

**THE EFFECT OF INTEREST RATES ON THE GROWTH OF REAL
ESTATE MARKETS IN KENYA**

BY

OMATO MECHA BRIAN

D61/71561/2014

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER
OF SCIENCE IN FINANCE IN THE SCHOOL OF BUSINESS, NAIROBI
UNIVERSITY**

OCTOBER, 2018

DECLARATION

This research project is my original work and has not been submitted for the award of a degree in any university.

Signature Date:

Omato Mecha Brian

D61/71561/2014

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

Signature Date:

Mr. Dan Chirchir.

University Supervisor

Signature Date:

Dr. Josephat Lishenga

University Supervisor

DEDICATION

I dedicate this work to my family and parents.

ACKNOWLEDGEMENT

Thanks to the almighty God without whose blessing this study would not have been possible. I would also like to express my sincere gratitude and thanks to my supervisors, Mr. Dan Chirchir and Dr. Josephat Lishenga for guidance during my master's program, for the time devoted to guide me throughout the project development. I also extend my gratitude to my family who have been patient with me during my absence while doing course work. I also convey my sincere gratitude to my brothers and sisters, for their best wishes, prayers and support. Thanks to my friends and colleagues for sharing knowledge and valuable assistance during my study.

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ABSTRACT

The main aim of the study was to establish the effect of interest rates on the growth of real estate in Kenya. Theories the study was anchored on include classical, liquidity Preference and loanable funds theories. The study was conducted using correlation study design to show the nature of relationship between changes in interest rates and growth of real estates in Kenya. The study used secondary data that included mortgage interest rates, inflation, GDP growth and real estate growth as captured by montage value of the commercial banks that offer mortgages. Data was collected quarterly for a period of 11 years from the year 2007 to the year 2017. The secondary data was obtained from Kenya commercial banks that offer mortgages and Kenya National Bureau of Statistics. The study also conducted trend analysis which showed that there have been unsteady fluctuations in GDP growth in Kenya, real estate growth, inflation and interest rate volatility in the study period.

The inferential findings from the correlation and regression analysis showed that inflation has a negative and significant effect on real estate growth in Kenya which implies that an increase in inflation rate leads to a significant decrease in real estate growth in Kenya. The findings also indicated that mortgage interest rate volatility has a negative and significant effect on real estate growth in Kenya which shows that an increase in mortgage interest rate volatility leads to a significant decrease in real estate growth and that GDP growth has a positive but not significant effect on real estate growth in Kenya. The study also concludes that the stability of the interest on mortgages is important if the real estate in Kenya was to grow. High volatility affects the growth of real estate negatively and significantly. To the real estate investors, the study recommends that there is a need to be cautious of the inflation rate and the mortgage interest rates fluctuations when making investment decisions. Similarly, to the real estate developers, there need to be a caution when making real estate investment decision since an increase in GDP does not necessarily mean an increase in demand of housing.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Buildings that are on a property and other properties in a land and also extends to include resources such as land, water, crops that cannot be moved is what is termed as a real estate. According to the Kenyan republic real estates consist of; residential dwellings that are single and multi-family, land that is used for commercial and agriculture spaces for offices, go downs and warehouses, shopping complexes and retail outlets.

According to Amadeo (2012) research deduced that charges that occur when one borrows money and paid together with the money borrowed is called interest rate. The lender fix a certain amount of money on a specified rate which is a percent of the total amount loaned. Another definition of interest rate is the amount that a borrower pays back together with the money that he/she had borrowed. Variables such as investment, inflation, and unemployment are also taken into account as monetary policies when interest is targeted.

When a country's investment and consumption rates need to be increased by the central bank, they mostly reduce the interest rates to improve the country's economy.

Due to the fact that the real-estate market and stock market carry most of the investments, reduction of interest rates may become risky and create an economic bubble (Liu, et al. 2008). In the early 1980s and 1990s, there were heavy unpaid debts by the banks due to bankruptcy after the central bank in Japan reduced the interest rates heavily which caused stagnation and led to many banks being closed and affect the country economy

1.1.1 Interest rate

The rate at which interest rates are charged and the amount charged in a mortgage capital influences the rate at which real estate's are produced due to the interbank exchanges and Treasury bills. Values are influenced due to effects on property level costs that result from interest rates according to Heure and Snyderman (1999). Value of investments and the Required Rates of Return (RROR) are significantly affected by investment competition and capital supply and demand. The economy is affected differently by low interest rates. The effect on low house prices and demand stimulation of interest rates have the same effect as low mortgage interest rates.

Nelson (2015) study found out that retail investors affect real estate prices by changing mortgage rates as they are directly affected. Investment demands and capital are also affected by the interest rates. Property prices are affected by the influence of the supply and demand for property through capital flow. Real estate investments are affected by change in prices which are also affected by returns through the interest rates. When there is destabilization in the credit markets, changes in rates are also affected. Prices of property are thus affected greatly by interest rates whether low or high according as flow of capital is also affected.

1.1.2 Growth of Real Estate in Kenya

Valuating the properties they intend to buy, estimation of how much money the properties will generate, whether the money generated will be through appreciation or rental income are factors to consider in making profits in real estate Kimemia (2005).

Valuation of real estate is done through income form operating discounted net or approaches in gross income multiplier. The insurance of a property, its management fees, maintenance and the utility costs are the expenses of an operating property. Payments of interest and the taxes are not included in the expenses. Determination of the expected revenue from the property must be done, this is done through estimation form the rents paid by other properties close by. A property's income-generating capacity can be found through the gross income multiplier approach. Properties in the same area are expected to generate almost the same income. Before deducting the expenses of an operating property, the total gross income is thus calculated. Forecasting of vacant rates s also done.

According to report by Kenya Housing (2008).There are two kinds of real estate purchases mostly used in Nairobi, cash purchases and mortgage purchases. In a study done by the World Bank through the CBK, the number of outstanding mortgage loans increased from 7,834 in 2006 to 13,803 in 2010. This is an actual increase of mortgages outstanding Kshs. 19.5b to Kshs. 61.4b between 2006 and 2010. Showing that the demand for mortgages and in general the demand for property in Kenya has sustainably increased over the years. The study measured the growth of real estate in Kenya by obtaining data from central bank on all mortgage value in commercial banks. The time period was the year 2007 to 2017.

1.1.3 Relationship between Interest Rates and Growth of Real Estate

According to Marete (2011) a person's ability to own property is greatly affected by the interest rate charges, if the interest rates are high, then it's difficult for them to purchase property. On the other hand if the interest rates go down, the property available gets more demand and that again makes the prices to go up.

Real estate demand and prices are lowered through the rise of interest rates and increase in obtaining of mortgages. Investment demands and capital are also affected by the interest rates. Property prices are affected by the influence of the supply and demand for property through capital flow. Real estate investments are affected by change in prices which are also affected by returns through the interest rates. Decrease in bonds are seen when the interest rates are high, and the bonds increase when there is decline in interest rate while the coupon rate becomes much more desirable.

REITs' high yields go up when market's interest rates decrease. Interest rates are controlled by the rate at which borrowing takes place which also leads to inflation. A growth was recorded by the construction sector of 8.3% in the year 2008 while 2007 had recorded a growth of 6.9% showing an increase as per the Central bank of Kenya survey 2015. The roads and housing were positively impacted by the loans give to the public at very low interest rates which resulted to a robust growth rate. A 7% growth rate was also experienced in the construction activities where 2008 had 2,205.8 thousand tonnes an increase from 2,061.4 thousand tonnes in 2007 in consumption of cement.

According to Crowe (2013) interest rates influence the growth of real estate markets as the loans are influenced by the amount of interest being charged which affects the mortgage rates thus affecting the price of the homes and the rent to be charged. The prices of homes are affected by the amount of mortgage laid and these affect the mode of acquiring a real estate.

