura, 2012).

1.1.4 Real Estate Market in Kenya

The Kenya real estate market has experienced a boom since 2002, confounding many interregional. Kenyaôs rapid economic development and a dynamic business regime are some of the reasons for the property market to remain strong despite the dip in other markets in the world (Makena, 2012).

Otwoma (2013), states that the real estate market in Kenya is dominated by private developers with the Government through the National Housing Corporation accounting for a small percentage. The demand for housing in Kenya continues to outstrip supply, particularly in urban areas with an estimated annual average supply of only 30,000 ï 50,000 units against estimated annual demand of over 150,000 units in the urban areas (Ministry of Housing, 2004). Factors that were cited by the Ministry to contribute to the national housing shortage include rapid urbanization, inaccessibility to land and housing finance, stringent planning regulations, restrictive building standards, high cost of

infrastructure, poor economic performance and high incidence of poverty, Housing is a major problem in Kenya especially in Nairobi.

Kabukuru (2012), indicate thatôs increase in remittance by diaspora has also been a key mover in real estate, In July 2012, total remittances inflow to Kenya stood at US$ 1,101 million, 42.86 percent which was higher than the total remittances of US$ 770 million in the year July, 2011 (CBK, 2012).

The government through the Ministry of Development is charged with the responsibility of ensuring efficient land transfers; its overall objective is to facilitate Kenyans to access quality housing. The rising demand for quality housing and plush office space has seen the emergence of innovative and futuristic multibillion-dollar gated communities and mini cities. These include Northlands City, Thika Greens Golf Estate, Four ways Junction, Tatu City, Migaa Golf Estate and Edenville Estate on the outskirts of Nairobi. According to Otwoma (2013), there seems to be lack of sensitivity in the Kenyan mortgage rate setting to the macro environment as indicated by the absence of response in mortgage rates to the drop in the cost of money as seen in the T-Bill rates.

The average rate on the 91 days T-Bills came down from a high of 20 per cent in January 2012 to a low of 5 per cent in July 2013. Mortgage rates would be expected to have fallen as is the case in many developed markets. The absence of a strong link to capital market funding and the lack of consumer price elasticity mean that banks are able to offer rates which are much higher than their cost of funds (World Bank, 2011). Bett (2006) noted that high interest rates on lending by financial institutions in Kenya have made credit

accessibility almost impossible to the poor and effectively negating on poverty alleviation.

1.2 Research Problem

In theory, the central bankôs monetary policy using the interest rate tools is used to control inflation levels and spur growth in economy. The use of none monetary tools to control the inflation level have been prescribed to be the best but due to complexity of monetary systems they have failed to be very effective. Monetary tools such as interest rate policy have been the most effective even though they have their own flaws. According to Halden (2012), using interest rates to deal with financial stability risks can carry a high cost. It is a very blunt instrument that affects the economy as a whole. So although it is an effective line of defense, it should be seen as one of the last lines of defense.

It is generally believed that monetary policy actions are transmitted to the economy through their effect on market interest rates. According to this standard view, a restrictive monetary policy by the Central Bank pushes up both short-term and long-term interest rates, leading to less spending by interest-sensitive sectors of the economy such as housing, consumer durable goods, and business fixed investment. Conversely, an easier policy results in lower interest rates that stimulate economic activity. Unfortunately, this description of the monetary policy process is difficult to reconcile with the actual behavior of interest rates. Although casual observation suggests a close connection between the actions of the Central Bank and short-term interest rates, the relationship between policy and long-term interest rates appears much looser and more variable (Roley and Sellon, 1995).

Real estate as key economic sector is very dependent on monetary sector, Brueggeman and Fisher (2008), identify interest rate as one of the driving factors in real estate development among other factors. This is also depicted by Wong, Hui and Seabrook (2003) whom found out that the impact of interest rates on housing prices was different during periods of inflation and deflation. According to Stanyer (2006), the level of interest rates and the ease with which income yielding properties can support debt interest payment are essential in real estate investing and growth as whole.

The previous researchers have found a correlation between Central bank interest rate and mortgage loans, but for the Kenyan scenario it is not as black and white as presumed. Interest rates are set by the Monetary Policy Committee (MPC) and are used to control inflation. Therefore, the mortgage interest repayments can easily change from month to month but banks take the opportunity to keep the mortgage rates high and not pass the base cut on to the consumers fast as they raise the rates (Mutero, 2007).In his study (Nzuve2012), 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.(Wahome2010) 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.

Kuttner and Shim (2013), used data from 57 countries spanning more than three decades to investigate the effectiveness including macro prudential measures, in stabilizing house prices and housing credit. In Conventional panel regressions, housing credit growth is significantly affected by changes in the maximum debt-service-to-income (DSTI) ratio, the maximum loan to-value ratio, limits on exposure to the housing sector and housing-related taxes. But only the DSTI ratio limit has a significant effect on housing credit growth when we use mean group and panel event study methods. Among the policies considered, a change in housing-related taxes is the only policy tool with a discernible Impact on house price appreciation. The recent research has mainly focused on the relationship between interest rate and mortgage, there is gap on relationship between interest rate policy and the impact it has on the growth of real estate. In this paper we will try to answer the question: is there relationship between Central Bank of Kenya interest rate policy and Real estate growth?

1.3 Objective of the Study

The objective of the study was to establish the relationship between central bankôs monetary policy and real estate growth in Kenya.

1.4 Value of the Study

This study will add value to the theoretical discussion by testing the relationship of interest rates policy and Real estate growth; this will be a Kenyan concept in where demand outweighs supply. The findings of the study are useful resource base to students pursuing banking, land economics and Finance, also researchers exploring the area of real estate and mortgages. The study provides useful data for comparative study purposes in future researches on this topic.

The study will be able to increase the knowledge of borrowers in real estate financing and thus providing an opportunity for them to expand their portfolios. This study will not only benefit theorist but also key players such as Government, central banks, real estate developers, mortgage banks and real estate consumers.

CHAPTER TWO

LITRATURE REVIEW

2.1 Introduction

This chapter looks the different research that has been done, the findings and the best approaches that will be used in this study on the relationship of CBR policy and real estate growth. This section will also explore the various models and empirical propositions by previous researchers in relation to the variables.

2.2 Theoretical Review

The section covers the theoretical basis of this study; it is informed by three theories namely: liquidity preference theory, portfolio theory and real estate and game theory. Researchers and scholars have discussed these theories in relation to the relationship between monetary policy and growth of real estate.

2.2.1 Liquidity Preference Theory

This is one of the theories that attempt to explain why the term structure of interest rates assumes different shapes .According to this theory investors will always prefer short-term securities to long term securities. The term structure of interest rates refers to different interest rates that exist over different term-to-maturity loans. The concept was first developed by Keynes (2008) the theory explains the determination of Interest rate by supply and demand of money. To encourage investors hold long term bonds, long term bonds should yield higher interest than short term bonds. The yield curve therefore will always be upward sloping. Long term bonds normally yields more than short-term bonds for two reasons; Investors generally prefer to hold short term securities because such

securities are more liquid since they can be converted into cash with little danger of loss of principal hence other things constant, investors will accept lower yields on short-term securities; At the same time borrowers react in the opposite way, they generally prefer long term debts to short-term debts because short-term debt exposes them to the risk of having to repay the debt under adverse condition (Reilly and Norton, 2006).

The implication of this theory is that short term mortgages should attract lower rates compared to longer term mortgages since for long term mortgage lenders would want to be compensated for uncertainty and volatility of interest rates in the future. Given that most mortgage loans are long term with a period of between 15 to 20 years, the high interest rates that they will attract are likely to hinder growth in the real estate sector.

2.2.2 Portfolio Theory and Real Estate

Bruggerman and Fisher (2008), indicated that investor will always consider adding real estate investment in their portfolio provided it will increase portfolio returns and reduce or maintain portfolio risk. Modern Portfolio Theory (MPT) was introduced by Harry Markowitz (1959), when he attempted to model benefits for establishing diversification strategies for a given portfolio investments.

MPT is regarded as a breakthrough in financial research which has had impact on both the practice of and theory of Investment management. Any discussion of the theory of stock price behavior has had to start with Markowitz (1952 & 1959). The Markowitz model is a single-period model based, where a portfolio is formed at the beginning of the

period with an objective is to maximize the portfolio's expected return. This is Subject to an acceptable level of risk.

As securities and assets are added to a portfolio, expected return and standard deviation change in different ways, based on the way in which the added securities co-vary with the other securities in the portfolio. Investments in real Estate companies help reduce the portfolioós total risk and improve overall asset allocation efficiency (Feldman, 2003).

2.2.3 Game Theory

Modern game theory began with the idea regarding the existence of mixed-strategy equilibria in two-person zero-sum games and its proof by John von Neumann. Game theory is built upon the assumption that the decision making of players is always interdependent. Consequently, players have to think ahead and devise a strategy based on expected countermoves of the other player(s). Basically, game theory deals with the modeling of situations of conflict and cooperation, together with the analysis of these models using mathematical techniques. Several scholars have tried to analyze the real estate market using game theory.

Jianrong and Binyi (2004), established a three-party dynamic game model with incomplete information and concluded that policies have been determining the basic direction of China's real estate market. Zhenguo and Li (2006), using game theory demonstrated itôs the individualsô rational behaviors that resulted in the arising, transmission, and burst of bubbles in the China real estate market. Ning andZhanglu (2006), studied the formation of housing price in Chinaôs real estate market and found that the developers would always develop and sell property at a high price.

Gengand Yun (2006), pointed out that the real estate market is a typical asymmetric information market. The pricing of commercial real estate and consumersô decision making constitutes a dynamic game with incomplete information. The developers could take their information advantage to influence consumersô decisions and push up the real estate price.

2.3 Determinants of Real Estate Growth

Property prices depend on market characteristics such as vacancy level, land availability, construction supply elasticity to respond to high or low speed to changes on the demand, as well as potential for economic growth, industrial and services activities located inside urban areas (Taltavull, 2003).

The real estate market in Nairobi has in the last 10 years thrived to an all-time high. In 2010 Nairobi recorded the highest growth in luxury house prices in the world. A study by Knight Frank found that the prices for real estate jumped by 25% in 2011. These prices can explained by the fact Kenya is safer than its neighbors. It is also attracting investment from international companies and from the diaspora. The growth in prices and number of developments can also be explained by other factors, such as increased credit at low interest rates from the financial institutions, improvements and construction of new roads and the new land laws (Kariuki, 2012).

2.3.1 Policy and Legal Framework

The legal frame work and the policy on real estate may be favorable to growth or unfavorable, the investment and credit firms including banks have always complained on

the policy frame work regarding land legislation and the mandated Government agency .this has been largely due to slow conversion of land as an asset to cash. Real estate is key part of Kenyan monetary system due high number of borrowers using real estate as collateral. The cabinet secretary Ngilu has been in the forefront in trying to bring change at the Ardhi house (Ministry of Land, Housing & Urban Development),the Ministry has been blamed due to inefficiency in processing real estate transitions and time taken to issue title deeds.KBA has been quick to point a finger at the ministry of land saying itôs one of the major reasons that banks are charging exorbitant rates due to illiquidity level of land in Kenya and cost associated (OTenant and Folawewo, 2007).

