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# Effect of Mortgage Market Risk on Mortgage Uptake: A Case Study of Mortgage Lenders in Kenya

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**Abstract:** Mortgage market is a financial system that provides opportunity for originating and trading mortgage loans. A mortgage loan is used for financing real estate investments. Although there has been a remarkable increase in demand for real estate investments in Kenya the amount of mortgage uptake is still low. Studies reveal risks as important macroeconomic variables in the mortgage market. However the effect of these risks on mortgage uptake in Kenya is inconclusive. The purpose of this study was to evaluate the effect of mortgage market risk on mortgage uptake. The objectives of the study were to determine the effect of credit risk, interest rate risk, price risk and liquidity risk on mortgage uptake in mortgage lending institutions in Kenya. Causal research design was used to establish the effect of mortgage market risk on mortgage uptake. Purposive sampling was used to select a sample size of 27 out of 37 mortgage lenders that had been involved in mortgage lending since 2008 to 2013. Secondary data was obtained from Central Bank of Kenya reports and mortgage special reports for the period under study. The assumptions that form a basis for use of the regression model were tested using homoscedasticity and autocorrelation. Ordinary Least Square method was used to determine the cause effect relationship among variables while hypotheses were tested at 5% significance level. The overall model was found to be significant with F=13.474 and p-value (0.00 < 0.05). The findings revealed that risks faced by lenders affect mortgage uptake such that if the risk involved in lending is high lenders limit the amount of mortgage lending. The study recommended that lenders should ensure risks are well managed so as to increase mortgage uptake. The findings would form a basis for lenders to formulate risk management strategies that would help to mitigate risks and increase mortgage uptake. The study also forms a basis for further research and adds to the existing body of knowledge.

**Keywords:** Credit Risk, Interest Rate Risk, Liquidity Risk, Mortgage, Price Risk, Real Property,
Mortgage Lending Institutions

## 1. Introduction

Mortgage financing is an important means of financing investment in real estate (Brueggeman & Fisher, 2008). Investing in real estate requires large amount of capital to be mobilized which the investors may not raise on their own (Central Bank of Kenya, 2012). This would result to investors borrowing funds from lenders secured in real estate with a mortgage. A mortgage is a loan secured by collateral of some specified real estate property that the borrower is obliged to pay back with predetermined set of installments (Biernert & Brunauer, 2007). According to Giddings (2007) it is a source of long term finance for the development of more new housing, urban infrastructure and a major driver for the deepening of capital markets.

In developed countries mortgage financing is more available and has gained recognition as opposed to developing countries (Hahm, 2004). According to Hassler, Chiquer and Lea (2004) the development of mortgage markets in most African countries is still at infancy. Most financial institutions are limited by high interest rates and the mismatch between the short term nature of deposits and the long term nature of mortgage lending. Vuyisani (2003) noted that mortgage finance system in Africa is faced with major challenges such as default rates, lack of long term funds required to match the duration of mortgage loans and high interest rates. In an effort to resolve the situation financial institutions have been established but find the market too risky. According to World Bank (2011) the Kenyan mortgage market is underdeveloped as mortgage financing is unaffordable, inaccessible and

unpopular. Although there has been a remarkable increase in demand for real estate investment in Kenya mortgage uptake is low(Arvantis, 2013).

According to Kariuki (2013) urgent attention needs to be given to increase the accessibility and eligibility of mortgages, if home ownership is to be increased to a wider band of Kenyans. The size of the mortgage portfolio is low with only a few lenders holding more than 70% in their portfolio, with a total mortgage value of Ksh 61.4 billion and 13803 mortgage accounts. This is far below expectation of bridging the housing gap of 156,000 units per annum (World Bank, 2011). The average mortgage amount is Ksh 6.6 million and requires a repayment of Ksh 90,000 per month for over 20 years at 12% interest rate, thus it is affordable only to those earning over Sh100,000 per month (Arvantis, 2013). This is way beyond what an average professional earns which means they cannot qualify even for the most basic mortgage product. This eventually has an impact on the number of people who take up mortgages and in turn the volume of the mortgage market. Initially lenders were restricted to 25% mortgage lending but the limit was increased to 40% with an intention of enhancing the growth of mortgage market (Njuguna 2011). The amount of mortgage lending in Kenya still is considered low by the international standard and with a 2.5% contribution to GDP as compared to South Africa whose contribution is at 26.4% (Central Bank; World Bank, 2013)

In a survey done by Central Bank of Kenya (2012) lenders pointed out several constraints on the further growth of the mortgage market. Most notably is long term access to funds, deficiencies in property valuation, credit risk and high interest rates. According to World Bank (2011) some mortgage lenders are liquidity constrained as a result of mismatch between short term deposits and the long term mortgage loans. Lenders also face the risk of default as credit bureaus do not offer comprehensive credit histories and the value of collateral can be affected during foreclosure and valuation process. Furthermore they face the risk that changes in interest rate will affect the net interest margin made on mortgage loans. Hass Consult Survey (2013) noted that the property market is characterized by constantly changing prices that are set arbitrarily thus affecting repayment and value of loans. Eventually, the inability of lenders to understand and manage these risks means that they charge a high risk premium making mortgages to be costly. Hassler *et al*. (2004) noted that mortgage lending is often rationed, relatively expensive and depository based when lenders remain vulnerable to credit, liquidity and interest rate risks. Therefore lenders are exposed to risks when lending but the effect of these risks on the amount of mortgage loans made is inconclusive in Kenya. Therefore this study aims to determine the effect of mortgage market risk on mortgage uptake among mortgage lending institutions.

Mortgage finance is important in increasing supply of residential property and development of urban infrastructure to support the growing population and urbanization. However according to a World Bank report, Kenya is experiencing a housing supply deficit of 156,000 units per year and mortgage finance is costly and inaccessible. Only 2.4% of the total population and 11% percent of the urban population could afford a mortgage, and assuming everyone who could afford a mortgage takes one. This would translate to just over 249,260 loan accounts, and a potential mortgage loan value of Kshs 800 billion, but the current mortgage loan value is 61.4 billion with13,803 loan accounts which is considerably smaller than the expected level of lending. In 2010 the mortgage lending limit imposed on lenders was increased from 25% to 40% and lenders were allowed to issue bonds to raise funds, this was intended to strengthen the mortgage market and increase mortgage lending. Despite of these measures, the number and total amount of mortgage loans is still low resulting to low level of housing supply and poor urban infrastructure. In a survey done in 2012 by Central Bank lenders pointed out credit risk, interest rate risk, liquidity risk and price risk as important macroeconomic variables in the mortgage market. However the effect of these risks on mortgage uptake in Kenya is inconclusive. Therefore this study aimed at determining the effect of mortgage market risk on mortgage uptake in mortgage lending institutions in Kenya. The study was guided by the following Specific objectives:

i.   To determine the effect of credit risk on mortgage uptake in mortgage lending institutions
ii.  To establish the effect of interest rate risk on mortgage uptake in mortgage lending institutions
iii. To establish the effect of price risk on mortgage uptake in mortgage lending institutions
iv.  To determine the effect of liquidity risk on mortgage uptake in mortgage lending institutions.

