

**THE EFFECT OF INTEREST RATES ON MORTGAGE UPTAKE
IN FINANCIAL INSTITUTIONS IN KENYA**

NYAKUNDI DAISY NYANCHOKA

D63/74084/2014

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

NOVEMBER 2015

DECLARATION

This research project is my original work and has not been presented for any award to any examination body.

Signed: _____ Date: 22/11/2015

Nyakundi Daisy Nyanchoka

D63/74084/2014

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

Signed: _____ Date: _____

Dr. Mirie Mwangi

Senior Lecturer,

Department of Finance and Accounting, School of Business

University of Nairobi

ACKNOWLEDGEMENT

I am very grateful to the Lord for his grace, strength and health to do this work. My most sincere appreciation goes to my supervisor Dr. Mwangi Mirie, who patiently guided me right from the proposal stage and finally to completion of this research project

My immense appreciation goes to my dearest mother whose unconditional love and support ensured completion of this work. I cannot thank you enough ‘mama’. I’m also thankful for the support of my colleague, Onyango Dickson, who gave me useful information which assisted in completing this work. To my family Ongeru, Momanyi and Arasa – thank you. Indeed I am very grateful to you all and to many other relatives, workmates and friends whose names I cannot mention individually I entrust God to reward you abundantly.

DEDICATION

This research paper is dedicated to my loving late father – Nyakundi Fredrick

‘Together forever’

TABLE OF CONTENTS

DECLARATION.....	ii
ACKNOWLEDGEMENT.....	iii
DEDICATION.....	iv
LIST OF FIGURES	viii
LIST OF TABLES	ix
ABBREVIATIONS.....	x
ABSTRACT.....	xi
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background of the Study	1
1.1.1 Mortgage Uptake	3
1.1.2 Interest Rates.....	4
1.1.3 Mortgage Uptake and Interest Rates.....	4
1.1.4 Financial Institutions Offering Mortgages in Kenya	5
1.2 Research Problem	6
1.3 Research Objective	9
1.4 Value of the Study	9
CHAPTER TWO	10
LITERATURE REVIEW	10
2.1 Introduction.....	10
2.2 Theoretical Review	10
2.2.1 Title Theory and Lien Theory of Mortgages	10
2.2.2 Classical Theory of Interest	11
2.2.3 Liquidity Preference Theory	12
2.3 Determinants of Mortgage Uptake.....	13
2.3.1 Interest Rate	13
2.3.2 Inflation.....	14
2.3.3 Money Supply.....	14
2.3.4 Gross Domestic Product	15

2.4 Empirical Review.....	16
2.5 Summary of the Literature Review.....	19
CHAPTER THREE.....	21
RESEARCH METHODOLOGY.....	21
3.1 Introduction.....	21
3.2 Research Design.....	21
3.3 Population of the Study.....	21
3.4 Data Collection Procedure.....	21
3.5 Data Analysis.....	22
3.5.1 Analytical Model.....	22
3.5.2 Test of Significance.....	23
CHAPTER FOUR.....	24
DATA ANALYSIS, RESULTS AND DISCUSSION.....	24
4.1 Introduction.....	24
4.2 Response Rate.....	24
4.3 Data Analysis and Findings.....	25
4.4 Descriptive Statistics.....	25
4.4.1 Variables Trend.....	26
4.5 Inferential Statistics.....	30
4.5.1 Correlation Analysis.....	30
4.5.2 Regression Analysis.....	31
4.6 Interpretation of the Findings.....	34
CHAPTER FIVE.....	36
SUMMARY, CONCLUSIONS AND RECOMMENDATION.....	36
5.1 Introduction.....	36
5.2 Summary of the findings.....	36
5.3 Conclusion.....	37
5.4 Recommendations for Policy.....	38
5.5 Limitations of the Study.....	39
REFERENCES.....	41
APPENDICES.....	46

Appendix I: List of Commercial Banks in Kenya	46
Appendix II: Research Data.....	46

LIST OF FIGURES

Figure 4.1: Trend in money supply.....	27
Figure 4.2: Trend in GDP	27
Figure 4.3: Trend in inflation.....	28
Figure 4.4: Trend in the value of mortgage uptake.....	29
Figure 4.5: Trend in interest rate.....	30

LIST OF TABLES

Table 4.1: Response rate	24
Table 4.2: Descriptive statistics	25
Table 4.3: Correlation analysis	31
Table 4.4: Model summary	32
Table 4.5: Analysis of Variance.....	33
Table 4.6: Regression Coefficients	34

ABBREVIATIONS

AfDB: African Development Bank

ANOVA: Analysis of Variance

CBK: Central Bank of Kenya

CPI: Consumer Price Index

GDP: Gross Domestic Product

KNBS: Kenya National Bureau of Statistics

KSH: Kenya Shillings

USA: United State of America

USD: United States Dollar

ABSTRACT

Financial institutions play the role of provision of credit facilities to both businesses and individuals. Empirical evidence has always shown that access to finance even in form of credit, has a profound effect on access to and affordability of basic, decent commodities. Such credit facilities include, among others, mortgage loan which is influenced by interest rate and other macro and micro economic factors. Despite the intervention of the central bank on the interest rate charged on mortgages by mortgage providers, interest rate has persistently remained high hindering mortgage uptake. The objective of this study was to investigate the effect of interest rates on mortgage uptake in financial institutions in Kenya. This study employed descriptive research design and multiple regressions analysis. The study covered the period between 2004 and 2013 with a sample size of 44 firms offering mortgage financing. Secondary quarterly data was collected from Kenya National Bureau of Statistics and Central Bank of Kenya. The study findings established a coefficient determinant of 95.1%. Money supply, interest rate and inflation were found to significantly affect mortgage uptake while GDP was found to be insignificant. The study concluded that interest rate negatively affects mortgage uptake and an increase in interest rate will lead to a decrease in mortgage uptake. The study therefore recommended that government should intervene to monitor interest rates and maintain it at reasonable levels to enhance mortgage uptake in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

A mortgage is said to be a security for the performance of an act while a mortgage loan is a loan secured by real property through the use of a mortgage note which evidences the existence of the loan and the encumbrance of that realty through the granting of a mortgage which secures the loan (Schmudde, 2004). One of the prime functions of the financial institutions is the provision of credit facilities for both businesses and individuals. Such credit facilities include mortgage loans. Commercial banks and mortgage finance institutions are the dominant players in mortgage credit provision at a 'price' known as interest rate. Interest rate is a major economic factor that influences the economic growth in any economy. Interest rate is described as the price a borrower pays for the use of money he does not own (Devereux & Yetman, 2002).

With the recent increase in population in urban cities across the developing countries, high demand for housing has been witnessed. However, the key impediment to housing includes but not limited to financing, property prices and inflation. Both the commercial banks and the housing financial corporations have devised various strategies to rip in the housing finance market. Finance in housing delivery is very significant because of the huge financial requirement. Africa in particular, has evidence showing an increase in the middle class who yearn to own their own homes in the urban cities. According to AfDB (2011) the continent's middle class has grown from 26.2% in 1980 to 34.3% of the population in 2010.

In Kenya for example, the middle class comprises 44.9% of the population (AfDB, 2013). This has exacerbated rapid urbanization and high demand for housing in Kenya. To meet the demand for housing, Kenyan households have resorted to various means to own homes. The most popular means of home ownership among the Kenyan households is house building which is considered low costly and convenient. However, in the urban cities, majority of the middles class resort to mortgages as means to own a house. This has seen rapid growth in housing finance system over recent years in both value of loans and number of loans. The market has now gone through the initial ‘germination’ stage and is preparing to enter its next development phase. Consideration now needs to be given to the requirements for ensuring continued growth and thus more mortgage uptake. The mortgage market is the third most developed in Sub-Saharan Africa with mortgage assets equivalent to 2.5 percent of Kenya’s GDP. Only Namibia and South Africa rank higher, with Botswana just slightly smaller (World Bank, 2011)

Some of the reasons cited for low market penetration are nested in the lack of affordability due to a combination of low incomes, high interest rates, high inflation and the inability of the financial markets to cater for long-term funding. Only around 11% of the population could afford a Ksh. 3.2 million (USD 37800) mortgage over 15 years (World Bank, 2011). The average mortgage across the country is Ksh 6.6 million (USD 70,500), requiring a repayment of Ksh. 90,000 (USD 1,000) per month over 20 years, well above the means of the majority of the population (CBK, 2011). Thus the focus, the effect of interest rates on mortgage uptake.