Other policy factors include the increase or decrease of levy fees, the final category of policies considered consists of measures that affect the cost of purchasing a home. They include taxes such as capital gains, wealth and value added taxes, subsidies on first-time home buyers and young couples and also on mortgage interest payment, fees such as stamp duties and registration fees and tax deductibility of mortgage interest payments. For brevity, all are referred to as Housing-related taxes (Tenant and Folawewo, 2007).

According Kuttner and Shim (2007), the effects of these taxes are easy to understand in the context of the user cost (UC) framework. Note that the effects on the house price do not depend on the existence of credit-constrained households. A tax increase would increase the UC even if everyone could be unconstrained. The effects on credit depend on the elasticity of housing demand. If demand were perfectly inelastic, the Kenya Property Developers Association in April said that following the review of certain fees by City

Hall, construction permit fees in Nairobi had risen from between 0.001 per cent to 0.006 per cent of the cost of construction, to 1.25 per cent (Daily Nation, 2014).considering other fees such as Nema fees ,city council fees are adding to the total cost of construction, coupled with high increase in land prices the investors will shy away from investing in real estate.

Currently Prospective homeowners and real estate developers will have to dig deeper into their pockets following the introduction of new taxes and fees by the government in the last few months. For instance, the government has raised the import duty on steel to 25 per cent, potentially raising the cost of this vital construction component if local steel mills do not significantly increase production. This has been followed up with a 0.5 per cent construction levy imposed by the National Construction Authority on works valued at more than Sh5 million. This has impacted on the growth rate of real estate (Business Daily, 2014).\

2.3.2 Economic Growth

GDP represents an overall change the economy, and is regarded as one of the market fundamentals that affect demand for private residential real. Also, GDP is affected by some market fundamentals. Since both price and GDP are expectation driven, they lag behind the release of information for market fundamentals; Englund and Ioannides (1997) compare the dynamics of housing prices in 15 countries, and discover that lagged GDP growth exhibits significant predictive power over housing prices. Huiand Yiuôs (2003),study, which uses the Granger Causality Test to empirically test the market

fundamental dynamics of private residential real estate prices in Hong Kong, confirms this result. It has been shown that it has been shown that GDP is positively related to real estate growth.

2.3.3Demographics

Demographics are the data that describes the composition of a population, such as age, race, gender, income, migration patterns and population growth. First is the population growth which is expected to put pressure on housing demand and hence push prices up. Taltavull (2003), found that population appears to have a strong significance in explaining the housing price levels.

Growth in household income also impacts real estate growth, while employment growth is important, the quality of jobs and the wages and salaries earned in these occupations are also important. Brueggeman and Fisher (2008), argue that there is a very strong association between house price and income/employment growth. A major shift in this data will have implications on real estate market, growth of population will increase demand for housing, growth of working or employed population will push the demand for housing higher since more people can afford to invest in real estate, conversely growth in unemployment will increase level of informal housing and a decline in real estate growth.

2.3.4Inflation

Inflation refers to the rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling. Central banks attempt to stop severe inflation, along with severe deflation, in an attempt to keep the excessive growth of prices to a minimum. Rate of inflation is controlled or indicated by level of interest rates. Interest rates affect an individualôs ability to purchase residential property. They affect the cost of financing and mortgage rates which in turn affects property. These rates also affect returns on substitute investments and price changes (Egert and Mihaljek, 2007).

According to Omengo (2012), High interest rates in Kenya are hurting real estate investment. Interest is a cost to the developer of real estate as it is to the end buyer. Since October 2011 the Central Bank of Kenya (CBK) has increased the Central Bank Rate (CBR) from 7% to 18% in an effort to tame runaway inflation and stabilize the weakening shilling. Consequently commercial banks have increased their lending rates from low figures of 11% to about 25%.While the intervention by the CBK brought almost immediate relief to the economy, the effects of high interest rates on real estate is yet to be felt.

Despite the increased interest rates towards the end of 2011 and the last 7 months of 2012, the property market in Kenya seems to be thriving and developers are constructing in Nairobi and also in the other counties. A drop in mortgage rates saw increased borrowing in and rise in demand for real estate. According to a report by Hassconsult

(2012) the overall sales asking prices rose by 5.1 per cent in September 2012. This was seen with the sharpest increase rise in prices being for apartments. This is up by 3.6 per cent on the previous quarter. The standalone houses prices went up by 3.4 per cent. This increased buying has also offered relief for developers, many of whom were becoming seriously stretched. The return to more normal levels of buying has come as a return to life for the sector (Hassconsult, 2012).

2.4 Empirical Theory Review

Gupta (2006), assesses the impact of monetary policy on real house price growth in South Africa using a factor-augmented vector auto regression (FAVAR), estimated based on a large data set comprising of 246 quarterly series over the period 1980:01 to 2006:04. This paper assesses the impact of a positive monetary policy shock on real house price growth for the five-segments of the South African economy using a FAVAR estimated with 246 variables spanning the period of 1980:Q1 to 2006:Q4. Overall, the results show that real house price growth responds negatively to a positive monetary policy shock, suggesting that the framework does not experience the home price puzzle.

According to Mishkin (2007), developments in the housing market can also affect credit markets. In the United States, rising delinquencies of subprime residential mortgages have led to Substantial losses to holders of securities backed by those mortgages and to sharp Increases in credit spreads for those securities. Furthermore, problems in the subprime Mortgage market have led investors to reassess credit risk and risk pricing, thereby widening spreads in general and weakening the balance sheets of some financial institutions. In this paper Mishkin examined what we know about the role of housing in

the monetary transmission mechanism and then explore the implications of this knowledge for the conduct of monetary policy.

According to Case and Shiller (2008), the meltdown in mortgage markets has substantially raised mortgage rates relative to their historical relationship to interest rates. They conducted a study analyzing the role of credit markets in mortgage prices and thus in house prices in USA housing market. The study showed that the spread between the interest rate on the average 30-year conforming mortgage and the 10-year Treasury bond had widened enormously in the last few years. In fact, while the yield on the 10-yearTreasury bond had fallen by nearly 1.5 percent in the past 2years, the average rate on conforming mortgage had fallen by about 0.5 percent. Problems in the entire economy combined with the broader credit crunch were responsible for the increase in the spread between mortgage rates and treasury securities.

Selim (2008), using hedonic regression model analysis the determinants of house prices in Turkey for both urban and rural areas. The study reveals that water system; number of rooms, type of house, pool, house size, type of building and locational characteristic isthe most significant variables affecting the house prices. Egert and Mihaljek (2007) used panel DOLS techniques in their study of determinants of house price dynamics in eight transition economies of central and eastern Europe and 19OECD countries. They analyzed fundamentals such as real income, real interest rates and demographic factors. They also analyzed the importance of transition specific factors such as improvements in housing quality and in housing market institutions and housing finance. In their study they established that per capita GDP, real interest rates and housing (or private sector)

credit as significant factors affecting house prices in both CEE and OECD countries. Demographic factors and labor market developments also played an important role in house price dynamics (Taylor, 1993).

Klyuev (2008), using the fundamentals model and the asset pricing approach studied the development of house prices in the United States from 1970 to 2008. In the fundamental model for house price determinants, he uses real disposable income, construction cost, unemployment, real mortgage rate and average household size. Klyuev links real rents and interest rates under asset pricing approach. In this study both methods yield substantial overvaluation in the U.S. housing market starting from 2001. He also found that house prices can deviate from their equilibrium values for long periods of time. Gupta (2008) while analyzing monetary policy shocks with three-variable SVARs for the middle-segment of the South African housing market. This result points to the benefit gained by using a large information set.

A paper by Hua (2010) investigates the impact of monetary policy on property prices for the case of China over the period 1999Q1-2006Q2. After considering the time series characteristics of the dataset, a high dimensional autoregressive distributed lag (ARDL) framework is used as the appropriate specification and the long-run relationship between property prices, interest rate, money supply and bank credit is identified by the bounds test. The empirical results suggest that there exist both long-run and short-run causality from real long-term interest rate and bank credit to property prices, implying these instruments may be more effective to control roaring property prices.

Maluku and Kamau (2010) present a GIS-based, computer-assisted analysis of the impact of location on residential property value in selected neighborhoods of Nairobi, Kenya. The results showed that multiple regression analysis and geostatistical analysis are viable computer-assisted valuation techniques that can easily incorporate the factor of location into property appraisal and produce values that compare well with those generated by professional valuers using traditional approaches, bat in a small fraction of the time. The selected neighborhoods where the study was conducted are Buruburu, Karen and Westlands. This study has shown the impact of location in the modeling of real estate property values to be significant. The results show three factors; distance to CBD, area of parcel, and distances to desirable amenities, stands out consistently as strong value determinants in all the three areas of Buruburu, Karen, and Westlands. These techniques clearly have the potential for assisting urban authorities in Kenya and similar countries to set up and update valuation roils much faster.

Olszewski (2012), reviews the impact of commercial real estate (CRE hereafter) on Macro-financial stability and gives some ideas, how central banks could deal with the risk by presenting the main features of the CRE market, explain its cycle and outline risks related to this market. Its relation to the financial sector is discussed.

Xiaoqin (2012), working paper was conducted using quarterly data from 1998:Q1 to 2009:Q4 and monthly data from July 2005 to February 2010, this paper examines the impact of key monetary policy variables, including long-term benchmark bank loan rate, money supply growth, and mortgage credit policy indicator, on the real estate price

growth dynamics in China. Empirical results consistently demonstrate that expansionary monetary policy tends to accelerate the subsequent home price growth, while restrictive monetary policy tends to decelerate the subsequent home price growth. These results suggest that Chinese monetary policy actions are the key driving forces behind the change of real estate price growth in China. We also show that hot money flow does not have a significant impact on the change of home price growth after controlling for the money supply growth.

Further on, basing on the experience of some countries with CRE crises, by critically assess the reactions of their central banks. The characteristics of the CRE market are presented on the case of Poland, because it is a fast growing market. Its analysis should simplify the understanding why the CRE market should be tracked by the central bank. This shows the relationship between real estate and monetary policy and how it should and need for close monitoring (Taltavull, 2003).

Empirically, not much has been done on interest rates in Kenya. According to Muguchia (2012), in her study of the effect of flexible interest rates on the growth of mortgage finance in Kenya during the financial period 2007 to 2011. Through the regression analysis conducted the study found out that the flexible interest rates have a strong negative and significant effect on mortgage financing among the financial institutions in Kenya.

Ngumo (2013) studied the effect of interest rates on the financial performance of firms offering mortgages in Kenya for the period 2007 to 2011. Linear regression analysis was used to analyze the data at 95% confidence level. The study established positive relationships in the five regression analysis between financial performance and the amount of mortgage loans advanced; three positive results were established between interest rates and the former. The study concludes that the amount of mortgage advanced by mortgage firms would lead to a high financial performance (EBIT) as it raises the revenue thereof. On the other hand, interest rate would positively relate with financial performance till is starts discouraging borrowings owing to increase in the cost of mortgage.