# 2. Literature Review

## 2.1. Theoretical Framework

This study is premised on the loanable funds theory, it is a classical theory developed by Wicksell Robertson in 1934. This theory states that the quantity of a financial security supplied changes at every given interest rate in response to a change in another factor besides the interest rate. One of these factors is the risk of a financial security, which causes a shift in the supply curve of loanable funds. Holding all other factors constant, as the risk of financial security decreases it becomes more attractive to suppliers of fund, hence the supply of funds increases. Conversely, as the risk of financial security increases it becomes less attractive to suppliers of funds hence the supply of funds decreases (Saunders & Marcia, 2001). This theory proposes that supply of loans will decrease if the mortgage loan is considered to be risky. Brueggeman and Fisher (2008) noted that, when lenders are supplying funds to the mortgage market they consider the returns and the associated risks in lending.

In title theory, the property-law doctrine states that a mortgage transfers title to a property to the mortgagee, who holds it until the mortgage has been paid off, at which time title passes to the mortgagor. In title theory, the banks retain the title since the mortgage is said to hold a title interest, they

have the right to possession under this theory. Some banks apply a lien theory. This theory only gives the mortgagee a lien interest in the property. In a title theory, the mortgage is treated as having transferred title to the mortgagee, subject to the mortgagee's duty to recovery if payment is made. The title is said to remain in the mortgagee until the mortgage has been satisfied and foreclosed. Although the mortgagee has the right of possession to the property, there is generally an express agreement giving the right of possession to the mortgagor. The mortgagee is said to hold the title for security purposes only. The mortgagor is given the right of possession.

Lien theory provides that a mortgagee of property holds only a lien, not title, to the property until such time as the mortgage is fully paid, at which time the lien is removed. In a lien theory bank, the mortgagor retains legal and equitable title to the property, but conveys an interest that the mortgagee can only foreclose upon to satisfy the obligation of the mortgagor. This is equivalent to a future interest in the property which allows the mortgagee to use the process of foreclosure. The interest is a security interest or mortgage, which forms a lien on the property. In this theory the right to possession arises upon a default. The mortgagor has a right to sue the mortgagee for any interference with his right of possession.

### 2.2. Mortgage Loan

According to Brueggeman and Fisher (2008) a mortgage is created in a transaction whereby one party pledges real property to another party as security for an obligation owed to that party. A mortgage can also be defined as a long term debt instrument backed by real property that is already owned or will be purchased by the borrower (Jacobus, 1999). It involves the potential buyer borrowing funds from a lender and then using these funds to purchase residential or commercial property.

In Kenya mortgage products are offered by commercial banks, microfinance institutions and housing finance company. An average mortgage loan is Sh6.6 million, and demands a monthly repayment of about Sh90, 000 for a period of 20 years ( World Bank, 2011). The average interest rate charged on mortgages is 18% and ranges between 11%-25%, with most of the financial institutions charging variable interest rate other than fixed interest rate (Central Bank of Kenya, 2012). In 2013 about 97.4% of mortgage loans were on variable interest rates basis compared to 85.6% in 2012 (Central Bank of Kenya, 2013). The most common fees payable for mortgages are legal fees, valuation fees, arrangement fees, stamp duty and mortgage protection policy premium. These fees are charged to ensure the lender is compensated for the risk of lending. Although, Central Bank (2012) noted since 2006, the average mortgage loan size has been growing steadily, in December 2011 the size of the mortgage was 61.4 billion in 2012 it grew to 122.2 billion. Also the numbers of mortgage accounts grew from 16,029 in 2011 to 19,177 in 2012 but still the level of lending is low.

### 2.3. Mortgage Lenders in Kenya

Mortgage lenders are those institutions that have mortgage securities in their portfolio, they include commercial banks, insurance companies, savings institutions, finance companies and mortgage banks (Rose, 2003). Institutions play a crucial role in the financing of real estate through mortgage financing. They lend for the purchase of land, development of existing buildings, finance construction projects and lend to non-financial firms based on real estate collateral (Davis & Zhu, 2004). Mortgage credit is positively related to profitability because it creates a long term source or revenue for the bank offering mortgage credit (Sharpele, 2000). Lenders in the mortgage market pursue a variety of income sources; they may retain new mortgage loans in their asset portfolio and receive the borrower's interest and principal payments, while other lenders may quickly sell any loans they make and instead pursue loan servicing, securitization and other fee generating services because of more predictable liquidity demands and lower capital requirements involved with supporting services (Rose, 2003). Each of these possible cash flows sources from a mortgage loan has its own advantages and disadvantages in terms of sensitivity to default, interest rate, liquidity risk and changes in sizes of cash flow expected to be received.

According to World Bank (2011) there are two types of lenders which can be authorized by the Central Bank of Kenya. These are ordinary banks and mortgage companies which include Commercial Banks and Housing Finance Company of Kenya (HFCK). HFCK was established at the beginning of 1966 to stimulate the private sector, by the Government in collaboration with Commonwealth Development Corporation. The main objective of HFCK was to promote a savings culture and make loan funds available to people wishing to acquire their own homes. Today Housing Finance provides integrated financial solutions and focuses on both commercial and residential property. In the first quarter of 2013, the amount of loans and advances to customers made by HFCK was 37.4 Billion (Central Bank; World Bank, 2013). Commercial Banks under the Banking Act of Kenya are authorized to conduct mortgage business for the purpose of financing house purchase, construction and refinancing purposes. Banks offer mortgages to their staff members or special customers and have just one or two loans on their books while other banks are much larger players who see mortgages as a major business center. (Central Bank; World bank, 2012). A survey done in 2012 by Central Bank revealed that about 70% of lending to mortgage market was by 5 institutions, that is, one medium sized bank (25.5%) and four banks from the large banks peer group (44.6%). Although a limit was placed on institutions not to lend more than 25% of their total deposit liabilities it was raised to 40% and mortgage finance companies were allowed to open current accounts for their customers, Pension funds and insurance companies can also be involved in lending as they represent a potentially huge source of longer term funds, but for the most part, their investment in housing finance has been very limited.

### 2.4. Kenyan Mortgage Market

Mortgage market is defined as a market in which mortgage loans, backed by real property are originated and sometimes

trade (Melicher & Norton, 2003). According to Fabozzi, Modigliani and Jones (2007) mortgage market is a collection of markets that include a primary market and secondary market where mortgages trade. Mortgages are originated by financial institutions in the primary market and can be packaged as securities to be sold in secondary market. The Kenyan mortgage market remains primary with little activity in the secondary market (Central Bank; World bank, 2012). This limits the funding base of lender market as they become liquidity constrained. According to World Bank (2011) if Kenya is to expand, it may need to emulate countries such as Colombia and South Africa, both of which have developed secondary mortgage markets. This would allow it to safely go beyond the current credit/ deposit levels and engage in longer term lending. The secondary market is established in order to free up capital by packaging mortgages and selling them as assets to institutional investors.