1.1.1 Mortgage Uptake

A mortgage is a transfer of a legal or equitable interest in a specific immovable property for the payment of debt. A mortgage document is thus created in a transaction whereby one party pledges real property to another party as security for the purpose of purchasing, renovating or construction of a house. The loan is secured by a mortgage lien over the property (Brueggeman, 2010). A majority of the financing institutions offer mortgage financing for house purchase, construction and refinancing purpose with the mortgage loan uptake largely skewed towards house purchase.

Based on a ranking of mortgage market constraints, banks identified access to long-term funds as the most constraining factor to the growth of their mortgage portfolio. Overlapping constraints of low level of incomes/informality and credit risk were listed as second and third respectively with high interest rates also being regarded as a major constraint (C.B.K, 2010).

Experts' recommendations about how to stimulate mortgage lending and thus uptake tend to be quite similar in that they all focus on promoting stable macroeconomic conditions, developing a legal framework for property rights, establishing a property market and a housing chain, building mortgage market infrastructure and encouraging funding sources to promote financial intermediation.

Steady growth in mortgage uptake over the years is a result of financial market liberalization in Kenya coupled with an increase in number of middle class. Financial liberalization led to many new entrants of mortgage providers which increased

affordability and accessibility of mortgage in Kenya. Stiff competition in the financial market led to a substantive reduction in interest rates charged on mortgage which enhanced mortgage uptake by the consumers (World Bank Report, 2011).

1.1.2 Interest Rates

Interest rate is defined as the percent premium paid on money at one date in terms of money to be in hand one year later. Interest rate is the “rent” paid to borrow money, the lender receives as compensation for foregoing other uses of the funds including personal consumption (Thygerson, 1998). Radha (2011) defines interest rate as the amount received in relation to an amount loaned, generally expressed as a ratio of dollars received per hundred dollars lent.

In relation to assets, interest rates on a particular financial instrument for example, a mortgage or bank certificate of deposit reflects the time for which the money is on loan, the risk that the money may not be repaid and the current supply and demand in the market place for funds available for lending (Siddiqui, 2012). According to Aboaagye et al (2008), interest rate always changes as a result of inflation and Central Bank’s rate and slightly varies from bank to bank depending on asset, staff cost, market power among other factors.

1.1.3 Mortgage Uptake and Interest Rates

When considering the determinants of interest rates on mortgage loans and uptake, we must consider the demand and supply of mortgage funds. Most mortgage lenders are intermediaries serving as conduits linking flow of funds from savers to borrowers. The market rate of interest on mortgage loans is established by what borrowers are willing to

pay for the use of funds over a specified period of time and what lenders are willing to accept in the way of compensation for the use of such funds. On the demand side of the market, it can be safely said that the demand for mortgage loans and therefore uptake is a derived demand (Brueggeman, 2010).

When supplying funds to the mortgage market, lenders also consider returns and the associated risk of loss on alternative investments in relation to returns available on mortgages. Hence, lender/borrower decisions to allocate funds to mortgages are made relative to returns/interest rates and risk on alternative mortgage uptake (Brueggeman & Fisher, 1997)

1.1.4 Financial Institutions Offering Mortgages in Kenya

A financial institution is an enterprise with financial services provision to its members and/or clients. It is a company, other than a bank, which accepts from members of the public money on deposit repayable on demand or at the expiry of a fixed period or after notice; and employs the money held on deposit or any part of the money, by lending, investment or in any other manner for the account. A mortgage finance company means a company (other than a financial institution) which accepts money on deposit repayable on demand or at the expiry of a fixed period. The repayment is usually with interest and other charges and secured by first mortgage or charge over land with or without additional security or personal or other guarantees. Mortgage financial institutions consist of commercial banks and companies licensed and regulated pursuant to the provisions of the Banking Act and the regulations and prudential guidelines issued there under (CBK, 2010).

There are two types of mortgage lenders which can be authorized by the Central Bank of Kenya. These are ordinary banks, which have the right to engage in mortgage business and mortgage companies. The Housing Finance Company of Kenya (HFCK), which still has a small government investment (7 percent), is the sole remaining mortgage finance company at present. There are no major differences in the regulations applying to the two types of institutions and they each compete on a level playing field.

Mortgage lending is however predominantly done by banks in Kenya. Of the 43 banks and one mortgage finance company in the Kenyan banking system, 25 of them have mortgage portfolios of differing sizes. Some of the lenders have just one or two loans on their books which may be to staff members or special customers and other banks are much larger players who see mortgages as a major business center. The largest lender in Kenya is now Kenya Commercial Bank (KCB) following its acquisition of savings & loans, which remains as a mortgage subsidiary of KCB. Overall the two largest lenders control over half the market and only 9 banks (6 large, 2 medium and 1 small bank) have a mortgage portfolio exceeding Ksh. 1 billion (World Bank, 2011).

1.2 Research Problem

Soaring interest rate in the financial market coupled with high collateral requirement impedes the growth of mortgage uptake. Market interest rates are a significant determinant of payment and prepayment probabilities of mortgage (Green & Shoven 1983). As such, when interest rates rise, the fall in the economic value of assets in savings and loan associations' portfolios varies from one form of mortgage to another. For either of the fixed interest rate contracts or adjustable rate contracts, the cash flow

from the mortgage is constant as long as it has not been prepaid. If the interest rate rises, the homeowner has a nominal capital gain, since his loan is assumed to be below market interest rate (Brueggeman, 1997).

The Kenyan market as with many other countries in Africa is characterized by a large demand and chronic undersupply of formal housing. At prevailing property rates affordability of basic housing remains a key constraint. In this respect most housing is financed primarily through debt which is in turn affected by factors such as fluctuating inflation and interest. Also, the population increase in Kenya coupled with influx of migration to urban cities has outstretched the demand for housing in Kenya causing housing deficit (World Bank, 2011). The housing gap can thus be partially financed by mortgages, while other solutions are required for lower income groups such as Housing Micro-finance and rental housing. Thus, if Kenya is to start tackling its unmet housing demand it will need to mobilize large amounts of private capital into the financial institutions. Growing the size and reach of the mortgage market is part of the solution for the upper and middle income urban segments of the population.

A study by Deng, Zheng & Ling (2004) established that borrowers' characteristics are significant in determining prepayment behavior in residential mortgage performance in China. Risk-based pricing in residential mortgage lending in China was found to help improve the efficiency of the market and enhance the credit availability to the most needed households. Increase in interest rates were also found to be positively and significantly related to growth in long term mortgage loans in Hong Kong housing market (Gerlach & Peng, 2005). Avery, Brevoort & Canner (2006) also carried out a study on higher priced home lending in 2005 and the result showed that low interest rate

schemes in commercial banks has a positive impact on the credit growth of mortgage finance loans for loan takeovers from existing lenders. California (USA), the study conducted by (Krainer & Laderman, 2011) showed that adverse changes in house prices leads to mortgage default.

Locally, Agao (2012) established a positive relationship between mortgage uptake and interest rates though the relationship was found to be insignificant as Muguchia (2012), studied the effect of flexible interest rates on the growth of mortgage financing in Kenya and the findings showed that flexible interest rates negatively impacts on mortgage financing. Additionally, Njongoro (2013) found a strong negative relationship between mortgage interest rate and growth of mortgage financing while Wambui (2013) assessed the effect of interest rate volatility on mortgage default rate in Kenya between 2008 and 2012 and the findings indicated a positive relationship between the level of interest and default rate. Makori & Memba (2015) established that interest rate spreading affects mortgage financing among commercial banks to a very great extent due to high interest rates.

Therefore from both the global and local studies conducted on interest rates and mortgages, there is evidence of mixed result on the effect of interest rate on mortgage uptake. Also, despite intervention of the central bank on the interest rate charged on mortgages by mortgage providers, interest rate has persistently remained high barring many households from applying for mortgages. Thus, this study sought to extend and fill the research gap by investigating the effect of interest rate on mortgage uptake in Kenya and therefore answer the research question on how interest rate single handedly affects mortgage uptake in Kenya.

1.3 Research Objective

To establish the effect of interest rates on mortgage uptake in financial institutions in Kenya

1.4 Value of the Study

The study findings and results will offer significant information to commercial banks and mortgage finance firms on how interest rates affect mortgage uptake. The information will be useful in their pricing strategies to improve on the performance of mortgage based on the prevailing market rate. Consumers will also be enlightened on how interest rate affects mortgage uptake in the consumer market.

