

Influence of Asset Quality, Capital Adequacy, Loan Structure and Macro-Economic Variables on Financing of Mortgage Products by Commercial Banks in Kenya

William Maina* and Timothy Okech

United States International University-Africa, Nairobi, Kenya

*Corresponding Author's Email: williammaina23@yahoo.com

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Abstract

The study sought to determine the influence of asset quality, capital adequacy, loan structure and macro-economic variables on Financing of mortgage products by commercial banks in Kenya. The study used a descriptive research design targeting 196 bank managers including, relationship managers, head of mortgage/retail sales, head of documentation, credit manager, head of documentation, head of finance, and finally head of legal. Data collected was coded and cleaned before undertaking necessary analysis that comprised descriptive and inferential statistics. Descriptive statistics was done by means of frequency tables, mean, standard deviations, charts and figures, while inferential statistics included ANOVA, regression and correlation analysis. The results show that asset quality, capital adequacy, loan structure, macroeconomic variables jointly influence 81.5% of the mortgage financing. Further they were positively and statistically significant in predicting the variation in mortgage financing ($F(4, 147) = 161.65, p < .000$). The study recommends that banks should consider their credit portfolio in making decisions on financing mortgage products. More so, banks should favour adjustable-rate mortgages as opposed to fixed-rate mortgages and that banks should not charge high loan fee for mortgage products. Finally, it is recommended that banks should support the government housing finance systems by offering various mortgage loan flexibilities to developers of affordable housing products and that it should formulate policy and procedure on mortgages that can support commercial banks in financing mortgage products.

Keywords: Capital Adequacy, Asset Quality, Loan Structure, Macro-Economic Variables, Financing of Mortgage Products

Introduction

Housing is considered one of the basic needs for human survival as declared by the Universal Declaration of Human Rights in Article 25 (World Bank, 2009). In the Article, it is affirmed that every person has the right to a standard of living, adequate for the health and well-being of individuals and family. Other provisions in the article include food, clothing, housing, medical care, necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood. The provisions have further been re-affirmed by subsequent conventions including International Covenant on Economic, Social and Cultural Rights, the Istanbul Declaration and Habitat Agenda and the Declaration on Cities and Other Human Settlements in the new millennium of 2001 (World

Bank, 2009). In Kenya, housing has been reiterated by the Government of Kenya (GoK) in the Kenya's Vision 2030, the 2010 Constitution, and finally "Big Four Agenda,"

The sector is also considered one of the key sectors that can revitalize economic growth in many countries including Kenya. This is because investment in housing and related infrastructure and services has multiple direct and indirect trickle-down effects. For instance, it fosters forward and backward multiplier effects in terms of additional investments in manufacturing of building materials, transport and marketing. Urbanization, however, continues to rise and is expected to increase exponentially in the coming decades such that it is feared that urbanization growth poses major infrastructure challenges such as housing deficit in many world economies (Owusu-Manu et al., 2018).

In order to increase access to housing, mortgage financing has been identified and considered as an alternative for generating funds towards the same (Owusu-Manu et al., 2018). Mortgage financing is considered as the process of underwriting and extending a home loan or mortgage on a property to a qualified applicant (McDonald & Thornton, 2008). A few of these loans are secured by the real property and provide a schedule of payments of interest with the repayment of the principal to a bank consisting of principal, interest, taxes, and insurance while, the house acts as collateral or loan security. Under this arrangement, the initial amount of the loan is the principal, while taxes and insurance vary and are normally calculated as a percentage of the value of the house all provided for in the mortgage contract.

Mortgage financing has evolved over time starting with the traditional role of mortgages as a predominant form of borrowing in rural economies. In this case, landowners borrowed against future rents to finance current consumption or the development of their estates. Under this arrangement, the mortgage lending was a direct loan from one individual to another, both of them usually wealthy (Miller & Milhaupt, 2000; Thuo, 2018). Some mortgage loans are secured by real property and provide a schedule for payments of interest and repayment of the principal loan through contracts arrangements (Mehdian, 2001). Lenders who include commercial banks could sale mortgage to other parties interested in getting the stream cash payment from borrower, in most of the times in security through securitization (World Bank, 2006). This arrangement considers the foreseen risk of the mortgage, which is the possibility that the loan would be paid back mostly considered as a function of the creditworthiness of the borrower. In this instance, the bank could foreclose and recoup some or all the initial capital and funds, interest rate risk and period delays involved in certain situations (Stiglitz & Weiss, 2005). The arrangement is such that the property that is purchased with the financing is used as collateral for the debt.

During this period, the lender acts as the mortgage holder on the property to the extent that in the event that the owner of the mortgaged property defaults on the loan, the mortgage company has the right to secure full ownership of the property and offer it for resale to another party (Asare & Whitehead, 2006). Under this arrangement, lenders are able to lend funds and partly use their deposit bases, capital and other funding sources to achieve a lower cost of funds. The mortgage provided for by commercial banks was considered one of the most important elements in commercial banking. This includes the rules that require banks to keep a certain capital structure such as the bank's equity or preference shares, which place the bank in the composition of investments such as bonds and loans that it owns. These are designed to support mortgage provider which includes commercial banks if significant unexpected losses were to

occur, while honoring any withdrawals or other essential obligation. The decision on the provision of the mortgage products by key financing institutions including commercial banks however, vary based on various key parameters including capital adequacy, asset quality, macroeconomic variables, and loan structure, among others.