### 2.5. Importance of Mortgage Financing

According to Lea and Chiquier (2007) mortgage finance improves the operation of the property market by increasing the number of housing and commercial units. It also affects the economy directly by facilitating transactions and by improving the environment in which transactions take place. Kibirige (2006) asserts that the mortgage finance sector creates employment directly to the construction industry and indirectly to other sectors. According to Giddings (2007) construction is a driver of economic growth, a multiplier of 1.0 is generated by housing construction meaning that for every dollar spent on housing, another dollar is spent in other sectors. In industrialized countries, mortgage financing is a major driver for deepening of capital markets which then serve as sources for long term financing. As the mortgage markets deepen, the supply of housing and urban infrastructure also increases. According to Erbas (2005) availability of residential mortgages has favorable impact on poverty alleviation, quality of housing, infrastructure, and urbanization. Kibirige (2006) noted a more formalized housing market that is subject to real estate taxes and utility charges, can serve as an important source of revenue for financially strapped local governments. In South Africa, more than 95% of local government revenue is derived from local sources including real estate taxes and surcharges on water and power. This results to a more financially viable local government. Therefore mortgage finance is not only important in increasing the asset portfolio of lenders and creating access to finance for borrowers but it is also important for social, economic and civic development.

### 2.6. Mortgage Market Risk

Risk is the possibility of a loss or the uncertainty associated with future events. According to Nyandemo and Sigh (2003) uncertainty is a situation when decision makers do not have full knowledge about the future of a product, demand, factor costs and other relevant variables. Financial institutions will try as much as possible to avoid the risk associated with loss in order to minimize negative consequences. The risk surrounding potential losses creates significant economic burdens for financial institutions. On the other hand the investment principle says that the largest potential returns are associated with the riskiest ventures (Trieschmann, Hoyt, & Sommer, 2005). Financial Institutions have an objective to increase returns for its owners, this often comes at the cost of increased risk. These risks affect the profitability and performance of institutions as a result it is important to understand and manage risks to which an institution in a given market is exposed to.

In a study done by Renaud and Jaffe (1996) they noted several factors that hinder development of mortgage markets in developing economies and proposed a strategy to expedite that development. They noted that lenders in developing economies are reluctant to make mortgage loans because of the risks in mortgage lending (credit, liquidity, interest and price). Together with required improvements in the primary market, a secondary market is likely to help solve the problem.

In mortgage financing, there are different customers from different backgrounds, and this exposes a lot of risk to both the borrower and the lender (Scanlon & Whitehead, 2004). Lewis and Neave (2008) noted that the major risks include credit risk to the lender, that the borrower will default on loan obligations and investment risk on the owner-occupier that the value of the home will fall, and with it the value of the owner-occupier's equity will also fall. Further there is interest-rate risk to either party to a loan that the interest rate will move against them and finally prepayment risk to the lender that the borrower will repay a loan (particularly a fixed-rate loan) before the end of its term (Agada, Murumba, & Besigiroha, 2009). According to World Bank (2011) some Kenyan lenders are liquidity constrained as the market is characterized by relatively liquid banking sector as a result of mismatch between short term deposits and the long term mortgage loans. Also, credit bureaus do not yet offer comprehensive credit histories on loan applicants and the value of collateral is tampered by deficiencies in the foreclosure process.

In spite of these risks the advent of institutional investors has given rise to skills necessary to manage the complex risks associated with housing finance. The creation of mortgage related securities provide the multiple instruments by which housing lenders can access these important sources of funds and better manage and allocate part of their risks (Central Bank; World Bank, 2013). In Kenya, measures to strengthen the mortgage market were put in place such as the limit placed on institutions not to lend more than 25% of their total deposit liabilities was raised to 40%, mortgage finance companies were allowed to open current accounts for their customers to increase their term deposits and lenders were allowed to issue bonds to raise funds for mortgage lending (Njuguna, 2011). These measures were put in place to mitigate risks, increase the level of mortgage lending and facilitate growth of the mortgage market.

## 2.7. Credit Risk

Credit risk is one of the oldest forms of risk faced by financial institutions (Broll, Pausch & Welzel, 2002).Credit risk arises because of the possibility that promised cash flow on financial claims held by financial institutions such as loans and bonds will not be paid in full. If the principal on all financial claims held by financial institutions were paid in full on maturity and interest payments were made on their promised dates, financial institutions would always receive back their original principal plus interest-that is they would not face credit risk (Saunders & Marcia, 2001). Credit risk carries the potential of wiping out enough of a financiers capital and forcing it into bankruptcy, thus managing this kind of risk has always been one of the predominant challenges in running a financial institution (Broll et a.l 2002). The potential loss a firm can experience from lending suggests that institutions need to collect information about borrowers whose assets are in their portfolio and to monitor those borrowers overtime. Thus managerial efficiency and credit risk management strategies directly affect the risk and returns of the portfolio (Saunders & Marcia, 2001). Credit risk in mortgages involves the risk that the interest and principal amount will not be paid when due. According to Lea (1990) it is risk brought about when the market value of the property falls below the market value of the mortgage.

Saunders and Marcia (2001) asserts that residential mortgages are the most important loan assets to banks and saving institutions, hence these applications are the most standardized of all credit applications. Two considerations dominate a financial institutions' decision as to whether to approve a mortgage loan application or not:-First the applicants ability and willingness to make timely interest and principal repayments. This is established by application of qualitative and quantitative models such as credit scoring model. The loan officer must also establish whether the applicant has sufficient income. Secondly, the borrower's collateral is considered after determining the creditworthiness of the borrower. The lender should make sure that the collateral that secures the loan is free and clear from other claims. Some institutions require a borrower to make a down payment of the property before issuing the loan to prevent the borrower from defaulting.

## 2.8. Interest Rate Risk

According to Coong (1995) interest rate risk is the exposure of a financial institution's current or future earnings and capital to interest rate change. Most financial Institutions suffer losses in profits or asset value when the general level of interest rates rises. According to Kolbe, Gaylon and Rudner (2003) a financial institution potentially exposes itself to interest rate risk in mismatching the maturity of its assets and liabilities. The lender is exposed to interest rate risk if interest rate on assets and liabilities is adjusted at different times or its subject to different contractual maturities (Bangkok Bank, 2008). Interest rate is a major factor that determines the lenders interest income on assets and interest expense on liabilities thus affecting the net interest income of the lender. Also changes in interest rate affects the refinancing and reinvestment decision of a borrower. In addition, a financial institution faces economic or present value uncertainty as well when interest rates change.

The fair market value of an asset or liability is conceptually equal to the present value of the current and future cash flows on that asset and liability. Therefore rising interest rates increases the discount rate on future asset cash flows and reduce the market price or present value of that asset or liability. Moreover, mismatching maturities by holding long term assets than liabilities means that when interest rates rise, the present value of the financial institution's assets fall by a larger amount than its liabilities (Fabozzi et al. 2007). This exposes the financial institution to the risk of economic loss and potentially to the risk of insolvency.

The increased globalization of financial markets flows has made the measurement and management of interest rate risk a prominent concern facing many modern financial institution managers (Saunders & Marcia, 2001). In a low interest rate volatility environment, the risk exposure to financial institution from mismatching the maturity of its assets and liabilities tends to be small. On the other hand high volatility of interest rates increases the risk exposure of a financial institution. Kenya being susceptible to inflationary pressure both internally and externally generated it is vulnerable to highly volatile interest rate changes (World Bank, 2011). The movement of interest rates affects lenders cost of funds and return on assets exposing it to interest rate risk. Lenders protect themselves against this risk by matching the maturity of their assets and liabilities. However matching is not consistent with an active transformation function for institutions. Although it does reduce the interest rate risk exposure it reduces the financial institution's profitability.