Further, the findings will also benefit the monetary policy makers on how interest rate affects mortgage uptake in Kenya. The study will also add to the existing literature on mortgage performance and more information to research organizations and scholars who will want to carry out further research in this area. Finally, the study will facilitate individual researchers to identify gaps in the current research and carry out research in those areas.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents literature review on the effect of interest rate on mortgage uptake. Specifically, this section will include the theoretical review, empirical review and the literature overview of the effect of interest rate on mortgage uptake.

2.2 Theoretical Review

Under this section, we will look at two theories of mortgages: Title theory and Lien theory of mortgages.

2.2.1 Title Theory and Lien Theory of Mortgages

Title theory states that a lender holds the actual legal title to a piece of real estate for the life of the loan while the borrower/mortgagor holds the equitable title. When the sale of the real estate goes through, the seller actually transfers the property to the lender, who then grants equitable title to the borrower. This means that the borrower can occupy and use the property, but the lender has legal ownership over it. In title theory, a lender can simply step in and take possession of the property if a borrower defaults on the loan. Since the lender already technically owns the property, the lender simply revokes the borrower's equitable title and reclaims the property (Buckley & Kalarickal, 2004).

On the other hand, lien theory states that the borrower takes the legal title to the property while a lender holds a mortgage lien over it. Notably, a lien is a non-possessory security interest in a piece of property. In the case of a mortgage lien, it is an interest that a

lender holds in real property that does not involve possession, but the property carries the encumbrance of the mortgage lien for the life of the loan. If the borrower attempts to sell the property before satisfying the debt, the mortgage lien will come up. Thus, the lien entitles the lender to step in and claim a portion of the proceeds sufficient to satisfy what is left off the loan before releasing the lien, which will clear the title and allow the sale to go forward. Because the lender in lien theory does not hold the legal title to property, lenders must go through a judicial process to either take title to the property or force a sale in the event that a borrower defaults on the loan (Buckley & Kalarickal, 2004).

For practical applications however, there is usually very little difference between the two mortgage theories. The principle difference arising is with the title theory, where, the mortgagee is given the right to possession before the foreclosure is complete. The mortgage language provides for possession rights being with the mortgagor up to the time of the foreclosure (Buckley & Kalarickal, 2004).

2.2.2 Classical Theory of Interest

The basic idea of this theory is that the demand for and supply of capital determine the rate of interest. The rate of interest is determined at a point where demand for capital is equal to supply of capital. The demand for capital arises from investment and the supply of capital arises from savings. Since this theory explains the determination of rate of interest by real market forces such as thrift, time preference and productivity of capital, it is also known as the real theory or non-monetary theory of interest (Blang, 1992).

The marginal productivity of capital diminishes as more of it is used for production. The marginal product curve of capital slopes downwards from left to right. Because of this, the demand curve of capital also slopes downwards from left to right. This means that lower the rate of interest, the greater the demand for capital. Further, supply of capital comes from savings. The supply of savings is affected by rate of interest that is, the higher the rate of interest the higher the volume of savings and vice versa. Hence, the supply curve of savings or capital rises upward from left to right (Njongoro, 2013).

2.2.3 Liquidity Preference Theory

People value money for both the transaction of current business and as a store of wealth. Thus, they will sacrifice the ability to earn interest on money that they want to spend in the present and instead have it in hand as a precaution. On the other hand, when interest rates increase, people become willing to hold less money for these purposes in order to secure a profit – the interest (Keynes, 1936). It can also be described as the idea that investors demand a premium for securities with longer maturities and hence greater risk as opposed to holding it and thus less risk.

In other words, the speculative demand for money is interest-elastic and extremely so, at very low rates of interest. The speculative demand for money is contrasted with the transactionary demand the latter being a stable function of income (Carpenter & Lange, 2002).

2.3 Determinants of Mortgage Uptake

2.3.1 Interest Rate

Interest rates are the single most critical factor in driving the mortgage market and access to more middle income housing. The rates are set by the Monetary Policy Committee (MPC) and its movements have a differential impact on the mortgage market and/or default (Wambui, 2013).

The three main types of mortgages are fixed interest contracts which automatically fall due on the sale of a dwelling, fixed rate loans which are assumable by a buyer and floating rate instruments. When interest rates rise, the fall in the economic value of these assets in savings and loan associations' portfolios varies from one form of mortgage to another. For either of the fixed interest rate contracts, the cash flow from the mortgage is constant as long as it has not been prepaid (Green & Shoven, 1983).

Increases in interest rates can have implications on financial stability through their impact on households' ability to meet their debt commitments. Higher interest rates would raise repayments on both mortgages and other loans, which may increase the number of households struggling to repay their debts. Interest rates chargeable on mortgages influence the mortgage quality in that the higher the interest the more expensive the mortgage product becomes lowering the mortgage finance uptake. Low interest rates on the other hand encourage mortgage uptake and prompt repayment thus guaranteeing quality products (Hass Consult, 2014).

2.3.2 Inflation

Inflation is the index that measures monthly price changes in a basket of goods and services that account for a high proportion of general household expenditure. In Kenya, the consumer price index (CPI) is the most commonly used form of inflation measure. According to Modigliani and Lessard (1974), inflation and the anticipation of its continuation tend to raise interest rates, including mortgage rates, by an "inflation premium" needed to compensate the lender for the anticipated erosion in the purchasing power of his claim.

The rise in interest in turn raises the annual payment needed to acquire a house of given value. This higher interest rate and resulting annual payment do not per se change the real cost of carrying a house in that they are offset by the gain to the debtor resulting from the gradual decline in the purchasing power of his debt and of his annual payment (Modigliani and Lessard, 1974). The rise in interest rates resulting from inflation has an important effect on the time profile of the stream of annual payments, expressed in terms of constant purchasing power. Whereas in a world of constant prices these payments are constant over the life of the mortgage, the inflation-induced increase in interest rates results in an increase in the level of real payments in the early years of the contract with a commensurate reduction in the later years.

2.3.3 Money Supply

Theoretically, since the change in money supply could result in the change in interest rate and bank credit, money supply could affect economic activities through both of them. Money could influence price level directly according to the quantity theory of

money. Thus, money supply could affect real estate prices through interest rate. According to the Keynesian theory, changes in monetary policies influence economic activities through interest rate. The increase in money supply reduces interest rates, which in turn, reduces financing costs of real estate development companies and consumers, and this ultimately affects real estate prices thereby affecting mortgage uptake (Blinder, 2008).

Croushore (2007), argues that rise in the supply of money must make interest rates to decline so to sustain the money market in balance. In case the money supply is increasing (supply curve shift to the right) without a corresponding shift in money demand curve the equilibrium interest rates declines. Similarly, if a shift in money supply is followed by a shift in money supply in the short run, the interest will not change. This implies that a monetary policy is ineffective in lowering the mortgage interest rates.

2.3.4 Gross Domestic Product

Gross Domestic Product (GDP) is a measure of all goods and services produced in the economy. The housing sector contributes directly and significantly to overall production activity. Low GDP implies that people's purchasing power will reduce hence the demand for real estate also reduces and consequently the mortgage uptake will decrease. Equally, when the GDP increases, the purchasing power also increases hence increasing the demand of real estate and so does the mortgage uptake.

Broadly speaking, when the economy is sluggish, so is real estate. Demand for housing is dependent upon income. With higher economic growth GDP and rising incomes

(employment rate) people will be able to spend more on housing (mortgages), this will increase demand, push prices up and require developers/banks to supply (Pettinger, 2013).

2.4 Empirical Review

Green & Shoven (1983) conducted a study on the effects of interest rates on mortgage prepayments in California (USA) from 1975 to 1982. The study used a proportional hazards model, to estimate the percentage reduction in prepayment probability associated with interest rate change. The findings indicated that market interest rates are a significant determinant of prepayment probabilities of mortgage.

Deng, Zheng and Ling (2004) assessed residential mortgage performance in China between March 1998 and October 2002. The study employed empirical analysis based upon a unique micro mortgage dataset with loan history information collected by a major residential mortgage lender in Beijing. The findings indicated that borrowers' characteristics are significant in determining prepayment behavior, hence may be used as an effective tool for screening potential high risk borrowers in the loan origination process. The study recommended that adopting a risk-based pricing in residential mortgage lending in China may improve the efficiency of the market and enhance the credit availability to the most needed households. This study did not include inferential statistics and majorly concentrated on borrowers' behavior as opposed to the mortgage providing institutions. Therefore this study will bridge the gap by analyzing the effect of interest rate on mortgage uptake.

