

Influence of Macroeconomic Variables on Financing of Mortgage Products by Commercial Banks in Kenya

William Maina* and Bernard Omboi

United States International University-Africa, Nairobi, Kenya

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

Cite: Maina, W., & Omboi, B. (2022). Influence of Macroeconomic Variables on Financing of Mortgage Products by Commercial Banks in Kenya. *The University Journal*, 5(1), 163-178.

Abstract

Various macroeconomic variables including gross domestic product (GDP), interest rate, inflation, money supply, and exchange rate, among others, have implication on financing of mortgage by financial institutions including Banks. In this paper, these variables are incorporated so as to analyze the influence of macroeconomic variables on mortgage financing by commercial banks. This study sought to determine the influence of macroeconomic variables on the financing of mortgage market products among commercial bank in Kenya. The study surveyed 196 head of documentation, credit operations, credit manager, legal, finance, relationship manager and head of retail sales from 28 commercial banks that offer mortgage products. Data was collected by the use of structured questionnaire. Findings on the effect of macroeconomic variables on the level of mortgage products financing showed that there is a statistically significant correlation between financing of mortgage products and macroeconomic variables ($r=.731$, $p<.0.000$). In addition, results showed that macroeconomic variables explain the variations of 53.5% of the mortgage financing. Based on the results, this paper concludes that macro-economic variables in terms of general price levels, gross domestic product, exchange rate and interest rate have a statistically significant influence on financing of mortgage products. Results are also conclusive that the additional costs on property price discourage buyers in acquiring property. The exchange rate applied at any given time affects financing of mortgages. This study recommends that commercial banks should develop a system that constantly monitors the macroeconomic environment to determine if the conditions are favorable for mortgage provision. The system should be developed to monitor macroeconomic indicators such as income level, inflation, interest levels, and exchange rates. Importantly, commercial banks should set favorable down payment, that clients can afford to payment at once and clear the balance in installments.

Keywords: Macroeconomic, Mortgage Financing, Commercial Bank, Income Level, Inflation, Interest Levels, Exchange Rates.

Introduction

In Kenya, it is estimated that there is annual shortfall in the urban housing in excess of 250,000 units with the current provision standing 50,000 per annum. This results into a deficit of approximately 200,000 units per annum (Kaimenyi, 2016). This situation compares to developed countries which have advanced housing finance systems in which funds flow from savers to home-buyers in the mortgage markets. Specifically, housing finance in developing countries often remains underdeveloped, despite its recognized economic and social importance, mainly due to the lack of macroeconomic stability, and the impact of variations in

commercial mortgage rates on banks' profitability is largely dependent on the degree of responses of asset and liability rates (Wahome, 2010).

In the recent past, mortgage industry has continued to grow competitively. Central Bank of Kenya (CBK), (2015) estimates 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).

The report further shows 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. In this study the influence of macroeconomic variables on mortgage financing by commercial banks in Kenya is considered.

Macroeconomic variables are considered as economic factors that affect the whole economy including financial institutions. Some of these include interest (lending and central bank rate), unemployment, money supply, interest rate spread, inflation rate and growth in gross domestic product, among others (Thujo, 2018). Lending interest rates is the cost of capital in an economy; it is a reward for investments and therefore constitutes the opportunity cost for money. High interest rate makes lending relatively more attractive to buying and is likely to worsen in case of competition in the market (Kariuki, 2015). The rates have also been associated with high repayment terms of the loans and high level that is considered unattained to the majority of potential homeowners.

According to Kariuki (2015), lending rates are considered as the cost of capital and the higher the rates, the more attractive renting is relatively to buying and is likely to be worsen in case of other competitors providing the services in the region or the country. Additionally, high interest rates are likely to impact positively on repayment terms of the loan, while, unstable interest and inflation rates have impacted significantly on the mortgage growth (Kariuki, 2015). The Central Bank rate expected to affect the mortgage uptake since mortgage rates are pegged towards the Central Bank rate. Specifically, increase in the Central Bank rate leads to a consistent increase in the mortgage rate which tends to slow down mortgage uptake since the Central bank rate act as a signal for commercial banks to tighten their lending (Central Bank, 2010; William, 2008).

Exchange rate enables comparison of prices of commodities quoted in diverse currencies and is determined by pegging a countries currency to another currency. According to Liow et al. (2005), excessive growth in money supply is likely to contribute towards inflationary environment and might affect the investments because of higher discount rate and this therefore affects the mortgage uptake. In terms of gross domestic product, when it is relatively low, it

means that the people's purchasing power is also low hence the demand for real estate and consequently the mortgage uptake will decrease and the opposite holds (Addae-Korankye, 2014).