## 2.9. Price Risk

Prices are determined by macroeconomic and credit market conditions and by the behavior of the individuals buying and selling properties. In the property market there is risk of sharp fall or increase in housing prices. This is a major concern not only to the owner of the property but also to lending institutions and to investors of structured products backed by residential mortgage loan (Brueggeman & Fisher, 2008).

The average change in prices is related to changes in fundamentals such as national and local macroeconomic variables, or market wide bubbles but not all properties in a market are affected at the same rate (Glower, Donal, & Hendersholt, 1998). Multiple studies have found that the relationship between a home's original value and the rate of appreciation varies over time according to the prevailing economic climate for example, lower-priced houses are more likely to appreciate as interest rates fall while income and employment rise. On the contrary increase in taxes would have a negative effect on prices (Li & Resenblatt, 2005). If the cost of rental housing should increase relative to house prices demand for owning should increase this is because individuals would prefer to take a loan and own if it is cheaper to own than

rent and also if there is price appreciation of real estate property.

At the time the loan is originated, the lender will ensure that the appraised value of the property is greater than the amount of the loan (Claurietie & Sirmans, 2006). Lenders want assurance concerning the price of the property because it will be serving as security for repayment of the mortgage debt and over time it must remain sufficiently high to repay the outstanding loan balance in the event of default. Lenders usually require that an estimate value be made by an independent fee appraiser (Brueggeman & Fisher, 2008). Lenders give out loans based on a ratio known as loan to value ratio, this ratio enables the lender to be cushioned from the high risk involved in the longer payback period. The loan value ratio is presented in Table 1.

*Table 1. Loan Value Ratio.*

| Bank Segment | Average Loan to Value | Minimum Loan to Value | Maximum Loan to Value |
|---|---|---|---|
| Large Banks | 85% | 60% | 100% |
| Medium Banks | 77% | 60% | 90% |
| Small Banks | 79% | 65% | 90% |
| Average | | 82% | |

Source: Central Bank of Kenya Survey, 2010

Table 2 shows that the loan to value ratio in 2010 for Kenyan banks was approximately 82% of the property value, with larger institutions offering much higher loan to value ratios (85%) than medium (77%) and smaller banks (79%).A loan to value ratio that is greater than 100% implies that loan amount is greater than the value of property which is risky. Lenders require a higher spread for a higher loan to value ratio given that the higher LTV represents a higher risk (Wang & Hongfei, 2007). In Kenya lenders offer on average a LTV that is less than 100% which means the value of property is greater than loan amount hence they are cushioned against risks of lending as they are guaranteed of the full recovery of loan in case of default as a result of fall in prices of property.

Bianco (2008) noted in the U.S there was a financial crisis in 2008 that started in the late 1990s. The house prices grew rapidly in response to low mortgage rates offered by lenders which attracted many borrowers to take up mortgages. The increased lending lead to increased demand that helped fuel the rise of housing prices and consumer spending, creating an unheard of increase in home values of 124 percent between 1997 and 2006. Some homeowners took advantage of the increased property values of their home to refinance their homes with lower interest rates and take out second mortgages against the added value to use for consumer spending. The number of loans rose as rising real estate values rose this led to lenders not considering higher-risk borrowers for loans. In turn, U.S. household debt as a percentage of income rose to 130 percent in 2007, 30 percent higher than the average amount earlier in the decade. It became difficult for borrowers to repay the loan and default rate increased; also it was difficult for lenders to recover the value of the loan as property prices declined drastically. This led to bankruptcy of some of

the institutions. However, in the case where mortgage rates are high this causes loans to be expensive and therefore the demand for purchasing a house declines therefore the prices of properties decline.

In Kenya the analysis of property prices is based on the Hass Property Price Index. The index has some methodological shortcomings which are inevitable in a developing market, but it represents a very useful tool which will grow in importance as the market develops (Central Bank of Kenya, 2012).The main drawback on the reliability of property valuations is lack of comparative data as the property market is still relatively thin and not all transactions will be accurately captured, especially at the lower end of the market (World Bank, 2011). Although Coong (1995) argues that if changes in market prices are predictable, then changes in prices cannot be perceived as risky. The property price index can be used in determining the prices of property and if it is possible to forecast prices then lending backed by property is not risky. On the contrary Hass Consult Survey (2013) noted that the property market is characterized by sky-rocketing prices that affect mortgage uptake. On the other hand lenders prefer to issue mortgages when the property prices are high because this guarantees the recovery of loan in case of default and prevents refinancing. Otherwise, for borrowers when the property prices fall it becomes favorable to undertake mortgages, refinance and invest in purchase of property with the expectation that the property price will rise and they will benefit.

### 2.10. Liquidity Risk

Loans are the major items on a bank's balance sheet and generate the largest flow of revenue income. However loans are also the least liquid asset item and the major source of credit and liquidity risk for most banks (Saunders & Marcia, 2001). With the instability of poor households' incomes, high foreclosure costs, and liquidity risk of longer term loans, in Kenya and many developing countries, causes lenders to prefer shorter-term loans which are often less risky than long-term loans (Oriaro, 2000). Mortgage loans tend to be rather illiquid because they are large and indivisible. Although Rose (2003) asserts that a liquid financial asset is readily marketable. In addition it is reversible meaning the holder of the asset can usually recover her funds upon resale with little risk of loss. Hence liquid assets carry lower interest rates than illiquid assets. Therefore investors strongly interested in maximum profitably try to minimize their holding of liquid assets. Lenders face the liquidity problem because loans being a long term asset are financed largely by depository institutions that obtain their funds through deposits that are primarily if not entirely of short term nature. These institutions engage inevitably in a higher speculative activity: borrowing short and lending long; that is, they mismatch the maturity of assets (mortgages) and the liabilities raised to fund these assets. A depository institution's balance sheet typically has a large amount of short term liabilities, such as demand deposits and other transaction accounts which fund relatively long-term, illiquid assets such as mortgages (Saunders &

Marcia, 2001). Speculation of this sort provides a losing proposition if interest rates rise as is bound to happen in the presence of significant inflation. The institution may be earning the contractual rate but to attract the deposits needed to finance the loan it must pay the current higher market rate (Brueggeman & Fisher, 2008). On the other hand Marshall (2009) argues that lenders originating mortgage loans by the use of deposits and holding them, has the great merit that solvent lenders have strong incentives both to underwrite mortgages carefully and, if necessary, to modify them.