In Kenya, mortgage industry has continued to grow competitively. Central Bank of Kenya (CBK, 2015) estimated the value of mortgage loans at KES 203.3 billion in December 2015 up from KES 164.0 billion in December of 2014, representing a growth of KES 39.3 billion (23.4%). Out of this, about 71.6% was financed by five institutions (one medium sized bank with 23.4%, and four banks from large peer group with 48.2% as compared to 68% lending by 4 institutions by end of December 2014. In the report there were 24,458 mortgage loans in the Kenyan market by end of December 2015 compared to 22,013 in December 2014, representing an increase of 2,445 mortgage loans (11.11% growth). In the report, it is demonstrated that the outstanding value of non-performing mortgages increased from KES. 10.8 billion in December 2014 to KES 11.7 billion in December 2015 (CBK, 2015). This was attributed to high cost of properties, high interest rates and incidental fees, low-income levels, difficulties with property registration and titling, stringent land laws, access to long term finance, high construction costs, lengthy charge process timelines, start-up costs, high cost of funds and credit risk. Whereas CBK identified these factors, there is need to examine their significance in influencing financing of mortgage products by commercial banks. The main providers of mortgages in Kenya are Housing Finance, Kenya Commercial Bank (KCB), Standard Chartered Bank, Barclays Bank and Stanbic Bank. A report by Centre for Affordable Housing Finance in Africa (CAHF, 2011), indicate the industry has grown to KES 91.2 billion as of December 2019 representing a growth of 48.5%.

The supply side through mortgage lending is however, still accessible to only a tiny minority – mortgage lending as a percentage of Gross Domestic Product (GDP) stood at 2.6% in 2012. There have been some efforts to expand the reach by the industry. New entrants through aggressive marketing have resulted in some newer products. For example, fixed rate mortgages have been made available for between 10- and 20-year terms. Some banks have recently introduced 100% financing for the full value of a house mortgage. One lender has also introduced mortgage insurance against the risk of a loss of income. The Retirement Benefit Authority in 2009 allowed that pension contributions of up to 40% to be used to secure a mortgage. This has the potential to leverage assets worth KES 290 billion (USD 3.625 billion) and increase access for lower-earning people that have accumulated substantial pensions. This is expected to increase the provision of affordable houses to the larger population of pensionable personnel and likewise increase the supply of mortgages in the country (RBA, 2009). While taking into consideration the mortgage market in Kenya, this study addressed the supply side by focusing on financing of mortgage products by specifically considering asset quality, capital adequacy, loan structure, macroeconomic variables and performance of the commercial lenders.

Statement of the Problem

In world economies including Kenya, financing of the mortgage products is considered low with only a few commercial mortgage lenders holding more than 70% in the portfolio. This comprises the total value of mortgage of KES 61.4 billion and 13803 accounts, compared with over 249,260 loan accounts, and a potential mortgage loan value of KES 800 billion that are needed (World Bank, 2016). Central Bank of Kenya (CBK) estimates that only 2.4% of the

total population and 11% present of the urban population could afford a mortgage (CBK, 2016). It is projected that with an average mortgage of KES 6.6 million that need payment of KES 90,000 monthly for over 20 years at 12% interest rate, is un-affordable to many household (Arvanitis, 2013). This according World Bank (2016) is considerably smaller than the expected level of lending. The situation is worsened by the 2010 mortgage lending limit imposed on lenders that was increased from 25% to 40%.

Various constraints are cited by CBK to account for the financing of the mortgage products. Among these include long term access to funds or capital adequacy, macroeconomic situation, credit risk, asset adequacy and high interest rates (loan structure). Whereas these factors have been identified and documented, their significance has not been ascertained. For example, even though the World Bank (2011) demonstrates that some mortgage lenders are liquidity constrained, due to disparity between short term deposits and the long-term mortgage, the importance in relation to asset quality, macroeconomic stability, among others, was not empirically examined. Additionally, whereas, there are initiatives considered attractive towards the provision of mortgage products by commercial banks, their joint moderating influencing on the financing of mortgage products remain empirically unexploited. As part of this paper, the study aimed at examining the joint influence of capital adequacy, asset quality, macroeconomic variables and loan structure on mortgage financing by commercial banks in Kenya

Literature Review

Theoretical Literature

There are a number of theories that relate to the study including loanable fund theory, title and lien theories of mortgages, modern portfolio theories, and credit risk theory. Others include Credit creation theory of banking, financial intermediation theory of banking, Buffer capital theory on capital adequacy, and modern mortgage lending model, Portfolio regulation theory. Whereas these theories are linked to the issues under consideration in the study, modern portfolio theory, title and lien theories of mortgages, credit risk theory, capital buffer theory and classical theory of interest, are discussed in order to identify the constructs of the study.

Modern Portfolio Theory

The modern portfolio theory (MPT) was first developed by Harry Markowitz in 1952. The modern portfolio theory presents that assets in an investment portfolio should not be selected individually, each on their own merits. Rather, it is important to consider how each asset changes in price relative to how every other asset in the portfolio changes in price (Iyiola et al., 2012). Harry Markowitz considered that if the only thing an investor was interested in was the value of the portfolio, then in order to maximize that value one need only invest in a single security, the one that provided the greatest return. However, this is not the way investors did, or should, act. The reality is that investors spread their money amongst a variety of holdings because they are interested in risk as well as return. If something goes wrong with one holding all is not lost as you still have investments in several other holdings. It is the same intuition that commercial banks choose to invest their capital in funding mortgage products (Shipway, 2009).