The long and short term relationship between interest rates and mortgage credit with an application to the Hong Kong housing market was assessed by (Gerlach and Peng, 2005). The findings showed that the increase in interest rates were positively and significantly related to growth in long term mortgage loans. Avery, Brevoort and Canner, (2006) carried out a study on higher priced home lending in 2005. The findings indicated that low interest rate schemes in commercial banks make positive impact on the credit growth of mortgage finance loans for loan takeovers from existing lenders. Over a longer term, growth rates in banks was linked to 19 mortgage firms ability to match services to the needs of the customers and generate adequate risk-adjusted returns, besides being influenced by the overall growth in mortgage finance market.

Mortgage loan securitization and relative loan performance in was analyzed by (Krainer and Laderman, 2011). Multivariate analysis was used on the data set that consisted of information on the characteristics, terms and eventual performance of more than 1.6 million first-lien conventional mortgage loans originated between January 1, 2007 and December 31, 2008, for properties in California (USA). The result showed that adverse changes in house prices leads to mortgage default.

Muguchia (2012) studied the effect of flexible interest rates on the growth of mortgage financing in Kenya during the financial period 2007 – 2011. The study was conducted on 26 commercial banks in Kenya and the Housing Finance of Kenya relied on secondary data from annual reports of the banks. The findings showed that flexible interest rates negatively impacts on mortgage financing. The study argued that without flexible interest rates, banks would not be able to lend since this is also affected by the cost of borrowing from the customers through deposits. Other independent variables in

the study included; inflation, non-performing loans, liquidity ratio and negative effects on mortgage financing, while money supply, GDP, customer deposits, bank capitalization and bank size had a positive effect on mortgage financing.

The effect of macroeconomic variables on the mortgage uptake for mortgage industry in Kenya was investigated by (Agao, 2012). The study examined the 44 mortgage firms that offer mortgage financing in Kenya. A multivariate regression analysis was used to arrive at the result. The study used quarterly secondary data for a period of 10 years from 2004 to 2013. The study established a positive relationship between mortgage uptake and interest rates though relationship was found to be insignificant.

The effect of mortgage interest rate on the growth of mortgage financing in Kenya for a period between 2009 and 2012 was assessed by Njongoro (2013). The study used a descriptive research design and secondary data for the 44 firms offering mortgage financing was collected from secondary sources. The findings indicated a strong negative relationship between mortgage interest rate and growth of mortgage financing. Wambui (2013) assessed the effect of interest rate volatility on mortgage default rate in Kenya between 2008 and 2012. The population of the study comprised all the forty three commercial banks and one mortgage finance company and used secondary data. The findings indicated a positive relationship between the level of interest and default rate whereby an increase in interest rate increased non-performing loans.

Mbula (2014) established the effect of mortgage financing on the performance of real estate industry in Kenya. The specific objectives of the study; to examine the effect of interest rate, loan terms, mortgage risks and inflation on performance of real estate

industry in Kenya. The population of interest comprised of 182 real estate firms in Nairobi licensed and registered in accordance with the estate agents Act. The study used both primary and secondary sources of data from published and audited annual reports of investments, C.B.K, KNBS and property price index from property consultants. Data analysis was done using SPSS (Statistical Package for Social Sciences) and descriptive statistics. The study found that mortgage financing had positive influence on financial performance of real estate. The study further revealed that interest rate affected the real estate performance to a great extent as mortgage prices are principally determined by real interest rates.

A study on the influence of capital market deepening on mortgage market growth in Kenya was conducted by Mogaka, Mboya and Kamau, (2015). Multiple regression analysis was used on panel data for the 30 year period from 1984 to 2013. The findings indicated that insurance assets and pension assets have the highest positive influence on mortgage growth in Kenya while equity market capitalization to GDP has the highest negative influence.

2.5 Summary of the Literature Review

From the empirical literature review it is evident that no consensus has been reached on the effect of interest rate on mortgage uptake. Gerlach and Peng (2005) found that increase in interest rates positively and significantly impacts on mortgage loans growth in the long term. In addition, Agao (2012) found a positive relationship between mortgage uptake and macro-economic variables (interest rates) though, the relationship was found to be insignificant. However, a study by Muguchia (2012) and Njongoro

(2013) revealed that interest rates negatively impacts on mortgage financing. Therefore, there is evidence of a knowledge gap in the effect of interest rate on mortgage uptake in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design, the study population, data collection method and data analysis procedures.

3.2 Research Design

The study used a descriptive research design. According to Morgan (2007), a descriptive survey is usually concerned with describing a population with respect to important variables with the major emphasis being establishing the relationship between the variables. The advantage of descriptive research design is its suitability when the population is large.

3.3 Population of the Study

According to Mugenda and Mugenda, (2003) target population is that population to which a researcher wants to generalize the results of the study. The study targeted all the 44 financial institutions offering mortgage financing therefore a census was employed since the population was discreet.

3.4 Data Collection Procedure

The study used secondary data. The data was collected from secondary sources since the nature of the data is quantitative. Quarterly data ranging from 2004 to 2013 was collected from various sources. Gross product and mortgage uptake was collected from

Kenya National Bureau of Statistics, inflation, interest rate and money supply was collected from the Central Bank of Kenya.

3.5 Data Analysis

The data collected was analyzed using multiple regression analysis: the relation of one dependent variable to multiple independent variables. The regression output was obtained using SPSS version 20.

3.5.1 Analytical Model

The regression model was as follows

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where:

Y= Natural log of Mortgage Uptake: mortgage uptake is the acquisition of mortgage loan by home buyer or builder either to purchase or secure against the property from a financial institution, such as a bank, either directly or indirectly through intermediaries.

Mortgage uptake was measured by the total value of mortgage loans taken on a quarterly basis in all the mortgage financial institutions in Kenya.

β_0 = Constant term

X_1 = Interest rate: According to Darryl (1969), interest rates are a price for the use of funds. Aggregate quarterly interest rate charged on mortgage loans was used as the measure in this study.

X₂ = Inflation: The percentage change in Consumer Price Index (CPI) on a year to year basis

X₃ = Natural log of GDP: Gross Domestic Product at Market Prices

X₄ = Natural log of Money Supply: There are three main monetary aggregates: M1, M2 and M3

Deposit liabilities are defined in narrower and broader senses as follows: narrow money (M1); broad money (M2); and extended broad money (M3).

M1= Currency outside banking system (in circulation) + demand deposits

M2 =M1 + time and savings deposits + certificates of deposits

M3= M2 + residents' foreign currency deposits

This study used M3 money supply in the analysis.

ε = Error Term.

3.5.2 Test of Significance

The researcher used the Analysis of Variance (ANOVA) model to test for significance of the regression model. The “F” statistic at 0.05 level of significance was used to measure the fitness and validity of the model. P-values and t-statistics were used to test the significance level of the coefficients of the independent variables in the model.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data findings and analysis in form of tables, figures, and inferential statistics. Descriptive statistics was used to analyze the findings obtained from the quarterly data obtained from firms offering mortgage financing in Kenya.

4.2 Response Rate

The study targeted 44 firms offering mortgage finance in Kenya and the data was obtained from all the 44 firms targeted. This therefore created a response rate of 100 %. This response rate was excellent to make conclusions for the study. Weisberg, Krosnick & Bowen (1996) recommended a response rate of at least 70 percent. Mugenda & Mugenda (2003) indicated that a response rate of 50 percent is adequate for analysis and reporting; a rate of 60 percent is good while a response rate of 70 percent and over is excellent. Based on the assertion, the response rate was considered excellent for the analysis.

Table4.1: Response rate

	Frequency	Percentage
Response	44	100.00%
Unresponsive	0	0.00%
Total	44	100.00%

Source: Research findings

4.3 Data Analysis and Findings

The study used descriptive and inferential analytical techniques was used to analyze the data obtained. Ordinary Least Squares (OLS) regression model was thus employed. However, before running the regressions, descriptive statistics and correlation analysis were calculated. Correlation analysis shows the relationships between the different variables considered in the study. The correlation matrix presented simple bi-variate correlations not taking into account other variables that may influence the result.

4.4 Descriptive Statistics

Table 4.2 presents the descriptive statistics and the distribution of the variables considered in this research: mortgage uptake, inflation, money supply (M3), GDP and interest rate. The descriptive statistic considered was minimum, maximum, mean and standard deviation. Mean was used to establish the average value of the data whilst standard deviation gave the dispersion in the data.