Theoretically, it is expected that the higher the inflation rate, the higher the house price and therefore the lower the mortgage uptake. At the same time, banks' decisions regarding mortgage applications may also be influenced by housing prices, which form an indicator of the collateral value of a house. Under this, the variables namely interest rate, GDP, inflation, exchange rate, among others, was included as constructs for macroeconomic variables to analyze their significance in influencing the financing of mortgage products by commercial Banks.

Kariuki (2015) opine that unstable interest and inflation rates have impacted significantly on the mortgage growth. The Central Bank rate affects the mortgage uptake since mortgage rates are pegged towards the Central Bank rate. Increase in the Central Bank rate leads to a consistent increase in the mortgage rate which tends to slow down mortgage uptake since the Central bank rate act as a signal for commercial banks to tighten their lending. This subsequently leads to an increase in the Commercial bank lending rates which is consistent with the mortgage rates (Central Bank, 2010). A higher mortgage rate leads to an increased cost of borrowing from both supply income side and demand of housing which further leads to defaults and foreclosures to the extreme cases. Higher mortgage rates may however be seen as an opportunity for investment by mortgage investors and therefore could assess the risk return trade-off and evaluate other competing investment which could be a business opportunity (William, 2008).

Exchange rate as a macroeconomic variable is the prevailing unit price of another country currency against the domestic currency. Reid and Joshua (2004), consider exchange rate as the value of the one unit of foreign currency against local currency. Omagwa (2005) posit that exchange rates like any other commodity are explained by the law of demand and supply. Murthy and Sree (2003) argue that exchange rate enables comparison of prices of commodities quoted in diverse currencies and is determined by pegging a countries currency to another currency. This is expected to impact on mortgage products.

Money supply is a broad measure of money in an economy such that an increase in money supply gives rise to greater inflation uncertainty. The process has had an adverse impact on the real estate market (Liow et al., 2005). According to Liow et al. (2005), excessive growth in money supply is likely to contribute towards inflationary environment and might affect the investments because of higher discount rate and this therefore affects the mortgage uptake. Other key factors that impact mortgage finance uptake include, GDP, employment data, manufacturing activities and prices, among others.

Gross Domestic Product (GDP) as a measure of the size of an economy is considered as the market value of all officially recognized final goods and services produced within a country in each period of time (Hardwick et al., 2010). This could be measured in real or nominal with nominal GDP reflecting total output in the economy at market price, while real GDP is GDP adjusted for price changes and inflation. It measures in constant prices the output of final goods and services and incomes within an economy. From Economic theory, when the GDP is

relatively low, it means that the people's purchasing power is also low hence the demand for real estate and consequently the mortgage uptake will decrease (Hardwick, et al., 2010).

Conversely, when the GDP increases, the purchasing power also increases, hence increasing the demand of Real estate and the mortgage financing. Gross domestic product creates a legitimate expectation among consumers and investors for continued economic development (Addae- Korankye, 2014). This encourages consumer spending and business investment which in turn increases the demand on the money supply moving through the economy. Periods of economic growth have some important features that influence the mortgage market (Ariemba et al, 2015).

Inflation, defined as a sustained increase in prices for a broad range of prices (Gallagher, 2011) affects the purchasing power of money. Inflation is measured by the changes in the Consumer price index (CPI) which measures the retail prices of goods and services purchased by households (Liow et al., 2005). It is theoretically expected that the higher the inflation rate the higher the house price and therefore the lower the mortgage uptake. Housing prices and other associated fees may enter mortgage lending both as a demand and a supply factor. Specifically, these prices, together with income and the mortgage rate, determine how much credit households wish to take out. At the same time, banks' decisions regarding mortgage applications may also be influenced by housing prices, which form an indicator of the collateral value of a house (De Greef & de Haas, 2000).

The foregoing demonstrates that various macroeconomic variables including gross domestic product, interest rate, inflation, money supply, and exchange rate, among others, have implication on financing of mortgage by financial institutions including Banks. In the study, these were incorporated so as to analyze the influence of macroeconomic variables on mortgage financing by commercial banks. Objectively, this study sought to determine the influence of macroeconomic variables on the financing of mortgage market products among commercial bank in Kenya.