Gaitho (2014) carried out an investigation on the causes of non-performing loans in Kenya. She found out that the main causes of NPL were the national economic downturn which lead to depression for business in general; reduced buying ability of consumers; insider lending; and owner concentration; inadequate procedures of credit risk assessment and credit management; misuse of loans; and legal delays.

2.5 Summary of Literature Review

Reilly and Norton (2006), concluded that borrowers react in the opposite way, they generally prefer long term debts to short-term debts because short-term debt exposes them to the risk of having to repay the debt under adverse condition, this was to supplement Keynes theory of liquidity preference, Keynes views that, interest rate is reward for parting with liquidity.

The theory of liquidity is that short term mortgages should attract lower rates compared to longer term mortgages since for long term mortgage lenders would want to be compensated for uncertainty and volatility of interest rates in the future (Hui and Seabrook, 2003).

Bruggerman and Fisher (2008), indicated one of the best ways to diversify risk in a portfolio is by use of real estate, this is because it reduces risk and is long term in nature. This means that most investors will strive to own real estate property in their portfolio for speculative purposes and thus driving the demand up. The game theory holds that, personal perception, expectation and action triggers another personôs reaction. Zhenguo and Li (2006), using game theory demonstrated itôs the individualsô rational behaviors that resulted in the arising, transmission, and burst of bubbles in the China real estate market Thus house prices are not always determined by macro-economic factors but due to information asymmetry and personal perception, the price game between consumers and speculative investors are one of the factors contributing to the high housing price. Most of the empirical review has been conducted on based on housing, interest and mortgages and how these variables affect each other. Most of the empirical review has been conducted on based on housing, interest and mortgages and how these variables affect each other (Stanyer, 2006).

There has been consistency in proving an existence of a relationship between mortgage, housing and interest rates. Currently there is study has been conducted in Kenya to show

the Nature of relationship between real estate and Interest rates policy in Kenya. This exhibits a gap and need for exploration in order to know whether a change Central bank rate policy affects impacts on rate of growth in real estate in Kenyan market (Yao and Zhang, 2005).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will present the methodology that was used to carry out the study. The chapter will consider in detail the method that was used to collect both primary and secondary data required in the study. In this chapter, the researcher discusses the research design, target population, data collection and sample. The researcher also discusses how this data was analyzed giving details of any models or statistical tools that were used in the analysis with reasons as to why these particular models or statistical tools will be used.

3.2 Research Design

The research design that was used involved a descriptive research design, by examining the relationship between CBR policy and growth in real estate. According to Simon (2006), a correlational study is the most appropriate methodology when attempting to determine what type of relationship that exists between two or more quantifiable variables.

3.3 Data Collection

Due to the nature of the study, the research relied mostly on secondary data. CBR policy data will be used to show the how the MPC has been adjusting interest rates and in real

estate the Hass Index has the most relevant data for real estate growth in Kenya. Thus the major source for data regarding our variables was CBK data and Hass index. The data points ranged between January 2004 to December 2013 by taking monthly data the research will have 10 data points.

3.4 Data Analysis

By considering the objective of the study which was to determine whether there was a relationship between CBR policy and growth in real estate, regression analysis was used. Determinants of real estate growth are analyzed using descriptive statistics of dependent and independent variables particularly the mean, median, standard deviation and inferential statistics; correlation and multiple regression. This was performed using the field data and the results interpreted according to the Coefficient of determination (R^2) values and the t and F at the 95% level of significance. Analysis of Variance (ANOVA) tests was used to test significance. A multiple regression model was used to analyze the data. Below is the regression model that was used:

$R.Eg= ϐ0+ϐ1CR1+ϐ2GP+ϐ3I+ϐ4E+ϐ5PI+e$

R.Eg = Real estate growth (measured by Hass Index)

CR= CBR policy (measured by change in interest rates)

GP=Government policy on Real estate (percentage change of cost for real estate Transaction processing)

I=Inflation (measured by consumer price index)

E = economic growth (Measured by GDP)

PI = population demographics (measured by percentage change in population size)

3.5 Significance Testing

Coefficient of determination was used in indicating how well the data fit the statistical model. It is a statistic used in the context of statistical model whose main objective is to predict the outcome or testing the hypothesis. Analysis of variance was used to show whether there is any significance differences between the means of three or more independent variable or unrelated groups. The tests were performed at 95% level of confidence

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

In this chapter data was tabulated and presented in form of charts and graphs. The results were analyzed in form of descriptive statistics (measures of central tendency), inferential statistics (measures of dispersion) and interpreted accordingly.

4.2 Response Rate

The study sought to collect data from Central Bank of Kenya and the Kenya National Bureau of Statistics. The researcher managed to collect data for the ten years period between 2004 ï 2013.

4.3 Correlation Analysis

Correlation measures the strength between the variables. Below is the correlation between central bankôs monetary policy and real estate growth in Kenya. Below are the results of the findings presented below in table 4.1

Table 4.1 Correlation of the Study Variables

	CBK policy	Government policy	Inflation	Economic Growth
CBK policy	1			
Government policy	.283	1		
Inflation	.317	.561	1	
Economic Growth	.484	.434	.554	1
Real estate growth	.267	.354	.443	.347

Source: Research (2014)

From the findings in the table 4.2 above, the Pearsonôs r for the correlation between central bankôs monetary policy and real estate growth in Kenya shows a weak negative relationship between the variables. From the p-values generate above, it is clear that these values are below 0.5 and close to 1.The study therefore concludes that that there is a statistically insignificant correlation between the two variables at 0.01 level. This means that there is a positive relationship between the two variables.

4.4 Real Estate Growth Trends

Table 4.1 presents a summary of findings with regards to the trend in growth in real estate in Kenya between 2004 and 2013.

Table 4.2: Trend in Growth in Real Estate in Kenya between 2004-2013

YEAR	Real Estate And Renting Businesses
2004	63,740
2005	65,882
2006	68,447
2007	70,860
2008	73,461
2009	75,674
2010	78,089
2011	80606
2012	85,171
2013	90,125

Source: Statistical Abstract, Kenya National Bureau of statistics (2013)

As it can be observed from table 4.1 real estate and renting business has been following an upward trend since the year 2007. For instance the investment stood at 70,860 a growth of 3.5% in 2007 and rose slightly to 73,461 representing a growth of 7% in 2008. However, the growth declined sharply to 3.0% in 2009 due reduction in capital investment and the poor performance of the economy as a result of the post-election violence that led to destruction of property and in the 2007 General elections. Despite the

decrease in the growth in 2009 the number of businesses rose to75,674. The growth picked up in the preceding years at 78,089 a growth of 3.2% and 80,606 a growth of 3.6% respectively in 2010 and 2011 respectively as investment climate became conducive and by the of the end of 2012 the investment was growing at 85,171 an equivalent growth of 3.8% depicting an increasing trend.

4.5 Real GDP Growth Trends

Figure 4.1, presents the GDP growth rates between 2004 and 2013.

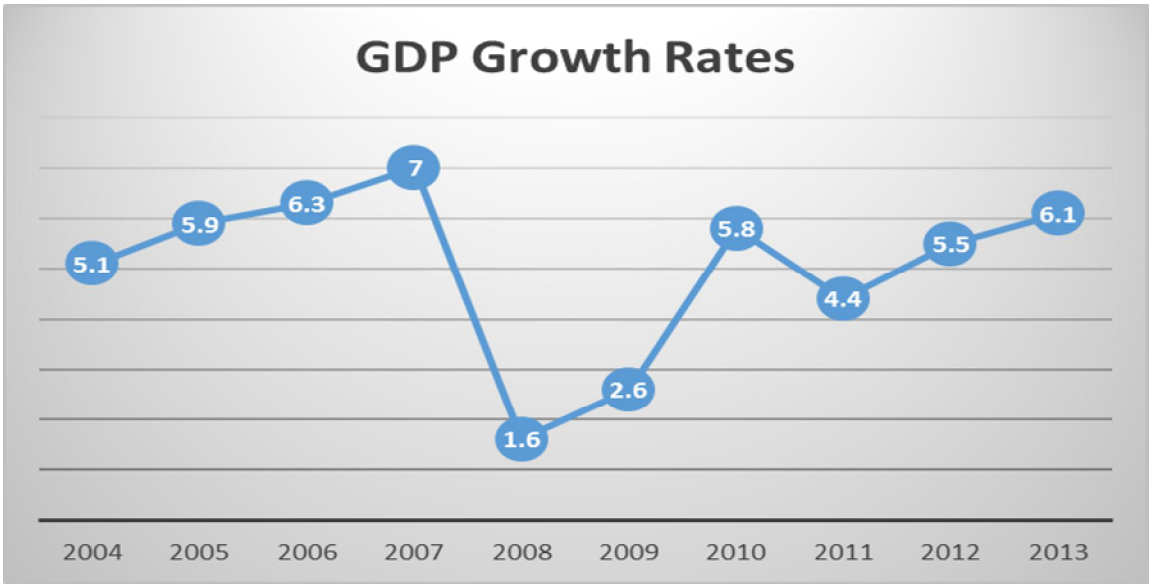

Figure 4.1: Real GDP Growth Trends

As seen in the figure 4.1, the Country experienced remarkable sustained economic growth with the GDP growth rate reaching 7.0 percent in 2007, the highest growth rate over the period. However a low growth rate of 1.6% in 2008 was as a result of: Internal shocks; Post-election disruptions; Unfavorable weather conditions. In addition external factor affecting the growth negatively include; High cost of food and fuel prices; continued Political bickering; External shocks; High crude oil prices; and Global financial crisis (Economic Survey 2008).

Risks likely to shape economic growth include: High international oil prices which could remain high for the rest of the year (due to instability in the Middle East and North Africa) .Fluctuations in the exchange rate and Inadequate rainfall which has so far been Insufficient; Rising global food prices; Political environment as the country moves close to 2012 elections. There were both positive and negative factors that affected growth in 2011. Positive factors include; Increased credit to the private sector; Higher public investments in infrastructure e.g. roads; Higher inflows of remittances from the Diaspora. Negative factors on the other hand includes; Erratic weather conditions; Escalating oil prices Weakening of the Kenya shilling which led to widening of the current account deficit and High inflation. Rapid economic growth was hampered by poor state of infrastructure, low investment and the spillover effects poor performance of the previous year. The year 2008 has so far experienced a combination of both internal and external shocks which have seriously curtailed economic growth in Kenya.

The economy responded accordingly with an improved growth rate of 2.6 per cent in 2009 (Economic Survey 2010). The growth was mainly attributed to: Resurgence of activities in the tourism sector; Resilience in the building and construction industry; and Transport and Communication sector. The governmentôs supported growth through an enabling environment and the economic stimulus package. However, economic performance was constrained by: Unfavorable weather condition; the global economic recession; Sluggish internal and external demand.

4.6 Interest Rate Growth Rates (2004-2013)

Figure 4.2 presents a summary of findings with regards to the interest rate growth rates between 2004 and 2013.