In Kenya asset and liability mismatch is a serious problem that lenders face. Managing this risk remains a great task for managers of institutions. In order to deal with this problem institution must maintain a high level of credibility and public confidence in their activities, particularly to attract small long term conservative savers (Mutero, 2010). The secondary mortgage market does not exist, thus mortgage lenders have to source for funds in order to issue out mortgage loans because they are mostly long term hence illiquid. However one of the aims of Kenya Vision 2030 is to establish a secondary mortgage market that will help boost the primary mortgage market. The institution which is most constrained is Housing Finance Company of Kenya which has more housing loans than deposits. This means it is dipping into its equity to fund itself together with the use of bank lines of credit. This is an expensive form of funding, and would not be sustainable over the longer term. To resolve this situation HFCK entered into the bond market to raise Ksh 10 billion to acquire finance for lending. Since the government allowed the holding of current accounts by customers of HFCK, It is actively promoting term savings products which will help extend the maturity of its retail deposit liabilities. KCB is also under pressure as it has a mortgage loan portfolio in excess of 10 percent of its deposit base. Whilst it still has room to grow, it sought to address its funding situation by doing a rights issue for Ksh 15 billion. This is in part to fund its regional growth in East Africa but also to allow it to expand its mortgage lending business. In addition, it is also entering into arrangements with International Finance Corporation for a credit facility to help expand its mortgage business ( World Bank, 2011). In 2009, Co-operative Bank issued an initial public offering and was able to raise capital to support its entry into mortgage lending, also Barclays Bank ventured into the bond market to support its mortgage business (Mutero, 2010). These measures taken by lending institutions are meant to increase the amount of lending as they reduce overreliance on deposit funding.

Kenya has a large investor base made up of individual investors, pension funds, insurance companies and banks themselves. Together these institutions have substantial funds which in many cases are seeking long term investments to match the long term liabilities which are generated by the pension or insurance businesses. In the finance bill 2010 it was proposed pension funds should be used to guarantee members mortgages. This will increase mortgage uptake and eventually enhance growth of the mortgage market. The total pension assets are close to Ksh 400 billion when National Social Security Funds are also included, insurance assets are around

Ksh 180 billion and the Unit Trust market as at end of 2010 was worth Ksh 28 billion. Overall funds of institutional investors, excluding the banking sector amount to over Ksh 600 billion, almost 10 times the current size of the mortgage market (Central Bank; World bank, 2013) According to Njuguna (2011) the use of pension funds to undertake mortgages is undergoing but at a slow pace. Otherwise these institutions can use their large funding base to fund mortgage loans, act as institutional investors in the secondary mortgage market and facilitate the establishment of a liquidity facility. Liquidity risk was measured by determining the loan to deposits ratio. This is computed as the total amount of mortgage loan issued divided by the total amount of deposits. Also it can be measured by the ratio of borrowed funds to total loan assets. This is computed as the total borrowed funds to finance the mortgage loans divided by the total value of mortgage loans. If the ratio of loan to deposits and borrowed funds to total assets is high it means that the lender relies heavily on short term funds to fund loans (Saunders & Marcia, 2001).

## 2.11. Empirical Review of Literature

According to Claurietie and Sirmans (2006) one major concern of the lender is the risk that borrowers will default on their obligations to repay the principal and interest. This is the default risk and it varies with the nature of land and credit worthiness of the individual borrower. Default risk relates to the likelihood that the borrower's income may fall after the loan is made, thereby jeopardizing the receipt of future mortgage payments. Similarly should the market value of a property fall below the outstanding loan balance the borrower will lose the motivation to repay the mortgage leading to default. The possibility that a default may occur means that lenders charge a premium or higher interest rates to offset possible loan losses. Dolde (2006) indicated that some mortgage loan defaults were believed to have a significant relationship with the characteristics of both mortgages and borrowers at the time of loan origination. He also noted that it is important that an objective analytical technique be applied to the analysis of the causes and prediction of mortgage default risk.

Mortgage Lenders advance mortgage loan on a maximum of 90% of the purchase price which as well should not exceed three times of the total annual income of the borrower, with the intent of minimizing uncertainty fall in property prices (Kolbe, Gaylon, & Rudner, 2003). At the time the loan is originated, the lender will ensure that the appraised value of the property is greater than the amount of the loan (Claurietie & Sirmans, 2006). Lenders want assurance concerning the price of the property because it will be serving as security for repayment of the mortgage debt and over time it must remain sufficiently high to repay the outstanding loan balance in the event of default. As defined by Coong (1995) interest rate risk is the exposure of a financial institution's current or future earnings and capital to interest rate change. Most financial Institutions suffer losses in profits or asset value when the general level of interest rates rises. Real estate tends to be

highly levered and thus the rate of return earned by equity investors tends to be affected by changes in interest rate. The goal is to control interest rate risk to an acceptable level. Interest rates chargeable on mortgages influence the mortgage quality in that the higher the interest the more expensive the mortgage product becomes, and the more susceptible to defaults due to high repayment costs. Low interest rates on the other hand encourage compliance and prompt repayment thus guaranteeing quality products (Mutero, 2010 ). According to Dolde (2006) liquidity risk occurs when a continuous market with many buyers and sellers and frequent transactions are not available. The more difficult an investment is to liquidate, the greater the risk that a price concession may have to be given to a buyer should the seller have to dispose off the investment quickly. Real estate has relatively high degree of liquidity risk. It can take 6-12 months to sell real estate income properties especially during periods of weak demand. A depository institution's balance sheet typically has a large amount of short term liabilities, such as demand deposits and other transaction accounts which fund relatively long-term, illiquid assets such as mortgages (Saunders & Marcia, 2001). Marshall (2009) argues that lenders originating mortgage loans by the use of deposits and holding them, has the great merit that solvent lenders have strong incentives both to underwrite mortgages carefully and, if necessary, to modify them.

# 3. Methodology

## 3.1. Research Design

The study employed causal research design, because the purpose of this study was to determine the effect of mortgage market risks on mortgage uptake. The aim of the study was to determine the cause effect relationship between the independent variables and the dependent variable. According to Copper and Schindler (2006) this design is used to explain how the independent variable produces change in the dependent variable therefore determining the cause effect relationship that exists among variables. Thus the design was appropriate in determining the effect of mortgage market risk on mortgage uptake.

## 3.2. Location and Population of the Study

The study was carried out in Kenya among mortgage lenders. These lenders were commercial banks and housing Finance Company, these institutions are distributed all over the country and offer the same services in their branches. The target population for this study was mortgage lending institutions. According to banking supervision report 2013 there were 37 institutions involved in mortgage lending in Kenya.

## 3.3. Sampling Procedures and Sample Size

Sampling is the process of selecting a suitable sample, or representative part of a population for the purpose of determining parameters or characteristics of the whole population (Kombo & Tromp, 2006). In selecting a sample

the researcher used purposive sampling. It is a non-probabilistic sampling technique that uses cases that have required information with respect to the objectives of the study (Mugenda & Mugenda, 2003). It was applied because the information concerning the lenders that have mortgage in their portfolio for the period required for study was in the Banking Supervision Reports from the year 2008 to 2013. The sampling technique was used to select 27 financial institutions that have been involved in mortgage lending between the year 2008 and 2012.

## 3.4. Data Collection Procedures

The study employed secondary data; the data was collected from central bank website, and financial statements of mortgage lending institutions. The data was quantitative and was collected from 27 mortgages lenders during the period 2008 to 2012. During the period under study there have been significant changes in real estate investments, level of mortgage lending, population and urbanization. Therefore this period was convenient for the collection of relevant and reliable data. This study utilized longitudinal data as it involved the collection of data for 5 years from the same subjects only once. The measurement scale applied was ratio scale; this is because when variables are measured at the ratio scale, powerful statistical procedures can be applied. This improves the quality of findings obtained from such studies and generalizations can be made to a wider population (Mugenda & Mugenda, 2003). The variables were determined by interest rate changes, ratio of nonperforming loans to new loans, changes in price of properties and ratio of loans to deposits as a measure of interest rate risk, credit risk, price risk and liquidity risk respectively.