Literature Review

Agao (2014) studied the effect of macroeconomic variables such as inflation rates, interest rates, level of money supply, Gross Domestic Product (GDP) and Economic Growth on the mortgage uptake for mortgage industry in Kenya. The researcher collected secondary data from the Central Bank of Kenya related to the 44 financial institutions that offer mortgage services in Kenya and carried an analysis of Pearson coefficients to establish the correlation between the dependent and independent variables. Agao (2014) also used multivariate regression analysis to develop a model that shows the extent to which the dependent variable (mortgage uptake) is influenced by the independent variables such as interest rates, GDP, house prices, inflation rates, levels of monetary supply, and rates of inflation. Agao (2014) established a high correlation between mortgage uptake and house prices at 0.859, as well as high correlation between mortgage uptake and money supply at 0.972. The researcher also established a high correlation between the mortgage uptake and GDP, mortgage uptake and house prices, as well as a moderate correlation between interest rates and mortgage uptake. The results are legit because it is expected that mortgage uptake was higher when house prices are higher, and there is a growth in the GDP (Ouma, 2015).

In terms of significance, Agao (2014) established a negative relationship between mortgage uptake and the rates of inflation. The negative relationship between mortgage uptake and inflation rates could be due to increase in mortgage prices during periods of high inflation, as well as increased financial risks which impact bank supply of mortgage products. On the other hand, the regression analysis shows that changes in interest rates would have the highest impact on mortgage uptake, followed by the levels of money supply, while the levels of money supply, real residential house prices, and inflation rates were negatively correlated to mortgage uptake. Inflation rates had the most negative correlation to mortgage uptake.

Agao (2014), however, did not explain the underlying reasons for the correlation figures between the dependent and independent variables. Whereas the regression analysis showed interest rates having the highest impact on mortgage uptake, and a moderate Pearson correlation between interest rates and mortgage uptake, the researcher concluded that the impact of interest rates on mortgage uptake was insignificant, which is erroneous, because interest rates are among the key determinants of mortgage supply and demand. The conclusions are contrary to the expectations that high interest rates would increase the cost of mortgage, hence reducing their demand within the market. Various researchers have established a positive and significant correlation between interest rates and mortgage market performance, among them, Gerlach and Peng (2005), and Avery, Brevoort and Canner (2006).

Agao (2014) did not also explore probable reasons for the impact of GDP growth on mortgage uptake, and it is not clear from the Pearson correlation coefficient, the multivariate analysis and the research conclusions whether GDP, and real prices impact mortgage financing to increase or decrease mortgage uptake. Agao's (2014) assertion of a negative but significant correlation between inflation rates and mortgage market uptake also contradicts past research that has shown a direct positive correlation between inflation rates and mortgage market performance, as established by Owuor (2017). As a result, further researcher is necessary to quantify the impact of macroeconomic variables on the financing, and hence the supply of mortgage products in Kenya.

Owuor (2017) sought to assess the relationship between selected macroeconomic factors such as interest, inflation, GDP and exchange rates and mortgage supply. The researcher utilized secondary data from the CBK based on financial reports by mortgage market players in Kenya between 2007 and 2016. The researcher used both inferential and descriptive statistical techniques, with linear correlations and multiple linear regression analysis showing the relationship between the dependent variable (mortgage market growth) and the independent variables. In his findings, Owuor (2017) established a strong positive correlation between interest rates, exchange rates, mortgage values, inflation, and GDP, and an absence of multicollinearity among the variables. The regression analysis showed a positive and significant relationship between interest rates, inflation rates and mortgage market, growth, as well as an insignificant relationship between exchange rates and mortgage market growth. The researcher also established that GDP is positively but insignificantly related to the mortgage market growth.

Owuor (2017) provided a justification for the positive and significant correlation between interest rates and mortgage market performance compared to Agao (2014), noting that higher interest rates are expected to raise mortgage prices, hence lowering demand. Furthermore, Owuor (2017) utilized the consumer price indices data to show the impact of inflation on

mortgage market performance. However, Owuor's (2017) assertion of a lack of multicollinearity among the variables is contestable, considering that inflation rates impact interest rates, which in turn impact exchange rates, and economic production activities that influence the GDP. Furthermore, the impact of factors such as exchange rates are likely to be felt more in the present circumstances, considering the increasing Diaspora remittances over the last five years, hence it is necessary to investigate how exchange rates presently impact mortgage growth in Kenya (Arthur et al., 2020).

Seeking to investigate the impact of the global financial crisis on the financial performance of mortgage finance institutions in Kenya, Macharia (2013) considered the global financial crisis, inflation, interest rates, foreign exchange rates and capital flow. The researcher administered a semi-structured questionnaire to 99 low level and middle level personnel from ten mortgage lenders in Kenya. Both descriptive and multivariate analyses were used to ascertain the relationship between financial performance and the independent variables. The regression equation showed that an increase in inflation, interest rates, resulted in a decrease in financial performance. On the other hand, an increase in foreign exchange rates and capital flow increases financial performance.

