Journal of Finance and Accounting
ISSN: 2790-0541
Vol. 5, Issue No. 1, pp 1- 19, 2025
www.edithcowanjournals.org

Lending Interest Rate on the Growth of Mortgage Financing in Kenya

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Article history

Received Date:
13th Nov 2025

Revised Date:
20th Nov 2025

Published Date:
25th Nov 2025

Keywords:

- *Lending Interest Rate*
- *Growth of mortgage financing*

Abstract

Purpose: The current study, sought to investigate the effect of average quarterly lending interest rate on quarterly growth of mortgage financing in Kenya. This study was guided by the loanable funds theory.

Design/ methodology/ approach: The study took a quantitative approach drawn from the positivism research philosophy. Therefore, the study was a time series research design which was used to track the growth of mortgage financing in Kenya for the last 20 years – from the year 2002 to 2021. The study targeted the time-series quarterly data from CBK for the last 20 years. Items to be collected included the following: average quarterly lending interest rate and quarterly growth of mortgage financing. The study used secondary data which was extracted from CBK quarterly data reports website for the period 2002 to 2021. The quantitative secondary data was analyzed by use of descriptive and inferential statistics. A 95% confidence interval was the statistical error variance used. Data was coded and analyzed using STATA 14 (or EViews 14.0).

Findings: The findings revealed that lending interest rate and growth of mortgage financing in Kenya are negatively and significantly related ($\beta = -0.265$, $p=0.020$). This implies that an increase in lending interest rate results in a decrease in the growth of mortgage financing by 0.419 units and vice versa.

Unique contribution to theory, policy and practice: Given the long-run negative effects of lending interest rates on the growth of mortgage financing in Kenya, the study recommends that the Central Bank of Kenya (CBK) should develop and implement policy frameworks aimed at stabilizing and minimizing inflationary pressures, which often trigger increases in interest rates. High lending rates erode the purchasing power of citizens, consequently, discouraging home ownership and slow down the development of the real estate sector. To address this, the CBK should consider adopting accommodative monetary policies that encourage credit expansion for housing development, while simultaneously strengthening financial regulations to safeguard against excessive risk-taking by lenders.

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1.0 INTRODUCTION

1.1 Background to the study

The growth of mortgage financing is a critical component of economic and social development, as it enables individuals and families to access decent housing while also stimulating construction, employment, and financial sector development. However, the effectiveness of mortgage markets globally and in Kenya is largely determined by macroeconomic factors, particularly the lending interest rate, which plays a pivotal role in shaping the cost and accessibility of mortgage credit.

Globally, fluctuations in interest rates have been closely linked to the performance of mortgage markets. For instance, in Sweden, declining interest rates over the years led to rising property prices and household debt as borrowing became cheaper (Yang et al., 2017). Conversely, rising rates reduce mortgage uptake as potential homeowners find repayments unaffordable. Similarly, in China and Russia, mortgage growth has been influenced by monetary policy actions and interest rate adjustments, which affect both the affordability of housing loans and the profitability of financial institutions offering them (Kadochnikova et al., 2020). These global experiences highlight the dual nature of interest rates — while low rates stimulate mortgage growth, high rates can stifle demand and create barriers to housing affordability.

In Sub-Saharan Africa, mortgage financing remains underdeveloped due to high lending rates, limited long-term capital, and structural inefficiencies in financial markets. The region's banking systems often rely on short-term deposits to fund long-term loans, creating liquidity mismatches that increase the cost of borrowing. For example, in West Africa, the Regional Mortgage Refinancing Fund was established to reduce lending rates and extend loan maturities, leading to modest growth in mortgage access (Banking in Africa, 2020). Similarly, in Tanzania, the transition to market-based monetary policy has exposed the sensitivity of interest rates to inflation and fiscal conditions, influencing mortgage pricing (Mwankemwa & Ndanshau, 2021). These developments suggest that lower and stable interest rates are crucial for stimulating mortgage uptake and sustaining the real estate market across African economies.