## 3.5. Data Analysis

The study employed descriptive and inferential statistics in the analysis of data. Data was tested for normality, linearity, homoscedasticity, multi-collinearity and autocorrelation. This was done to determine whether the assumptions of regression model are present. Hypotheses were tested at 5% level of significance using inferential statistics such as student's t-test, and F-test in order to support the statistical hypotheses. Multiple linear regressions were used to determine the degree and magnitude of the relationship that exists between the variables; this statistical tool took in combination several independent variables that affect a dependent variable. The variables in the study were related using a stochastic multiple linear regression model of the form:

$$Y_{i,t} = \beta_\circ + \beta_1 CR_{i,t} + \beta_2 IR_t + \beta_3 PR_{i,t} + \beta_4 LR_{i,t} + \mu_{i,t}$$

Where Y=Loan uptake; i= Mortgage Lenders; t=Years; $\beta_\circ$, =fixed individual effect'; $\beta_1, \beta_2, \beta_3, \beta_4$ = Predictor Variable Coefficients; $CR_{i,t}$= Credit Risk for Lender i in year t; $IR_{i,t}$ = Interest rate risk in year t; $PR_{i,t}$ = Price risk in year t; $LR_{i,t}$= Liquidity risk for Lender i in year t; $\mu_{i,t}$= error term.

# 4. Empirical Results and Discussions

## 4.1. Descriptive Analysis

Descriptive statistics were used to test for normality of data. Normality test was used to determine the normal distribution of the sampled data in order to make accurate and reliable conclusions. The mean which is a measure of central tendency was used in generalization of findings while standard deviation was used as a measure of dispersion from the mean. The summary of descriptive statistics is shown in Table 2.

*Table 2. Descriptive Statistics.*

| Variables | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|
| Loan | -623764600 | 4266600000 | 2404828410 | 15500228 |
| Interest Rate Risk | -0.7526 | 0.8727 | -0.092765 | 0.056033 |
| Credit Risk | -0.4406 | 0.4952 | -0.009837 | 0.0462099 |
| Price Risk | -0.1861 | 0.1622 | -0.126964 | 0.0716494 |
| Liquidity Risk | 0.0006 | 0.7108 | 0.164930 | 0.2366261 |

n=27

In Table 2 the mean is a summary of the average for all the variables, while as standard deviation summarizes the concentration of data around the mean, loans had a mean of 2,404,828,410 which represents the mean amount of mortgage originated by all mortgage lenders in Kenya. Interest rate risk had a mean of -0.0927 which represents the average changes in interest rates in the period under study. Credit risk had a mean of -0.009837 which indicates the mean changes in credit risk for the period under study for all lenders. Price risk had a mean of -0.127 which indicates the average changes in prices of property for the period under study. Liquidity risk had a mean of 0.1649 which indicates changes in liquidity risk for all the lenders in the period under study. The standard deviation for credit risk was 0.0462099, price risk had 0.0716494, liquidity risk had 0.2366261 while interest rate risk had 0.0560333. The standard deviations for the variables are closer to zero which implies that the values are concentrated around the mean. Liquidity risk had the highest deviation from its mean this could imply that it would have a higher effect on the dependent variable.

## 4.2. Homoscedasticity

Homoscedasticity was used to determine whether the variance of the error term is constant and the same for all observations. Violation of homoscedasticity makes standard errors of estimators biased and inconsistent. Therefore tests of hypothesis are no longer valid and standard errors are incorrect (Andrean, 2007). Homoscedasticity can be detected by use of scatter plot as shown in figure 1.

The residuals are plotted in the y-axis and predicted values are plotted on the x axis. If the width of the residuals either increases or decreases as the predicted values increases or are not concentrated around the centre then the assumption of constant variance is not met and the problem of heteroskedasticity exists, thus ordinary least square method should not be used rather generalized least squares method should be used in estimating the regression (Aczel & Sounderpandian, 2002). In Figure 1, as the predictive values are increasing the residuals are neither increasing nor decreasing, they are fairly clustered around the line of total fit and are concentrated around the centre. This shows existence of homoscedasticity which implies the standard errors are correct and have equal variances thus the results were used for hypothesis testing and the ordinary least square method was used.
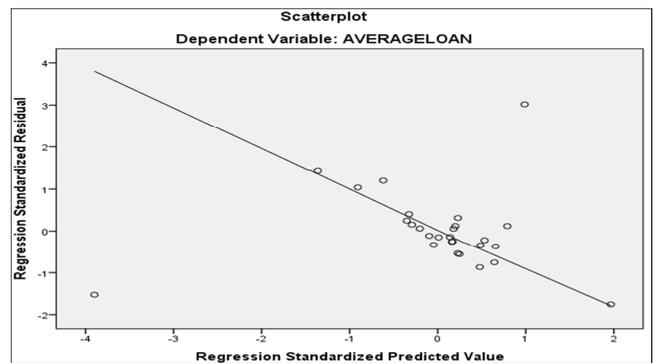


*Figure 1. Test for Homoscedasticity.*

## 4.3. Multicollinearity

Multicollinearity was used to test correlation between the independent variables. The presence of multicollinearity makes it difficult to isolate the impact of each independent variable on the dependent variables and also standard errors for each independent variable become inflated (Landau & Everitt, 2004). Multicollinearity can be corrected by excluding one or more of the correlated independent variable from the regression model (Lind, Marchal, & Wathen, 2008). To check for multicollinearity Variance Inflation Factor and Tolerance level were used. A VIF of less than 10 or a tolerance level of greater than 0.1 is acceptable. A summary of multicollinearity statistics is shown in Table 3

*Table 3. Collinearity Statistics.*

| Independent Variables | Tolerance | VIF |
|---|---|---|
| Interest rate risk | 0.380 | 2.628 |
| Credit risk | 0.580 | 1.724 |
| Price risk | 0.654 | 1.529 |
| Liquidity risk | 0.401 | 2.491 |

In Table 3 interest rate risk had the lowest tolerance level of 0.38 and price risk had the highest tolerance level of 0.654. The tolerance level for all the independent variables was greater than 0.1 which suggests the absence of multi-collinearity problem. Interest rate risk had the highest VIF of 2.628 and price risk had the lowest VIF of 1.529, the VIF for all the variables was less than 10 hence this suggests there is no multi-collinearity among the independent variables. Multicollinearity was also tested using eigen values and the

condition index. The condition index is computed as square root of the ratio of the largest eigen value to each successive eigen value. A condition index is of less than 10 implies there is no existence of multicollinearity. A summary of eigen values, condition index, and variance proportions is provided in Table 4.