Among the factors identified by the respondents as most likely to be responsible for a financial crisis include depreciation and currency devaluation, excessive debt levels, reduction in economic activities, increased government deregulation fluctuating, international trade imbalances, asset liability mismatches, increased inflation, real estate bubbles, basic commodity prices, poor credit appraisal, and overvaluation of real property.

The causes of the 2008 financial crisis can be obtained from secondary documents, hence should not be the subject of the primary data collection exercise. Furthermore, reliable data regarding the macro-economic factors can be obtained from secondary sources; hence there was no need of collecting subjective personal opinions without conducting a proper analysis using descriptive and inferential statistical techniques. Macharia (2013) did not also describe the respondents' profile, and which specific information was expected from them courtesy of the positions they occupied within the various banks. The main research objective was ambiguous considering that the Global Financial Crisis was an isolated event whose recurrence cannot be predicted with certainty. Nevertheless, the independent variables are significant macro-economic factors whose impact on mortgage sector performance can be analyzed based on the available secondary data, as this research intends to do.

Ng'ang'a (2017) also considered exchange rates, inflation and the GDP per capita as among the dependent macroeconomic variables that affect the mortgage market in Kenya. The researcher collected inflation, exchange rates, and mortgage finance market data from secondary sources such as the CBK, and the World Bank. Ng'ang'a (2017) used a regression model to examine the relationship between the dependent and independent variables. The findings indicated a positive relationship between GDP per capita and mortgage market performance. It was also established that exchange rates have a positive relationship with mortgage performance while inflation rates had no significant impact.

Ng'ang'a (2017) did not however present the exact data used in the analysis. Although Ng'ang'a (2017) asserted that the research would use CBK, and World Bank data between 1998 and 2015, it is not clear from the analysis how the data was used to build the regression

model. Ng'ang'a's (2017) findings, such as the impact of exchange rates and inflation on mortgage market, contradicts findings with Owuor's (2017), hence the need to conduct further research using current data for quantitative analysis to determine the extent to which macroeconomic variables such as exchange rates, GDP and inflation impact mortgage market performance.

Methodology

This study used descriptive survey design. The study surveyed 196 head of documentation, credit operations, credit manager, legal, finance, relationship manager and head of retail sales from 28 commercial banks that offer mortgage products. Data was collected by the use of structured questionnaire. Data analysis included descriptive and inferential analysis which included correlational and regression analysis.

Results

Demographic Characteristics

Findings in Table 1 revealed 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.

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%

Macroeconomic Variables

Results in Table 2 show that most of the respondents (M= 4.4, SD=0.8) agreed that interest rate charged by commercial banks on mortgage affects financing of mortgages. On the other

hand, some respondents (M= 1.9, SD=1.2) disagreed that Central Bank lending rate has no effect on financial mortgage products by the bank. According to the results quite a number of respondents (M= 2.0, SD=0.8) disagreed that the country's GDP has no effect on the financing of mortgage products offered by commercial banks in Kenya. More so, majority of the respondents (M= 3.5, SD=1.2) agreed that the exchange rate applied at any given time affects financing of mortgages. Results however showed that respondents disagreed that general price level has no effect on the financing of mortgage products, as shown with mean of 2.1 and as standard deviation of 0.6. The results as depicted in Table 2 further show that most of the respondents (M= 4.3, SD=0.8) agreed that interest rates chargeable on mortgages influence the mortgage financing by Banks. In addition, results demonstrated that more than half of the respondents (M= 3.9, SD=1.2) agreed that the cost of a property includes additional costs which on average amount to significant percent of the property value which can deter the buyers hence affecting the financing of mortgages. These results are illustrated in Table 2.

Table 2: Macroeconomic Variable

	Mean	Std. Deviation
Interest rate charged by commercial banks on Mortgage affects financing of mortgages	4.4	0.8
Central Bank lending rate has no effect on financial mortgage products by the bank	1.9	1.2
The country's GDP has no effect on the financing of mortgage products offered by commercial banks in Kenya	2.0	0.8
The exchange rate applied at any given time affects financing of mortgages	3.5	1.2
General price level has no effect on the financing of mortgage products	2.1	0.6
Interest rates chargeable on mortgages influence the mortgage financing by Banks	4.3	0.8
The cost of a property includes additional costs which on average amount to significant percent of the property value which can deter the buyers hence affecting the financing of mortgages.	3.9	1.2
Overall	3.16	0.94

Financing of Mortgage Products

Results in Table 3 show average mean score of 3.14 for financing of mortgage with a standard deviation of 1.18. In particular, most of the respondents (M= 3.5, SD=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. More than half of the respondents (M= 3.6, SD=1.2) agreed that their bank fulfilled its housing finance mandate by providing mortgage loan insurance to lenders. 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. 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, as shown by (M= 2.5, SD=1.3).