According to Bai, et al. (2008), investors need to be compensated through higher expected returns for higher levels of risk. Core to the theory is diversification, where investors are considered risk averse, thereby owning different classes of asset portfolios considered less risky compared to owning similar asset portfolios (Mangram, 2013). According to the theory,

investors select from different asset classes that would minimize their risks and increase their returns. The expected return is the weighted sum of the individual assets, while the portfolio risk is a function of the variances of each asset and the correlation values among them. The main goal of diversification is to offset idiosyncratic risks, where a loss in one asset is offset by a gain in a second negatively correlated asset. The theory has various underlying assumptions, first, investors are rational, hence will avoid risky investments, second, returns are normally distributed and that investors have access to the same information and have the same views regarding expected rate of return. Finally, the theory assumes that the costs of taxes and trading are not considered when making investments decisions (Mangram, 2013).

The modern portfolio theory mathematically formulates the concept of diversification in investing, with the aim of selecting a collection of investment assets that has collectively lower risk than any individual asset. The possibility of this can be seen intuitively because different types of assets often change in value in opposite ways. But diversification lowers risk even if assets' returns are not negatively correlated-indeed, even if they are positively correlated (Iyiola, Munirat, & Nwugo, 2012).

The modern portfolio theory is applicable to this study as it used to explain the issues facing commercial banks on funding mortgages. Almost all financial institutions have the same problem with the added complication that they need to explicitly include the characteristics of their liabilities in the analysis. While the structures of these problems vary somewhat, they are similar enough that we classify both as portfolio theory (Elton, & Gruber, 1997). In line with the commercial banks business goal of profit making, the MPT attempts to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets (Xidonas et al., 2012).

The modern portfolio theory provides practical insights into how a commercial bank should structure a loan portfolio considering its objectives. At the risk of oversimplification, a commercial bank's goals include, make strong profits, avoid large losses, and maintain high shareholder value (Bennett, 1999). The commercial banks' profits are derived from its ability to add economic value for its customers. A bank's economic value as an ongoing franchise is at stake if poor lending threatens the organization with failure. Careful loan underwriting and effective risk diversification help keep the likelihood of failure tolerably low. In maintaining high shareholder value, the portfolio theory makes an interesting contribution. The theory emphasizes that the market value of an asset cannot be determined in isolation based on its risk and return features. Rather, the real issue faced by bank owners is how their shares in the bank will affect risk and return in their own portfolios (Bennett, 1999).

Further, commercial banks as investors in mortgage market are faced with an extraordinary range of options when it comes to building and maintaining a portfolio mortgage. At the point in time when the portfolio mortgage is created decisions must be made as to what assets to include and in what proportion, known as asset allocation. When running the portfolio mortgage decisions must be made about when to make any adjustments as a consequence of a changing economic environment or requirements, decisions that are often complicated by consideration of taxes and costs (Shipway, 2009).

Distinct from other financial market players, firms in the mortgage market including commercial banks have been slow to use MPT in their decision-making processes. Research shows that diversification has slowly entered the lexicon and decision-making processes of institutional real estate investors, but those that used the quantitative methods espoused by MPT were in the minority (Viezer, 2010). To be sure, not all stock and bond managers use MPT to construct or analyze their portfolios, but the real estate practitioners' unwillingness to use these quantitative tools is due to their discomfort with MPTs reliance on data they see as unrepresentative and MPTs abstraction from the traditional real estate decision-making process, which has been concerned with the details and specifics of doing the deal. Despite its shortcomings, MPT has proven to be more than shorthand for the portfolio selection process and it is a powerful engine of inquiry (Viezer, 2010).

Title and Lien Theories of Mortgages

Developed by William H. Lloyd in 1896, the theory holds that the lender holds title to the property until the borrower completes repayment. According to the theory, the borrower does not keep title to the property during the mortgage term and instead, the borrower returns the title to the mortgage holder after signing the mortgage for the loan (Kimball & Willen, 2012). This means the seller will hold the title to the property as security, until all payments are made. The legal title to the property is given to the lender, while the equitable title is handed to the borrower, and upon completion of payments, the legal title is handed to the borrower (Uroko, 2012). The theory is applicable to financial institutions, which retain ownership of the property, but disadvantageous to the borrower, who risks losing the property upon failing to make payments (Kirui, 2016).

Under the theory, the borrower attains both legal and equitable title upon signing the mortgage agreement, with the lender holding a lien on the property (Kimball & Willen, 2012). The non-possessory lien protects the lender, who is able to repossess the property in case the borrower defaults. Under lien theory, buyers hold the deed to the property during the mortgage term and are contractually obligated to make all the payments to the lender. The mortgage acts as a lien on the property, but the buyer holds the title, with the lender's lien removed on condition of completion of mortgage payments.

It may be argued that the lien theory is applied by Kenyan banks, where customers assume property ownership as soon as the mortgage contract is signed (Omollo, 2017). As provided for under Sections 95 to 104 of the Land Act of 2012 that describes the covenants, conditions and powers implied in charges. A charge is only a security and does not indicate transfer of ownership (Kirui, 2016). The lien theory is more attractive to Kenyan borrowers, who assume ownership and occupy the property as they make the mortgage payments, hence saving on rent payments. Ownership also allows the customers to sell off the property and make lump-sum payments of the mortgage. This brings in to the relevancy of a number of the constructs that are to be addressed in the study. The lien theory is more applicable to this study, which aimed at assessing the influence of asset quality, loan structure, government regulations and mortgage performance on the supply of mortgage products offered by commercial banks in Kenya.