In Kenya, the link between lending interest rates and mortgage financing is particularly significant. The country faces a housing deficit of over two million units, growing by about 200,000 annually, while only a small fraction of newly built houses are affordable to low-income earners (Centre for Affordable Housing, 2020). Access to housing finance remains a major challenge, primarily due to high mortgage interest rates and stringent lending conditions. Despite government interventions, such as the establishment of the Kenya Mortgage Refinance Company (KMRC) in 2020 to enhance liquidity and promote affordable mortgages, lending rates in commercial banks remain relatively high—ranging between 12% and 15% (CBK, 2021). These rates significantly constrain mortgage affordability for the majority of Kenyans, whose income levels are insufficient to service such expensive loans (Agusto Market Intelligence, 2024).

The Central Bank of Kenya (CBK) plays a critical role in determining the benchmark interest rate, which influences the rates at which banks lend to consumers. Periods of high inflation or currency depreciation typically lead the CBK to tighten monetary policy, increasing interest rates to stabilize the economy. However, this has the unintended consequence of making mortgage borrowing more expensive, thereby reducing mortgage uptake. Evidence from CBK reports shows that between 2019 and 2020, the total number of active residential mortgage

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www.edithcowanjournals.org

accounts declined by 3.7%, while the total value of loans dropped from Ksh 237.7 billion to Ksh 232.7 billion, largely attributed to high lending rates and the economic effects of the COVID-19 pandemic (CBK, 2020). Although the average mortgage loan size slightly increased, the total market contraction indicated affordability challenges among potential borrowers.

The interest rate cap introduced in Kenya in 2016 further complicated the dynamics of mortgage lending. While the policy aimed to make loans more affordable by capping interest rates at 4% above the CBK base rate, it inadvertently discouraged banks from lending to higher-risk borrowers, including those seeking mortgages. As a result, the supply of mortgage credit contracted, reducing the number of loans issued. After the cap was lifted in 2019, interest rates adjusted upward again, restoring profitability for lenders but renewing affordability concerns for borrowers. This cyclical pattern illustrates how fluctuations in lending rates can directly influence the volume and growth of mortgage financing in Kenya.

From a macroeconomic perspective, the lending interest rate interacts with other factors such as lending interest rates to determine the overall cost of credit and the availability of mortgage finance. According to Keynesian and monetary theories, lower interest rates stimulate investment and spending, while higher rates suppress borrowing and consumption (Keynes, 1936; Friedman & Schwartz, 1963). In the mortgage market, when the CBK increases interest rates to curb inflation, the cost of mortgage loans rises, reducing affordability for households. Conversely, when rates are lowered, borrowing becomes cheaper, encouraging more households to take up mortgages and boosting housing demand. However, in Kenya's case, the benefits of low rates are often offset by structural issues such as high property prices, limited access to long-term financing, and the concentration of mortgage products among high-income earners.

Empirical evidence suggests that in Kenya, most banks offer mortgage loans at interest rates between 12% and 15%, which remain relatively high compared to developed economies where rates can be below 5%. This makes mortgages inaccessible to a large portion of the population, given that average household incomes are low and repayment terms are typically short. Cooperatives and SACCOs, which provide more affordable credit at around 12% interest, have shorter repayment periods—usually not exceeding five years—making them unsuitable for large-scale housing financing. Consequently, only about 26,000 active mortgage accounts exist in Kenya, reflecting the narrow reach of the formal mortgage market (World Bank, 2019).

The interaction between interest rates and mortgage growth also affects financial stability and economic development. High lending rates discourage borrowing, leading to slower growth in the real estate and construction sectors, reduced job creation, and lower overall economic activity. On the other hand, excessively low interest rates, if maintained for too long, may create risks of asset bubbles and unsustainable debt levels, as observed in countries like Sweden and the United States before the global financial crisis. Thus, achieving a balance in monetary policy is essential—interest rates must be low enough to promote mortgage access but not so low as to encourage risky borrowing and market instability.