***Table 4.** Collinearity Diagnostics.*

| Dimension | Eigen Value | Condition Index | Variance proportions | | | | |
|---|---|---|---|---|---|---|---|
| | | | Constant | Interest rate risk | Credit risk | Price risk | Liquidity risk |
| 1 | 2.378 | 1.000 | 0.02 | 0.00 | 0.01 | 0.02 | 0.03 |
| 2 | 1.603 | 1.218 | 0.01 | 0.12 | 0.10 | 0.00 | 0.02 |
| 3 | 0.796 | 1.728 | 0.00 | 0.06 | 0.46 | 0.01 | 0.05 |
| 4 | 0.148 | 4.006 | 0.03 | 0.79 | 0.10 | 0.18 | 0.78 |
| 5 | 0.075 | 5.634 | 0.75 | 0.03 | 0.33 | 0.68 | 0.11 |

In Table 4 liquidity risk had the highest condition index of 5.634 while interest rate risk had the lowest condition index of 1.218. The condition index for all the independent variables was less than 10 which implies the absence of multicollinearity. Variation in the independent variables that can be explained by other independent variables was highest for price risk at 68% and lowest for interest rate risk at 3% but they were all less than 70%.This also implies there is no multicollinearity between the independent variables hence it was possible to isolate the impact of each independent variable on the dependent variable.

### 4.4. Pair Wise Correlations

Pearson correlation coefficient (r) was used to determine the degree or strength of linear relationship among the variables. Linearity increases the predictive power of the model and the validity of the estimated coefficients. A correlation of $r > \pm 0.7$ implies that the variables are strongly related either positively or negatively. The study sought to determine the correlation between the variables in order to determine the strength of the relationship at 5% significance level. A summary of the correlation coefficients and significance level for all the variables is shown in Table 5.

***Table 5.** Correlation Coefficients.*

| | Loan | Interest rate risk | Credit risk | Price risk | Liquidity risk |
|---|---|---|---|---|---|
| Loan | 1.000 | -0.72 | -0.567 | 0.09 | -0.670 |
| Interest rate risk | -0.72 | 1.000 | 0.345 | -0.055 | 0.570 |
| Credit risk | -0.567 | 0.345 | 1.000 | -0.564 | 0.314 |
| Price risk | 0.090 | -0.055 | -0.564 | 1.000 | -0.115 |
| Liquidity risk | -0.607 | 0.570 | 0.314 | -0.114 | 1.000 |

#### 4.4.1. Correlation Between Loan and Credit Risk

Pearson correlation was used to determine the relationship between credit risk and loan. The correlation coefficient was -0.567 with p-value (0.001) which was found to be significant at 5% significance level suggesting the existence of a moderate negative relationship between credit risk and loan amount in that the higher the ratio of non-performing loans to new loans the higher the credit risk and this results to lenders rationing the lending of mortgages.

#### 4.4.2. Correlation Between Loan and Interest Rate Risk

Pearson correlation was used to determine the relationship between interest rate risk and loan. The correlation coefficient was -0.72 with P value (0.000) which was found to be significant at 5% significance level which implies a strong negative relationship between interest rate risk and loan amount. The more frequent there are adverse changes in interest rates such that the cost of funds is higher than the return on assets then the higher the interest rate risk and the lesser the amount of mortgages originated.

#### 4.4.3. Correlation Between Loan and Price Risk

Pearson correlation was used to determine the relationship between price risk and loan. The correlation coefficient was -0.09 with p value (0.803) which was found not to be significant at 5% significance level. This implies that the relationship between price risk and loan is not significant. This may be attributed to lenders giving loans that have a low loan to value ratio therefore in case of fall in property prices the lenders are still able to recover the amount of mortgage lent.

#### 4.4.4. Correlation Between Loan and Liquidity Risk

Pearson correlation was used to determine the relationship between liquidity risk and loan. The correlation coefficient was -0.607 with p value (0.01) which was found to be significant at 5% significance level. This implies there is a moderate negative relationship between liquidity risk and loan amount. The higher the amount of loans as compared to deposits the higher the liquidity risk involved in lending thus a lender may ration the amount of lending because they are liquidity constrained.

### 4.5. Econometric Model

***Table 6.** Significance of the Model.*

| R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|
| 0.843[a] | 0.710 | 0.657 | 907236708.471 | 2.154 |

***Table 7.** Analysis of Variance.*

| Model | Sum of Squares | df | Mean square | F | Sig |
|---|---|---|---|---|---|
| Regression | 4435911695435 | 4 | 1108977923858 | 13.474 | 0.000 |
| Residual | 1810772579432 | 22 | 8230784451966 | | |
| Total | 6246684274868 | 26 | | | |

n=27, k=5

The multiple correlation coefficient (R) indicates the

correlation between dependent variable and the independent variables jointly predicted by the model. The multiple coefficient of determination ($R^2$) determines the changes or variation in dependent variable as explained by independent variables jointly. A coefficient of $R^2 \geq 0.7$ is preferred as it implies more than 70% of the variation in dependent variable is explained by the independent variables and the existence of a strong correlation between the variables. The significance of the model is presented in Table 6 and Table 7.

In Table 6 multiple coefficient of correlation (R) was 0.843 which implies that the degree of association between mortgage uptake and credit risk, liquidity risk, price risk and interest rate is strong and positive. The ($R^2$) was 71% which implies that 71% of the variations in mortgage uptake are explained by the credit risk, price risk, liquidity risk and interest rate risk jointly in the model, while 29% of variation in mortgage uptake is explained by random error or other factors. Anova was used to determine the usefulness of the independent variables in explaining variation in the dependent variable. It was used to test the significance of the regression relationship between mortgage uptake and credit risk, liquidity risk, price risk and interest rate risk. It provided an F test for the null hypothesis that all the slope coefficients in the regression are simultaneously equal to zero at 5% level of significance. In Table 7, the F value 13.474 and p-value (0.000) means that the smallest level of significance at which the null hypothesis can be rejected is practically zero. In this case the null hypothesis was rejected at 5% significance level so as to conclude that at least one of the slope coefficients in the model does not equal to zero hence the explanatory variables credit risk, price risk, liquidity risk, and interest rate risk significantly explain variations in mortgage uptake. Durbin Watson test (d) statistic was used to test for autocorrelation which occurs when regression errors are correlated across observations. The presence of autocorrelation may result to a multiple coefficient of determination that is overestimated or t-values that are inflated resulting to a type 1 error (Lind, Marchal, & Wathen, 2008).Autocorrelation is not present when the Durbin Watson statistic takes values between 0 and 4. From Table 9, the calculated Durbin Watson statistic was 2.154 at 5% significance level which implies the absence of autocorrelation problem in the regression model thus the multiple coefficient of determination was well estimated and the t values are correct in testing the hypotheses.

*Table 8. Coeffecients of Variables.*

| Model | Unstandardized Coefficients | | Standard coefficients | | |
|---|---|---|---|---|---|
| | B | Std error | Beta | T | sig |
| Constant | -0.9949 | 0.4810 | | -1.972 | 0.061 |
| Interest rate risk | -2.2529 | 0.8101 | -0.517 | -2.781 | 0.011 |
| Credit risk | -6.0733 | 0.5977 | -0.573 | -3.801 | 0.001 |
| Price risk | -7.4875 | 0.7082 | -0.573 | -2.438 | 0.023 |
| Liquidity risk | -0.1829 | 0.1186 | -0.028 | -0.154 | 0.879 |

### 4.6. Test of Significance of Regression Coefficients

In determining the cause effect relationship between the dependent variable and the explanatory variables the regression coefficients were tested at the 5% level of significance using t-test. The regression is presented in Table 8.