Table4.2: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Money Supply M3(000)	379521	1924700	950640.88	501424.327
GDP(000)	260382	446247	348350.05	48153.516
Inflation (%)	3.3300	29.1300	11.485000	6.7223351
Mortgage Uptake(000)	19740	194026	68719.65	58960.896
Interest rate (%)	5.8800	18.0000	8.964750	2.8185712

Source: Research Findings

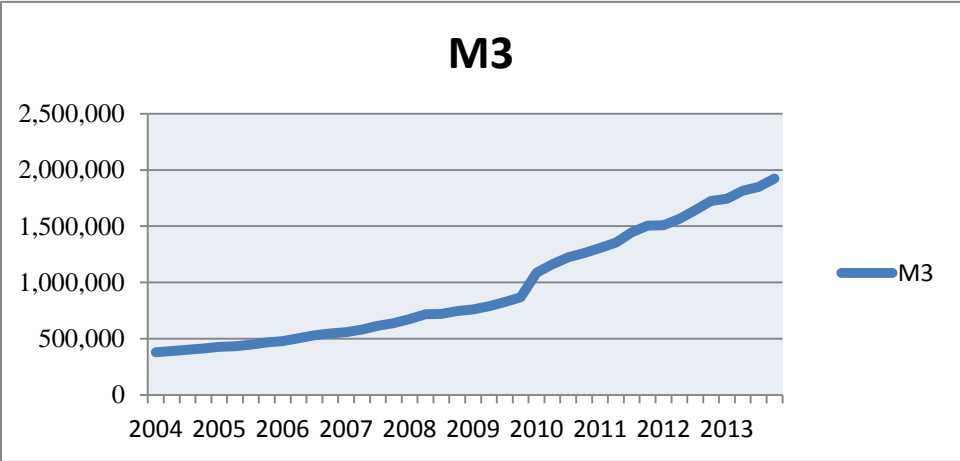
The results on table 4.2 indicate that money supply (M3) had a mean value of 950,640,880 with standard deviation of 501,424,327. GDP had a mean of 348,350,050 between 2004 and 2013 with a standard deviation of 48,153,516. On the average, inflation rate recorded a mean of 11.485 percent with standard deviation of 11.485. Kenya also experienced high levels of inflation in the study period as indicated by a maximum overall annual inflation rate of 29.13 percent with a minimum inflation rate reaching 3.33 percent. High inflation rate was attributed to increase in crude oil prices, drought and a low agriculture produce which pushed the consumer price index.

Mortgage uptake value during the study period recorded a mean of 68,719,650 with a standard deviation of 58,960,896. Interest rate registered an average rate of 8.96% with a standard deviation of 2.81.

4.4.1 Variables Trend

Figure 4.1 below shows a steady increase in money supply in thousands of Ksh. from 2004 to 2013. Increase in money supply is attributed to central bank expansionary monetary policies like lower interest rates, buying of securities through open market operations and a reduction of cash reserves ration.

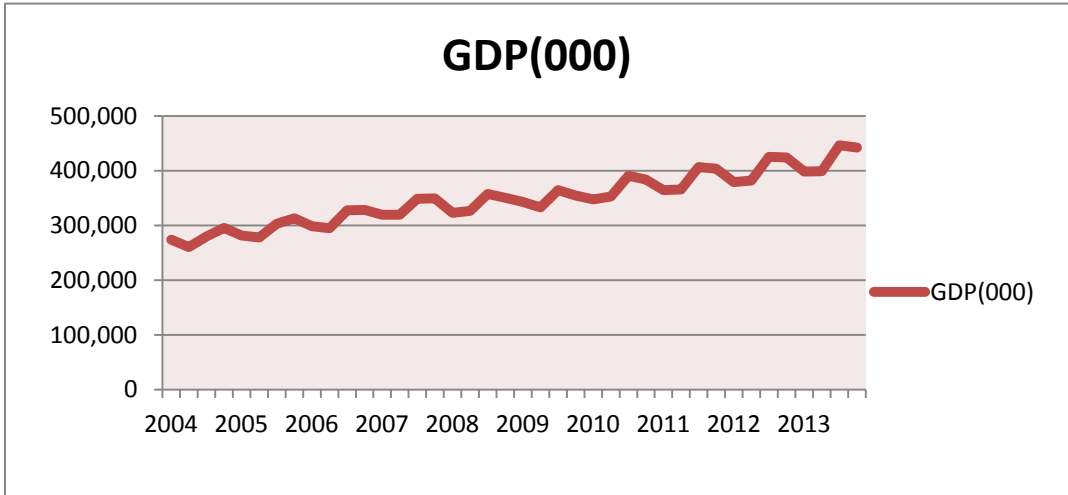
Figure 4.1: Trend in money supply



Source: Research Findings

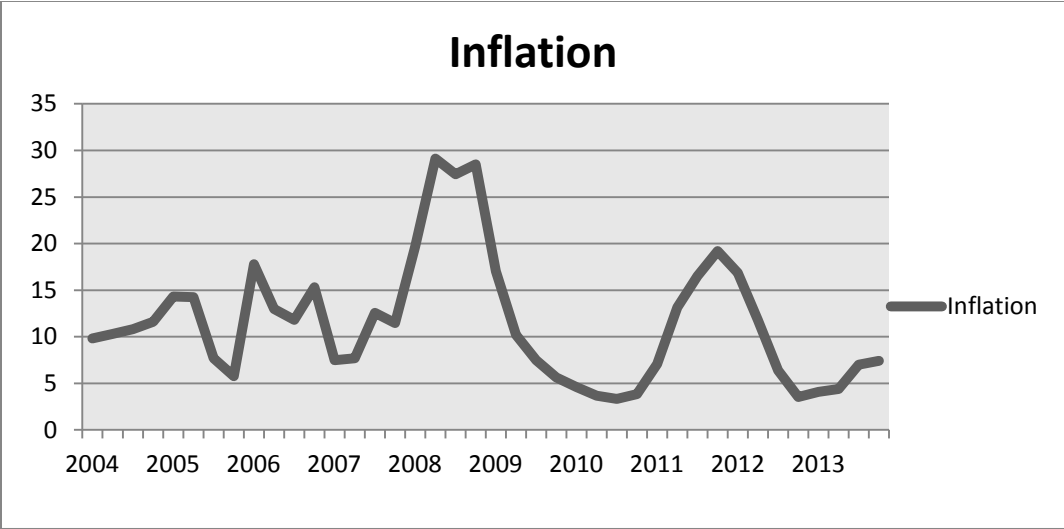
Figure 4.2 illustrates the trend in GDP in thousands of Ksh during the study period. The figure demonstrates that GDP at market value has been increasing over the years from 2004 to 2013. Expansionary fiscal policies like increase in government expenditure and reduction in taxation coupled with increase in investment increase the level of GDP.

Figure 4.2: Trend in GDP



The trend in inflation is indicated by figure 4.3 below. Inflation graph is characterized by shifts in inflation from low to high in some periods. The shifts in inflation were due to growth in money supply and depreciation and appreciation of the local currency.

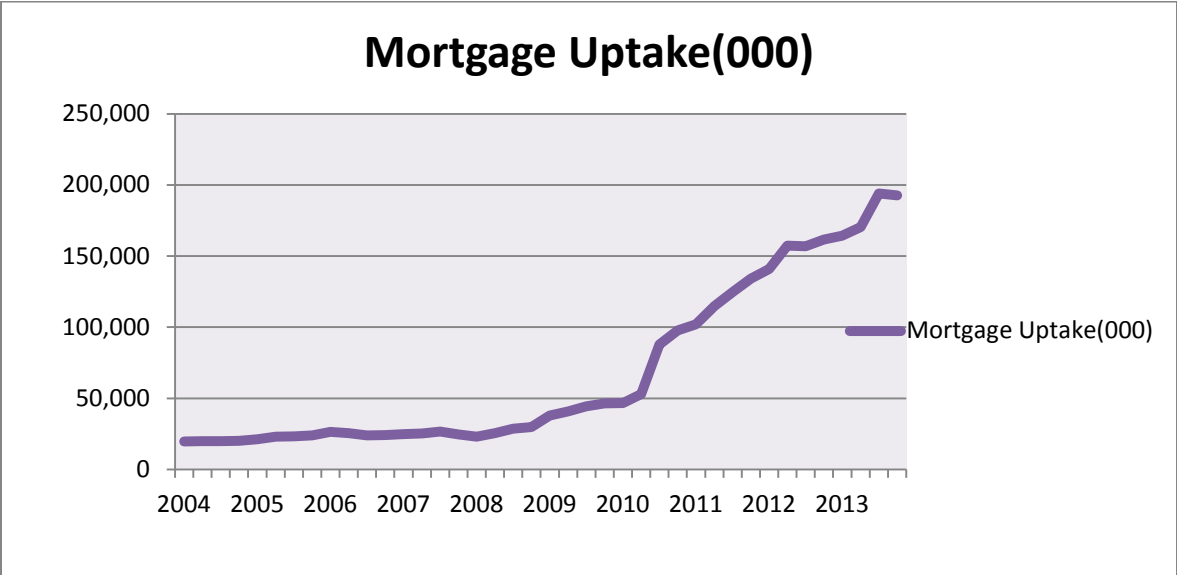
Figure 4.3: Trend in inflation



Source: Research Findings

Figure 4.4 shows steady increase in mortgage uptake in thousands of Ksh. from 2004 to 2013. Steady increase in mortgage uptake value resulted from increase in middle class, economic growth and lower interest over the period.