To address these challenges, Kenya's policy framework should focus on stabilizing inflation and maintaining predictable interest rate movements. The CBK, in coordination with fiscal authorities, needs to implement measures that ensure macroeconomic stability while promoting credit accessibility. Additionally, expanding KMRC's role in refinancing long-term mortgages at lower rates could help reduce the overall cost of housing loans. Encouraging banks to

diversify mortgage products, adopt risk-based pricing, and leverage technological innovations such as digital mortgage platforms could further enhance affordability and accessibility.

In summary, lending interest rates are a decisive determinant of mortgage financing growth in Kenya. The relationship is inversely proportional—as lending rates increase, the cost of borrowing rises, reducing mortgage uptake and slowing the expansion of the housing sector. Conversely, a decline in rates stimulates mortgage demand and supports the government's affordable housing agenda. Therefore, sustained efforts to manage interest rates, curb inflation, and strengthen financial sector reforms are essential for promoting inclusive and sustainable growth in Kenya's mortgage market.

1.2 Statement of the problem

The growth of mortgage financing in a perfectly sustained economy is expected to improve mortgage financing (Bulatovaet al., 2019; Kadochnikova et al., 2020; Mwankemwa & Ndanshau, 2021). To that effect, the Kenyan government has launched a number of programs to offer inexpensive housing and expand house custody through mortgages, including the establishment of the KMRC to administer low-cost liquidity for mortgage loans (Central Bank of Kenya, 2021).

Notwithstanding various government initiatives to increase homeownership in Kenya, the mortgage industry has seen a case of urban housing being unaffordable. This stems from the high cost of mortgages/high cost of properties (World Bank, 2019). Evidence suggests that the residential mortgage demand represented a 3.7 percent decline in the total count of residential mortgage accounts, to 26,971 in 2020 from 27,993 in 2019. The total value of active mortgage loans fell 2.1 percent, from Kshs 237.7 billion in 2019 to Kshs 232.7 billion in 2020 (Central Bank of Kenya, 2021; KMRC, 2021). The foregoing has been combined with Kenya's lack of accessibility to cheap home finance, as indicated by fewer than 25,000 mortgage loans outstanding. Similarly, banks have restricted lengthy financing options, and few banks have used capital markets to finance mortgage loans. It is worth noting that mortgage loans account for less than 10 per cent of overall housing debt; the balance is provided through SACCOs and housing cooperative systems (KMRC, 2021; World Bank, 2017). This leaves a huge housing demand versus supply gap where the high cost of mortgages leaves the poor people stuck in unaffordable houses.

Despite the cited issues affecting growth of mortgage financing in Kenya, there is little evidence of empirical studies conducted in Kenya. Methodological gaps have been presented by Omondi (2017) studied mortgage financing between 2011 and 2015, with a sample size of 22 institutions, Wanjiku Bosire and Matanda (2021) looked at 13 Kenyan REITs businesses while Luyali et al. (2021) focused on 35 mortgage lending financial institutions between 1985 and 2019. The current study only focuses on a population of 1 mortgage financing business (KMRC). The above studies have presented methodological and contextual gaps since they have not presented findings up to the year 2022 on how mortgage financing has been performing. Contextual gaps were presented by La Cava (2016) and Sutton, Mihaljek, and Subelyte (2017) whose case were based in the United States. Shi et al. (2021) and Xu (2017) also investigated mortgage financing in China's financial institutions. From the above studies, there is need to fill the presented gaps and look into the effect of lending interest rates on the growth of mortgage financing in Kenya. The current study sought to extrapolate the findings to shed light on the issues of growth of mortgage financing up to the year 2021.