Further, the findings show that most of the respondents (M= 3.6, SD=1.1) agreed that their bank offered various mortgage loan flexibilities to developers of affordable rental projects. Respondents were, however, neutral on whether their bank provided low-cost mortgage to

government assisted social housing sponsor (M= 3.3, SD=1.1). According to results most of the respondents (M= 3.7, SD=1.4) 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. Lastly, respondents agreed (M= 4.3, SD=0.8) that their bank supported the government housing finance system. These results are presented in Table 3.

Table 3: Financing of Mortgage Products

	Mean	Std. Deviation
The bank facilitates access to affordable better quality housing including support for all forms of housing and housing financing options including home ownership and rental	3.5	1.3
The bank fulfils its housing finance mandate by providing mortgage loan insurance to lenders	3.6	1.2
We play an instrumental role in facilitating market related housing activities, particularly with respect to mortgage finance	3.4	1.3
Our bank facilitates financing for certain housing market segments, such as rental housing, retirement homes and dwellings located in rural and remote areas	2.5	1.3
The bank offers various mortgage loan flexibilities to developers of affordable rental projects	3.6	1.1
The bank provides low-cost mortgage to government assisted social housing sponsors	3.3	1.1
The bank plays an important role in ensuring lenders can obtain the funding they need to offer borrowers mortgages with attractive interest rates	3.7	1.4
The bank supports the government housing finance system	4.3	0.8
Average	3.14	1.18

Regression Assumptions

Normality Test

Normality tests 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 4, Macroeconomic Variable (skewness=-.730; kurtosis = .099) was found to be normally distributed.

Table 4: Normality Test on Macroeconomic Variable and Mortgage Financing

	Macroeconomic Variable
Skewness	-0.730
Std. Error of Skewness	0.179
Kurtosis	0.099
Std. Error of Kurtosis	.356

In addition, to the skewness and kurtosis test on the Table 4, Figure 1 of the histogram with normality curve shows a normal curve based on data distribution for Macroeconomic Variables.

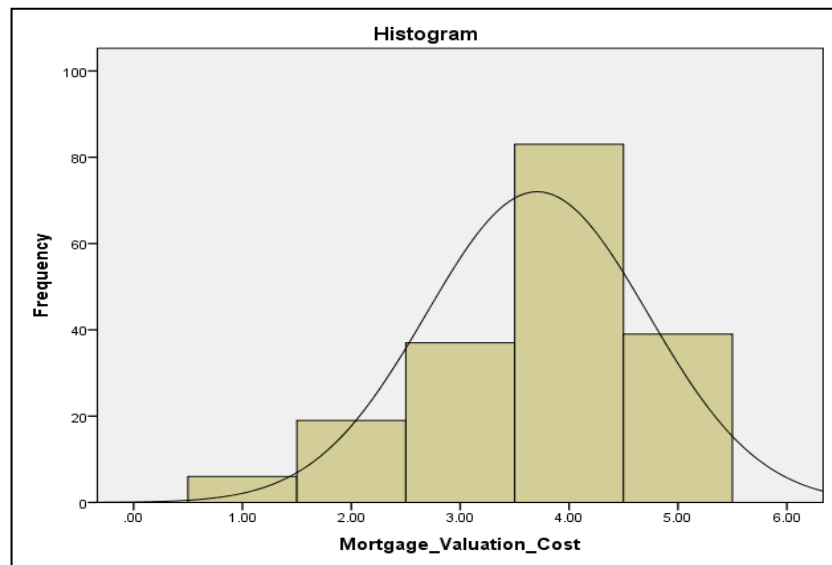


Figure 1: Histogram on Macroeconomic Variable

Multicollinearity Test

This study sought to ascertain that the independent variable did not have a high similarity with the dependent variable to affect the regression model. A multicollinearity test was done to ascertain this through Variance Inflation Factor (VIF). Variance Inflation Factor values of between 1 and 10 indicate no issues of multicollinearity. Results in Table 5 shows the VIF=1 and therefore there was no issue of multicollinearity between asset quality and mortgage financing.

Table 5: Multicollinearity Statistics on Macroeconomic Variable and Mortgage Financing

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	1.671	0.153		10.927	0		
	Macroeconomic Variable	0.499	0.038	0.731	13.217	0	1	1

a Dependent Variable: Mortgage Financing

Heteroscedasticity on Macroeconomic Variable and Mortgage Financing

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. In the results obtained here it was concluded

that there was no presence of heteroscedasticity in the data since the $p > .05$. The findings are shown in Table 6.

