INTEREST RATE, MONEY SUPPLY AND GROWTH OF MORTGAGE FINANCING AMONG COMMERCIAL BANKS IN KENYA

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ABSTRACT

Mortgage loans have become necessary to financial institutions in Kenya, including commercial banks which earn profits on them, like any other type of loan. The goal of this project was to investigate the effects of interest rate and money supply on the growth of mortgage financing among Kenyan Commercial banks. The study adopted a descriptive research design. The population contained 35 loan lending commercial banks over a period between 1985 and 2019. Secondary data was used from desired financial statements available to the public of the singular commercial banks and other posted reports of financial institutions and establishments in conformity with the study. Time-series data were analyzed using STATA version 13 software, regression analysis and model specification tests. The hypothesis was tested using the multiple regression approach a significance level of 0.05 was used. The study found that interest rate (coef= -0.0822, p= 0.007) and money supply (coef= 0.548, p= 0.00) have significant effects on the growth of mortgage financing among Kenyan commercial banks. Kenya's central bank should put in place mechanisms to guarantee that interest rates and money supply do not have adverse impacts on bank mortgage financing. The government should guarantee currency stability since currency fluctuations may have a negative impact on commercial bank mortgage borrowing.

Keywords: Interest Rate, Money Supply, Growth of Mortgage Financing

INTRODUCTION

In most developing economies where short-term financial contracts dominate financial systems, mortgage finance becomes a critical segment in policy agenda to lengthen financial contracts. Mortgage finance also attempts to create non-bank sections in financial systems (Beck et al., 2016). Unlike other human basic needs such as clothing and food, housing requires a regular flow of income and heavy capital outlay to meet this long-term objective (Doling, Vandenberg & Tolentino, 2013).

Mortgages are routinely used and are available for house financing in developed economies than developing and undeveloped economies. Countries with less income and developing middle-income countries register only a small fraction of their GDP as mortgage debt. As an example, in many lower-middle-income across Asia and Africa, only 1% or less of their GDP is outstanding total mortgage debt whereas in the Netherlands it is 83% of their GDP. Mortgage financing has gained recognition and is readily available in developed economies compared to developing economies (Hahm, 2014). This arises from challenges such as mismatch between the long-term nature of mortgages and the short-term nature of customer deposits in addition to high-interest rates charged on loans (Hassler, 2016).

In Africa, the mortgage sector is a reflection of the various nations' economic performance. This is since challenges facing the mortgage industry mostly emanate from the economic downturns in a given country. Moss (2016) found that in Ghana, the nation experienced political instability and economic decline which negatively affected the banking sector. The mortgage sector was also affected and there was reduced uptake of mortgage loans. Mohammed (2014) noted that the housing finance corporation in Ghana was not successful in addressing the issue of the housing shortage. On the other hand, Nigerian housing became more modernized but its progress was impeded by the high cost of land in the urban regions and inadequate real estate developers.

According to Ndungu (2017), Kenya mortgage services are available in banks as well as mortgage finance. The provision of mortgage loans is regulated by the state government. For instance, in 2002, the government stretched the mortgage loan payback period from 5 years to 11-26 years so that the facility could be affordable to a large number of citizens with varying specifications on housing. A report by World Bank in 2016 indicated that the Kenyan mortgage market is underdeveloped and it is only affordable by a specific class of citizens with huge

incomes, the majority of who are public servants. Despite the demand for the same having been increasing, the uptake has not moved in the same direction leading to a slower pace of development and growth in the mortgage sector.

Kariuki (2017) suggests that there is a need to address issues surrounding the slow growth of the mortgage sector by making loans available and accessible to a wider range of people. The house financing portfolio has remained low with a value of Ksh. 61.5B and less than 15000 mortgage accounts. This is too far below the expectation of over 156000 house units per year. Arvantis (2016) the average amount of mortgage loan stood at Ksh. 6.6 million, both in banks and at the housing finance cooperation. The repayment of this amount will require installments of Ksh. 90,000 monthly for 20 years and above with a fixed rate of 12%.