1.3 Study Purpose

i. The study sought to determine the effect of lending interest rate on the growth of mortgage financing in Kenya

1.4 Research Hypothesis

i. **H_0**: Lending interest rate does not have a significant effect on the growth of mortgage financing in Kenya.

2.0 LITERATURE REVIEW

2.1 The Loanable Funds Theory

Robertson (1934) proposed the loanable funds principle, which states that the quantity of financial stability offered fluctuates at each particular rate of interest in reaction to a variation in a component besides the cost of borrowing. One of these factors is the threat to financial stability, which causes a change in the supply of money available for lending. Holding all other parameters equal, when financial safety threat decreases, it appears more desirable for fund suppliers, culminating in an increase in fund provision (Kohn, 1981).

Foreign borrowers, governments, consumers, and governments all need loanable money, according to the theory. According to the loanable funds hypothesis, the provision of loanable resources originates from foreign mortgages, financial sector currency holdings, and national reserves (Bertocco & Kalajzić, 2022). The above elements affect long-term interest rates, whereas market financial and monetary situations influence short-term borrowing costs. As per McGibany and Nourzad (2004), the parameters influencing loanable resources will reach a balance point when all of the factors listed are in balance. Consumers in nations with fluctuating mortgage prices are highly susceptible to interest rate fluctuations (Jakab & Kumhof, 2018).

In contrast, when the risk of financial security rises, it becomes less appealing to fund providers, resulting in a reduction in the supply of funds (Túñez Area, 2021). According to this theory, if a mortgage loan is deemed hazardous, the availability of loans would drop. According to Fereidouni (2010), lenders evaluate the rewards and risks involved with lending when providing money to the mortgage market. The main drivers of home prices are anticipated prices, income, and interest rates are all factors to consider. Since they are risk-averse, many financial institutions are slow to respond to changes in monetary policy. It is stated that increasing loan prices have caused many banking institutions to diversify their holdings to escape the risks of the financial markets (De Vries & Boelhouwer, 2005). As a result, anticipated returns have decreased because individuals are being deterred from taking out home loans (Oakley, Zhang & Kidd, 2019).

As a result, the theory informs the current study by highlighting that the primary source of demand for loanable money is investment demand. Mortgage finance must guarantee that interest rates are established by the borrowers to achieve appropriate mortgage pricing. If interest rates are low, there will be a large demand for loanable money for investment reasons and vice versa. As a result, the theory supports the argument that interest rates influence mortgage demand and how they are priced. As a result, the theory has been useful in understanding the link between lending interest rates and mortgage finance in Kenya.

2.2 Lending Interest Rate and Growth of Mortgage Financing.

Ariso (2015) investigated the impact of mortgage interest rates on the increase of mortgage lending among Kenyan banking entities from 2012 to 2014. The 44 authorized financial institutions and home financing companies were the intended audience. Secondary sources

were used to obtain data, and a descriptive research method was used. The research found a very modest positive association between mortgage interest rates and mortgage lending growth. Thus, it was noted that when interest rates fell by 9 per cent in 2013, existing loans grew by 13 per cent, a tiny shift relative to the 19 per cent growth in loans existing when rates of interest fell by 3.5 percent. This suggests that mortgage interest rates are a small influence driving mortgage growth.

Omondi (2017) investigated the effect of interest rates on mortgage adoption in Kenyan lenders. The descriptive research design was used in the investigation. The study was conducted between 2011 and 2015, with a sample size of 22 institutions that provided mortgage loans. CBK yearly reports were used to obtain secondary quarterly data. The study discovered that lending interest rates had a beneficial impact on mortgage funding in Kenyan lenders. In keeping with this conclusion, the investigation indicates that lending interest rates in Kenyan financial institutions have a direct link. Furthermore, the study found that mortgage risk had a negative impact on mortgage funding in Kenyan financial institutions. The survey indicated that mortgage volatility has a negative influence on mortgage financing, and that a significant degree of mortgage volatility decreases mortgage financing.