Table 6: Heteroscedasticity on Macroeconomic Variable and Mortgage Financing

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.164	0.08		2.045	0.043
	Macroeconomic Variable	0.032	0.022	0.118	1.465	0.145

a Dependent Variable: AbsUt

Linearity Test on Macroeconomic Variable and Mortgage Financing

Linearity test determines whether there is a linear association between the independent variable and the dependent variable that is a requirement in regression analysis. Results in Table 7 show that the P-value for Deviation from Linearity is greater than the significance P-value ($p > 0.288$). It is thus concluded that Macroeconomic Variable had linear relationship with mortgage financing.

Table 7: Linearity Test on Macroeconomic Variable and Mortgage Financing

			Sum of Squares	df	Mean Square	F	Sig.
Mortgage Financing * Macroeconomic Variable	Between Groups	(Combined)	11.911	30	0.397	1.126	0.318
		Linearity	0.105	1	0.105	0.299	0.586
		Deviation from Linearity	11.806	29	0.407	1.155	0.288
	Within Groups	43.363	123	0.353			
	Total	55.275	153				

Correlation on Macroeconomic Variable and Mortgage Financing

The study sought to determine the association between the financing of mortgage products and Macroeconomic Variable. Results in Table 8 show that there is a statistically significant correlation between financing of mortgage products and Macroeconomic Variable, $r = .731$, $p < 0.000$.

Table 8: Correlation on Macroeconomic Variable and Mortgage Financing

		Mortgage Financing	Macroeconomic Variable
Mortgage Financing	Pearson Correlation	1	.731**
	Sig. (2-tailed)		.000
Macroeconomic Variable	Pearson Correlation	.731**	1
	Sig. (2-tailed)	.000	

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

Regression on Macroeconomic Variable and Mortgage Financing

The extent of Macroeconomic Variable influence on mortgage financing was evaluated by R^2 that demonstrates the variance in the residual variable that is explained by the predictive variable. From the findings contained on Table 9, the R^2 was .535 indicating that Macroeconomic Variable explains for 53.5% of the mortgage financing.

Table 9: Model Summary on Macroeconomic Variable and Mortgage Financing

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.731a	0.535	0.532	0.41134

a Predictors: (Constant), Macroeconomic Variable
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 10, Macroeconomic Variable was statistically significant in predicting the variation in the dependent variable that is mortgage financing ($F(1,152) = 174.689, p < .000$).

Table 10: ANOVA on Macroeconomic Variable and Mortgage Financing

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.557	1	29.557	174.689	.000b
	Residual	25.718	152	0.169		
	Total	55.275	153			

a Dependent Variable: Mortgage Financing
b Predictors: (Constant), Macroeconomic Variable

The regression coefficients in Table 11 show that Macroeconomic Variables positively influence mortgage financing ($\beta = 0.499, t = 13.217, p < .000$). This means that with one unit increase in Macroeconomic Variable, mortgage financing increases by 49.9%.

From the regression analysis, the equation obtained is given as:

$$Y = 1.671 + 0.499X_1 + 0.038$$

X_1 = Macroeconomic Variable

Table 11: Coefficients on Macroeconomic Variable and Mortgage Financing

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	1.671	0.153		10.927	.000
	Macroeconomic Variable	0.499	0.038	0.731	13.217	.000

a Dependent Variable: Mortgage Financing

Discussion

The results show that most of the respondents agreed that the interest rate charged by commercial banks on mortgages affects the financing of mortgages. In line with these results, Kariuki (2015) found that high-interest rates make lending relatively more attractive to buy

and are likely to worsen in case of competition in the market. High-interest rates are also related to high repayment terms of the loans and high level that is considered unattainable to most of the potential homeowners. Hence, unstable interest and inflation rates have affected significantly mortgage growth. However, the results also showed that most of the respondents disagreed that the Central Bank lending rate has no effect on financial mortgage products by the bank. The results correspond with the findings of the Central Bank (2010) that asserts its rates affect the mortgage uptake because mortgage rates are pegged towards the Central Bank. An increase in the Central Bank rate leads to a consistent increase in the mortgage rate which tends to slow down mortgage uptake since the Central bank rate act as a signal for commercial banks to tighten their lending.