1.2 Research Problem

Many people would be able to purchase homes if the interest charged at banks are reduced to their convenience. If many people are able to acquire homes, then the homes in the market will reduce thus supply will be lower and then will push the costs to be higher once again. Supply is thus increased by the fact that interest rates high and therefore many people are not able to acquire loans to purchase for a home. Prices are pushed to be low by the rate of over supplying.

It was reported that most of the individuals that purchased property in the year 2010, bought the real estates with cash that shows that most of the people were not able to attain loans due to the high interest rates that were being charged by the banks, when the interest rates were lowered, demand for houses again went up due to demand as most people could acquire loans with low interest rates (World Bank- CBK, 2010). In June 2010, there were about 13,803 mortgage accounts only. This gap shows that the dream of most Kenyans with the will to own property will not become a reality anytime soon. Most of the banks restructured their products due to the findings of this study. The CFC Stanbic Bank was able to offer affordable mortgage for housed and also offered loans with interest rates that were fair.

Sekine et al. (2003) studies show that, the interest rate affects how most people are able to acquire property where low charges enable many people to acquire loans and then the real estate markets also raise prices due to the demand after many people are able to acquire loans in order to obtain financing a loan. An important difference of Chen et al (2006) from Sekine et al. (2003) points out on property prices being the

main determinant of the cost of borrowing while Chen (2006) links property prices as merely a proxy to collateral change being the main determinant of cost of borrowing.

Cuevas (1988) argued that financial regulations usually constrain the range of interest-rates that banks can charge on loans. However, Cuevas and Graham, (1985) studies show that lenders as price-setters of explicit and implicit charges on loans which can either increase or lower the cost of borrowing. The interpretation of this result in the Honduras study (1983 survey) was that the range within which interest rates could vary was too narrow to elicit any meaningful response by the participants in the market. Prices of houses are influenced by monetary policies according to previous studies done Bernanke (1995). Changes in how prices change and the rate of demand are also controlled by how much interest rates being charged. Mortgage rates are affected greatly by policy rates as mortgage rates of real estates have a great impact on housing, it is therefore because of this impact that this study was focused on determining the effect of interest rates on the growth of real estate in Nairobi unlike other studies the focus of this study was on the most recent periods that is 2007 to 2017.

In 2002, the Kenya real estate sector experienced a boom, which confounded many in the area. The growth and development of economy and the Kenyan business regime were the main reasons for the property market to remain strong despite the dip in other markets in the world.

Inflation is the main driver of how interest rates are charged which also controls the rate of borrowing. The central bank of Kenya controls the rate of interest rates in the banks and they supervise whether the banks follow their rules and regulations, these factors then lead to control their own mortgage rates with a few basis taken from the lending rates pre-determined by the central bank. This study therefore sought to fill

the research gap by investigating the effect of interest rates on the growth of real estate market in Nairobi Kenya. The study sought to answer the question, what is the effect of interest rate on growth of real estate markets in Nairobi?

1.3 Research Objectives

The research objective of this study was to establish the effect of interest rates on the growth of real estate markets in Kenya.

1.4 Value of the Study

The research can help developers and borrowers of money who want to invest in real estate to know the impact of interest rates volatility on their finances. In Kenya, mortgages are very expensive and thus are afforded and applied by the big developers. It is open for all investors globally to invest in real estates, in that all people globally can own property in the Kenya soil. For this to be successful real estate investors need to understand the relationship that exists between changes in interest rates and the growth of real estate markets more so how to control these interest rates through the monetary policy.

The study can assist financial analyst to be able to give proper financial service i.e. consultation on real estate development and how changes in interest rate will likely affect their source of finance in is a loan or mortgage. Other researches would also be done on how real estate prices are affected by other factors in other Kenyan towns. The information in this study will help the investors to advice their buyers and sellers on how patterns in real estate's change from time to time.

The customers will receive information on the factors they should consider, the area's best to invest in, best places to invest and the best time to invest in real estate property. The scholars will also benefit since they will acquire information that will

assist them in undertaking researches that involve real estate property through the conclusions that will be made by the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature review of the effect of interest rates on the growth of real estate markets in Kenya is discussed in this chapter. The research topics trends are also highlighted. Research areas, methodology, theoretical approaches and findings are included in this chapter. The sources of the literature review are highlighted from other countries and other areas. Gaps identified are also outlined; it deals with the historic and current state of research in the field.

2.2 Theoretical Review

How changes in interest rate have an impact on the growth of real estate is explained through several theories discussed in this study. How interest rate and growth of real estate relate to each other are also explained. These theories include classical, liquidity Preference and loanable funds theories. These theories use their own assumptions to explain how prices of real estate properties are affected by interest rates.

2.2.1 Classical Theory

According to Goacher (1998) Classical theory uses forces in demand and supply to determine the rate on interest. The saving amount paid is what this theory terms as interest. The demand at which borrowing takes place is compared to the savings supply according to the classical theory.

Interest rates are determined by economics classical theory applied in the classical theory of interest rates. The borrowing demand is responsible for the comparison of supply of savings of the classical theory of interest rates. Both supply and demand are balanced through determination of the intersection points.

Interest rates drop when savings are great more than the investments and this makes the balance, if investments are more than the savings, then interest rates increase until then the savings rise where the two now balance. Factors rather than supply and demand are not discussed in this theory and how they affect interest rates. These factors not explained include; fund creation, income importance and changes in wealth that affect the rate of borrowing and the economy at large.

Interest rate is the amount that a borrower pays back together with the money that he/she had borrowed. Variables such as investment, inflation, and unemployment are also taken into account as monetary policies when interest is targeted. Joseph and Stieglitz (1995). Economic behaviour play a role in interest rates which is strained by the modern economic theory: economic activity is affected by investments which are also affected by interest rates. The interest rates and the economic activities level are controlled by monetary policy as the central role.

2.2.2 Loanable Funds Theory

It was believed that invisible hands were responsible for the economic activities according to David and Malthu (1999) who were economists and influenced the development of this theory, they indicated that factors such as price mechanism, interference from the government and self-interest needed to be minimized. These economists used money demands and loanable funds supply to describe interest rate.

Loanable funds and credit demand are the determinants of interest rates as assumed in the loanable funds theory. Domestic businesses, consumers, the government and foreign borrowers are the originators of loanable funds demand as per the loanable funds theory. On the other hand, balances of money dispersion and creation of money are of domestic savings generate supply. Profitable projects will increase when the interest rates are lowered. Savings supply loanable funds. The more people save in banks, the more capital is available to loan people when the interest rates are low. Lending and saving is discouraged by high rates of interest. Saving and lending too will be discouraged by low interest rates as they will not have any gains. Loanable funds rise when the supply curve is high.

The equality of loanable funds and demand for supply determines the rate of market rates. These two factors influence the equality of interest rates if only both of them are equal. Issues such as households, policy makers, home buyers and sellers. Affordability of housing is greatly affected by the rate at which mortgage rates are offered where the index reduces when the mortgage is high and vice versa. In the Eastern part of Asia it was experienced that interest rates affected the decline of economy as the charge greatly contributed to stability of exchange, where capital flight was reduced and default risk increased and thus expected returns lowered.

The relationship that exists between low interest rates and house price bubbles is very weak. House values should be increased by interest rates being also low as explained by the standard theory per McGibany and Nourzad (2004). Countries such as Sweden are affected by the level of interest rates as they affected their levels of purchasing of homes as it has affected them in the past (Debelle, 2004).

Variation of prices is determined by interest rates, income and prices expected Vries (2005). Risks are also experienced in the banks due to the levels in the interest rates offered. Implications that are strong also matter. Bubbles are not caused necessary by the fact that the price of houses rise when interest rates are low. This finding should be explained in how the house prices go up when the interest rates are low.

2.2.3 The Keynesian Theory

The desire of holding money and supply of the money is said to determine interest rate accruing to this theory. Loss of liquidity is payments of interest rate, being a liquid asset. Transactions precautionary and speculative are the three motives that explain holding of money as formulated by Keynes. The foregoing of interest is also affected by the holding of money at a cost as argued by Keynesian. Government bonds are also bought through interest rates by those that hold money as assets.