Central Bank of Kenya, (2012) report revealed factors that slow down the development of mortgage financing. The findings among others reported that the credit risk, high interest rate, disparities in property pricing and long-term access to funds were some of the factors. The report cited immense variance between the short-termed deposits and long-term mortgage loans as a hindrance to growth. Hass Consult Survey (2013) in its survey established that the real estate market is characterized by uncertainties in prices that are set without professional intervention which in turn has an effect on repayment and the value of the credit. Consequently, the mortgage lending institutions set up a high-risk premium rendering the mortgage facility expensive.

Statement of the Problem

The banking industry is one of the sectors being used to facilitate the realization of vision 2030, to this end, there is a need of ensuring the provision of financial services and investment opportunities that will create an efficient, vibrant and globally competitive financial services environment in Kenya (Central Bank of Kenya, 2017). In Kenya, the growth in mortgage financing has been poor despite Central Banks' interest rate capping. For instance, mortgage accounts holders in KCB bank which is the leading mortgage lender in Kenya went down to 6496 from 7007 in 2015, a decline of 7.3%. Housing Finance, the second-largest mortgage provider in the country, also saw a decline in its customers from 5,993 to 5,711 which was 4.7 % lower as compared to the same period. In 2017, mortgage accounts for all the banks reduced from 24,458 in 2016 to 24,085 which was a reduction of 1.5% in the same period (Central Bank of Kenya, 2017).

Various studies have been conducted in Kenya on mortgage financing. Jumbale (2016) sought to establish the relationship between the prices of houses and real estate financing. Muli (2016) on the other hand studied the relationship between prices of property and mortgage lending in Kenya. Leonard and Owiti (2013), when investigating the determinants of mortgage uptake, found out that the capital market negatively affected mortgage growth. A closely related study by Agao (2014) on the effect of macroeconomic drivers on mortgages within the Kenyan mortgage sector found a significant and negative association between mortgage uptake and inflation rates, and positive relationships with the rate of interest and the level of the money supply. This study, therefore, sought to establish if there are any linkages between the interest rate and money supply on the growth of mortgage financing among commercial banks in Kenya.

Research Objectives

i. To examine the effects interest rates on the growth of mortgage financing among commercial banks in Kenya.
ii. To establish the effects of money supply on the growth of mortgage financing among commercial banks in Kenya.

Hypothesis

H_{01}: Interest rate has no significant effect on the growth of mortgage financing among commercial banks in Kenya.

H_{02}: Money supply has no significant effect on the growth of mortgage financing among commercial banks in Kenya.

Scope

The study covered all the 43 commercial banks regulated by the Central Bank of Kenya. The commercial banks formed units of analysis in the study, while observations were obtained from the annual financial statements of the commercial banks in Kenya. The data collection covered a thirty-five (35) year period from 1985 to 2019, this period of years was selected for the study. The study only focused on the interest rate and money supply and mortgage financing as the study variables. The study utilized secondary data.

Significance of the study

The findings from the study may be used by various regulators in different jurisdictions to improve on their mortgage financing approaches and create additional prudential guidelines and policies. The findings of this study may assist the banks to monitor the key macro-economic factors and understand; the extent to which these factors affect mortgage financing of commercial banks. Commercial banks may easily determine the necessity of seriously taking into account the various market trends as far as the macroeconomic factors are concerned to remain competitive. Information acquired from this study may help the investors and customers understand the key macroeconomic factors and how they affect the mortgage financing on the other hand strengthening the banking industry on how to overcome the effect of factors under study which may lead to the risk of default or otherwise. As a result, they may make informed investment decisions. The findings may add to the already existing body of knowledge in the field of mortgage financing. In addition, the study may provide opportunities for further research in the area of mortgage financing among the banking sector in Kenya.