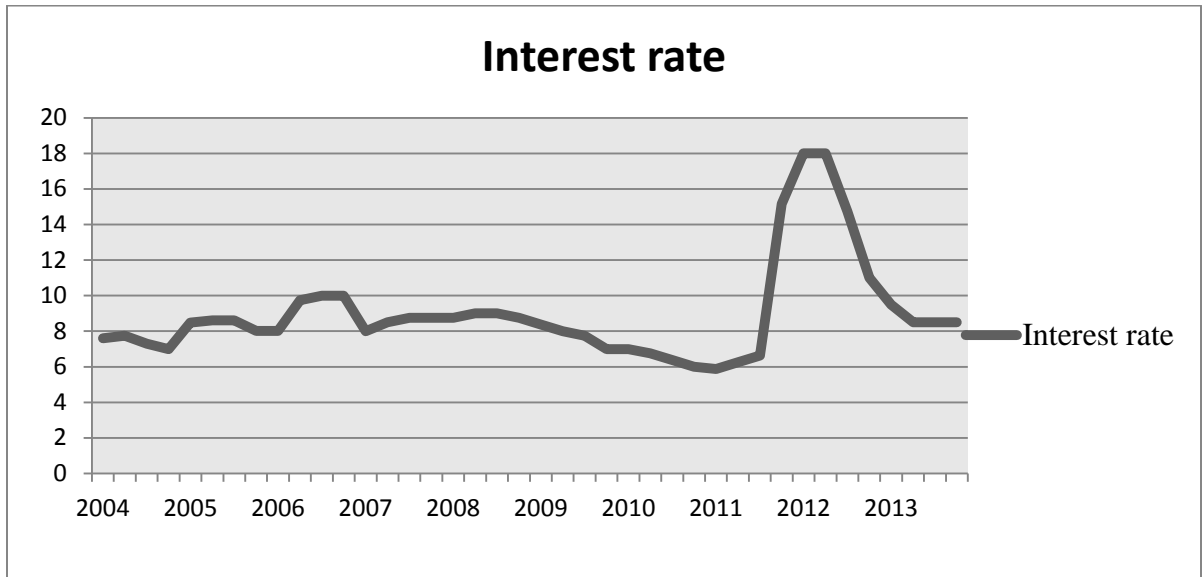
Figure 4.4: Trend in the value of mortgage uptake



Source: Research Findings

Interest rates as a percentage remained relatively constant between 2004 and 2009 as demonstrated by figure 4.5 below. However, a sharp increase in interest was witnessed in the first quarter of the year 2011 and a subsequent decline in 2012 and 2013.

Figure 4.5: Trend in interest rate



Source: Research Findings

4.5 Inferential Statistics

The inferential statistics involved the use of correlation and multiple linear regression analysis. The regression analysis was done using Ordinary Least Squares (OLS) method. Correlation statistics is a method of assessing the relationship between variables. It measures the extent of association between the ordering of two random variables although the correlation matrix presented simple bivariate correlations not taking into account other variables that may influence the results.

4.5.1 Correlation Analysis

This part sought to establish the correlation between the independent and the dependent variable. Table 4.3 shows the results obtained

Table 4.3: Correlation Matrix

	(Mortgage Uptake)	Interest rate	Inflation	GDP	M3
(Mortgage Uptake)	1				
Interest rate	-.348*	1			
Inflation	-.328*	.207	1		
GDP	.893**	.281	-.211	1	
M3	.967**	.303	-.259	.942**	1

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

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Research Findings

The results on table 4.3 shows that there is a negative and weak linear relationships ($R=-0.348$) between mortgage uptake and interest rate. The relationship between inflation and mortgage is also weak and negative ($R=-0.328$). The association between GDP and mortgage uptake is very strong and positive ($R=0.893$). Money supply showed strong and positive relationship with mortgage uptake ($R=0.967$).

4.5.2 Regression Analysis

A multiple linear regression model was used to estimate mortgage uptake in the study. The estimate was carried out basing on the effect of the four independent factors: GDP, money supply, interest rate and inflation. In addition, the β coefficients for each independent variable generated from the model was subjected to a t-test, in order to test

the significance of each variable. The study thus came up with a model summary, the ANOVA for the effect sizes and the regression model.

4.5.2.1 Model Summary

Table 4.4 illustrates regression result for the model summary.

Table 4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975 ^a	.951	.945	.1943342

a. Predictors: (Constant), M3, Inflation, Interest rate, GDP

Source: Research Findings

The results on table 4.4 indicates that the R square value is 0.951 implying that 95.1% of the total variation in the dependent variable (mortgage uptake) is explained by the independent variables (GDP, M3, interest rate, inflation) while 4.9% of the variation is explained by other factors not considered by the model and the error term. The results also show that the correlation coefficient value is 0.975 which indicates that there is a strong correlation between the dependent and the independent variables.

4.5.2.2 Analysis of Variance

The Analysis of Variance (ANOVA) was used to check how well the model fits the data.

The results are presented in table 4.5.

Table 4.5: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.461	4	6.365	168.543	.000 ^b
	Residual	1.322	35	.038		
	Total	26.782	39			

a. Dependent Variable: Mortgage Uptake

b. Predictors: (Constant), M3, Inflation, Interest rate, GDP

Source: Research Findings

The results on table 4.5 shows that the F statistics value of 168.45 is statistically significant at 5% level of significance since the P value of $0.000 < 0.005$. These results indicate that the regression model is a good and reliable predictor of the relationship between interest rates and mortgage uptake in financial institutions in Kenya.

4.5.2.3 Model Coefficients

Table 4.6 shows the regression coefficients results

Table 4.6: Regression Coefficients

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.498	6.340		-.236	.815
Inflation	-.013	.005	-.108	-2.612	.013
Interest rate	-.028	.012	-.094	-2.257	.030
GDP	-.749	.671	-.125	-1.115	.272
M3	1.595	.179	1.029	8.895	.000

a. Dependent Variable: Mortgage Uptake

Source: Research Findings

The following regression equation was established:

$$Y = -1.498 - 0.028X_1 - 0.013X_2 - 0.749X_3 + 1.595X_4 + \varepsilon$$

The results on table 4.6 show that interest rates and inflation have a negative and statistically significant relationship with mortgage uptake. The results also show that GDP has an insignificant negative relationship with mortgage uptake while money supply has a positive and significant relationship with mortgage uptake.

4.6 Interpretation of the Findings

The study findings established that the relationship between interest rates and mortgage uptake was statistically significant at 5% level of significance as shown by the ANOVA results. The results also show that interest rates and inflation have a significant negative relationship with mortgage uptake as indicated by a beta value of -0.028. This indicate

that there is an inverse relationship between mortgage uptake and interest rates and also inflation such that a unit increase in interest rates and inflation will reduce mortgage uptake by 0.028 and 0.013 units respectively.

The results also established that GDP had an insignificant negative relationship with mortgage uptake and indication that there is also an inverse relationship between mortgage uptake and economic development. This means that a drop in economic development reduces mortgage uptake by 0.749 units. The results also established that there was a statistically positive relationship between mortgage uptake and money supply an indication that a unit increase in money supply increases mortgage uptake by 1.595 units.

These results are similar to those of Green & Shoven (1983) who established that market interest rates are a significant determinant of prepayment probabilities of mortgage. Mbula (2014) also established that interest rate affected the real estate performance to a great extent as mortgage prices are principally determined by real interest rates. Additionally, Muguchia (2012) also established that flexible interest rates negatively impacts on mortgage financing. Hass Consult (2014) also established that increases in interest rates can have implications on financial stability through their impact on households' ability to meet their debt commitments.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter is a synthesis of the entire study, and contains summary of research findings, exposition of the findings in line with the objectives, conclusions and recommendations. In addition the chapter presents the study limitations and suggestions for further research.