It is argued that the property that is mortgaged result into additional loan by the bank to the mortgagor. This results into increase in loan volume and with this increase the interest arising from the loan increases the profitability hence good performance for the banks. However, for housing finance to be effective, those seeking to be home owners have to be motivated to invest

in home ownership. For example, in the U.S around 1930s mortgage acquisition was largely due to subsidies provided via mortgage interest and gains treatment, and the lower mortgage rates and affordable housing mandates. Banks and mortgage companies are principal lenders and mortgages are sold to investors in the secondary markets as mortgaged backed-securities and this constitute the major funding. Both variable and fixed rate mortgages are issued, and the role of government is to regulate securities. Nevertheless, access to housing continues to elude the urban poor who simply cannot muster the financial resources required to acquire mortgage. In Kenya, lack of commercial bank short term mortgage has been faulted as a leading obstacle against housing production.

The Capital Buffer Theory

Proposed by Marcus (1984) and later improved on by Milne and Whalley (2001), the theory postulates that banks aim at holding more capital than required that is maintaining regulatory capital above the regulatory minimum. This is considered as an insurance against breach of the regulatory minimum capital requirement. Specifically, the capital buffer is about the excess capital a bank holds above the minimum capital required. According to the theory, banks with low capital buffers attempt to rebuild an appropriate capital buffer by raising capital and banks with high capital buffers attempt to maintain their capital buffer. In an empirical study Jiang and Zhang (2017) established that the effect of capital buffer and franchise value on bank risk-taking is heterogeneous across quartiles. They noted that among the greatest risk banks, more capital buffer tends to reduce risk-taking; however, higher franchise value does not appear to reduce it.

Zheng et al. (2012) carried out an empirical study to examine the internal mechanism between capital buffers and risk adjustment. They established that the relationship between capital buffer and risk adjustment is significantly positive, which is more or less consistent with the capital buffer theory, that is banks with adequate capital adjust their capital buffer and risk positively, while for low-capital banks, the relationship is negatively related. In addition, they noted that short-term adjustment management of capital and risk relies on the quantity of capital held by the banks beyond the minimum regulatory requirements. Banks with smaller capital buffer will increase capital and at the same time reduce risk to reconstruct suitable one. Meanwhile, banks with adequate capital, in order to maintain their capital buffer, will increase the risk taking when their capital rises. Banks' adjustment speed of target level depends on the size of capital buffer, proving that the speed of adjusting capital buffer of banks with smaller capital buffer is significantly faster than their counterparts with larger capital buffers. However, the same was not observed for risk adjustment.

The buffer theory predicts that a bank approaching the regulatory minimum capital ratio may have an incentive to boost capital and reduce risk in order to avoid the regulatory costs triggered by a breach of the capital requirements. However, poorly capitalized banks may also be tempted to take more risk in the hope that higher expected returns will help them to increase their capital. This is one of the ways risks relating to lower capital adequacy affects banking operations. In this regard, more capital tends to absorb adverse shocks and thus reduces the likelihood of failure. In the process, portfolio risk and regulatory capital are assumed to be positively related. Banks raise capital when portfolio risk goes up in order to keep up their capital buffer. The provisions of the theory in terms of capital adequacy and its constructs are considered necessary for the study and therefore, they were incorporated to examine how this affects financing of mortgage products by commercial banks in Kenya.

Classical Theory of Interest Rates

The classical theory of interest rate was developed by David Ricardo, Marshall, A.C. Pigou, Cassels, Walras, Taussing and Knight. The theory states that the rate of interest is determined by the supply and demand for savings (Pal, 2018). According to the classical theory, the rate of interest rate is determined by the intersection of demand and supply of investment (or capital). Interest is the price of investment because firms borrow money for investment. Thus, investment depends on interest rate. Low interest rate encourages high investment and high interest rate leads to reduction in investment. So, investment is inversely related to interest rate.

Household save their money to earn interest rate. High interest leads to high saving and low interest leads to low saving. Thus, saving is directly (or positively) related to interest rate. Firms' demand for investment is fulfilled by households' saving. Thus, saving is supply and investment is demand in goods market. Thus, interest rate is determined at the intersection between supply of saving and demand for investment. Interest rate adjusts to equilibrate the goods market through saving and investment (Pal, 2018).

The classical theory underlies the study's objective considering the microeconomic variables. The classical theory explains for the macroeconomic variable, interest rates as the factor which brings the demand for investment and the willingness to save into equilibrium with one another. Investment represents the demand for investible resources and saving represents the supply, whilst the rate of interest is the 'price' of investible resources at which the two are equated. Just as the price of a commodity is necessarily fixed at that point where the demand for it is equal to the supply, so the rate of interest necessarily comes to rest under the play of market forces at the point where the amount of investment at that rate of interest is equal to the amount of saving at that rate (Keynes, 2018).

Empirical Literature

Basten and Koch (2015) assessed the impact of higher banking capital requirements resulting from the Counter-cyclical Capital Buffer (CCB) on mortgage pricing. The CCB is part of various macro-prudential instruments that are designed by regulatory agencies to counter pro-cyclicality in the banking sector, as established by the Basel III committee (Grace et al., 2015). These policies call for the accumulation of capital during periods of accumulating risks, which would act as a buffer in case losses materialize. The researchers established that CCB changes mortgage supply composition, since capital-constrained and mortgage-specialized banks raise prices more than their competitors do.