The most important medium of exchange is money. Money is used in purchasing of goods and services by customers while purchase of raw materials and hiring of factor services needs money from organizations. Money is therefore help by people as it's needed in all aspects of purchase. Spending of money is required at a daily basis but income is received either monthly, weekly or a yearly basis; this therefore needs a bridge between use and time of receiving. The income that customers receive and how they use it determines the money they will be able to transact with and the amount they will also save. The more money customers receive, the more they spend and thus make their transactions higher. Money is also needed for other needs that are not visible but may possibly happen; Keynes indicated that this money also needs to be accounted during spending and purchasing. This money is called active balance as it is saved for specific purposes. The rate of interest determines the active balances

demand. This shows how the government pay an interest that is fixed through selling and buying in speculative motives of the Government Securities or Treasury Bills as argued by Keynes.

According to Keynes, interest rates influence the growth of real estate markets as the loans are influenced by the amount of interest being charged which the affects the mortgage rates thus affecting the price of the homes and the rent to be charged. The price of homes are affected by the amount of mortgage laid and these affects the mode of acquiring a real estate.

Real estate demand and prices are lowered through the rise of interest rates and increase in obtaining of mortgages. Investment demands and capital are also affected by the interest rates. Property prices are affected by the influence of the supply and demand for property through capital flow. Real estate investments are affected by change in prices which are also affected by returns through the interest rates. Decrease in bonds are seen when the interest rates are high, and the bonds increase when there is decline in interest rate while the coupon rate becomes much more desirable.

2.2.4 Liquidity Preference Theory

Investing is influenced by liquidity as preference which affected economic units as asserted by Liquidity preference theory. The future interest rates are affected by the premium currently being offered according to this theory. Scarce liquid resources are paid thorough premiums. Prediction of future expenditures rely upon liquid assets which are hard and they also affect the purchase of goods and services as economic units in liquidity's preference. Liquidity theory works with almost the same terms as classical theory in its short term nature of considering the supply and demand for money as the determinants of interest rates.

Monetary phenomenon is what clearly explains the rates of interest per the theory. It is a time's partying with liquidity as a reward. Supply and demand for money determines the interest rate. This fact is therefore necessary to introduce the discussion of both supply and demand. High interest rates are demanded by investors, premiums, long term maturity securities, greater risks as all other factors are the same according to the liquidity preference theory.

2.2.5 Interest Rates Theory

A percentage of the borrowed amount which is an annual charge is called interest rate. The borrowing of funds is significantly affected by the changes in interest rates. Expenditures are decreased by high interest rates while increase in expenditures leads to low interest rates.

Interest rates determine the borrowing of funds. Expenditures overall costs are added by the high interest rates. Demand is aggregated through consumption and investment spending which is induced by changes in interest rates. Values are influenced due to effects on property level costs that result from interest rates according to Heure and Snyderman (1999). Value of investments and the Required Rates of Return (RROR) are significantly affected by investment competition and capital supply and demand.

2.3 Determinants of Growth of Real Estate

In most of the developing countries, home owners' wealth is represented by the real estates they own. Most investors are lured and attracted by the how big the real estates are. The main factors that influence availability of investments and real estate market are discussed in this study.

2.3.1 The Economy GDP

Gross Domestic Product (GDP) which captures both the aggregate level of income per capita and population size (Ho & Cuervo, 1999). An increase in real GDP would increase the income of the population in the economy resulting in increased demand for real estate through higher prices of primary property and higher rentals.

2.3.2 Pricing Model

Property values are measured and identified through the Price Model in most of the empirical studies done. The attributes of a house or apartment depends on the place where it is located and its monetary value which is explained by the modelling approach. Features such as a home's physical size, its environmental characteristics, location, number of rooms and age determine its market price. The effects that a house has either positive or negative are determined by its price though the amenities too might determine its market value Plaut (2003).

2.3.3 Inflation

There is a correlation between house prices and inflation, when there is too much money in circulation in the market the house prices tend to go up thus making it so difficult to acquire real estates. Interest rates are also affected by inflation as the increase in interest rates is due to increase in inflation and vice versa, (Daniel, 2013).

2.3.4 Population

Housing is a major problem in Kenya especially in Nairobi. Despite initiatives by the Government of Kenya to ensure that Kenyans have access to basic housing requirements

In Nairobi millions of people live in informal settlements and sprawling slums (UN-HABITAT, 2008). The houses available and those under construction have not been able to meet the demand of housing despite the high prices according to National Housing Corporation, (2009) although there is continued planning of providing dwelling places for people in Nairobi, efforts by the Government of Kenya and the private sector are trying to meet the short for housing in the country. Property prices are affected by the influence of the supply and demand for property through capital flow. Real estate investments are affected by change in prices which are also affected by returns through the interest rates. Decrease in bonds are seen when the interest rates are high, and the bonds increase when there is decline in interest rate while the coupon rate becomes much more desirable.

The perimeters of Nairobi are expanding to bursting point due to the demand for real estate. Improved infrastructure like the Thika super highway project, easy utilities access, financial and easy communication services led to improvement of real estate performance in Kenya by these factors. Mini cities and futuristic multibillion-dollar gated communities have been influenced by the high demand for good quality housing and plush office spaces. The move to introduce Real Estate Investment Trusts (REITS) by the Capital Markets Authority (CMA) is another boost to the sector players. These plans will make real estate companies to be listed in the Nairobi Securities Exchange (NSE).

2.4 Empirical Review

Muli (2011) conducted a study on the relationships between house prices and mortgage credit in Kenya. She investigated the relationship between real house price and real disposable income and interest rate after tax. The study concluded that there

was a strong positive correlation between real house prices and real disposable income. It also found a strong positive correlation between real house prices and real interest rate after tax. The association between real house price and real household debt was found to have positive relationship; house turnover and housing price were found to have positive correlation as well as real house price and house stock. She concluded that a cause-effect relationship exists between the variables and the movement of these variables can push prices of houses higher through liquidity effects.

Marete (2011) studied what determined the prices of property in Kenya's Kiambu County. Questionnaires were used to collect the primary data and a survey design was also adopted. The study done found out the Kiambu County location was the main determinant of the cost of property prices. Here, the property's value was determined by its location unlike where most properties prices are determined by demand and supply. When pricing an asset, the seller will consider many factors but key among them is the cost of creating or adding value to that asset as well as the perceived and real demand of that asset.

The consumer's durables immediate demand and interest rate relationship was determined by Kau and Keenan (1980). Determination of the expected revenue from the property must be done, this is done through estimation from the rents paid by other properties close by. A property's income-generating capacity can be found through the gross income multiplier approach. Properties in the same area are expected to generate almost the same income. Before deducting the expenses of an operating property, the total gross income is thus calculated. Forecasting of vacant rates is also done.

According to Kau and Keenan (1980), the people who have cash money in their banks and don't have to apply for loans are not affected by interest rates. The suppliers are affected by demand as low demand results form increase in interest rates while prices decrease and thus the supply is lee. Follain (1986) argued that interest rates influence the growth of real estate markets as the loans are influenced by the amount of interest being charged which the affects the mortgage rates thus affecting the price of the homes and the rent to be charged. The price of homes are affected by the amount of mortgage laid and these affects the mode of acquiring a real estate.

kimemia (2003) investigated the role of interest rates on housing prices in Hong Kong for the period from 1981 to 2001. They used the correlation and regression analysis as well as the Granger causality test to establish the relationship between the two variables during the times of inflation and deflation; they found that housing prices displayed a moderately high correlation with interest rates in the deflationary period (1998-2001), positive effect of interest rates.