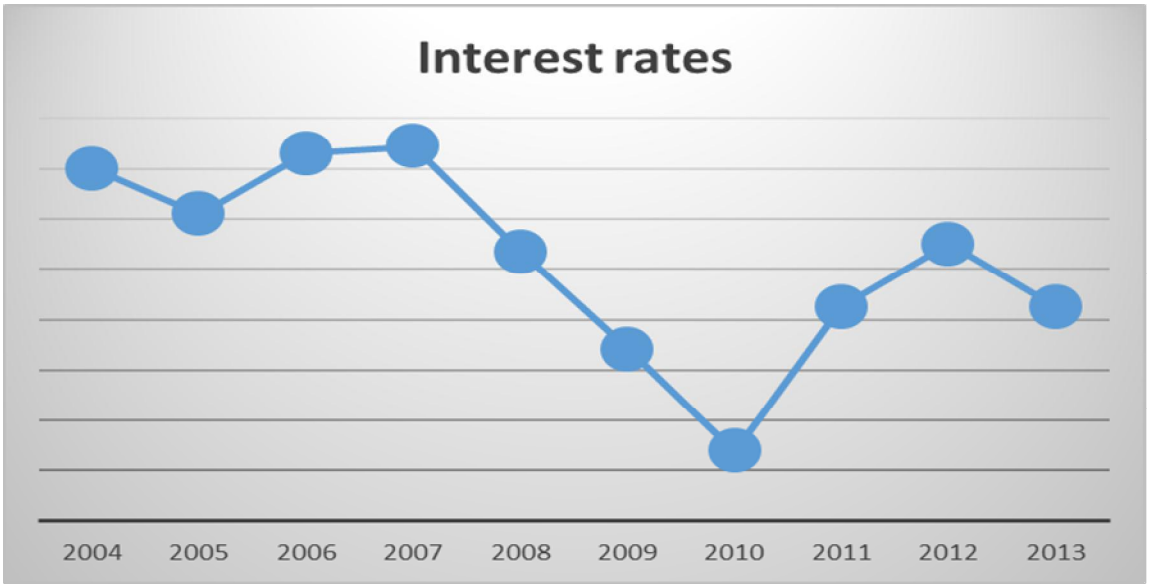

Figure 4.2: Interest Rate Growth Rates (2004-2013)

As seen in figure 4.2, it is evident that interest rates were on a steady rise except in 2010 where they dropped to 2.78, they however picked up in 2011. The average yield rate for the 91-day Treasury bills, which is a benchmark for the general trend of interest rates, increased from 8.097 per cent in January 2013 to 8.384 in February 2013. The inter-bank rates were 9.047 during the period Interest rates growth. The Central Bank has a statutory objective to formulate and implement a monetary policy directed at achieving and maintaining stability in the general level of prices. In March 2011, the Monetary Policy Committee increased the Central Bank Rate (CBR) by 25 basis points.

4.7 Inflation Rates (2008-2013)

Figure 4.3, presents a summary of findings with regards to the inflation rates between 2004 and 2013.

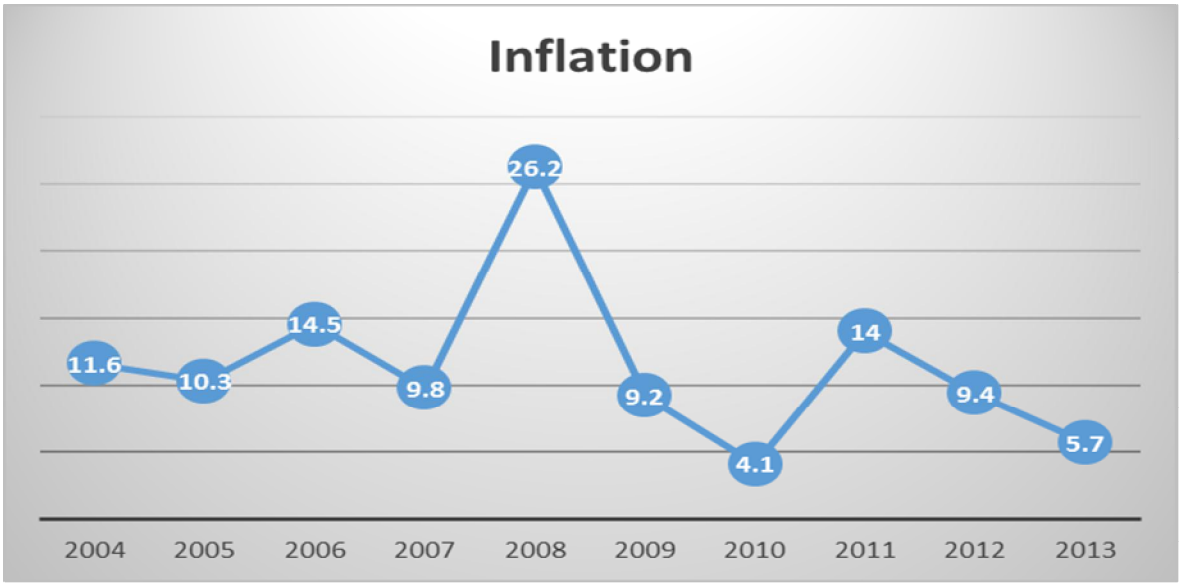

Figure 4.3: Inflations Rates (2008-2013)

The average annual inflation rate rose from 9.8% in 2007 to26.2% in 2008. This was the highest rise in inflation since1994 when it reached 28.8%. Underlying inflation rose from 5.7% in2007 to 11.1% in 2008. The rise in inflation was caused by the high food and fuel prices witnessed during the period under review. Inflation eased from 16.2% in2008 to 9.2% in 2010. This was occasioned by reduction in fuel and food price. Inflation was contained within the Governmentôs target of 5.0 per cent in2010. The average annual inflation was 4.1 percent in 2010 down from a high of 10.5 percent recorded in 2009. The decline in the inflation rate was mainly on account of:-Favorable weather which led to low food prices emanating from improved agricultural production, Competition between the mobile telephone operators which resulted in reduction in calling rate. Annual inflation increased to 14.0 per cent in 2011 from 4.1 per cent in

2010. The Inflation rate averaged at 6.4 per cent during the review period from a high 16.5 per cent experienced during the third quarter of 2011 and the rise in inflation was mainly on account of:- Sharp increase in oil prices, Inadequate rainfall in the first half of the year, which pushed prices of staple foods upwards and Weakening of Kenya shilling against major currencies (Economic Survey 2012).

4.8 Regression Analysis

Test statistics involving the t distribution on the effect individual explanatory variables, the F statistics on the overall effect of the regression equation for instance the Analysis of Variances (ANOVA).In addition test on violation of the classical linear regression assumptions was undertaken.

Table 4.3: Model Summary

Model Summary

Model,	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.771[a]	.595	.619	2.513

a. Predictors: (Constant), Interest Rates, Inflation, Population, GDP, GP

From the findings, it can be observed that 60% percent in growth in real estate is independent of the changes in GDP, variation in interest rates, changes in inflation rates and growth in population. This is the autonomous investment. In other words, all the variables in the model contributed 77% of level of explanation on growth of real estate.

Table 4.4: ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.835	3	9.945	10.7249	.041[b]
	Residual	20.277	26	0.7799		
	Total	50.113	29			

a. Dependent Variable: Real Estate Growth
b. Predictors: (Constant), Interest Rates, Inflation, Population,GDP, GP

From the above findings, it was observed that the level of significances less than 5%, (0.41).This means that the regression model was statically significant in predicting the relationship between the effect of monetary policy and growth of real estate in Kenya.

Table 4.5: Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	48.383	80.611		2.312	.656
	Population	.282	2.111	.353	3.120	.021
	Inflation	-.002	.979	-.002	-1.702	.102
	GDP	1.655	.622	-.149	1.912	.026
	GP	1.416	.979	-.402	2.757	.034
	Interest Rates	2.592	1.524	.508	2.688	.014

a. Dependent Variable: Real Estate Growth

Below is the regression model that was obtained:

Real Estate Growth=$48.382+.282X_1-.002X_2+1.655X_3+1.416X_4+2.592X_5$

According to the findings, the results revealed that the p-values of the predictor variables were less than 5%., as follows: p=0.021, p=0.026, p=0.034 and P=0.014. This implies that the model was statistically significant since the p-values in the model were less than 5%. On the same note, the above findings revealed that the relationship between the variables was direct apart from the rate of inflation which showed that there was an in inverse relationship with real estate growth. This is because its p-value=0.102 which was more than 5% meaning that the model was statistically insignificant.

4.9 Chapter Summary and Discussions

According to the findings obtained from the regression analysis, it was concluded that the relationship between the variables was found to be direct apart from the rate of inflation which showed that there was an in inverse relationship with real estate growth. This is because its p-value=.102 which was more than 5% meaning that the model was

statistically insignificant. These findings are consistent with the following studies: A study conducted by Muguchia (2012) determined the effect of flexible interest rates on the growth of mortgage finance in Kenya during the financial period of 2007 to 2011. From the regression analysis, the study found out that the flexible interest rates have a strong negative and significant effect on mortgage financing among the financial institutions in Kenya.

The regression analysis also revealed that the p-values of the predictor variables were less than 5%., as follows: p=0.021, p=0.026, p=0.034 and P=0.014. This implies that the model was statistically significant. These findings are consistent with the following studies: Gupta (2006), assesses the impact of monetary policy on real house price growth in South Africa using a factor-augmented vector auto regression (FAVAR), estimated based on a large data set comprising of 246 quarterly series over the period 1980:01 to 2006:04. This paper assesses the impact of a positive monetary policy shock on real house price growth for the five-segments of the South African economy using a FAVAR estimated with 246 variables spanning the period of 1980:Q1 to 2006:Q4. Overall, the results show that real house price growth responds negatively to a positive monetary policy shock, suggesting that the framework does not experience the home price puzzle, encountered by Kasai.

These findings are also supported by Ngumo (2013) studied the effect of interest rates on the financial performance of firms offering mortgages in Kenya for the period 2007 to 2011. Linear regression analysis was used to analyze the data at 95% confidence level.

The study established positive relationships in the five regression analysis between financial performance and the amount of mortgage loans advanced; three positive results were established between interest rates and the former. The study concludes that the amount of mortgage advanced by mortgage firms would lead to a high financial performance (EBIT) as it raises the revenue thereof. On the other hand, interest rate would positively relate with financial performance till is starts discouraging borrowings owing to increase in the cost of mortgage

CHAPTER FIVE
FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter begins with a discussion of the findings in relation to study objectives. Factors affecting growth in real estate included the GDP Growth, inflation growth, interest rates and Population growth. In addition the chapter summarized findings based on the data analysis. These findings were with respect to the contribution of each independent variable to the growth in real estate, summary of the statistical significance of each variable and test of explanatory ability of the independent variables.

5.2 Summary of findings

According to the findings, the Pearsonôs r for the correlation between central bankôs monetary policy and real estate growth in Kenya showed a weak negative relationship between the variables. It was concluded that there was a statistically insignificant correlation between the two variables at 0.01 level. This means that there is a positive relationship between the two variables.