According to Basten and Koch (2015), CCB has shifted mortgages from less resilient to more resilient banks. However, the research was based in Switzerland, whose mortgage market traits are different from the Kenyan mortgage market. Furthermore, the CCB provisions under Basel III requirements have been established to be less effective for the African banking sector, which are not significantly exposed to contagion and systemic risks that arise from the counter cyclical of banking capital buffers on the economy (Kolade, 2017). The CCB addresses capital adequacy requirements, but does not consider other factors such as Macroeconomic Variable, asset quality and loan structure on the impact of mortgage supply. Counter-cyclical Capital Buffer policies are dependent on a set of macroeconomic conditions, normally implemented in reaction to periods of stress in the banking sector to stem losses (Stellinga, 2020).

According to Kolade (2017), higher capital buffers are associated with higher revenue diversification, increased market power, and higher costs of funding. However, research results by Kolade (2017) showed that Basel III countercyclical capital buffer requirements are less effective when implemented in African countries, such as Kenya. Kolade (2017) further observed that a one percentage point increment in the equity capital ratio resulted in an increase in the basis points by 32.41 points; hence the higher capital requirements by the Basel III significantly impact bank lending rates. Higher common equity is also associated with lower bank risks, but business cycles have no impact on bank risks. Kolade (2017) also established that there was a positive relationship between bank market power and market risks; hence an increase in common equity capital should be accompanied with controls on bank market power to reduce excessive risk appetites for banks. However, Kolade (2017) was more focused on the capital requirements under Basel III, and less on the impact of other factors such as mortgage valuation on the performance of the banking sector in Africa.

According to Nyanyuki and Omar (2016) mortgage lending has improved the profitability of commercial banks. The researchers established that mortgage costs and loan structure had a significant correlation on the performance of mortgage lending by commercial banks in Mombasa County. However, Nyanyuki and Omar (2016) did not treat performance of mortgage lending as an independent variable, but as a dependent variable, hence did not assess how various factors influencing the performance of mortgage lending would influence the supply of mortgage products. On the other hand, there is a positive linear relationship between interest rate spread and financial performance of mortgage lending institutions, according to research results by Gitau (2014). Also, tier 1 banks have large interest spread compared to tier 2 and tier 3 banks. However, Gitau (2014) is less current with the present interest rate regime which underwent periods of rate capping between 2016 and 2019, before the CBK scrapped rate capping. Furthermore, the research did not assess how other factors other than interest rate spread by tier 1 banks translated to their supply of mortgage products.

On the other hand, Agao (2014) assessed the impact of macroeconomic variables such as the CBK rate, the inflation rate, the level of money supply, the GDP, and real residential house prices on the Mortgage uptake for mortgage industry in Kenya. The study utilized secondary data of the 44 financial institutions that offer mortgage financing, and used a multiple regression model to assess the impact of the macroeconomic factors on the mortgage industry.

Agao (2014) established significant relationships between mortgage uptake and interest rates, inflation rates, house prices, GDP, and level of money supply, with interest rates having the highest impact on housing prices. However, there is a significant positive relationship between mortgage uptake and interest rates, which is contrary to the expectations that higher interest rates increase the cost of mortgage, which would reduce demand (Arise, 2015; Muthaura, 2012). As such, the relationship between the independent variables and the dependent variables used by the researcher is not clear, considering that the researcher's conclusions that interest rates play an insignificant role in mortgage uptake, which is contrary to expectations in line with the law of demand. Furthermore, the conclusions by Agao (2014) were based on the trend of growth in the mortgage market over a ten-year period, without addressing how each of the macroeconomic factors contributed to the mortgage market growth. Lastly, the macroeconomic factors considered by Agao (2014) are not in direct connection with the joint factors considered in this research, such as capital adequacy, loan structure and Macroeconomic Variable.

According to Mogaka et al., (2015) the macroeconomic factors with the highest impact on mortgage growth in Kenya include GDP per capita, inflation and informal sector employment, and are positively correlated with growth of the mortgage market in Kenya. The study obtained secondary data of the dependent and independent variables over a thirty-year period and used multiple regression analysis to assess the relationship between the variables. However, the study by Mogaka et al. (2015) focused on macroeconomic factors and their impact on mortgage growth, and did not consider bank specific factors that would impact mortgage supply. This study has a defined set of factors that transcend macroeconomic factors. The focus on macroeconomic factors does not include other factors such as loan structure, asset quality and capital adequacy, and their combined impact on the supply of mortgage products in Kenya

Methodology

This study used descriptive research design targeting 196 bank managers including; relationship managers, head of mortgage/retail sales, head of documentation, credit manager, head of documentation, head of finance, and finally head of legal. A structured questionnaire was used to collect quantitative data. Data was analyzed through quantitative techniques, including descriptive and inferential statistics. Regression analysis and analysis of variance (ANOVA) were undertaken to establish the nature and the magnitude of hypothesized relationships. The relationship was considered statistically significant if the P-value was less than 0.05.