Public policies such as administration, taxation, credit controls, land use controls and provision of new buildings affect property markets in Kenya (Syagga, 1999). Prices of real estates are affected by interest rates as they are the main factors used by Central Bank of Kenya to control credit and inflation. The performance of real estates in Nairobi central business district were studied by (Njiru, 2008). Compared to the financial sector, the study found that regulations and monitoring were not well done in real etate investments.

Nairobi's value for residential property and how it was affected by location was conducted by Mulaku and Kamau (2010) on a computer-assisted analysis. Buruburu, Karen and Wetlands were the areas where the study was conducted. The value for real estate property was found to be significantly affected by the location. Factors such as

distance to CBD, area of parcel, and distances to desirable amenities were found to be the main determinants of value of property in the areas of Buruburu, Karen, and Westlands. Real estate demand and prices are lowered through the rise of interest rates and increase in obtaining of mortgages. Investment demands and capital are also affected by the interest rates. Property prices are affected by the influence of the supply and demand for property through capital flow. Real estate investments are affected by change in prices which are also affected by returns through the interest rates. Decrease in bonds are seen when the interest rates are high, and the bonds increase when there is decline in interest rate while the coupon rate becomes much more desirable (Mulaku & Kamau, 2010).

Omboi (2011) did a study on how Meru's County's what factors influenced real estate prices. The variables used in this study are income of real estate investors, location of a real estate property, demand and realtors and brokers. Income from real estate property was found to be the key factor influencing real estate property prices in Meru Municipality accounting for all factors in constant for almost 80% of the property prices. The rest of the 20% was found to be influenced by demand. Property prices in Meru Municipality were insignificantly affected by property's location and realtors and brokers.

Smith and Smith (2006) indicated that the relationship that exists between low interest rates and house price bubbles is very weak. Several researches have been done on real estate bubbles in different countries. Ilou, (2010) conducted a study in two cities in China (Beijing and Shanghai). A housing price bubble had been formed by Beijing between 2005 and 2008. A bubble was however found to have existed since 2003 to 2004. The peak stage (1991-1997), cycle trough stage (1998-2003) and the second

cycle peak stage (2004-2008) were later formed in Beijing's market due to the bubble. USA also had a bubble in the 1990s in the housing sector and also the stock bubble.

The bubble caused and increased demand for housing which led to increase in house prices. The increase of prices of houses rose high in the year 1990 due to the low interest rates that had been given by the central bank. The average rate was about 25% which was on the higher side. Mortgages went up of the houses and this also affected the rate of how people saved and used their money.

There was lack of support in prices in the year 2007 when the bubble began due to the building boom that brought up the oversupply of building. The year 2008 recorded the largest price drops in the number of homes that had started to reduce from 2006 according to the Case and Shiller home price index (2008) report. The prices went down after an increase in interest rates were made in the USA, as decline in interest rates means an increase in the home prices (Baker, 2008). The increase in house prices mostly shows that a bubble is likely to occur. However, Cuevas and Graham, (1985) studies show that lenders as price-setters of explicit and implicit charges on loans which can either increase or lower the cost of borrowing. The interpretation of this result in the Honduras study (1983 survey) was that the range within which interest rates could vary was too narrow to elicit any meaningful response by the participants in the market. Property purchases have been faced by many cases of fraud in Kenya. There were many properties that were destroyed by the Kenyan government in November 2011 in the case that they stood at public land (Nyagah, 2012).

Muthaura (2012) looked at how interest rates and real estate development related to each other in Kenya. Kenyan rates of interest and how they affected investment in real estates was established. The simple user cost model was used to analyse the research problem. A sample of 18 mortgage lending banks in Kenya was used out of the whole

targeted population of 35 as at November 2010 in analysing the research problem. Data of between 2007-2011 was collected by use of data collection forms of the sampled 18 mortgage lending banks. They found that house prices were affected by interest rates as house prices were increased by retail borrowers and the investors so as to be able to pay the money borrowed to ensure that an even break is created.

2.5 Research Gaps

In different aspects, shortcomings have been found in all the theories discussed. These limitations have been experienced due to the fact that theories are people's assumptions in changes of economic influence. Most of the financial practitioners use the loanable funds theory which also has its share of limitations. Most of the factors affecting markets are influenced by the loanable funds theory. The limitations found in the theories are due to lack of balance between savings and investments, supply and demands, loanable funds supply and demand of foreign net and exports required.

Investing is influenced by liquidity as preference which affected economic units as asserted by Liquidity preference theory. The future interest rates are affected by the premium currently being offered according to this theory. Scarce liquid resources are paid thorough premiums.

Prediction of future expenditures rely upon liquid assets which are hard and they also affect the purchase of goods and services as economic units in liquidity's preference. Liquidity theory works with almost the same terms as classical theory in its short term

nature of considering the supply and demand for money as the determinants of interest rates.

In the Keynesian Theory, Keynes stated that the rate of interest is determined by the supply of money and the desire of holding money. Loss of liquidity is payments of interest rate, being a liquid asset. Transactions precautionary and speculative are the three motives that explain holding of money as formulated by Keynes, which is not the case since many factors come into play thus a gap.

Classical theory uses forces in demand and supply to determine the rate on interest. Investment demands are what demands are termed as while supply of savings are the supplies. The saving amount paid is what this theory terms as interest. The demand at which borrowing takes place is compared to the savings supply according to the classical theory. Classical theory uses forces in demand and supply to determine the rate on interest. Investment demands are what demands are termed as while supply of savings are the supplies. The saving amount paid is what this theory terms as interest. The demand at which borrowing takes place is compared to the savings supply according to the classical theory thus a gap is left because focus on demand and supply factors is a limitation since here are other factors that come into play in determination of interest rates.

The government's legal provisions that are stable and infrastructure increase. The growth and purchase of real estate has grown in Nairobi, coastal areas, The Kenya's Rift valley and the Western frontier due to good roads, access to financial services, utilities, and effective means of communication.

Demand and supply is affected by the forces that influence them. A report by the Kenya National Bureau of Statistics shows that there has been rapid growth in the purchase and demand for real estates in the urban areas compared to the rural areas with an increase of five times. This demand has resulted from the fact that most of the Kenyan citizens, staff members from various republics and other agencies such as UN, foreign companies and multinationals tend to look for good homes near the urban centres.

2.6 Conceptual Framework

As per the topic on the study of effect of interest rates on the growth of the real estate market in Kenya, the major variables were as per the below figure.

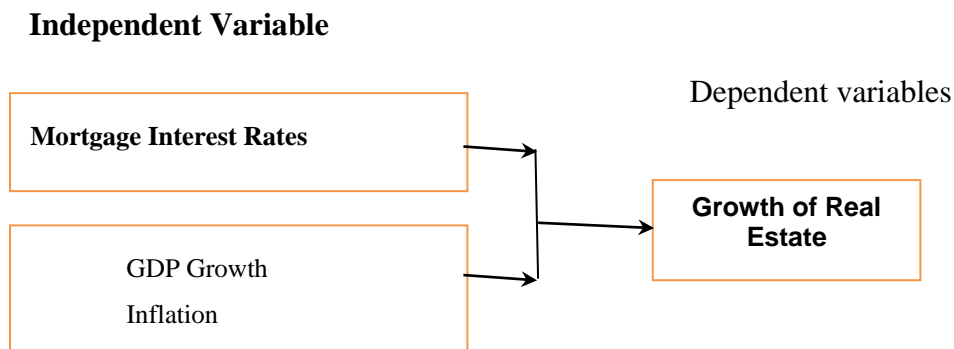


Figure 2.1 Conceptual Framework

Source: Author, 2018

Mortgage interest rate- Investment demands and capital are also affected by the interest rates. Property prices are affected by the influence of the supply and demand for property through capital flow. Real estate investments are affected by change in prices which are also affected by returns through the interest rates. When there is destabilization in the credit markets, changes in rates are also affected. Prices of property are thus affected greatly by interest rates whether low or high according as flow of capital is also affected.

Inflation -when there is too much money in circulation in the market the house prices tend to go up thus making it so difficult to acquire real estates.