From the findings, the risks likely to shape economic growth include: high international oil prices which could remain high for the rest of the year (due to instability in the Middle East and north Africa). Fluctuations in the exchange rate and inadequate rainfall which has so far been insufficient; rising global food prices; political environment as the country moves close to 2012 elections. There were both positive and negative factors that affected growth in 2011. Positive factors include; Increased credit to the private

sector; higher public investments in infrastructure for example roads; higher inflows of remittances from the Diaspora. Negative factors on the other hand includes; Erratic weather conditions; Escalating oil prices Weakening of the Kenya shilling which led to widening of the current account deficit and High inflation. Rapid economic growth was hampered by poor state of infrastructure, low investment and the spillover effects poor performance of the previous year.

The average annual inflation rate rose from 9.8% in 2007 to 26.2% in 2008. This was the highest rise in inflation since 1994 when it reached 28.8%. Underlying inflation rose from 5.7% in 2007 to 11.1% in 2008. The rise in inflation was caused by the high food and fuel prices witnessed during the period under review. Inflation eased from 16.2% in2008 to 9.2% in 2010. This was occasioned by reduction in fuel and food price. Inflation was contained within the Governmentôs target of 5.0 per cent in2010. The average annual inflation was 4.1 percent in 2010 down from a high of 10.5 percent recorded in 2009. The decline in the inflation rate was mainly on account of:-Favorable weather which led to low food prices emanates from improved agricultural production, Competition between the mobile telephone operators which resulted in reduction in calling rate.

Multiple Regression analysis had four variables namely; GDP, interest rates, inflation rates and population growth. The effect of each variable on the growth in real estate was as follows: GDP had a positive contribution to real estate investment as expected by theory. On the other hand Interest rates showed a significant negative relationship with real estate investment which was in line to the studyôs expectations.

Similarly, Inflation growth related negatively to real estate investment as the theory postulated. In addition, though their effect was insignificant, population growth related negatively to real estate investment. The reason for an inverse relationship between population growth and real estate was due to the fact that most of the houses build are for middle and upper income earners whereas majority of the population are low income earners. The Multiple regression provided results that were fairly in line with the expectations of the study and the literature.

5.3 Limitations

Data on major variables deemed necessary for the study such as GDP, inflation rates, and interest rates and population growth as well as real estate were not readily available. In addition the period on which the study was premised is relatively short to provide a good data set for sound conclusions to be drawn from the study. However, effort was made to get monthly economic data from economic surveys and Statistical Abstract for the key variables, hence increasing the variability, validity and testability of the data.

The Central Bank of Kenya works under very strict confidentiality in order to secure any unauthorized access to information pertaining to the study variables. Due to time limit and financial constraints, it was not possible to carry out comprehensive research pertaining to the scope of the study. The study was therefore limited basically to the central Bank of Kenya located in Nairobi Region and not the entire sub-Saharan countries.

The study utilized secondary data, which had already been obtained and in the public domain. Unlike the primary data which is firsthand information, despite that the secondary data was tested for precision and remained relevant since it reflected current macroeconomic conditions and financial soundness in the republic of Kenya.

Secondary data was collected from KNBS, CBK and World Bankôs World Development Indicators. The study was also limited to the degree of precision of the data obtained from the secondary source. While the data was verifiable since it came from the CBK, KNBS and World Bank publications, it nonetheless could still be prone to these shortcomings.

5.4 Conclusions and Recommendations

Some other measures that help to curb rising interest rates and inflation include the following: Establishment of a well-developed financial sector, including a more integrated micro-credit sector. This can help expand access to an array of financial services (credit and insurance; saving facilities and payment instruments). This helps to finance small private firms at rates that do not cripple their operations.

Alternative Technologies: Using alternative technologies can be challenging in the Kenyan market, but if done correctly it has the potential to be an essential piece of bringing down the cost.

The study recommends that the most important aspect to be aware of is ensuring that the look and feel of the home is similar, if not the same, as traditional techniques. When someone purchases a home, whether they are rich or poor, they want to put their savings into old-fashioned brick and mortar rather than a shiny new technology that is untested

and unfamiliar. The ministry of housing disseminates information on low cost housing technology through the establishment of appropriate building technology centres in each constituency.

The recommends study recommends that those policy makers should enact rules that encourage and attract foreign investors wishing to invest in real estate into the country as well as discouraging investments of countries savings locally.

The study findings established that lending rates have increased continuously over the study period. Based on the inverse relationship existing between lending rates and economic growth as established by the study findings, this study calls upon for regulatory measures on the interest rates.

From the results it was concluded that GDP; interest rates and inflation rates were the major determinants of real estate investment at the 0.05 level as per the SPSS fitted model. Besides GDP growth contributed the most to the growth in real estate in Kenya.
It was further concluded that the population growth was statistically insignificant negative impact on real estate investment. GDP was positively related to real estate investment whereas interest rates and inflation rates were negatively related to the growth in real estate. Factors such as Interest rates, GDP and inflation rate had statistically significant influences on real estate investment. Policy measures geared toward improving the economic growth and curbing rising inflation rates and interest rates should be undertaken as they increased the investment level.

This study therefore recommends that central bank to design and develop proper measures for to regulate monetary policies to ensure that there exists a proper balance between interest rates and circulation of money in the economy this will create a stable environment for investment in real estate and growth of the economy.

5.5 Areas for Further Research

A comparative study can be carried out to establish whether investment in real estate in other countries is able to impact the economic development. Thus enabling comparison with the Kenyan experience and provide concrete facts upon which reliable conclusions can be made.

The present study can further be investigated over a larger time period say twenty years this could have given the data more validity since it would have been for a wider scope and also could have also generated different results. The sample size should also be increased to get a more representative sample and make better conclusions.

The Research study can further be extended to assess the impact of Monetary Policy on developmental projects for the Growth of Economy, Quality improvements, Household production, the underground economy, Health and life expectancy, the environment, Political immunity and ethnic justice.

The study can be narrowed down to assess the impact of CBKôs Monetary Policy on the N.S.E or the Banking industry because the level of Money Supply in the economy also affects how investors and banks make their investments. Future researchers and academicians should conduct further studies on the same variables outside Kenya for

example in the East African Region to establish the effect of monetary policy on growth of real estate. Findings and conclusions can then be made on concrete facts.

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APPENDIX I: SECONDARY DATA

COMMERCIAL BANKS' WEIGHTED AVERAGE INTEREST RATES (%) 1/					
YEAR	MONTH	Deposit	Savings	Lending	Overdraft
1991	JUL	13.5	12.97	16.71	16.15
	AUG	13.59	13.24	16.42	13.79
	SEP	13.49	13.1	17.26	16.95
	OCT	13.47	13.3	17.78	17.53
	NOV	13.7	13.37	17.94	18
	DEC	13.73	13.22	17.87	17.91
1992	JAN	13.71	13.18	17.13	15.05
	FEB	13.83	13.3	17.61	16.37
	MAR	13.85	13.45	18.12	18.47
	APR	13.76	13.38	17.37	15.3
	MAY	13.66	13.16	18.53	18.81
	JUN	13.65	13.43	18.54	18.7
	JUL	13.61	13.5	18.68	18.95
	AUG	13.61	13.4	18.62	19.02
	SEP	13.81	13.47	18.95	19.07
	OCT	14.23	13.41	19.47	19.73
	NOV	14.29	13.28	19.15	19.64
	DEC	14.39	13.23	19.51	19.76
1993	JAN	14.24	13.15	19.57	19.75
	FEB	14.25	13.28	19.7	19.86
	MAR	14.45	13.19	19.82	19.96
	APR	15.32	14.38	20.77	21.35
	MAY	15.49	13.34	24.16	24.2
	JUN	17.28	13.43	24.51	25.28
	JUL	18.47	14.22	25.45	26.73
	AUG	22.51	14.81	26.37	27.73
	SEP	23.03	15.45	27.04	28.27
	OCT	23.04	16.51	30.06	32.23
	NOV	23.43	17.28	30.81	32.86
	DEC	22.36	17.37	31.64	33.5
1994	JAN	23.27	18.62	32.18	33.31
	FEB	20.84	18.4	32.16	33.24
	MAR	19.98	17.46	30.68	32.62
	APR	18.61	18	32.28	33.28
	MAY	17.76	17.44	30.97	32.3
	JUN	17.42	16.11	31.49	33.17

	JUL	16.69	15.07	32.17	32.94
	AUG	16.67	15.07	32.18	32.94
	SEP	16.76	14.97	31.37	32.66
	OCT	15.11	13.9	29.21	29.76
	NOV	14.05	12.4	25.96	26.98
	DEC	13.05	12.15	25.91	26.87
1995	JAN	12.2	12.16	25.24	26.03
	FEB	12.08	11.81	24.09	24
	MAR	11.3	11.66	23.61	23.33
	APR	10.83	9.21	23.32	22.78
	MAY	9.81	9.08	23.09	22.61
	JUN	10.13	9.31	23.32	23.08
	JUL	10.32	9.07	22.96	23.04
	AUG	11.9	8.96	24.72	24.64
	SEP	11.8	9.22	26.19	25.91
	OCT	11.97	9.13	26.43	26.44
	NOV	12.46	9.26	28.38	28.57
	DEC	12.77	9.49	28.99	29.23
1996	JAN	13.33	9.64	27.81	27.94
	FEB	13.62	9.7	27.79	27.97
	MAR	13.89	10.18	28.06	28.42
	APR	14.23	10.06	27.99	28.53
	MAY	14.19	10.65	28.06	28.39
	JUN	14.17	10.74	28.34	28.54
	JUL	14.05	10.67	28.15	27.87
	AUG	13.9	10.55	28.17	27.99
	SEP	14.28	10.74	28.44	28.12
	OCT	14.19	10.78	28.78	28.91
	NOV	14.29	10.97	28.7	28.87
	DEC	14.65	11.22	28.58	28.9
1997	JAN	14.54	10.91	28.81	28.71
	FEB	14.47	10.87	28.6	28.43
	MAR	14.33	10.88	28.57	28.46
	APR	14.24	10.99	28.57	28.16
	MAY	14.95	12.43	27.26	28.78
	JUN	13.89	10.59	27.49	28.52
	JUL	14.11	10.79	26.86	27.72
	AUG	14.06	10.82	26.48	27.37
	SEP	14.53	10.71	28.21	28.96
	OCT	15.21	10.92	29.07	29.66
	NOV	15.88	10.19	29.8	30.25