Findings

Background Information

Table 1: Demographic Characteristics

		Frequency	Percent
Age bracket in Years	Less than 30	21	13.3%
	30-35	31	20.0%
	36-40	52	33.3%
	40-45	41	26.7%
	46-50	10	6.7%
Gender	Male	52	33.3%
	Female	103	66.7%
Highest level of Education	Diploma	41	26.7%
	Bachelor's Degree	72	46.7%
	Master's Degree	31	20.0%
	Doctorate	10	6.7%
Number of Years Worked in the Bank	1 - 3 Years	19	12.5%
	4 - 9 Years	58	37.5%
	10 - 15 Years	45	29.2%
	16 - 19 Years	32	20.8%

Findings in Table 1 show that 33.3% of the respondents were between the age of 36 – 40 years old, 26.7% were aged between 40 – 45 years old. In addition, 13.3% of the respondents had less than 30 years old, while there 6.7% had between 46 – 50 years old. According to results 66.7% of the respondents were female, while 33.3% were male. Results show that 46.7%, 26.7% and 20% of the respondents had attained bachelor's degree, diploma, and masters' degree, respectively. The remaining 6.7% had doctorate degree. Results show that 37.5% of

the respondents had worked in the bank for 4 – 9 years, while 29.2% had worked in the industry for 10 – 15 years. Further, 20.8% of the respondents had worked in the industry for between 16 – 19 years, while only 12.5% had an experience of between 1 - 3 years.

The results on the combined effect of asset quality, capital adequacy, loan structure, macroeconomic variables on the level of mortgage financing, revealed that together asset quality, capital adequacy, loan structure, macroeconomic variables and mortgage financing explain for 81.5% of the mortgage financing. Results showed average mean score of 3.14 for financing of mortgage with a standard deviation of 1.18. In particular, most of the respondents with a mean of 3.5 and a standard deviation of 1.3 agreed that their bank facilitated access to affordable better quality housing including support for all forms of housing and housing financing options including home ownership and rental. Majority of the respondents with a mean of 3.6 and a standard deviation of 1.2 agreed that their bank fulfilled its housing finance mandate by providing mortgage loan insurance to lenders. Further, the table shows that most of the respondents with a mean of 3.6 and a standard deviation of 1.1 agreed that their bank offered various mortgage loan flexibilities to developers of affordable rental projects.

Statistical Tests for Combined Variables Effect on Financing of Mortgage Products

Normality Test

Normality test is used to ascertain that the data set is well-modeled by a normal distribution. Normal data is an underlying assumption in parametric testing. In this case, the study sought to ascertain if the data was normally distributed using skewness and kurtosis test. The normality test is positive when Skewness and kurtosis statistics fall between -1.0 and + 1.0. As shown in Table 2, asset quality (skewness=-.519; kurtosis = -.806), capital adequacy (skewness=-.803; kurtosis = -.025), loan structure (skewness=-.207; kurtosis = -.578), Macroeconomic Variable (skewness=-.730; kurtosis = .099), and mortgage financing (skewness=-.713; kurtosis = -.349), were found to be normally distributed.

Table 2: Normality Test on Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Mortgage Financing

	Asset Quality	Capital Adequacy	Loan Structure	Macro-economic Variable	Mortgage Financing
Skewness	-0.519	-.803	.207	-0.730	-.713
Std. Error of Skewness	0.58	.580	.230	0.179	.597
Kurtosis	-0.806	.025	-.578	0.099	-.349
Std. Error of Kurtosis	1.121	1.121	.457	.356	1.154

In addition, to the skewness and kurtosis test on the Table 2, Figure 1 of the histogram with normality curve shows a normal curve based on data distribution for loan structure.

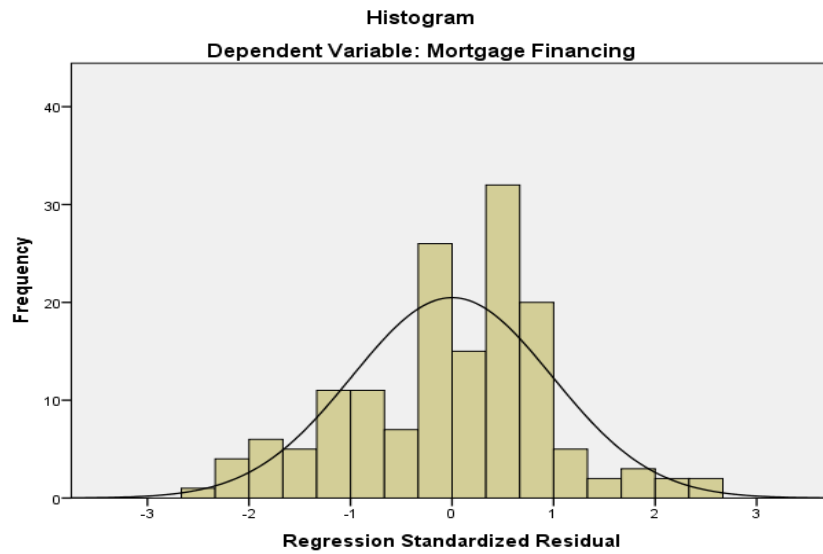


Figure 1: Histogram on, Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Financing of Mortgage Products

Multicollinearity Test

A multicollinearity test was done to ascertain this through Variance Inflation Factor (VIF). VIF values of between 1 and 10 indicate no issues of multicollinearity. Results in Table 3 shows that the VIF=1 an indication that there was no issue of multicollinearity between loan structure and mortgage financing.