GDP-Economy -An increase in real GDP would increase the income of the population in the economy resulting in increased demand for real estate through higher prices of primary property and higher rentals.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter expounds on the various stages and phases that were followed in completing the study. It is a preview of the research method, the target population and the sample that was used, the data collection method and how the data gathered was analysed. This helped in achieving the objectives of the study and also reported the findings in an organized manner.

3.2 Research Design

The study was conducted using correlation study design to show the nature of relationship between changes in interest rates and growth of real estates in Kenya. The relationship between change in interest rates and growth of real estates in Kenya was best handled using correlation analysis as it is a joint relationship of the variables but not a causal relationship, where it shows the nature of the relationship between the research variables and the direction of the relationship Mugenda, (2005).

3.3 Data Collection Methods

The study used secondary data that included mortgage interest rates, inflation, GDP growth and real estate growth as captured by mortgage value of the commercial banks that offer mortgages. Data was collected quarterly for a period of 11 years from the year 2007 to the year 2017. The secondary data was obtained from, Kenya commercial banks that offer mortgages and Kenya National Bureau of Statistics.

3.4 Data Analysis

The process of collecting data, interpretation of the data and its processing is the whole process that involves data analysis Mugenda and Mugenda, (2003). Data was analysed using a linear regression model in order to relate interest rate volatility and real estate growth in Kenya. The model treated real estate growth captured in terms of the value of real estate mortgage as the dependent variable while the mortgage interest rate was the independent variable. Statistical Package for Social Sciences (SPSS) was used to aid in the analysis.

Multiple linear regression model was used and this model helped in bringing out the effects of interest rates volatility on real estate growth. The regression model was as follows:

$$\text{Ln}(y) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where;

Log y = Dependent variable (Growth of Real Estate measured by natural logarithm of the quarterly investments in real estate, that is real estate mortgage value)

α = regression constant,

$\beta_1 - \beta_3$ = Regression coefficients (change in y for every unit change in X)

X_1 = Quarterly Mortgage Interest Rate Volatility

X_2 = Inflation

X_3 = GDP Growth

e = Error term

3.5 Measurement of variables

3.5.1 Real Estate Growth

Real estate growth was measured by the value of investments in real estate. The study measured the real state growth by the value of mortgages from all the commercial banks in Kenya in the study period. Natural logarithm of the value was established.

3.5.2 Interest Rates Volatility

Charges that occur when one borrows money and paid together with the money borrowed is called interest rate. This includes mortgages interest rates in the study. The volatility of mortgage interest rate was represented by the quarterly realized volatility. This was calculated using the standard deviation of the mortgage interest rates by the commercial banks.

3.5.3 Inflation

The commodities increase generally is called inflation. Interest rates are also affected by inflation as the increase in interest rates is due to increase in inflation and vice versa. The year's base price is expressed in a quarterly

$$\text{Inflation} = \frac{\text{CPI 2} - \text{CPI 1}}{\text{CPI 1}} * 100$$
 is the inflation's annual percentage.

3.5.4 Gross Domestic Product Growth

Inflation and price changes are economy's size measures. The services and final goods are measured in constant prices in an economy's income. The current year's prices are multiplied with the prices of year base.

3.6.5 Diagnostic Tests

Since the study adopted a linear regression model, the assumptions of linear regression were observed first before running the regression model. The study conducted multicollinearity test, autocorrelation tests and normality test to ensure that these assumptions were not violated. Multicollinearity was tested using Variance Inflation factor method (VIF) where a value above 10 is an indication of multicollinearity. Durbin Watson test was used to test for autocorrelation where a value of 2 indicates no presence of serial correlation. Kolmogorov Smirnov test of normality was used to test for normality of the dependent variable. A significance value greater than 0.05 indicates that the null hypothesis of normality is not rejected and vice versa.

3.6.6 Test of Significance

The study tested whether the effect of interest rates on real estate growth was significant by using a level of significance set at 5%. If the significance of the beta coefficient of the regression model is less than 0.05, then a significant relationship exists and vice versa.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

In this chapter, the study sets out to present the findings of the study. This includes examination of the response rates followed by general information/demographic information about the respondents. After the demographic variables were examined, some in-depth results of the different aspects of the study were elaborated.

4.2 Trend Analysis

The study established the trends to indicate the changes in the study variables over the study period spanning 11 years. Secondary data was used for the study. Trend analysis has been conducted per objective of the study.

4.2.1 Trend Analysis of Real Estate Growth

The study measured real estate growth in terms of the mortgage value across the mortgage offering commercial banks in Kenya. The natural logarithm of the mortgage was obtained. Trends for the 11 years, 3 quarters every year were established as shown in Figure 4.1. The findings indicate an unsteady trend in the growth of real estate in Kenya in the study period. The value has however been increasing unsteadily over the years.

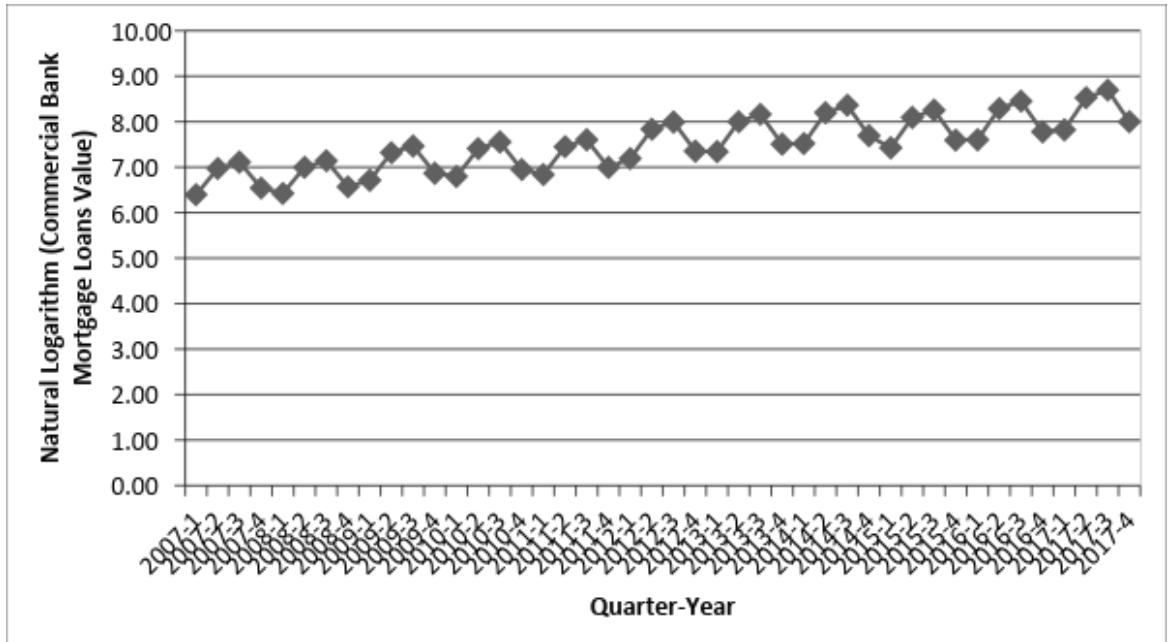


Figure 4.1 Trends of Real Estate Growth

4.2.2 Trend Analysis of Interest Rates Volatility

The study established the volatility of the average mortgage interest rate for the commercial banks offering mortgages in the study period and established trend analysis. The findings are presented in Figure 4.2. The findings similarly showed unsteady, increasing and decreasing trends in the volatility of the mortgage interest rates. The trends show that it cannot conclusively be argued that the volatility has steadily been increasing or steadily been decreasing.