	DEC	16.02	9.73	29.85	30.4
1998	JAN	15.94	9.77	29.81	30.43
	FEB	15.88	9.77	29.9	30.43
	MAR	15.89	9.8	30.2	30.81
	APR	18.37	10.81	30.41	29.28
	MAY	17.85	11.23	30.54	30.69
	JUN	16.87	12.27	30.46	30.74
	JUL	16.67	11.56	30.37	30.69
	AUG	16.35	10.81	29.77	30.59
	SEP	15.96	10.46	29.08	29.76
	OCT	15.39	9.74	28.99	29.58
	NOV	14.67	9.57	28.19	28.84
	DEC	12.99	7.96	26.16	26.66
1999	JAN	11.25	6.54	23.67	23.88
	FEB	9.66	5.93	22.83	22.94
	MAR	8.93	5.49	21.36	21.07
	APR	8.18	5.14	20.9	20.9
	MAY	7.55	4.52	20.86	20.81
	JUN	7.83	4.57	20.7	20.86
	JUL	7.65	5.15	21.12	21.02
	AUG	7.79	4.81	21.93	21.95
	SEP	8.44	5.35	22.45	22.48
	OCT	9.1	5.72	23.12	23.14
	NOV	9.48	6.04	24.43	24.79
	DEC	9.74	6.15	25.19	25.58
2000	JAN	10.38	6.42	25.14	25.91
	FEB	9.17	6.04	25.39	25.67
	MAR	8.01	5.14	23.76	24.09
	APR	7.61	5.3	23.44	24
	MAY	7.21	4.77	23.4	23.93
	JUN	7.01	4.89	23.11	22.86
	JUL	6.67	4.71	22.39	22.09
	AUG	6.26	4.53	21.23	20.93
	SEP	6.22	4.36	20.57	20.58
	OCT	6.22	4.31	20.22	19.94
	NOV	6.2	4.36	19.79	20.1
	DEC	6.22	4.51	19.6	19.73
2001	JAN	6.54	4.67	20.27	20.18
	FEB	6.55	4.63	20.13	20.48
	MAR	6.92	4.66	20.19	20.12
	APR	6.58	4.64	19.56	19.89

	MAY	6.44	4.42	19.2	19.52
	JUN	6.36	4.39	19.26	19.65
	JUL	6.22	4.34	19.71	19.98
	AUG	6.24	4.43	19.54	19.71
	SEP	6.27	4.89	19.44	19.63
	OCT	6.21	4.37	19.77	19.8
	NOV	5.87	4.35	19.44	19.83
	DEC	5.7	4.4	19.49	20.04
2002	JAN	5.72	4.42	19.3	19.31
	FEB	5.52	3.54	19.18	19.19
	MAR	5.42	3.71	18.86	18.78
	APR	5.48	4.12	18.69	18.88
	MAY	5.31	4.02	18.54	18.73
	JUN	5.21	4	18.38	18.46
	JUL	5.08	3.89	18.12	18.32
	AUG	4.99	3.74	18.12	18.56
	SEP	4.8	3.53	18.14	18.52
	OCT	4.66	3.79	18.34	18.89
	NOV	4.75	3.81	18.05	18.56
	DEC	4.75	3.47	18.34	18.56
2003	JAN	4.68	3.41	19.02	18.52
	FEB	4.4	3.42	18.83	17.81
	MAR	3.99	3.28	18.49	17.26
	APR	4.06	3.27	18.57	17.27
	MAY	3.71	3.14	18.52	17.18
	JUN	4.84	3.07	15.73	14.93
	JUL	4.49	1.79	15.3	14.43
	AUG	3.37	1.72	14.81	14.96
	SEP	3.07	1.44	14.82	14.31
	OCT	3.13	1.43	14.75	14.13
	NOV	3.32	1.44	14.07	14.02
	DEC	3.29	1.38	13.47	13.74
2004	JAN	3.12	1.22	13.48	13.3
	FEB	2.47	1.47	13.01	12.3
	MAR	2.32	1.3	13.12	11.65
	APR	1.96	1.24	12.67	11.08
	MAY	2.22	1.15	12.55	10.79
	JUN	2.2	1.15	12.17	10.72
	JUL	2.25	1.1	12.31	11.1
	AUG	2.26	1.08	12.19	10.81
	SEP	2.63	1.03	12.27	10.95

	OCT	2.33	1.07	12.39	11.85
	NOV	2.66	1.3	11.97	12.21
	DEC	2.77	0.98	12.25	12.69
2005	JAN	3.08	0.97	12.12	13.14
	FEB	3.47	0.96	12.35	13.82
	MAR	3.75	0.98	12.84	14.03
	APR	3.91	1.1	13.12	14
	MAY	4.05	1.07	13.11	13.94
	JUN	4.21	1.24	13.09	13.83
	JUL	4.14	1.3	13.09	13.54
	AUG	4.3	1.3	13.03	13.81
	SEP	4.35	1.34	12.83	13.5
	OCT	4.43	1.32	12.97	13.56
	NOV	4.5	1.37	12.93	13.33
	DEC	4.52	1.38	13.16	13.67
2006	JAN	4.48	1.33	13.2	13.81
	FEB	4.48	1.36	13.27	13.34
	MAR	4.28	1.34	13.33	13.26
	APR	4.35	1.33	13.51	13.81
	MAY	4.36	1.31	13.95	14.02
	JUN	4.35	1.27	13.79	13.78
	JUL	4.31	1.32	13.72	13.48
	AUG	4.08	1.41	13.64	13.43
	SEP	4.04	1.36	13.54	13.42
	OCT	4.11	1.35	14.01	13.94
	NOV	4.15	1.37	13.93	13.96
	DEC	4.11	1.35	13.74	13.91
2007	JAN	4.35	1.42	13.78	14.11
	FEB	4.21	1.41	13.64	14.05
	MAR	4.19	1.43	13.56	13.95
	APR	4.11	1.35	13.33	13.26
	MAY	4.14	1.57	13.38	13.35
	JUN	4.18	1.54	13.14	13.2
	JUL	4.33	1.65	13.29	13.34
	AUG	4.31	1.6	13.04	13.39
	SEP	4.34	1.67	12.87	13.26
	OCT	4.27	1.64	13.24	13.29
	NOV	4.33	1.65	13.39	13.43
	DEC	4.32	1.67	13.32	12.96
2008	JAN	4.37	1.72	13.78	13.41
	FEB	4.37	1.7	13.84	13.26

	MAR	4.43	1.72	14.06	13.48
	APR	4.41	1.71	13.91	13.46
	MAY	4.45	1.71	14.01	13.53
	JUN	4.48	1.7	14.06	13.3
	JUL	4.54	1.67	13.9	13.46
	AUG	4.65	1.68	13.66	13.11
	SEP	4.62	1.73	13.66	13.43
	OCT	4.65	1.74	14.12	13.91
	NOV	4.86	1.61	14.33	13.85
	DEC	4.89	1.65	14.87	14.39
2009	JAN	5.19	2.1	14.78	13.84
	FEB	5.23	2.13	14.67	13.46
	MAR	5.09	1.9	14.87	13.78
	APR	5.12	1.91	14.71	13.66
	MAY	5.1	1.67	14.85	14.13
	JUN	5.28	2.08	15.09	14.41
	JUL	5.09	1.67	14.79	13.94
	AUG	5	1.65	14.76	13.9
	SEP	5.05	1.65	14.74	13.76
	OCT	5.03	1.85	14.78	14.03
	NOV	5.06	1.71	14.85	14.24
	DEC	4.84	1.73	14.76	14.13
2010	JAN	5	1.75	14.98	14.25
	FEB	4.89	1.81	14.98	14.25
	MAR	4.74	1.81	14.8	13.59
	APR	4.49	1.85	14.58	14.5
	MAY	4.58	1.76	14.46	14.38
	JUN	4.45	1.75	14.39	14.23
	JUL	3.85	1.55	14.29	14.03
	AUG	3.74	1.5	14.18	13.97
	SEP	3.53	1.47	13.98	13.81
	OCT	3.58	1.46	13.85	13.64
	NOV	3.54	1.4	13.95	13.77
	DEC	3.59	1.45	13.87	13.69
2011	JAN	3.43	1.25	14.03	13.93
	FEB	3.41	1.41	13.92	13.65
	MAR	3.47	1.37	13.92	13.6
	APR	3.47	1.38	13.92	13.68
	MAY	3.51	1.38	13.88	13.72
	JUN	3.68	1.37	13.91	13.59
	JULY	3.85	1.37	14.14	13.89

	AUG	4.07	1.37	14.32	14.28
	SEP	4.21	1.35	14.79	14.64
	OCT	4.83	1.33	15.21	14.87
	NOV	5.75	1.41	18.51	18.67
	DEC	6.99	1.59	20.04	20.2
2012	JAN	7.66	1.62	19.54	20.38
	FEB	8.01	1.69	20.28	20.53
	MAR	8.01	1.72	20.34	20.53
	APR	9.04	1.58	20.22	20.27
	MAY	8.42	1.59	20.12	20.41
	JUN	7.88	1.46	20.3	20.36
	JULY	8.25	1.66	20.15	19.96
	AUG	7.85	1.58	20.13	20.31
	SEP	7.4	1.55	19.73	19.8
	OCT	6.86	1.6	19.04	19.13
	NOV	8.71	1.58	17.78	18.77
	DEC	6.8	1.6	18.15	17.79
2013	JAN	6.51	1.65	18.13	17.97
	FEB	6.29	1.61	17.84	17.68
	MAR	6.54	1.42	17.73	17.54
	APR	6.39	1.45	17.87	17.71
	MAY	6.53	1.53	17.45	17.6
	JUNE	6.65	1.73	16.97	16.92
	JULY	6.59	1.64	17.02	17
	AUG	6.36	1.67	16.96	16.89
	SEP	6.55	1.64	16.86	16.42
	OCT	6.43	1.63	17	16.96
	NOV	6.61	1.58	16.89	16.5
	DEC	6.65	1.58	16.99	16.51
2014	JAN	6.55	1.56	17.03	16.82
	FEB	6.57	1.49	17.06	16.88
	MAR	6.61	1.56	16.91	16.44
	APR	6.48	1.53	16.7	16.44
	MAY	6.42	1.54	16.97	17.85
	JUN	6.56	1.5	16.36	15.88
	JUL	6.59	1.33	16.91	17.12
	AUG				

1/ The weights correspond to each bank's market share in either deposit liability in the case of deposit interest rates or loans and advances in the case of lending rates.