Theoretical Review

Classical Theory of Interest Rates

The classical theory posits that rate of interest is determined by the savings and investment in a loanable fund market, (Hanson, 1951). According to (Meltzer, 1976), the classical economists by their quantity theory of money stipulates cyclical fluctuations in velocity are small, relative to changes in money supply (M), and minimize the effects on the velocity of interest rate or relative prices and output. So they indicate that fluctuations in spending are entirely the results of changes in money. The interest rate therefore is determined by the loanable fund market whilst fluctuation in the economy is influenced stock of money. Interest rate movement is a major concern to all financial institutions and markets. It affects the decision-making, performance, and growth of any particular institution (Madura, 1989).

The classical theory of Interest Rates was proposed by Fisher (1968) and it points out that supply and capital demand determines the interest rate. The equilibrium rate of interest is established at a point where capital demand and supply are equal. Savings are determined by capital supply while investments are realized on capital demand. When the interest rate goes up, capital demand goes up and vice versa (Drumond & Jorge, 2013). The classical theory thus finds its relevance in

this study since the mortgage is affected by interest rates when capital demanded goes up. With lower interest rates, individuals will be encouraged to borrow and take up mortgage loans (Hass Consult, 2013). This will eventually lead to the growth of mortgage financing among commercial banks.

Quantity Theory of Money Demand

It was founded by Fisher (1911) it was operationalized by use of the exchange equation. According to theory, the money demand is subject to the transactions volume. This means that people demand cash as a function of what they need for transactions. The association between the two can be illustrated as *MV =PT*. According to Fisher (1911), individuals want money to conduct transactions and this demand is not responsive to changes in interest. The Cambridge school later altered or rather modified the equation so that T was replaced with Y. Thus, Y which denotes output is a function of T since the more production in an economy, where more products and services are acquired. The equation of exchange becomes: MV=PY After modification, it then follows that there is equilibrium, where the money demanded should equal the supply of money. In case of a slight change in the money supply, the equilibrium is affected, when interests on the loan change upwards, the mortgage facility will no longer appeal to investors. The theory is linked to the money supply variable.

Conceptual Framework
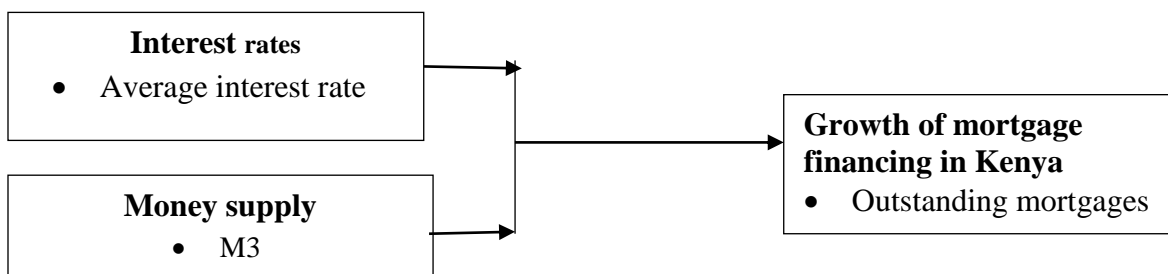
Figure 1: Conceptual Framework

Empirical Literature Review

Mixed evidence has been reported by prior studies of the effect of interest rate on banks' profitability, for instance, Rashid and Jabeen (2016) reported a negative effect of interest rate on banks' performance, Yahya, Akhtar, and Tabash (2017) found a positive effect. The high-interest rates in Kenya are among the principal reason why the mortgage market remains underdeveloped. Estate, (2016) concludes that compared to its counter in Sub-Sahara, (South

Africa) which has a mortgage debt to GDP ratio of 20%, Kenya stands at a mere 4.5%. (CBK, 2015) also notes that it's significantly smaller compared to that of the US which stood at 70%. The high-interest rate environment is a result of the high inflation prevalent in Kenya which according to (Boamah, 2017) stifles the development of a mortgage market.