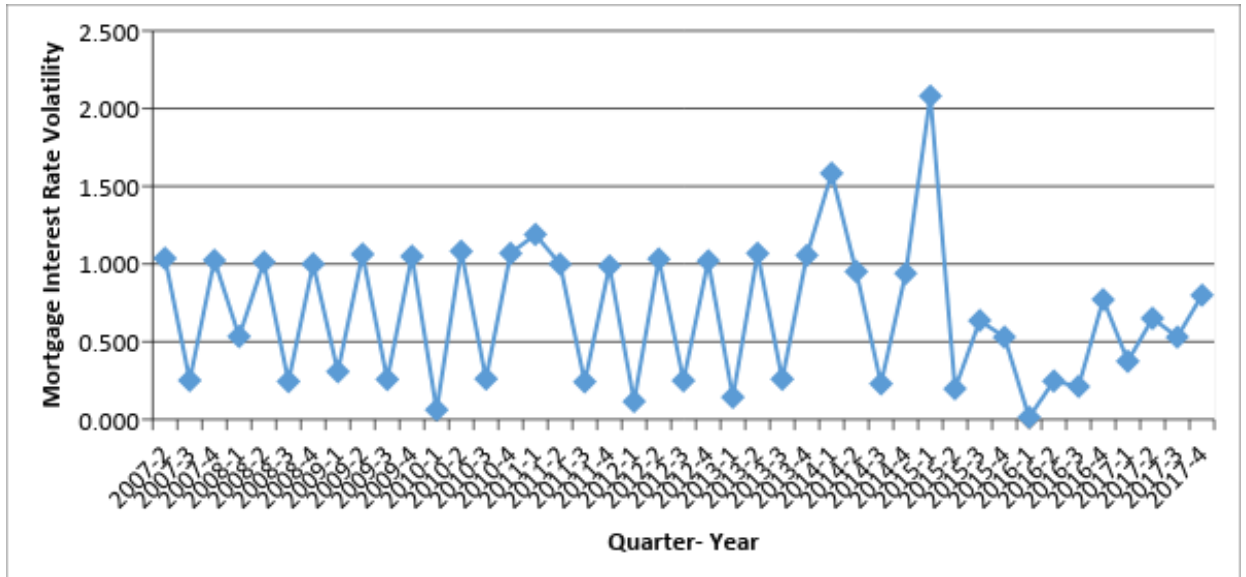


Figure 4.2 Trends of Mortgage Interest Rate Volatility

4.2.3 Trend Analysis of Inflation

The study established the rate of quarterly inflation rate in the study period and established trend analysis. The findings are presented in Figure 4.3. The study findings indicated that the inflation rate in Kenya keeps fluctuating over the years. However, the highest inflation rate experienced in Kenya which is up to date a record is the last quarter of the year 2018. The year 2010 had the lowest rate of inflation in Kenya.

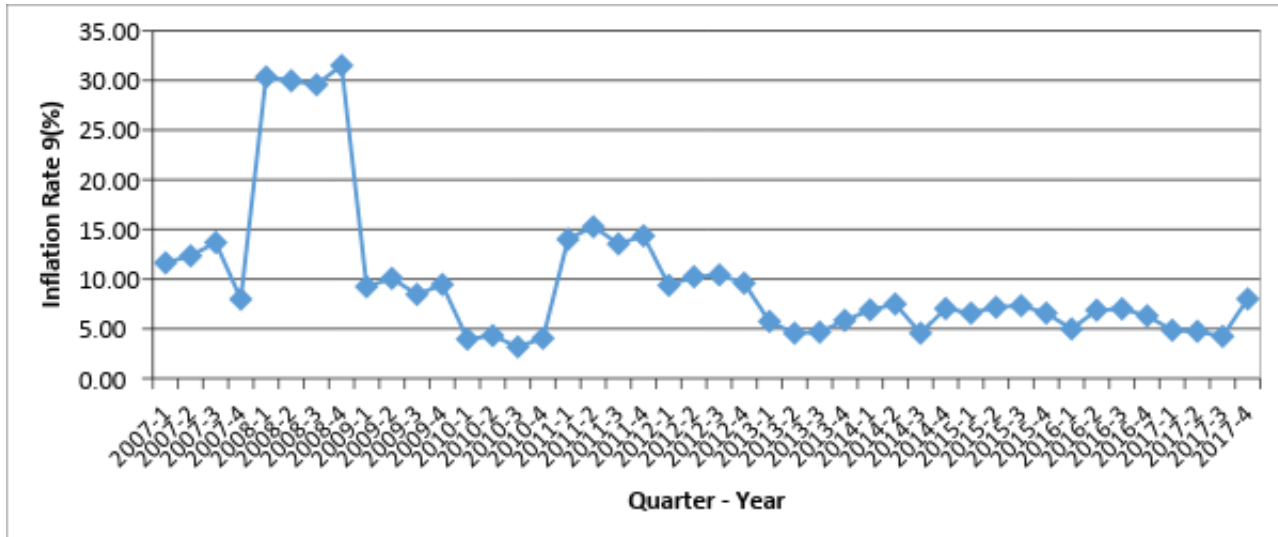


Figure 4.3 Trends of Inflation Rate

4.2.4 Trend Analysis of Gross Domestic Product Growth

The study also established the changes in the GDP growth over the study period and established trend analysis. The findings are presented in Figure 4.4. The findings indicated that the trends in GDP have been unsteadily increasing and decreasing over the study period. However, the same tend to be highest in the year 2010 and lowest in the year 2008. This can be attributed to the post-election violence of that period in Kenyan history. However, after rebuilding, the trends improved in the years that followed.

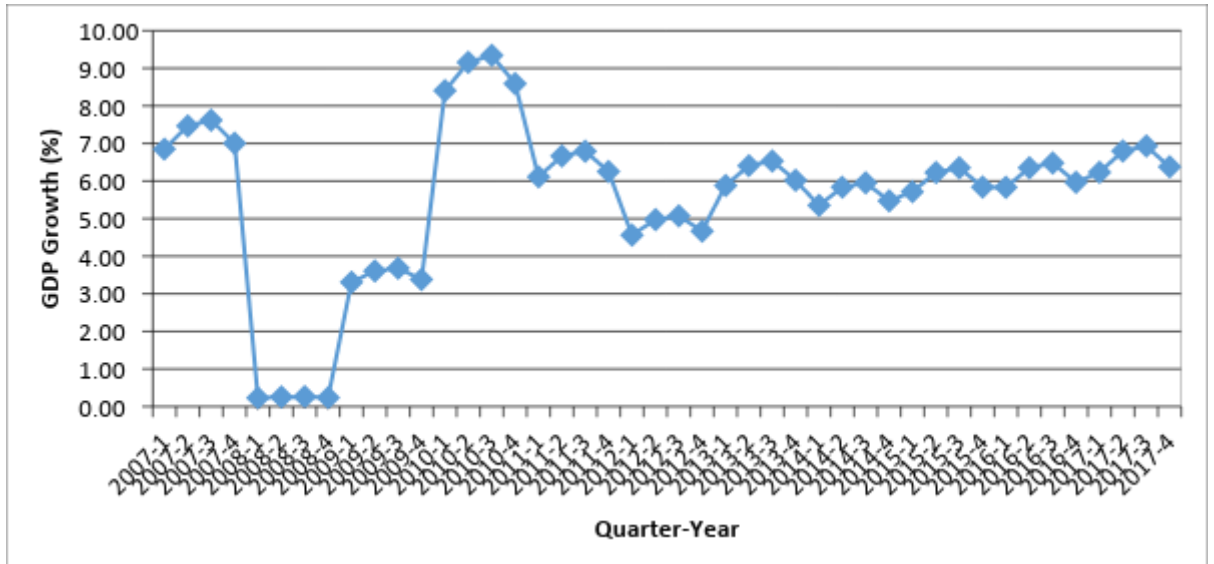


Figure 4.4 Trends of GDP Growth

4.3 Diagnostic Tests

Since the study was using linear regression analysis, there was a need to conduct diagnostic tests to ensure that the assumptions of linear regression model were not violated. Among the tests conducted was multicollinearity test, autocorrelation test and normality test.