5.2 Summary of Findings

The objective of the study was to establish the effect of interest rate on mortgage uptake among the firms offering mortgage finance in Kenya. The study adopted descriptive research design where mean, standard deviation, minimum and maximum were considered. Inferential statistics was also used to test the significance of the variables at 95% level of confidence. The findings established that money supply had a mean of 950,640,880 with standard deviation of 501,424,327. GDP recorded a mean of 348,350,050 with a standard deviation of 48,153,516. On the average, inflation rate recorded a mean of 11.485 percent with standard deviation of 11.485. Mortgage uptake value during the study period recorded a mean of 68,719,650 with a standard deviation of 58,960,896. Interest rate registered an average rate of 8.96% with a standard deviation of 2.81.

The result established a coefficient of determinant of 95.1% which showed that interest rate and the control variables contribute to the changes in mortgage uptake. Interest

rate was established to be statistically significant at 5% level of significance and negatively affects mortgage uptake in that one unit increase in interest rate will lead to 0.094 unit decrease in mortgage uptake value. Inflation was found to be statistically significant at 5% level of significance and a unit increase in inflation will result to 0.108 unit decrease in mortgage uptake. However, GDP was established to be statistically insignificant at 5% level in affecting mortgage uptake. Money supply is statistically significant at 5% level of significance. Therefore a unit increase in money supply will lead to 1.029 unit increase in mortgage uptake value.

5.3 Conclusion

The findings provide evidence that the explanatory variables (money supply, interest rate, inflation and GDP) considered, explain mortgage uptake. This is supported by an R-square value of 95.1%. From the study findings, it is evident that money supply, interest rate and inflation statistically is significant at 95% confidence level in explaining the variation in mortgage uptake value.

However, GDP was established to be insignificant at 5% level of significance which illustrates that GDP growth is not a major contributor to mortgage uptake. Further, the findings showed that both interest rate and inflation have negative coefficients. Therefore, we conclude that interest rate and inflation negatively affect mortgage uptake. Also, money supply has a positive impact on mortgage uptake in Kenya as demonstrated by the positive coefficient in the regression result.

It should also be noted that the mortgage market is not strictly ‘macro – economical’. Thus it is almost obvious that there are other underlying variables in the study that somehow affect the results.

5.4 Recommendations

From the findings and conclusions, mortgage uptake is explained by money supply, interest rate and inflation, factors that are controlled by the Central Bank. The Central Bank of Kenya should therefore employ monetary policies to ensure sustained money supply in the economy to enhance mortgage uptake. Government should also intervene to monitor interest rates and maintain it at reasonable levels to enhance mortgage uptake in Kenya. This is because of the significant effect they have on the mortgage uptake and they determine lending rates and hence drive the demand through increased or reduced access to financing. This is so since the mortgage concept is unfortunately mostly suited for people who have a promise of being employed for a long period and/or with a constant source of income for very long periods.

Policy makers should ensure that interests charged on mortgage facilities are competitive in the market so as to attract mortgage takers. The government should enact legislation which regulates the inflation and interest rates since the study drew these as the key impediments in the mortgage industry so as to protect the interests of both consumers and lenders in the market.

Notably, mortgages are completely out of reach for the entire rural population. Some steps could be taken to improve affordability including and more so to the rural populace. New products designed to help affordability and over the longer term look at

options for suitable subsidy programs/guarantee mechanisms should be created. Just like the tax holidays for the business at Export Processing Zones the government and the private institutions could consider coming up with such products to even encourage the suppliers of mortgages to go into the rural areas.

Additionally, the government should initiate measures to oversee valuation of property so as to reduce arbitrary pricing of properties. Such measures could include development of a property index to guide the public on property prices say, give estimation of prices per square foot for various comparable properties to the mortgages, have a reduction of stamp duty and especially for first time home (mortgage) buyers.

Full disclosures of all charges related to mortgages funding should be done by the financial institutions to enable buyers make informed decisions this also includes disclosure on various components that might affect the effective interest rate year to year. The government and private institutions should also support development of secondary mortgage market as an alternative source of mortgage financing.

Further during periods of high inflation, the commercial banks interest rates are hugely affected which in turn have a major impact on the mortgage rates. The government should come up with mechanisms to at the very least cushion the mortgage market from huge shocks. This will help curb the 'fear' of the Kenyan population from the highly volatile mortgage industry and thus a rise in the uptake.

5.5 Limitations of the Study

In carrying out this study, the major problem related to incomplete records availed by the mortgage firms. Both financial and non-financial institutions have a predisposition of

failing to make public their true financial position. This puts to test the validity of the data used in the study therefore the result might not convey the true result.

Also, the banks with-hold the information even on request with their defense being, internal policies limit submission of data to the public. The Central Bank which is the regulator has not required banks to submit detailed statistics and hence banks submit the very minimal information. This greatly affected the study.

5.6 Suggestions for Further Research

The findings of this study set a ground for further research in a number of areas. First, the results indicated that interest rate is very significant in determining mortgage uptake. The study heavily based on the macro economic variables affecting mortgage uptake. Thus, further studies could be done concentrating on the micro economic variables like the local government infrastructure, city council fees, rates and levies, the standing law pertaining land and mortgage financing, the taxes among other factors.

Additionally, effect of mortgage interest rate spread on growth of mortgage market could be looked into. This follows the wide spreads in the market within the commercial banks. The rate given by the Central Bank known as the KBRR in comparison to what is offered by the banks has very big spreads noted. Thus, investigation ought to be done.

Further, studies on the extent to which demand for mortgage/housing affects interest rate movement and thus the value supplied should be looked into. The value supplies could be derived from the total mortgage value/price and the units of mortgages supplied.

REFERENCES

- Aboagye, Q. Akoena, T., Antwi, A. & Gockel, A. (2008). Explaining Interest Rate Spreads in Ghana, *African Development Review*, 20(3), 378- 399
- African Development Bank Report (2013). The Middle Class in African countries
- Agao, E. A. (2012). The effect of macroeconomic variables on the mortgage uptake for mortgage industry in Kenya. *Unpublished MBA Project*, University of Nairobi
- Avery, R. & Canner G. B. (2006). *Higher Priced Home Lending the 2005*. HMDA Data Federal Reserve Bulletin
- Blang. M. (1992). *The Methodology of Economics*. 2nd edition. Published by press syndicate of University of Cambridge
- Brueggeman, W. B & Fisher, J. D. (1997). *Real Estate Finance and Investments*, 10th edition, Irwin-McGraw Hill, Boston
- Buckley, R. & Kalarickal, J. (2005), Housing Policy in Developing Countries: Conjectures and Refutations. *The World Bank Research Observer*, Vol. 20
- Carpenter, S. B. & Lange, J. (2002). *Money Demand and Equity Markets*. Board of Governors of the Federal Reserve System and Cornerstone Research, October.
- Central Bank of Kenya Annual Report 2010
- Central Bank of Kenya Annual Report 2013

- Collins, N. & Wanjau, K. (2011). The effects of interest rate spread on the level of non-performing assets: A case of commercial banks in Kenya. *International Journal of Business and Public Management*, 1(1): 58-65
- Cooper, D. R. & Schindler, P S (2000). Business research methods, seventh edition New York: Irwin/Mcgraw-Hill
- Croushore, D. (2007). *Money and Banking: A Policy Oriented Approach. 2nd Edition.* Boston: Houghton.
- Darryl, R. F. (1969). High Interest Rates Cause and Cure, Federal Reserve Bank of Missouri. *A Speech given for the Fourth Annual Conference for Missouri Banks*
- Deng, D., Zheng, D. & Ling, C. (2004). An Early Assessment of Residential Mortgage Performance in China. *Journal of Finance and Economics*, 2(10), 14-20
- Devereux, M. B., & J. Yetman (2002). Price setting and exchange rate pass through: Theory and evidence.
- Gerlach, S. & Peng, W. (2005). Bank Lending and Property Prices in Hong Kong. *Journal of Banking and Finance*, 29, 461–481.
- Green, J. & Shoven, J.B. (1983). The effects of interest rates on mortgage prepayments. *Working Paper No. 1216*
- Hass consult, (2014). *The Hass Property Index: Q1–Q4 Reports 2012-2013, Report 2014*
- Karanja, A.W. (2009). Mortgage financing and profitability of commercial banks in Kenya. *Unpublished MBA Project, University of Nairobi*

- Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. Retrieved from web edition Adelaide. Published by eBooks Adelaide.
- Krainer, J. & Laderman, E. (2011). Mortgage Loan Securitization and Relative Loan Performance. *Working Paper 2009-22*
- Makori, J.O, & Memba, F. (2015). Factors influencing performance of mortgage financing among commercial banks in Kisii town Kenya. *International Journal of Economics, Commerce and Management*. 3 (3), 9-12
- Mbula, R. (2014). Effect of mortgage financing on performance of real estate industry in Kenya. *Unpublished MBA Project, Kenyatta University*
- Modigliani, F. & Lessard, D. (1974). Inflation and the Housing Market: Problems and Potential Solutions.
- Mogaka, A. J, Mboya, K. J & Kamau, R. G. (2015). The Influence of Capital Market Deepening on Mortgage Market Growth in Kenya. *Research Journal of Finance and Accounting*. 6(10), 12-15
- Morgan. D. L. (2007). Paradigms Lost and Pragmatism Regained: Methodological Implications of Combining Qualitative and Quantitative Methods, *Journal of Mixed Methods Research*, 1:48
- Mugenda, A. & Mugenda, O. (2003). *Research Methods: Quantitative and Qualitative Approaches*. Acts Press, Nairobi.