Olweny (2011) found that IR volatility has a positive correlation with interest rates that are short-term in nature. A positive and significant correlation existed between volatility and the rates of interest. Muguchia (2017), sought to find out how, mortgage financing; is influenced by flexible interest rates. A negative and significant relationship was found on the study variables. The study recommended fixed interest rates to be established by the banks so that investors can project and plan the possible interest amount to pay back; hence increasing the uptake for the mortgage.

Karoki (2013) applied a descriptive research approach to find out what diatremes prices of the real estate sector in Kenya. To establish the determinants, a multivariate regression analysis was conducted. On the outcomes; interest rates, GDP and supply of money influenced prices of real estate which were positive and significant. The greatest influence on the dependent was interest rates, followed by GDP and then money supply. Mwangi, (2006) sought to identify the determinants of mortgage finance uptake. The study covered the period from 2001-2005. The independent variables were money supply, liquidity ratio and inter-bank funds rate. The study utilized secondary data from the CBK. The study findings showed that money supply had the greatest effect, explaining 41% of the variations in mortgage finance uptake. The liquidity ratio and inter-bank funds rate were found to have an insignificant influence on mortgage finance uptake. Income levels in Kenya are both low in absolute terms and also very unevenly distributed. This is a common occurrence in the majority of sub-Saharan Africa and is one of the single most difficult barriers to overcome in building a vibrant mortgage market (World Bank, 2011).

METHODOLOGY

The study used a descriptive research design. The target population for this study consisted of a census of all the 42 commercial banks licensed by the Central Bank of Kenya (Central Bank of Kenya, 2019). In this study, the accessible population comprised 35 mortgage lending commercial banks (Central Bank of Kenya, 2016). The study utilized data for a period of thirty-five years, covering the period; January 1985 to December 2019. Data on the dependent

and independent variables were collected by the use of secondary data, mainly from financial statements between the years 1985-2019 of individual commercial banks in Kenya under study. After data collection, cleansing of the data was done to ensure that it is complete. Times series data analysis was done by the use of STATA version 13 software. Various diagnostic tests were carried out to ascertain the appropriateness of the data for regression analysis. Tests for normality, multicollinearity and heteroscedasticity were conducted.

RESULTS AND DISCUSSIONS

Descriptive Statistics

Descriptive summary statistics

Table 1: Descriptive summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
IR	35	18.01714	5.228625	12.4	30.5
M3	35	2241158	383489.7	1768900	3400000

The mean interest rate between 1985 and 2019 was 18.0 with a standard deviation of 5.2. The minimum interest rate was 12.4 and the maximum was 30.5. The money supply had a mean of 2241.1.6B, a minimum of 1768.9B and a maximum of 3400B.

Correlation Analysis

Correlation analysis statistics were worked out to establish the relationship between the predictor variables and the dependent variable.

Table 2: Correlation matrix

	GMF	IR	M3
GMF	1.0000		
	35		
IR	-0.3527	1.0000	
	0.0377		
	35	35	
M3	0.5940	0.0170	1.0000
	0.0002	0.9228	
	35	35	35

The outputs of the correlation matrix show that interest rate has a significant negative relationship with the growth of mortgage financing. T(r= -0.3527, p value= 0.0377). A

significance level of 0.05 was used. The position is supported by the classical theory of interest rate which holds that interest rate determines the demand for capital (Drumond & Jorge, 2013).

The correlation output further shows that there is a positive and significant correlation between money supply and growth of mortgage financing(r=0.594, p value= 0.0002). This finding means that when the amount of money in circulation increases mortgage financing on the other hand also increases. Similarly, Karoki (2013) applied a descriptive research approach to reveal what controls prices of the real estate sector in Kenya and found that supply of money had an influence on prices of real estate which was positive and significant.

Regression Analysis

Effect of Interest Rates on Growth of Mortgage Financing

To examine how interest rates affect the growth of mortgage financing among Kenyan commercial banks a simple time-series regression analysis was conducted.