4.3.1 Multicollinearity Test

The study conducted the test to ensure that the independent variables in the study were not highly correlated with each other. This is because high correlations among them lead to false standard errors which give false t values and significance of relationships as well. The study adopted the variance inflation factor (VIF) test where values below 10 were the cut-off points. The findings showed that the VF values were below 10 hence there was no problem of multicollinearity among the predictor variables. A regression model was hence suitable for the study.

Table 4.1 Variance Inflation Factor Test of Multicollinearity

	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Mortgage Interest Volatility	0.994	1.006
GDP Growth	0.385	2.595
Inflation	0.385	2.598

4.3.2 Test of Autocorrelation

Autocorrelation test establishes whether the error term is correlated since the data was collected over a period of 11 years. In most cases, when the error term is correlated, it leads to spurious standard error which gives false results. Durbin Watson test was used to establish whether the problem of autocorrelation existed before the data was used to run a linear regression model. The findings in Table 4.2 indicated that the value of DW was 1.973 which agrees that there was no problem of autocorrelation since its approximately 2. A regression model was therefore suitable for the study.

Table 4.2 Durbin Watson Test of Autocorrelation

Test	Statistic
Durbin Watson	1.973

4.3.3 Normality Test

Normality of the dependent variable was also checked to ensure that this assumption was not violated. The study used Kolmogorov Smirnov test of normality to establish the normality of the dependent variable. An insignificant value leads to failure of rejecting the null hypothesis which is for normality. From Table 4.3, the Sig value =

0.553 which shows that the data was normally distributed hence a regression model was suitable.

Table 4.3 Kolmogorov Smirnov Test of Normality

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Real Estate Growth	0.071	44	.200*	0.978	44	0.553
* This is a lower bound of the true significance.						
a Lilliefors Significance Correction						

The findings were confirmed in Figure 4.5 as shown below. The data portrayed a bell shape to mean that it was normally distributed with no left or right outliers. This confirmed the Kolmogorov Smirnov test that a linear regression model was suitable.

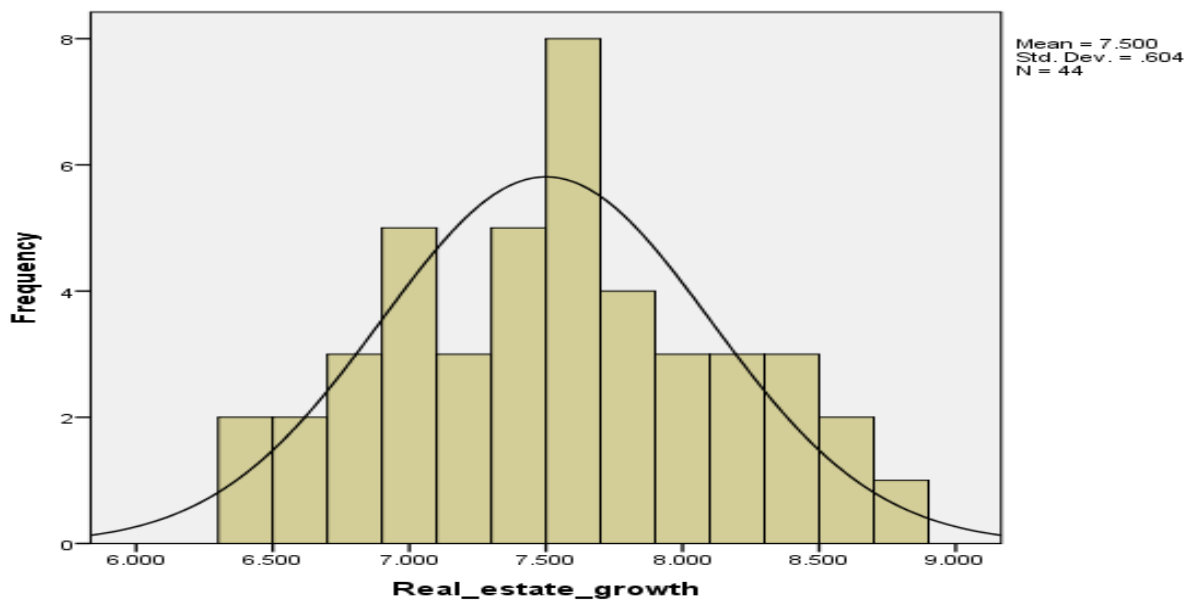


Figure 4.5 Normality Curve

4.4 Correlation Analysis

Correlation analysis was conducted to establish the direction of association between the variables used in the study. The findings indicated that inflation rate was negatively and significantly associated with real estate growth in Kenya ($r = - 0.514$, $\text{Sig} = 0.000$, < 0.05). These findings imply that in the study period, an increase in inflation rate leads to a significant reduction in the real estate growth in Kenya.

The study findings also revealed that mortgage interest rate volatility was negatively and significantly associated with real estate growth in Kenya ($r = - 0.319$, $\text{Sig} = 0.030$, < 0.05). These findings imply that in the study period, an increase in mortgage interest rate volatility leads to a significant reduction in the real estate growth in Kenya.

The study findings lastly showed that GDP growth had a positive but weak and insignificant association with real estate growth in Kenya ($r = 0.091$, $\text{Sig} = 0.556$, > 0.05). These findings imply that in the study period, an increase in GDP growth increased real estate growth but the increase was not significant.

Table 4.4 Correlation Matrix

		Inflation	GDP Growth	Mortgage Interest Volatility	Real Estate Growth
Mortgage interest volatility	Pearson Correlation		-0.077	0.068	
GDP Growth	Pearson Correlation	-.784**	1		
	Sig. (2-tailed)	0			
Inflation	Pearson Correlation	1		1	
	Sig. (2-tailed)	0.619	0.661		
Real Estate Growth	Pearson Correlation	-.514**	0.091	-.319*	1
	Sig. (2-tailed)	0.000	0.556	0.030	
	N	44	44	44	44
* Correlation is significant at the 0.05 level (2-tailed).					

4.5 Regression Analysis

After the diagnostic tests indicated that an ordinary linear regression was suitable, the study adopted this regression model. This was to establish the change in real estate growth given changes in inflation, interest rate volatility and GDP growth. The model summary findings are shown in Table 4.5. The findings showed that the coefficient of determination (R square) was 0.299 which indicated that Mortgage interest volatility, GDP Growth and Inflation rate jointly account for up to 29.9% of the variation in the growth of real estate in Kenya in the study period. Therefore, other factors not studied account for the remaining 71.1% of the variation in the growth of real estate in Kenya.

Table 4.5 Model Summary

R	R Square	Adjusted Square	R	Std. Error of the Estimate
.546	0.299	0.246		0.524689
Predictors: (Constant), Mortgage interest volatility, GDP Growth, Inflation				

The study also established the model fitness of the regression model as shown in Table 4.6. The findings showed that the F statistic in this case 5.676 was significant at 5% level of significance (Sig = 0.002, < 0.05). This implies that the regression model developed to predict real estate growth given inflation, interest rate volatility and GDP growth was fit.

Table 4.6 ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.688	3	1.563	5.676	.002
Residual	11.012	40	0.275		
Total	15.7	43			
Dependent Variable: Real Estate Growth					
Predictors: (Constant), Mortgage interest volatility, GDP Growth, Inflation					

To establish the relationship between the study variables, a regression model coefficient was used as shown in Table 4.7. The findings indicated that inflation has a negative and significant effect on real estate growth in Kenya (Beta = - 0.058, Sig = 0.002, < 0.05). This means that an increase in inflation rate by one unit, leads to a significant decrease in real estate growth in Kenya by 0.058 units. The findings also indicated that mortgage interest rate volatility has a negative and significant effect on real estate growth in Kenya (Beta = - 0.169, Sig = 0.032, < 0.05). This means that an

increase in mortgage interest rate volatility by one unit leads to a significant decrease in real estate growth in Kenya by 0.169 units. It was also shown that GDP growth has a positive but not significant on real estate growth in Kenya (Beta = 0.060, Sig = 0.322, > 0.05). This means that an increase in GDP growth by one unit, leads to an insignificant increase in real estate growth in Kenya by 0.060 units.