#### 4.6.1. The Effect of Credit Risk on Mortgage Uptake

The study sought to find out the effect of credit risk on mortgage uptake. In Table 8, the coefficient obtained from regression was -6.0733 with (p-value 0.001 < 0.05) thus the null hypothesis that credit risk has no significant effect on mortgage uptake was rejected which leads to the conclusion that there is a statistically significant relationship between credit risk and mortgage uptake. In this case credit risk has an effect on mortgage uptake such that a unit increase in credit risk will result to a decrease in mortgage uptake by 6.0733 units. This may be attributed to the increase in the ratio of non performing loans to new loans which may result to lenders restricting loan origination and advancing loans only to credit worthy customers. This finding is consistent with finding of a study by Lewis and Neave (2008) who noted that one of the major risks faced by mortgage lenders is credit risk. The finding conflict that of Njiru and Moronge (2013) that found out that credit risk has a lesser effect on mortgage uptake in Kenya.

#### 4.6.2. The Effect of Interest Rate Risk on Mortgage Uptake

This study aimed at determining the effect of interest rate risk on mortgage uptake. The coefficient obtained from regression was -2.529, (p value 0.011 < 0.05). The null hypothesis that interest rate risk has no significant effect on mortgage uptake was rejected which leads to the conclusion that there is a statistically significant relationship between interest rate risk and mortgage uptake Hence interest rate risk has an effect on mortgage uptake such that a unit increase in interest rate risk will result to a decrease in mortgage uptake by 2.2529 units. Interest rate affects the cost of borrowing funds such that high interest rates will affect the cost of funds and hence resulting to high cost of borrowing as a result borrowers would find mortgage loans expensive and inaccessible. The findings support a report by Hassler *et al.* (2004) who noted that lenders remain vulnerable to significant interest rate risk when they are involved in mortgage lending. Also according to Vuyisani (2003) mortgage finance is faced with major challenges such as changes in interest rates which may result to restrictive lending.

#### 4.6.3. The Effect of Price Risk on Mortgage Uptake

This study aimed at finding out the effect of price risk on mortgage uptake. The coefficient obtained from regression was -7.4875, (p-value 0.023 < 0.05). Therefore the null hypothesis that price risk has no significant effect on mortgage uptake was rejected which led to the conclusion that there is a statistically significant relationship between price risk and mortgage uptake. In this case price risk has an effect on mortgage uptake such that a unit increase in price risk will result to a decrease in mortgage uptake by 7.4875

units. This may be attributed to risk of fall in property values below the mortgage value resulting to default by borrowers or the risk that the lenders may not recover the full amount from the sale thus lenders may restrict lending until when prices of property are favorable or they impose a low loan to value ratio to protect themselves from price risk. The finding is consistent with the report of Hass Consult Survey (2013) which associated property prices with mortgage uptake in Kenya. The difficulty in property valuations and changes in prices of property is a limitation to mortgage lending World Bank (2011).

### 4.6.4. The Effect of Liquidity Risk on Mortgage Uptake

This study sought to find out the effect of liquidity risk on mortgage uptake. The coefficient obtained was -0.1829 with (p-value 0.879 >0.05).Thus the null hypothesis that liquidity risk has no significant effect on mortgage uptake was not rejected which led to the conclusion that there is no statistically significant relationship between liquidity risk and mortgage uptake. Hence liquidity risk does not affect mortgage uptake. The findings may be as a result of high deposit amount both long term and short term that is more than the amount of mortgages advanced or lenders sourcing for funds to improve on their liquidity in order to originate mortgages. The findings of this study conflicts the results of Hassler *et al.* (2004) who noted that as lenders remain vulnerable to significant liquidity risk they often ration the amount of mortgage lending. Also according to World Bank, liquidity constraint is one of the major obstacles to mortgage lending. On the other hand the findings are consistent with Marshall (2009) who argues that originating mortgage loans by use of deposits has the merit that solvent lenders have strong incentives to underwrite mortgages.

### 4.7. Regression Equation

Ordinary least square regression equation

$$Y = -0.9949 - 6.0733CR - 2.2529IR - 7.4875PR - 0.1829LR + \mu_{i,t}$$

According to the equation holding credit risk, price risk, liquidity risk and interest rate risk constant would result to Kshs 0.9949 billion drop in mortgage uptake. A 1 unit increase in credit risk would lead to decrease in mortgage uptake by 6.7033 units, a 1 unit increase in interest rate risk would lead to a decrease in mortgage uptake by 2.2529 units, a 1 unit increase in price risk would lead to a decrease in mortgage uptake by 7.4875 units and a 1unit increase in liquidity risk would lead to decrease in mortgage uptake by 0.1829 units. Credit risk, interest rate risk and price risk had p- value less than 0.05 which means that these risks are significant in predicting changes in mortgage uptake. The p-values for the constant and liquidity risk were however greater than 0.05 hence they were insignificant and do not have a significant effect on mortgage uptake. After running the regression the expected value of the error term becomes zero hence the error term is not included in the model.

## 5. Conclusions and Recommendations

### 5.1. Conclusions

The study found out that credit risk has a significant negative effect on mortgage uptake. If the risk of default increases the amount of mortgages lent decreases. Loan amount is adjusted for the perceived credit risk and loans are extended only to credit worthy customers because of the significant effect the risk has on the cash flows and solvency of the lender. Price risk has a significant negative effect on mortgage uptake such that increases in price risk result to a decrease in the amount of mortgages originated. When property prices are unfavorable mortgage lenders restrict the amount of lending. The study found a significant negative relationship between interest rate risk and mortgage uptake. Increase in interest rate risk results to a decrease in amount of mortgage lent by mortgage lenders. Changes in interest rates result to mismatch between the cost of funds and return on assets this affects the net interest margin hence the profitability of lenders. Thus lenders charge a high risk premium that protects them from the risk of loss as a result of changes in interest rates. The effect of liquidity risk on mortgage uptake was found to be insignificant. Thus changes in the amount of deposits does not affect amount of mortgages originated. The level of deposits is able to fund the loans, alternatively lenders acquire funds to improve on their liquidity and this enables them to originate mortgages.

### 5.2. Recommendations

Based on the findings of the study the following recommendations are made:

i. Lenders should improve on their risk management strategies because risks affect the amount of lending. The inability of lenders to manage these risks means that they charge high risk premiums making mortgages to be costly or lenders restrict the amount of lending.

ii. Lending involves borrowers that have different capacity hence lenders should diversify their mortgage portfolio and develop different mortgage products that are able to suit their different customers as a strategy to reduce rate of default.

iii. Lenders should set mortgage rates that are sensitive and respond to changes in the macroeconomic environment and should not charge high interest margins that lead to increase in the costs of borrowing.

iv. A secondary mortgage market should be developed to help in reducing risks faced by mortgage lenders as well as provide a mechanism for packaging of mortgages into securities that are sold to institutional investors. Institutional investors such as pension funds and insurance companies should be encouraged to invest in the purchase of mortgages securities and also guarantee members mortgages as they have substantial funds to invest for long term this would lead to continued increase in liquidity hence increase mortgage uptake and eventually growth of mortgage market.

# Acknowledgement

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