Source: Central Bank of Kenya

THRHR

Inflation (%)			
Inflation (month-on-month) %	**Inflation (annual average) %**		
2005	Jan	14.87	12.27
	Feb	13.94	12.6
	Mar	14.15	13.07
	Apr	16.02	13.76
	May	14.78	14.61
	Jun	11.92	15.1
	Jul	11.76	15.34
	Aug	6.87	14.53
	Sep	4.27	13.24
	Oct	3.72	11.99
	Nov	4.4	10.89
	Dec	4.7	9.87
2006	Jan	8.39	9.36
	Feb	9.39	9.01
	Mar	8.85	8.61
	Apr	5.44	7.77
	May	4.47	6.95
	Jun	4.28	6.33
	Jul	4.16	5.73
	Aug	4.92	5.57
	Sep	5.93	5.7
	Oct	6.55	5.94
	Nov	6.64	6.12
	Dec	7.98	6.39
2007	Jan	4.63	6.08
	Feb	3.02	5.55
	Mar	2.19	4.99
	Apr	1.85	4.69
	May	1.96	4.47
	Jun	4.07	4.46
	Jul	5.48	4.57
	Aug	5.3	4.6
	Sep	5.53	4.57
	Oct	5.38	4.48
	Nov	6.08	4.45

	Dec	5.7	4.27
2008	Jan	9.4	4.69
	Feb	10.58	5.32
	Mar	11.9	6.13
	Apr	16.12	7.32
	May	18.61	8.7
	Jun	17.87	9.86
	Jul	17.12	10.83
	Aug	18.33	11.92
	Sep	18.73	13.02
	Oct	18.74	14.13
	Nov	19.54	15.25
	Dec	17.83	16.27
2009	Jan	13.22	16.56
	Feb	14.69	16.87
	Mar	14.6	17.07
	Apr	12.42	16.72
	May	9.61	15.93
	Jun	8.6	15.11
	Jul	8.44	14.35
	Aug	7.36	13.42
	Sep	6.74	12.41
	Oct	6.62	11.42
	Nov	5	10.24
	Dec	5.32	9.24
2010	Jan	5.95	8.64
	Feb	5.18	7.88
	Mar	3.97	7.03
	Apr	3.66	6.32
	May	3.88	5.85
	Jun	3.49	5.43
	Jul	3.57	5.03
	Aug	3.22	4.69
	Sept	3.21	4.4
	Oct	3.18	4.12
	Nov	3.84	4.02
	Dec	4.51	3.96
2011	Jan	5.42	3.93
	Feb	6.54	4.05
	Mar	9.19	4.49
	Apr	12.05	5.2

	May	12.95	5.96
	Jun	14.48	6.88
	Jul	15.53	7.88
	Aug	16.67	9
	Sep	17.32	10.18
	Oct	18.91	11.49
	Nov	19.72	12.82
	Dec	18.93	14.02
2012	Jan	18.31	15.1
	Feb	16.69	15.93
	Mar	15.61	16.45
	Apr	13.06	16.5
	May	12.22	16.4
	June	10.05	15.97
	Jul	7.74	15.27
	Aug	6.09	14.33
	Sep	5.32	13.29
	Oct	4.14	12.04
	Nov	3.25	10.67
	Dec	3.2	9.38
2013	Jan	3.67	8.2
	Feb	4.45	7.24
	Mar	4.11	6.33
	Apr	4.14	5.61
	May	4.05	4.96
	Jun	4.91	4.56
	Jul	6.03	4.44
	Aug	6.67	4.5
	Sep	8.29	4.75
	Oct	7.76	5.05
	Nov	7.36	5.39
	Dec	7.15	5.72
2014	Jan	7.21	6.01
	Feb	6.86	6.21
	Mar	6.27	6.39
	Apr	6.41	6.58
	May	7.3	6.85
	June	7.39	7.05
	July	7.67	7.19

CENTRAL BANK RATES									
YEAR	MONTH	Repo	Reverse Repo	Interbank	91-Day Tbill	182-days Tbill	364-days Tbill	Cash Reserve Requirement	Central Bank Rate
1991	JUL	-	-	18.84	17.14	-	-	-	-
	AUG	-	-	19.44	16.7	-	-	-	-
	SEP	-	-	19.22	17.18	-	-	-	-
	OCT	-	-	19.95	17.78	-	-		
	NOV	-	-	19.41	16.95	-	-		
	DEC	-	-	19.73	17.31	-	-		
1992	JAN	-	-	20.22	18.2	-	-		
	FEB	-	-	19.82	17.19	-	-		
	MAR	-	-	20.4	17.9	-	-		
	APR	-	-	28.57	18.05	-	-		
	MAY	-	-	26.17	18.32	-	-		
	JUN	-	-	27.18	18.76	-	-		
	JUL	-	-	27.56	17.67	-	-		
	AUG	-	-	25.52	17.76	-	-		
	SEP	-	-	25.16	18.43	-	-		
	OCT	-	-	25.41	19.41	-	-		
	NOV	-	-	24.07	18.01	-	-		
	DEC	-	-	26.81	18.14	-	-		
1993	JAN	-	-	26.46	17.87	-	-		
	FEB	-	-	26.55	17.86	-	-		
	MAR	-	-	30.52	25.07	-	-		
	APR	-	-	35.18	45.79	-	-		
	MAY	-	-	68.25	68.04	-	-		
	JUN	-	-	61.15	84.29	-	-		
	JUL	-	-	54.92	84.67	-	-		
	AUG	-	-	66.27	79.51	-	-		
	SEP	-	-	60.16	75.69	-	-		
	OCT	-	-	34.83	70.88	-	-		
	NOV	-	-	36.21	55.26	-	-		
	DEC	-	-	35.52	43.52	-	-		
1994	JAN	-	-	25.9	33.55	-	-		
	FEB	-	-	22.72	23.87	26.44	-		
	MAR	-	-	21.69	27.62	29.68	-		
	APR	-	-	24.79	30.85	29.24	-		
	MAY	-	-	15.71	31.24	32.58	-		

	JUN	-	-	16.48	32.38	33.98	-		
	JUL	-	-	14.67	29.74	32.42	-		
	AUG	-	-	10.38	24.13	25.05	-		
	SEP	-	-	9.86	17.39	24.32	-		
	OCT	-	-	6.89	16.95	15.89	-		
	NOV	-	-	13.05	17.22	16.16	-		
	DEC	-	-	8.9	17.49	18.22	-		
1995	JAN	-	-	10.5	16.74	18.52	-		
	FEB	-	-	12.44	17.63	18.46	-		
	MAR	-	-	10.23	16.84	17.33	-		
	APR	-	-	8.37	15.16	15.82	-		
	MAY	-	-	9.98	15.09	15.84	-		
	JUN	-	-	9.49	16.39	17.06	-		
	JUL	-	-	17.89	18.48	18.61	-		
	AUG	-	-	22.41	19.65	15.04	-		
	SEP	-	-	11.09	21.16	15.19	-		
	OCT	-	-	11.92	24.07	16.61	-		
	NOV	-	-	12.07	24.87	21.03	-		
	DEC	-	-	20.61	21.67	18.95	-		
1996	JAN	-	-	15.23	21.25	19.26	-		
	FEB	-	-	19.15	25.96	22.2	-		
	MAR	-	-	11.35	26.68	22.21	-		
	APR	-	-	10.96	24.16	18.57	-		
	MAY	-	-	10.96	21.96	20.27	-		
	JUN	-	-	13.25	21.85	20.77	-		
	JUL	-	-	13.65	21.76	20.3	-		
	AUG	-	-	16.16	21.63	-	-		
	SEP	23.63	-	19.59	23.1	-	-		
	OCT	22.17	-	17.67	24.08	-	-		
	NOV	19.71	-	16.67	22.09	-	-		
	DEC	18.85	-	16.02	21.53	19.49	-		
1997	JAN	16.35	-	14.41	21.61	20	-		
	FEB	12.29	-	11.15	21.44	20	-		
	MAR	13	-	12.93	21.42	-	-		
	APR	10.54	-	13.19	21.02	-	-		
	MAY	12.5	-	15.01	20.35	-	-		
	JUN	10.23	-	12.86	19.44	19.81	-		
	JUL	-	-	14.77	18.45	19.39	-		
	AUG	-	-	17.59	19.69	19.31	-		
	SEP	-	-	26.86	26.2	20.03	-		
	OCT	-	-	23.13	27.15	26.97	-		

	NOV	-	-	25.44	26.78	26.74	-		
	DEC	-	-	18.71	26.36	26.04	-		
1998	JAN	23.97	-	21.15	26.28	25.97	-		
	FEB	-	-	28.87	26.33	26.12	-		
	MAR	23.55	-	24.18	26.74	26.43	-		
	APR	-	-	25.81	26.98	26.63	-		
	MAY	-	-	25.11	26.38	26.48	-		
	JUN	-	-	21.7	25.48	26.23	-		
	JUL	24.5	-	17.34	24.67	25.38	-		
	AUG	-	-	23.64	23.74	24.53	-		
	SEP	22.58	-	18.99	22.47	22.67	-		
	OCT	20	-	16.35	20.59	21.14	-		
	NOV	17.25	-	10.87	17.66	18.17	-		
	DEC	10.65	-	9.38	12.56	13.32	-		
1999	JAN	10.43	-	7.91	10.7	10.52	-		
	FEB	8.55	-	6.7	8.95	8.34	-		
	MAR	-	-	6.34	8.84	8.71	-		
	APR	9	-	7.5	9.03	9.5	-		
	MAY	8.55	-	7.42	9.63	9.59	-		
	JUN	11.44	-	9.28	11.44	10.33	-		
	JUL	13.72	-	8.85	14.47	12.35	-		
	AUG	14.15	-	13.54	14.84	15.18	-		
	SEP	16.45	-	15.21	15.78	15.36	-		
	OCT	17.07	-	9.84	17.63	16.13	-		
	NOV	17.52	-	16.55	18.14	17.57	-		
	DEC	16.62	-	13.04	19.97	18.8	-		
2000	JAN	17.76	-	10.78	20.3	19.67	-		
	FEB	12.63	-	9.42	14.84	15.22	-		
	MAR	9.11	-	7.56	11.28	11.61	-		
	APR	9.85	-	6.39	12.44	-	-		
	MAY	10.09	-	7.95	11.22	11.75	-		
	JUN	9.85	-	6.73	10.47	-	-		
	JUL	9.61	-	6.7	9.9	-	-		
	AUG	9.37	-	9.89	9.25	-	-		
	SEP	10.26	-	8.47	10.36	-	-		
	OCT	10.16	-	8.26	10.65	-	-		
	NOV	10.95	-	10.24	11.17	-	-		
	DEC	12.26	-	9.79	12.9	12.1	-		
2001	JAN	14.47	-	11.84	14.76	14.4	-	10	
	FEB	14.92	-	11.95	15.3	15.36	-	10	
	MAR	14.75	-	9.3	14.97	14.88	-	10	