Table 3: R-squared and ANOVA

```
   Source |     SS          df      MS            Number of obs =      35
----------+------------------------------         F( 1,  33)    =    8.69
    Model | .979336103     1 .979336103           Prob > F      = 0.0377
 Residual | 6.89433561    33 .208919261           R-squared     = 0.1244
----------+------------------------------         Adj R-squared = 0.0978
    Total | 7.87367172    34 .23157858            Root MSE      = .45708
```

The NOVA output shows that the probability F test value was 0.0377 an implication that the variable is statically significant at a 95% confidence level. This means that the interest rate has significant explanatory power on the growth of mortgage financing. R squared is the coefficient of determination. The results indicate that the interest rate has 0.1244 or nearly 12.44% power in explaining the growth of mortgage financing as illustrated by the coefficient of determination (R-sq). The results demonstrate the model's fitness as a good estimator of the effect of interest rates on the growth of mortgage financing among Kenyan commercial banks.

Table 4: Coefficients

```
--------------------------------------------------------------------------------
      GMF |    Coef.      Std. Err.    t     P>|t|      [95% Conf. Interval]
-----------+--------------------------------------------------------------------
       IR | -.0324593    .007055    -4.60   0.038    -.0629609    -.0019576
    _cons |  5.078024    .2809467   18.07   0.000     4.506433     5.649614
--------------------------------------------------------------------------------
```

The p-value for the t-test is 0.038 which is less than 0.05 meaning that the interest rate has a significant effect on the growth of mortgage financing among Kenyan commercial banks at a 95% confidence level. The coefficient of interest rate is -0.032 and the coefficient of the constant is 5.078. This shows that when the interest rate is 0 growth of mortgage financing is 5.078. The coefficient of interest rate is a negative coefficient meaning that the relationship is negative.

Effect of Money Supply on the Growth of Mortgage Financing

Table 5: R-squared and ANOVA

```
    Source |       SS       df       MS              Number of obs =      35
-----------+------------------------------           F(  1,    33) =   17.99
     Model | 2.77836972     1   2.77836972           Prob > F      =  0.0002
  Residual |  5.095302     33   .154403091           R-squared     =  0.3529
-----------+------------------------------           Adj R-squared =  0.3333
     Total | 7.87367172    34   .23157858            Root MSE      = .39294
```

The NOVA output shows that the probability F test value was 0.000 an implication that the variable is statically significant at a 95% confidence level. The variable has explanatory power. R squared is the coefficient of determination. The results indicate that the money supply has 0.3529 or nearly 35.3% power in explaining the growth of mortgage financing as illustrated by the coefficient of determination (R-sq). The results demonstrate the model's fitness as a good estimator of the effect of money supply on the growth of mortgage financing among Kenyan commercial banks.

Table 6: Regression Coefficients

```
-------------------------------------------------------------------------
  GMF |    Coef.    Std. Err.     t      P>|t|     [95% Conf. Interval]
----------+--------------------------------------------------------------
    M3 | 0.522001    .113764   4.59   0.000      2.13629   6.074152
  _cons | -21.55337  6.140573  -3.51   0.001    -34.04646   -9.06028
-------------------------------------------------------------------------
```

The p-value for the t-test is 0.000 which is less than 0.05 meaning that money supply has a significant effect on the growth of mortgage financing among Kenyan commercial banks at a 95% confidence level. The coefficient of the money supply is 0.522 and the coefficient of the constant is -21.55. This shows that when the money supply is 0 growth of mortgage financing is -21.55. The coefficient of the money supply is a positive coefficient meaning that the relationship is positive.