Table 3: Multicollinearity Statistics on Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Mortgage Financing

Model		Un-standardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.87	0.116		7.524	.000		
	Loan Structure	0.207	0.027	0.324	7.815	.000	0.733	1.365
	Macroeconomic Variable	0.145	0.036	0.212	4.045	.000	0.459	2.181
	Asset Quality	0.194	0.034	0.285	5.71	.000	0.505	1.981
	Capital Adequacy	0.174	0.036	0.288	4.804	.000	0.351	2.847

a Dependent Variable: Mortgage Financing

Heteroscedasticity

Heteroscedasticity test was carried out through the Glejser test, to establish if there was a difference in the residual variance of the observation period to another period of observation. In the Glejser test when the value $p > 0.05$, there is no issue of Heteroscedasticity while if the $p < 0.05$, there is an issue of Heteroscedasticity. As shown in Table 4 there was no presence of

heteroscedasticity, as the p-value for the independent variables including, capital adequacy, asset quality, Macroeconomic Variable, and loan structure, was greater than 0.05.

Table 4: Heteroscedasticity on Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Financing of Mortgage Products

Model		Un-standardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.354	0.128		2.767	0.006
	Capital Adequacy	-0.012	0.027	-0.051	-0.432	0.667
	Asset Quality	-0.041	0.029	-0.158	-1.411	0.16
	Macroeconomic Variable	0.029	0.022	0.106	1.303	0.195
	Loan Structure	0.008	0.023	0.034	0.365	0.715

a Dependent Variable: AbsUt

Correlation Analysis

The study sought to determine the association between the financing of mortgage products and asset quality, capital adequacy, loan structure, Macroeconomic Variables and mortgage financing. Results in Table 5 show that there is a statistically significant correlation between financing of mortgage products and loan structure, ($r=.660$, $p<.0.000$), asset quality ($r=.739$, $p<.0.000$), capital adequacy ($r=.800$, $p<.0.000$), and Macroeconomic Variables ($r=.731$, $p<.0.000$).

Table 5: Correlation on Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Financing of Mortgage Products

		Mortgage Financing
Loan Structure	Pearson Correlation	.660**
	Sig. (2-tailed)	.000
Capital Adequacy	Pearson Correlation	.800**
	Sig. (2-tailed)	.000
Asset Quality	Pearson Correlation	.739**
	Sig. (2-tailed)	.000
Macroeconomic Variable	Pearson Correlation	.731**
	Sig. (2-tailed)	.000

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

Regression Results on the Joint Influence of Combined Variables and Financing of Mortgage Products

The extent of asset quality, capital adequacy, loan structure, Macroeconomic Variable and mortgage financing combine influence on mortgage financing was evaluated by R^2 that demonstrates the variance in the residual variable that is explained by the predictive variables. From the findings contained on Table 6, the R^2 was .815 indicating that asset quality, capital adequacy, loan structure, Macroeconomic Variables and mortgage financing together explain for 81.5% of the mortgage financing.

Table 6: Model Summary on Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Financing of Mortgage Products

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.903a	0.815	0.81	0.26262

a Predictors: (Constant), Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Mortgage Financing
b Dependent Variable: Mortgage Financing

The ANOVA was used to assess whether the model was significant in predicting the dependent variable. As shown in Table 7, these variables jointly are positive and statistically significant in predicting the variation in the dependent variable that is mortgage financing ($F(4, 147) = 161.65, p < .000$).

Table 7: ANOVA on Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Financing of Mortgage Products

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	44.594	4	11.149	161.65	.000b
	Residual	10.138	147	0.069		
	Total	54.733	151			

a Dependent Variable: Financing of Mortgage Products
b Predictors: (Constant), Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable

The regression coefficient in Table 8 shows that loan structure positively influences mortgage financing ($\beta = 0.207, t = 7.815, p < .000$), which means that with one-unit increase in Macroeconomic Variable, mortgage financing increases by 20.7%. Asset quality positively influence mortgage financing ($\beta = 0.145, t = 4.045, p < .000$), which means that with one-unit increase in Asset quality, mortgage financing increases by 14.5%. Capital adequacy positively influence mortgage financing ($\beta = 0.194, t = 5.71, p < .000$), which means that with one-unit increase in capital adequacy, mortgage financing increases by 19.4%. Macroeconomic Variable positively influence mortgage financing ($\beta = 0.174, t = 4.804, p < .000$), which means that with one-unit increase in Macroeconomic Variable, mortgage financing increases by 17.4%.

Table 8: Coefficients on Asset Quality, Capital Adequacy, Loan Structure, Macroeconomic Variable and Financing of Mortgage Products

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	0.87	0.116		7.524	.000
	Loan Structure	0.207	0.027	0.324	7.815	.000
	Asset Quality	0.145	0.036	0.212	4.045	.000
	Capital Adequacy	0.194	0.034	0.285	5.71	.000
	Macroeconomic Variable	0.174	0.036	0.288	4.804	.000

a Dependent Variable: Mortgage Financing

Discussion

Majority of the respondents agreed that their bank facilitated access to affordable better-quality housing including support for all forms of housing and housing financing options including homeownership and rental. In corresponding with these results, Leece (2004) argues that the process strengthened the competitive position of the banks, enabling centralized lenders to enter the market which adopted the use of securitization as a source of mortgage funds. The results also demonstrated that the majority of the respondents were in agreement that their bank fulfilled its housing finance mandate by providing mortgage loan insurance to lenders. In corresponded with these results, Asare and Whitehead (2006) argued that the lender acts as the mortgage holder on the property to the extent that in the event that the owner of the mortgaged property defaults on the loan, the mortgage company has the right to secure full ownership of the property and offer it for resale to another party. Similarly, Leavy et al (2005) also noted that lenders are able to blend funds and partly use their deposit bases, capital, and other funding sources to achieve a lower cost of funds, but over the long term the net interest margin will have to reduce if financial access is to improve. Contrary to the results, Nyanyuki and Omar (2016) argued that mortgage lending has enhanced commercial banks' profitability. Hence, mortgage costs and loan structure have a significant correlation with the mortgage lending performance by commercial banks.