	APR	11.75	-	8.53	12.9	12.9	-	10	
	MAY	11.14	-	10.85	10.52	11.31	-	10	
	JUN	11.92	-	10.71	12.07	-	-	10	
	JUL	12.37	-	10.78	12.87	12.58	-	10	
	AUG	12.44	-	11.98	12.84	-	-	10	
	SEP	11.52	-	10.67	12.39	-	-	10	
	OCT	11.16	-	10.45	11.63	-	-	10	
	NOV	11.16	-	10.13	11.5	-	-	10	
	DEC	11.05	-	10.42	11.01	-	-	10	
2002	JAN	10.81	-	10.29	10.85	-	-	10	
	FEB	10.51	-	9.79	10.61	11.12	-	10	
	MAR	10.19	-	10.05	10.14	10.6	-	10	
	APR	10.07	-	9.64	10.01	10.47	-	10	
	MAY	9.12	-	8.54	9.04	9.98	-	10	
	JUN	8.11	-	8.19	7.34	8.8	-	10	
	JUL	8.2	-	7.63	8.63	9.36	-	10	
	AUG	8.2	-	8.25	8.34	9.49	-	10	
	SEP	7.56	-	7.29	7.6	8.62	-	10	
	OCT	7.84	-	8.3	8.07	8.54	-	10	
	NOV	7.91	-	8.12	8.3	8.76	-	10	
	DEC	8.14	-	8.69	8.38	8.79	-	10	
2003	JAN	8.17	-	9.04	8.38	8.73	-	10	
	FEB	7.17	-	7.06	7.77	8.14	-	10	
	MAR	6.23	-	6.22	6.24	6.64	-	10	
	APR	5.94	-	5.88	6.25	6.83	-	10	
	MAY	5.5	-	5.67	5.84	6.68	-	10	
	JUN	0.84	-	1.62	3	4.12	-	6	
	JUL	0.78	-	0.45	1.54	2.95	-	6	
	AUG	0.48	-	0.43	1.18	2.12	-	6	
	SEP	0.47	-	0.54	0.83	1.35	-	6	
	OCT	0.56	-	0.69	1	1.61	-	6	
	NOV	0.64	-	0.73	1.28	1.88	-	6	
	DEC	0.78	-	0.81	1.46	2.09	-	6	
2004	JAN	1.06	-	0.82	1.58	2.35	-	6	
	FEB	1.13	-	0.9	1.57	2.33	-	6	
	MAR	1.27	-	1.27	1.59	2.53	-	6	
	APR	1.56	-	1.72	2.11	3.12	-	6	
	MAY	1.56	-	2.05	2.87	3.61	-	6	
	JUN	1.29	-	1.29	2.01	3.15	-	6	
	JUL	1.49	-	1.52	1.71	2.98	-	6	
	AUG	1.94	-	2.1	2.27	3.49	-	6	

	SEP	2.5	-	2.95	2.75	4.03	-	6	
	OCT	2.76	-	3.56	3.95	5.16	-	6	
	NOV	4.95	-	4.66	5.06	6.03	-	6	
	DEC	8.97	-	9.41	8.04	8.19	-	6	
2005	JAN	7.25	-	8.72	8.26	8.76	-	6	
	FEB	7.23	-	8.14	8.59	8.96	-	6	
	MAR	7.26	-	8.13	8.63	8.91	-	6	
	APR	7.28	-	8.28	8.68	8.92	-	6	
	MAY	7.26	-	8.3	8.66	9.02	-	6	
	JUN	7.34	-	7.37	8.5	8.96	-	6	
	JUL	7.43	-	7.51	8.59	9.08	-	6	
	AUG	7.67	-	7.77	8.66	9.09	-	6	
	SEP	7.77	-	8.03	8.58	8.9	-	6	
	OCT	7.8	-	7.98	8.19	8.52	-	6	
	NOV	7.72	-	7.64	7.84	8.37	-	6	
	DEC	7.74	-	7.79	8.07	8.49	-	6	
2006	JAN	7.81	-	7.78	8.23	8.84	-	6	
	FEB	7.78	-	7.73	8.02	8.85	-	6	
	MAR	7.5	-	7.52	7.6	8.52	-	6	
	APR	6.78	-	6.97	7.02	7.36	-	6	
	MAY	6.68	-	8.11	7.01	7.48	-	6	
	JUN	6.39	-	6.41	6.6	7.32	-	6	9.75
	JUL	5.73	-	5.74	5.89	6.42	-	6	9.75
	AUG	5.94	-	5.66	5.96	6.47	-	6	10
	SEP	6.16	-	6.02	6.45	7.45	-	6	10
	OCT	6.23	-	6.08	6.83	8.31	-	6	10
	NOV	6.33	-	6.18	6.41	7.99	-	6	10
	DEC	6.34	-	6.34	5.73	7.32	-	6	10
2007	JAN	6.43	-	6.43	6	8.28	-	6	10
	FEB	6.75	-	6.52	6.22	8.56	-	6	10
	MAR	6.7	-	6.55	6.32	7.97	-	6	10
	APR	6.84	-	6.81	6.65	7.93	-	6	10
	MAY	7.03	-	7.11	6.77	7.98	-	6	10
	JUN	7.07	-	6.98	6.53	7.19	-	6	8.5
	JUL	7.19	-	7.07	6.52	7.17	-	6	8.5
	AUG	7.49	-	7.38	7.3	7.99	-	6	8.75
	SEP	7.81	-	7.59	7.35	7.82	-	6	8.75
	OCT	7.44	-	7.65	7.55	7.84	-	6	8.75
	NOV	6.42	-	6.5	7.52	8.04	-	6	8.75
	DEC	7.13	-	7.05	6.87	7.87	-	6	8.75
2008	JAN	7.75	-	7.66	6.95	8.09	-	6	8.75

	FEB	6.9	-	7.18	7.28	8.3	-	6	8.75
	MAR	6.46	-	6.35	6.9	7.82	-	6	8.75
	APR	6.67	-	6.59	7.35	8.3	-	6	8.75
	MAY	7.42	-	7.72	7.76	8.75	-	6	8.75
	JUN	7.61	-	7.79	7.73	8.84	-	6	9
	JUL	7.41	-	8.07	8.03	9.09	-	6	9
	AUG	6.35	-	6.92	8.02	8.75	-	6	9
	SEP	6.06	-	6.7	7.69	8.08	-	6	9
	OCT	6.03	-	6.81	7.75	8.32	-	6	9
	NOV	6.27	-	6.83	8.39	8.86	-	6	9
	DEC	6.36	-	6.67	8.59	9.08	-	5	8.5
2009	JAN	5.1	6.73	5.95	8.46	8.93	-	5	8.5
	FEB	5.08	6.03	5.49	7.55	7.89	-	5	8.5
	MAR	4.62	5.53	5.57	7.31	7.91	-	5	8.25
	APR	4.05	5.79	5.81	7.34	8.34	-	5	8.25
	MAY	6.18	5.43	5.55	7.45	8.77	-	5	8
	JUN	0	4.01	3.08	7.33	8.28	-	4.5	8
	JUL	0	3.35	2.69	7.24	8.14	-	4.5	7.75
	AUG	0	4.31	3.68	7.25	8.12	8.71	4.5	7.75
	SEP	0	3.43	3.38	7.29	8.09		4.5	7.75
	OCT	0	3.5	2.57	7.26	7.98	8.44	4.5	7.75
	NOV	0	3.5	3.11	7.22	8.02		4.5	7
	DEC	0	3.66	2.95	6.82	7.38	8.01	4.5	7
2010	JAN	0	3.91	3.69	6.56	7.02		4.5	7
	FEB	0	2.8	2.39	6.21	6.61	7.38	4.5	7
	MAR	0	2.43	2.21	5.98	6.34		4.5	6.75
	APR	0	2.46	2.46	5.17	5.58	6.01	4.5	6.75
	MAY	0	2.41	2.16	4.21	4.41	-	4.5	6.75
	JUN	0	2.41	1.15	2.98	2.86	4.14	4.5	6.75
	JUL	0	1.72	1.35	1.6	1.72	-	4.5	6
	AUG	0	1.84	1.66	1.83	2.03	2.96	4.5	6
	SEP	0	1.84	1.18	2.04	2.14	-	4.5	6
	OCT	0	1.84	0.98	2.12	2.1	3.06	4.5	6
	NOV	0	1.07	1.01	2.21	2.28	-	4.5	6
	DEC	0	1.41	1.18	2.28	2.59	3.36	4.5	6
2011	JAN	0	1.23	1.24	2.46	2.7	3.69	4.5	5.75
	FEB	0	1.18	1.13	2.59	2.76	3.72	4.5	5.75
	MAR	1.66	1.18	1.24	2.77	3.06	4	4.5	6
	APR	4.5	2.99	3.97	3.26	3.51	5	4.5	6
	MAY	5.72	0	5.54	5.35	4.57	6.77	4.5	6
	JUN	5.73	6.36	6.36	8.95	9.93	-	4.75	6.25

	JULY	0	6.25	8.61	8.99	9.85	10.22	4.75	6.25
	AUG	0	6.25	14.29	9.23	10.15	11.07	4.75	6.25
	SEP	0	5.75	7.46	11.93	11.28	12.54	4.75	7
	OCT	18.89	0	14.95	14.8	14.68	14.5	4.75	11
	NOV	0	0	28.9	16.14	15.9	16.62	4.75	16.5
	DEC	17.75	0	21.75	18.3	18.3	20.96	5.25	18
2012	JAN	17.88	0	19.27	20.56	20.69	21.96	5.25	18
	FEB	13.78	0	18.15	19.7	19.88	20.96	5.25	18
	MAR	0	0	24.02	17.8	18.24	17.04	5.25	18
	APR	15.47	0	16.15	16.01	16.92	16.92	5.25	18
	MAY	16.97	0	17.16	11.18	12.71	12.43	5.25	18
	JUN	17.6	0	17.09	10.09	10.67	12.43	5.25	18
	JULY	14.31	0	13.71	11.95	12.21	13	5.25	16.5
	AUG	9.65	0	8.97	10.93	11.77	12.85	5.25	16.5
	SEP	8.42	0	7.02	7.77	9.36	10.34	5.25	13
	OCT	9.74	0	9.14	8.98	10.33	10.57	5.25	13
	NOV	8.3	0	7.14	9.8	10.47	11.94	5.25	11
	DEC	6.39	0	5.84	8.3	9.25	11.71	5.25	11
2013	JAN	6.6	0	5.86	8.08	8.09	11.67	5.25	9.5
	FEB	9.1	0	9.25	8.38	8.4	11.66	5.25	9.5
	MAR	9.35	0	8.93	9.88	9.89	12.54	5.25	9.5
	APR	9.14	0	7.9	10.38	10.75	12.49	5.25	9.5
	MAY	7.96	0	7.16	9.46	10.04	11.29	5.25	8.5
	JUNE	7.93	0	7.14	6.21	7.12	8.57	5.25	8.5
	JULY	7.48	0	7.93	5.92	6.23	8.81	5.25	8.5
	AUG	0	8.61	8.88	10.03	9.57	11.35	5.25	8.5
	SEP	7.11	0	7.52	9.58	10.15	10.91	5.25	8.5
	OCT	0	0	10.66	9.72	10.28	10.75	5.25	8.5
	NOV	0	12.35	10.77	9.94	10.54	10.97	5.25	8.5
	DEC	7.95	11.28	8.98	9.52	10.41	10.69	5.25	8.5
2014	JAN	0	0	10.43	9.26	10.36	10.65	5.25	8.5
	FEB	0	0	8.83	9.16	10.35	10.67	5.25	8.5
	MAR	6.92	0	6.47	8.98	10.08	10.46	5.25	8.5
	APR	8.39	0	7.4	8.8	9.83	10.2	5.25	8.5
	MAY	8.42	0	7.76	8.82	9.86	10.09	5.25	8.5
	JUN	6.46	0	6.6	9.81	10.5	10.55	5.25	8.5
	JUL	0	0	8.08	9.78	10.74	10.96	5.25	8.5
	AUG	0	0	11.79	8.29	8.85	10.28	5.25	8.5
	SEP								