Combined regression

Table 7: R-squared, ANOVA and Regression Coefficients

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    Source |      SS      df      MS              Number of obs =      35
-----------+-------------------------------       F( 2,   32)   =   15.04
     Model | 3.81486709    2  1.90743355          Prob > F      = 0.0000
  Residual | 4.05880463   32  .126837645          R-squared     = 0.4845
-----------+-------------------------------       Adj R-squared = 0.4523
     Total | 7.87367172   34  .23157858           Root MSE      = .35614
-------------------------------------------------------------------------
   GMF |    Coef.    Std. Err.      t     P>|t|     [95% Conf. Interval]
-----------+-------------------------------------------------------------
    IR | -.083398    .0186830   -4.46   0.007    -.0571957   -.0096002
    M3 | 0.547834    .112025     4.89   0.000     2.360914    5.934754
  _cons | -21.22201  5.566718   -3.81   0.001    -32.56104   -9.882974
-------------------------------------------------------------------------
```

Interest rate and money supply had a combined explanatory power of 0.4845 or 48.45% on growth of mortgage financing as illustrated by the obtained R squared value. The output further shows that the analysis of variance (ANOVA) findings imply that the regression model is significant at 0.05 significance level as illustrated by the probability of the F statistics which is 0.0000. This further demonstrates that the model fits is a good estimator of the effect of the macroeconomic factors on the growth of mortgage financing among commercial banks in Kenya.

H_{01}: Interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks

The regression output shows that the beta coefficient of interest rate is a significant predictor of the growth in mortgage financing as shown by the p-value of the t statistics of 0.007. It is also observed that the interest rate has a negative beta coefficient which is -0.0833 which means that the interest rate has a negative effect on the growth of mortgage financing. The null hypothesis that interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks is rejected. The findings of the study are supported by Green and Wachter (2017) revealed that the decline in nominal prime interest rates from an average of 15 percent in 1980 to 4.4 percent in 2004 across several countries lead to improved access to mortgages, increase in demand for housing, and increase in house prices across most of the industrialized countries in the world.

H_{02}: Money supply has no significant effect on the growth of mortgage financing among Kenyan commercial banks

The beta coefficient of money supply (0.548) is positive and significant (p-value 0.000). A unit change in the money supply would change the growth of mortgage financing positively by 0.548 units. Therefore the null hypothesis that money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks is rejected and concludes that money supply has a significant effect on the growth of the mortgage financing among Kenyan commercial banks. The findings of the study were consistent with that Karoki (2013) who found that supply of money had an influence on prices of real estate which was positive and significant.

Conclusion

The study concludes that interest rate has a significant negative relationship with the growth of mortgage financing among Kenyan commercial banks. The study rejects the null hypothesis that interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks thus interest rate has a significant effect on the growth of mortgage financing among Kenyan commercial banks.

The study concludes that there is a positive and significant correlation between money supply and growth of mortgage financing. The study rejects the null hypothesis that money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks thus money supply has a significant effect on the growth of the mortgage financing among Kenyan commercial banks.

Recommendations

The Central Bank of Kenya should use monetary policies to ensure a steady supply of money in the economy to increase mortgage uptake. The government should intervene to manage interest rates and keep them at appropriate levels. This is due to the enormous impact they have on mortgage uptake; they set lending rates and, as a result, stimulate demand by increasing or decreasing access to credit. This is because the mortgage concept is sadly best suited for persons who can guarantee that they will be employed for a long time and/or have a steady source of income for a long time.

To attract mortgage takers, policymakers should ensure that the interest rates paid on mortgage facilities are competitive in the market. Since interest rates and money supply were identified as important factors in the mortgage business by the study, the government should establish legislation to protect the interests of both consumers and lenders in the market.

Suggestions for further studies

The study focused on only the commercial banks in Kenya; however other financial institutions offer mortgage loans. Thus further studies should consider incorporating the other financial institutions that offer mortgage loans. The study used interest rates and money supply variables and as such further studies could use other variables not included in the study. In addition, the study adopted specific measures of the study variables and thus suggests that other measures could be used by future researchers to ascertain the findings of the study.

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