According to the results, respondents disagreed that the country's GDP has no effect on the financing of mortgage products offered by commercial banks in Kenya. In line with the findings, Addae-Korankye (2014) noted that when the GDP increases, the purchasing power also increases hence increasing the demand for Real estate and the mortgage uptake. GDP creates a legitimate expectation among consumers and investors of continued economic development. Similarly, Ng'ang'a (2017) established a positive relationship between the GDP per capita and mortgage market performance. Further, Hardwick, et al. (2010) confirms that when the GDP is relatively low, it means that the people's purchasing power is also low hence the demand for real estate and consequently the mortgage uptake will decrease. Ariemba et al. (2015) also affirm with these results that periods of economic growth have some important features that influence the mortgage market.

From the results majority of the respondents agreed that the exchange rate applied at any given time affects the financing of mortgages. In line with the results, Ng'ang'a (2017) also revealed that exchange rates have a positive relationship with mortgage performance. Similarly, Murthy and Sree (2003) argue that the exchange rate enables the comparison of prices of commodities quoted in diverse currencies and is determined by pegging a country's currency to another currency. This, therefore, is expected to impact mortgage services. Further, Omagwa (2005) confirms that exchange rates like any other commodity are explained by the law of demand and supply.

The results also show that respondents disagreed that general price level has no effect on the financing of mortgage products. In a similar perspective, Greef et al. (2000) noted that the higher the inflation rate the higher the house price, hence, the lower mortgage uptake. Housing prices and other associated fees may enter mortgage lending both as a demand and a supply factor. Similarly, banks' decisions regarding mortgage applications may also be influenced by housing prices, which form an indicator of the collateral value of a house.

Based on the results, most of the respondents agreed that the interest rate chargeable on mortgages influences the mortgage financing by Banks. Equally, Central Bank (2010) asserted that a consistent increase in the mortgage rate tends to slow down mortgage uptake because commercial banks have to tighten their lending. The results resonate with the findings of William (2008) that a higher mortgage rate results in an increased cost of borrowing from both the supply income side and demand of housing which further leads to defaults and foreclosures to the extreme cases. Hence, high mortgage rates lead to a lower mortgage uptake. However, high mortgage rates can be considered as an opportunity for investment by mortgage investors

and thus might assess the risk-return trade-off and examine other competing investments, which could be a business opportunity.

Additionally, results demonstrated that the majority of the respondents agreed that the cost of a property includes additional costs which on average amount to a significant percentage of the property value which can deter the buyers hence affecting the financing of mortgages. Still, based on the findings of a study done by Liow et al. (2005) makes a more plausible explanation that excessive growth in money supply is likely to contribute towards inflationary environment and might affect the investments because of higher discount rate and this therefore affects the mortgage uptake.

Results showed that there is a statistically significant correlation between financing of mortgage products and macroeconomic variables ($r=0.731$, $p<0.000$). In addition, results showed that macroeconomic variables explain the variations of 53.5% of the mortgage financing. In line with results here Agao (2014) in a study of the effect of macroeconomic variables on the mortgage uptake for mortgage industry in Kenya, established that there is a high correlation between mortgage uptake and house prices at 0.859, as well as high correlation between mortgage uptake and money supply at 0.972. The researcher also established a high correlation between the mortgage uptake and GDP, mortgage uptake and house prices, as well as a moderate correlation between interest rates and mortgage uptake. Similarly, Owuor (2017) assessed the relationship between macroeconomic factors and mortgage supply and established that there is a positive and significant relationship between interest rates, inflation rates and mortgage market, growth, as well as an insignificant relationship between exchange rates and mortgage market growth. The researcher also established that GDP is positively but insignificantly related to the mortgage market growth. Owuor (2016) explained that higher interest rates are expected to raise mortgage prices, hence lowering demand. In line with results here Ng'ang'a (2017) also considered exchange rates, inflation and the GDP per capita as among the dependent macroeconomic variables that affect the mortgage market in Kenya. He established a positive relationship between the GDP per capita and mortgage market performance. He also observed that exchange rates have a positive relationship with mortgage performance while inflation rates had no significant impact.

Conclusion

Based on the results, this study concludes that macro-economic variables in terms of general price levels, gross domestic product, exchange rate and interest rate have a statistically significant influence on the financing of mortgage products. Macroeconomic variables account for about 54.6% of the variations in mortgage financing by commercial banks in Kenya. It is thus concluded that interest rate charged by commercial banks on mortgage affects financing of mortgages. Results were also conclusive that the additional costs on property price discourage buyers in acquiring property. The exchange rate applied at any given time affects financing of mortgages.

Recommendations

This study recommends that commercial banks should develop a system that constantly monitors the macroeconomic environment to determine if the conditions are favorable for mortgage provision. The system should be developed to monitor macroeconomic indicators such as income level, inflation, interest levels, and exchange rates. Importantly, commercial

banks should set favorable down payment, that clients can afford to payment at once and clear the balance in installments.