Table 4.7 Regression Model Coefficient

Predictors	B	Std. Error	t	Sig.
Mortgage interest volatility	-0.169	0.083	-2.036	0.032
Inflation	-0.058	0.018	-3.238	0.002
GDP Growth	0.060	0.060	1.002	0.322
(Constant)	8.523	0.507	16.82	0.000
Dependent Variable: Real Estate Growth				

Therefore, the resulting regression model becomes:

$$\text{Real Estate Growth} = 8.523 - 0.058 (\text{Inflation}) - 0.169 (\text{Mortgage interest volatility})$$

4.6 Discussions of Major Findings

The findings indicated that mortgage interest rate volatility has a negative and significant effect on real estate growth in Kenya which implies that an increase in mortgage interest rate volatility leads to a significant decrease in real estate growth in Kenya. It can be argued that when mortgage interest rate volatility increase, it distorts the saving plans of the mortgage consumers which in turn affects their demand for mortgage. The findings are consistent with Kau and Keenan (1980) who suggested an inverse relationship between interest rates and the immediate demand for consumer durables. Similarly, Kau and Keenan (1980) established that higher interests rates were associated with lower demand for houses hence lower real estate growth.

The study findings also showed that inflation has a negative and significant effect on real estate growth in Kenya which implies that an increase in inflation rate leads to a significant decrease in real estate growth in Kenya. The findings are in congruence with the findings of Won, *et. al*, (2003) who revealed that higher inflation rates lowered the demand for houses thus reducing real estate growth.

It was also shown that GDP growth has a positive but not significant effect on real estate growth in Kenya which implies that an increase in GDP growth leads to an insignificant increase in real estate growth in Kenya. The findings are consistent with the findings of Muthaura (2012) and Nyagah (2012) who argued that macro-economic factors also determined the demand and growth of real estate investments in Kenya.

4.7 Chapter Summary

The study focused on establishing the effect of interest rates on the growth of real estate in Kenya. Using secondary data spanning 11 years between the year 2010 and 2017, the study established that there has been fluctuations in GDP growth in Kenya, real estate growth, inflation and interest rate volatility in the study period. In addition, the study established that inflation has a negative and significant effect on real estate growth in Kenya which implies that an increase in inflation rate leads to a significant decrease in real estate growth in Kenya. The findings also indicated that mortgage interest rate volatility has a negative and significant effect on real estate growth in Kenya and GDP growth has a positive but not significant effect on real estate growth in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Findings

The main aim of the study was to establish the effect of interest rates on the growth of real estate in Kenya. The study collected secondary data spanning 11 years between the year 2007 and 2017 and adopted regression analysis to establish the relationships. The study also conducted trend analysis which showed that there have been unsteady fluctuations in GDP growth in Kenya, real estate growth, inflation and interest rate volatility in the study period.

The inferential findings from the correlation and regression analysis showed that inflation has a negative and significant effect on real estate growth in Kenya which implies that an increase in inflation rate leads to a significant decrease in real estate growth in Kenya. The findings also indicated that mortgage interest rate volatility has a negative and significant effect on real estate growth in Kenya which shows that an increase in mortgage interest rate volatility leads to a significant decrease in real estate growth and that GDP growth has a positive but not significant effect on real estate growth in Kenya. Implying that even with an increase in GDP, people don't necessarily buy housing units.

5.2 Conclusions

The study concludes that inflation is an important determinant of the growth of the real estate in Kenya and it affects the growth negatively and significantly. The study also concludes that the stability of the interest on mortgages is important if the real estate in Kenya was to grow. High volatility affects the growth of real estate

negatively and significantly. The study lastly concluded that GDP growth is not a significant factor in the growth of real estate in Kenya to mean that even with an increase in GDP, people don't necessarily buy housing units in Kenya and hence GDP growth should not be used as an indicator of the demand for housing units in Kenya.

5.3 Recommendations

To the real estate investors, the study recommends that there is a need to be cautious of the inflation rate and the mortgage interest rates fluctuations when making investment decisions. Similarly, to the real estate developers, there need to be a caution when making real estate investment decision since an increase in GDP does not necessarily mean an increase in demand of housing units in Kenya. To the regulator and monetary policy maker, CBK, the study recommends a careful analysis of the market in order to manage the monetary factors like inflation since its effect on the development agenda of the country is negative given that housing is one of the big four agenda of the current administration.

5.4 Limitations of Study

Despite the fact that rigorous efforts were made to ensure that the results of the study are admissibly accurate, it is worth acknowledging the fact that no study can feasibly be free of limitations. The study period can well be a limitation of this study given only an 11 year period was targeted by the study. Similar findings might not necessarily be achievable given a different set of years.

5.5 Areas for Further Study

Future studies on the same theme can seek to establish the determinants of real estate growth from the demand side where the opinion of the consumers can be sought through primary data. Future studies can also seek to expand the time period to cover a wider scope other than just 10 years. Since the study established that Mortgage interest volatility, GDP Growth and Inflation rate jointly account for up to 29.9% of the variation in the growth of real estate in Kenya in the study period, it means that other factors not studied account for the remaining 71.1% of the variation in the growth of real estate in Kenya. Other studies can therefore be conducted to establish the other factors which affect real estate growth such as population, employment rate and per capita income.

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APPENDICES

Appendix I : Data Set

Year	Real Estate Growth (Natural Log Mortgage Amount)	Mortgage Interest rates	Inflation	Economic Growth
2007-1	6.40	16.29	11.64	6.85
2007-2	6.97	17.75	12.34	7.47
2007-3	7.11	18.11	13.67	7.62
2007-4	6.54	16.66	7.99	7.01
2008-1	6.42	15.90	30.34	0.23
2008-2	7.00	17.33	29.98	0.25
2008-3	7.14	17.68	29.56	0.26
2008-4	6.57	16.26	31.50	0.24
2009-1	6.71	16.70	9.23	3.31
2009-2	7.32	18.20	10.07	3.60
2009-3	7.46	18.57	8.45	3.68
2009-4	6.87	17.08	9.45	3.38
2010-1	6.80	16.99	3.96	8.40
2010-2	7.41	18.52	4.32	9.16
2010-3	7.55	18.89	3.18	9.34
2010-4	6.95	17.38	4.05	8.59
2011-1	6.84	15.70	14.02	6.11
2011-2	7.45	17.11	15.28	6.66
2011-3	7.60	17.45	13.56	6.80
2011-4	6.99	16.06	14.34	6.25
2012-1	7.19	16.22	9.38	4.56
2012-2	7.84	17.68	10.22	4.97
2012-3	7.99	18.04	10.43	5.07
2012-4	7.35	16.59	9.59	4.67

2013-1	7.34	16.80	5.72	5.88
2013-2	8.00	18.31	4.56	6.41
2013-3	8.16	18.67	4.67	6.54
2013-4	7.51	17.18	5.85	6.01
2014-1	7.52	14.94	6.88	5.35
2014-2	8.20	16.29	7.50	5.83
2014-3	8.36	16.61	4.56	5.95
2014-4	7.69	15.28	7.03	5.47
2015-1	7.43	12.34	6.58	5.71
2015-2	8.09	12.06	7.17	6.23
2015-3	8.26	11.16	7.32	6.35
2015-4	7.59	11.91	6.58	5.84
2016-1	7.60	11.89	4.98	5.83
2016-2	8.29	12.24	6.86	6.35
2016-3	8.45	11.94	7.00	6.48
2016-4	7.78	13.03	6.32	5.96
2017-1	7.82	12.50	4.85	6.23
2017-2	8.52	11.58	4.73	6.79
2017-3	8.70	12.33	4.24	6.93
2017-4	8.00	11.20	7.99	6.38