Respondents could neither agree nor disagree whether their bank played an instrumental role in facilitating market-related housing activities, particularly with respect to mortgage finance. The results are parallel to arguments by Basten and Koch (2015) that CCB changes mortgage supply composition since capital-constrained and mortgage-specialized banks raise prices more than their competitors do. Counter-cyclical Capital Buffer has shifted mortgages from less resilient to more resilient banks. Stricter capital requirements have not discouraged less resilient banks from risky mortgage lending. Similarly, respondents remained neutral on whether their bank facilitated financing for certain housing market segments, such as rental housing, retirement homes, and dwellings located in rural and remote areas. Similarly, Kolade (2017) also argues that there is a positive relationship between bank market power and market risks; hence an increase in common equity capital should be accompanied by controls on bank market power to reduce excessive risk appetites for banks.

Further, findings show that most of the respondents agreed that their bank offered various mortgage loan flexibilities to developers of affordable rental projects. The results resonate with the findings of Nyanyuki and Omar (2016) that Mortgage lending has improved the profitability of commercial banks. Mortgage costs and loan structure had a significant correlation on the performance of mortgage lending by commercial banks in Mombasa County. In a similar perspective, Agao (2014) that there exist significant relationships between mortgage uptake and interest rates, inflation rates, house prices, GDP, and level of money supply, with interest rates having the highest impact on housing prices. However, the researcher established a significant relationship between mortgage uptake and interest rates, which is contrary to the expectations that higher interest rates increase the cost of a mortgage, which would reduce demand.

Respondents were, however, neutral on whether their bank provided the low-cost mortgage to government-assisted social housing sponsors. Contrary to these results, Mogaka, Mboya, and Kamau (2015) argued that GDP per capita, inflation, and informal sector employment are positively correlated with the growth of the mortgage market in Kenya and have the highest

impact on mortgage growth in Kenya. Further, in a similar view, Gitau (2014) noted that there is a positive linear relationship between interest rates spread and financial performance of mortgage lending institutions that influence. In addition, tier 1 banks have a large interest spread compared to tier 2 and tier 3 banks. However, the results correspond with the view of Basten and Koch (2015) that CCB has shifted mortgages from less resilient to more resilient banks. Stricter capital requirements have not discouraged less resilient banks from risky mortgage lending.

According to the results, most of the respondents agreed that their bank played an important role in ensuring lenders can obtain the funding they need to offer borrowers mortgages with attractive interest rates. In line with these findings, Gitau (2014) argued that there is a positive linear relationship between interest rate spread and the financial performance of mortgage lending institutions. Also, tier 1 banks have a large interest spread compared to tier 2 and tier 3 banks. Further, Agao (2014) adds to these results noting that there is a significant relationship between mortgage uptake and interest rates, which is contrary to the expectations that higher interest rates increase the cost of a mortgage, which would reduce demand.

Lastly, respondents were in agreement that their bank supported the government housing finance system. Similarly, the findings of Nyanyuki and Omar (2016) resonate with the results noting that mortgage costs and loan structure had a significant correlation on the performance of mortgage lending by commercial banks in Mombasa County. Further, Kolade (2017) argues that there is a positive correlation between bank market power and market risks, thus, an increase in common equity capital needs to be accompanied with controls on bank market power to minimize excessive risk appetites for banks.

Results showed that asset quality, capital adequacy, loan structure, Macroeconomic Variables and mortgage financing together explain for 81.5% of the mortgage financing. In line with results here Agao (2014) also found out that there exist significant relationships between mortgage uptake and interest rates, inflation rates, house prices, GDP, and level of money supply, with interest rates having the highest impact on housing prices. In addition, Mogaka, Mboya and Kamau (2015) established that the factors with the highest impact on mortgage growth in Kenya include GDP per capita, inflation and informal sector employment, and are positively correlated with growth of the mortgage market in Kenya.

Conclusion

From the study results it is inferred that asset quality, capital adequacy, loan structure, macroeconomic variable and mortgage financing have a statistically significant correlation with financing of mortgage products. Further that asset quality, capital adequacy, loan structure, macroeconomic variable and mortgage financing together explain for 81.5% of the mortgage financing by commercial banks in Kenya. Informed by the results it was conclusive that banks in Kenya support the government housing finance system. These banks play an important role in ensuring lenders can obtain the funding they need to offer borrowers mortgages with attractive interest rates. The bank offers various mortgage loan flexibilities to developers of affordable rental projects. This study recommends that mortgage products should be designed in consideration of the macroeconomic factors including, income level, inflation, interest levels, and exchange rates. These factors should inform the mortgage loan structure that would offer workable payment plans for mortgage that ensure successful mortgage payment with zero or close to zero default rate. Asset quality should be the leading factor in

the decision to award mortgage. In assessing the assign, the mortgage quality, the bank should consider the macroeconomic factors including, inflation, economic growth, and income. In terms of capital adequacy, the study recommends that for commercial banks should have a capital plan that outlines the prevailing and future capital requirements, expected capital expenditures, desirable capital level, external capital sources and needed capital action.

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