The study recommends that a mortgage down payment should be around 35% of the mortgage total cost to be affordable. In addition, it is recommended that property should have less additional costs to attract more clients.

More so, this study recommends that interest rates should be set at minimal levels, since higher interest rates tend to raise mortgage prices, hence lowering demand. It is recommended that banks should provide favorable interest rates for mortgage products. The Central Bank lending rate should also be favorable to support financial mortgage products. It is also the duty of the government to support a health mortgage market. They can attain this through proper policy mechanisms that manage the inflation rate at the appropriate level and ensuring that the local currency is stable to foreign currency.

References

- Addae-korankye, A. (2014). Causes and control of loan default /delinquency in microfinance institutions in Ghana. *American International Journal of Contemporary Research*, 4(12), 36–45.
- Wahome, M. W. (2010). *A survey of factors influencing mortgage financing in Kenya* (Masters' Thesis), University of Nairobi, Kenya.
- Agao, E. A. (2014). The effect of macroeconomic variables on the mortgage uptake for mortgage industry in Kenya (Doctoral dissertation), University of Nairobi.
- Ariemba, J. M., Mboya, K. J., & Kamau, R. G. (2015). The influence of macro economic factors on mortgage market growth in Kenya. *Journal of Finance and Accounting*, 3(4), 77-85
- Arthur, E. K., Musau, S. M., & Wanjohi, F. M. (2020). Diaspora remittances and financial inclusion in Kenya. *European Journal of Business and Management Research*, 5(2), 1-10.
- Central Bank of Kenya (2010). *World Bank, mortgage finance in Kenya: Survey Analysis*.
- Central Bank of Kenya and the World Bank (2010). Mortgage finance in Kenya: Survey analysis. Retrieved from <https://www.centralbank.go.ke/wp-content/uploads/2016/08/Housing-Finance-Survey-in-Kenya-November-2010.pdf>
- De Greef, I., & de Haas, R. (2000, October). Housing prices, bank lending, and monetary policy. In *Financial Structure, Bank Behaviour and Monetary Policy in the EMU Conference* (pp. 5-6).
- Gallagher, M. (2011). *The Effect of Inflation of Housing Prices* from <http://homeguides.sfgate.com/effect-inflation-housing-prices-2161.html>
- Gerlach, S., & Peng, W. (2005). Bank lending and property prices in Hong Kong. *Journal of Banking & Finance*, 29(2), 461-481.
- Gu, A., & Trefetzer, J. (2003). Mortgage payment as a portion of income: A better solution. *International Real Estate Review*, 6(1), 121-135.
- Kaimenyi, D. (2016). A public audit report on the effectiveness of IFMIS, in public sector. *Kenya Case*, 31 (3) 89, 92.
- Kariuki, L. W. (2015). *Determinants of mortgage uptake*. (Unpublished MBA Project), University of Nairobi

- Liow, K.H., Ibrahim, M.F. & Huang, Q. (2006). Macroeconomic risk influences in the property stock market. *Journal of Property Investment and Finance*, 24(4), 295-323.
- Macharia, P., & Wanyoike, D. (2016). Factors influencing mortgage uptake from financial institutions in Nakuru Town, Kenya. Commerce and management. *International Journal of Economics*, 4(10) 568-598.
- Murthy, Y., & Sree, R. (2003). A study on financial ratios of major commercial banks. *Research Studies, College of Banking & Financial Studies, Sultanate of Oman*, 3(2), 490-505.
- Ng'ang'a, A. K. (2017). The impact of interest rate capping on the financial performance of commercial banks in Kenya (Doctoral dissertation), University of Nairobi.
- Omagwa, J. (2005) Foreign exchange risk management practices by foreign owned commercial banks in Kenya. (Unpublished MBA research project), University of Nairobi.
- Ouma, S. (2015). *Assembling export markets: The making and unmaking of global food connections in West Africa*. John Wiley & Sons.
- Owuor, N. D. (2017). The Relationship between macroeconomic factors and the mortgage market growth in Kenya. *European Scientific Journal*, 14(10), 68-82.
- Reid, W. & Joshua, D. (2004). *The theory and practice of international financial management*. Upper Saddle River, NY: Prentice Hall.
- Thuo P.N., (2018) Determinants of mortgage uptake among financial institutions in Kenya. (Unpublished MBA Project), KCA University
- Thuo, P. N. (2018). Determinants of mortgage uptake among financial institutions in Kenya (Doctoral dissertation), KCA University.
- William, B. B. & Jeffrey, D.F. (2008). *Real estate finance and investment (13th Edition)*. McGraw Hill, Singapore