- Muguchia, L. (2012). The Effect of Flexible Interest Rates on the Growth of Mortgage Financing in Kenya, *Unpublished MBA Project*. University of Nairobi
- Mutero, J. (2007). Access to Housing Finance in Africa: *Exploring the Issues: Kenya*, Finmark Trust, December, 2007
- Muthaura, A. (2010). The relationship between interest rate and real estate investment in Kenya. *Unpublished MBA Project*. University of Nairobi
- Njongoro, J. N. (2013). The effect of mortgage interest rate on the growth of mortgage financing in Kenya. *Unpublished MBA Project*. University of Nairobi
- Pettinger, T. (2013). *Factors that Affect the Housing Market*. Helping to simplify economics. Economicshelp.org
- Radha, U. (2011). Analyzing the Sources and Impact of Segmentation in the Banking Sector: A Case Study of Kenya. *Economics PhD Thesis*. University of London.
- Schmudde, A. David. (2004). A Practical guide to mortgages and liens. Philadelphia, American Law Institute.
- Siddiqui, S. (2012). Interest Rate Volatility on non-Performing loans in Pakistan, *International Research Journal of Finance and Economics*, 21(11), 12-21
- Thygeson, K. (1995). *Management of Financial Institutions*. New York: Harper Collins
Collage Publishers

Wambui, N. S. (2013). The effect of interest rate volatility on mortgage default rate in Kenya. *Unpublished MBA Project*, University of Nairobi

World Bank. (2011). Developing Kenya's Mortgage Market. Report No. 63391-KE

APPENDICES

Appendix I: List of Commercial Banks in Kenya

1. African Banking Corporation Ltd
 2. Bank of India
 3. Bank of Africa Kenya Ltd
 4. Bank of Baroda (Kenya) Ltd.
 5. Barclays bank of Kenya Ltd
 6. CFC Stanbic Bank Limited
 7. Chase Bank Kenya Ltd
 8. Charterhouse Bank Ltd
 9. Citibank N A Kenya
 10. Co-operative Bank of Kenya
 11. Commercial Bank of Africa
 12. Consolidated Bank
 13. Credit Bank Ltd
 14. Development Bank of Kenya
 15. Diamond Trust Bank
 16. Dubai Bank Kenya Ltd
 17. Ecobank Kenya Ltd
 18. Equatorial Commercial Bank
 19. Equity Bank
 20. Family Bank Ltd
 21. Fidelity Commercial Bank Ltd
 22. Fina Bank
 23. First community Bank Ltd
 24. Giro Commercial Bank Ltd
 25. Guardian Bank Ltd.
 26. Gulf African Bank Ltd
 27. Habib Bank A.G Zurich
 28. Habib Bank Ltd
 29. Imperial Bank Ltd
 30. I&M Bank
 31. Jamii Bora Bank Ltd
 32. K-Rep Bank
 33. KCB Bank
 34. Middle East Bank (K) Ltd
 35. National Bank
 36. NIC Bank
 37. Oriental Commercial Bank Ltd
 38. Paramount Universal Bank Ltd
 39. Prime Bank
 40. Standard Chartered Bank Kenya
 41. Trans-National Bank (K) Ltd
 42. UBA Kenya Bank Ltd
 43. Victoria commercial Bank Ltd
- Non-Banking Financial Institution**
1. Housing Finance Company Ltd.

Source: CBK supervision report 2013 pg. 85-106

Appendix II: Research Data

Year	Money Supply-M3	GDP(000)	Inflation	Mortgage Uptake(000)	Interest rate	lnGDP	ln(Mortgage Uptake)	lnM3
2004	379,521	273,983	9.8	19,740	7.6	12.5208	9.8904	12.8467
	389,506	260,382	10.3	20,014	7.75	12.4699	9.9042	12.8726
	403,113	279,699	10.8	19,805	7.3	12.5415	9.8937	12.9070
	414,197	295,274	11.6	20,064	7	12.5957	9.9067	12.9341
2005	428,743	281,335	14.3	21,355	8.49	12.5473	9.9690	12.9686
	431,830	277,857	14.23	22,954	8.61	12.5349	10.0412	12.9758
	446,857	303,053	7.67	23,321	8.61	12.6217	10.0571	13.0100
	466,190	313,004	5.77	23,934	8.02	12.6540	10.0831	13.0523
2006	478,763	298,153	17.8	26,457	8.02	12.6054	10.1833	13.0790
	504,457	295,111	12.97	25,565	9.75	12.5951	10.1490	13.1312
	528,507	327,868	11.8	24,002	10	12.7004	10.0859	13.1778
	545,783	328,338	15.3	24,228	10	12.7018	10.0953	13.2100
2007	557,650	319,289	7.47	24,848	8	12.6739	10.1205	13.2315
	581,440	319,696	7.7	25,285	8.5	12.6751	10.1380	13.2733
	615,595	348,672	12.57	26,631	8.75	12.7619	10.1898	13.3303
	638,440	349,189	11.47	24,578	8.75	12.7634	10.1096	13.3668
2008	673,720	322,757	19.7	22,987	8.75	12.6847	10.0427	13.4206
	716,890	326,599	29.13	25,471	9	12.6965	10.1453	13.4827
	719,543	357,649	27.43	28,782	9	12.7873	10.2675	13.4864
	747,127	350,258	28.5	29,902	8.75	12.7664	10.3057	13.5240
2009	761,007	342,820	17.03	37,960	8.38	12.7450	10.5443	13.5424
	789,807	332,800	10.2	40,908	8	12.7153	10.6191	13.5795
	824,550	364,423	7.47	44,444	7.75	12.8061	10.7020	13.6226
	866,800	354,344	5.63	46,401	7	12.7780	10.7451	13.6726
2010	1,086,504	347,744	4.58	46,733	7	12.7592	10.7522	13.8985
	1,160,438	352,979	3.68	52,925	6.75	12.7742	10.8766	13.9643
	1,224,547	390,817	3.33	87,836	6.38	12.8760	11.3832	14.0181
	1,261,646	383,763	3.84	97,637	6	12.8578	11.4890	14.0479
2011	1,305,511	364,549	7.05	102,036	5.88	12.8064	11.5331	14.0821
	1,355,670	365,470	13.16	114,815	6.25	12.8089	11.6511	14.1198
	1,444,592	406,453	16.51	124,727	6.63	12.9152	11.7339	14.1833
	1,505,853	403,440	19.19	134,162	15.17	12.9078	11.8068	14.2249
2012	1,509,222	378,795	16.87	140,950	18	12.8448	11.8562	14.2271
	1,564,173	381,962	11.78	157,397	18	12.8531	11.9665	14.2629
	1,640,561	425,119	6.38	156,927	14.75	12.9601	11.9635	14.3105
	1,723,349	424,209	3.53	161,660	11	12.9580	11.9933	14.3598

2013	1,744,233	398,511	4.08	164,397	9.5	12.8955	12.0100	14.3718
	1,815,433	399,156	4.37	170,320	8.5	12.8971	12.0454	14.4118
	1,849,167	446,247	6.99	194,026	8.5	13.0086	12.1757	14.4302
	1,924,700	442,235	7.42	192,602	8.5	12.9996	12.1684	14.4703

Sources:

- i. GDP and Inflation rates - Kenya National Bureau of Statistics**
- ii. Money Supply (M3) and Mortgage loan values - Central Bank of Kenya**
- iii. Interest Rates -: <http://www.tradingeconomics.com/kenya/interest-rate>**