Owuor (2017) investigated the association between macro-economic variables and the economic expansion of the Kenyan mortgage industry. The descriptive study was used, which utilized quarterly secondary information from 2007 to 2016. The data was analyzed using descriptive and inferential statistics (that is by use of a multiple linear regression model). The research found a directly proportional and significant correlation between loan rates and lending revenue growth. The availability of loanable funds impacts mortgage growth of diverse ways.

Alper et al. (2020) examined the effect of interest rate restrictions in Kenya, which were implemented in September 2016 to lower borrowing costs, expand access to credit, and increase the saving rates. The study conducted an accounting decomposition exercise using bank balance sheets and income statements of the interest rates, loan loss provisions, operating costs and pretax profit margins on private sector lending. The study discovered that the interest rate control scheme has resulted in a breakdown of loans to SMEs, a dwindling of micro-financial institutions' loan books, and lower debt facilitation. Interest rate caps were also shown to decrease the sensing impact of monetary policy. These findings show that the negative consequences may be avoided particularly if the threshold (cap) was fixed higher enough to enable lending to somewhat high-risk depositors, and that substitute attempts to alleviate the high cost of borrowing could be desired.

La Cava (2016) took advantage of differences in factors that could explain residential investment income across nations, such as interest rates, real estate prices, and rising incomes. The study assessed the variation across US states in factors that could explain housing capital income, such as interest rates, housing prices and income growth. The data was collected on a annually from the early 1980s to at least 2012. According to the findings, the long-run increment in the accumulated percentage of residential investment income is primarily due to increased apportioned rental income received by owner-occupiers. Similarly, the recent increase in the percentage of residential investment income represents a mixture of reduced interest rates in some large United States urban centers. Consequently, the study found that the decline in lending rates during the 1980s and 1990s increased requirements for housing and drove the prices of houses and rents in supply-limited areas.

Guyo (2017) investigated the impact of interest rate caps on loan take-up among Kenyan commercial banks. The study targeted 42 commercial banks and used secondary data collected

from the Central Bank of Kenya. The study underscored that the level of interest had a significant relationship with the uptake of loans. The relationship was negative thus showing that the capping on interest rates led to a major decline in the supply of loans by the commercial bank. Agao (2014) echoes these findings by showing that interest rates (lending rates) have the ability to influence such variables as GDP and the level of the money supply the most. The trend analysis indicated that a steady rise in macroeconomic variables such as money supply and interest rates steadily increase the uptake of mortgages in Kenya.

Gakuo (2018) agrees that interest rate surges could have an influence on financial predictability by affecting households' level' abilities to fulfil their liabilities. The population of this study includes 43 commercial banks that were operational in the study period. Monthly sources of data were utilized for 30 months from June, 2015 to December, 2017. Rising interest rates would significantly raise a mortgage and other loan repayments, potentially increasing the number of homes trying to cope to pay back their loans. Loan rates have an impact on lending quality because the higher the price of mortgages, the more expensive the loan affecting the uptake of mortgages.

Kigomo (2016) examined the implications of mortgage rates in Kenya for homeownership. The research sampled the components that contribute significantly to mortgage utilization, and the targeted population were the customers who had obtained or were in the process of obtaining a home loan from one of Kenya's mortgage companies. Secondary data was gathered using snowballing, whereas primary data was gathered through a self-administered questionnaire. Income levels, followed by interest rates and other mortgage expenses, had the largest influence on mortgage uptake, according to the study's findings. A paucity of credit data and significant credit risks were the third most important factors impacting mortgage uptake.

Sutton, Mihaljek, and Subelyte (2017) assessed the reaction of property prices in 47 advanced and developing market nations to variations in short- and long-term lending rates. They used information from the finest house price datasets chosen by administrative agencies, spanning over 50 years of quarterly observational data in the U. S. and over 1,000 yearly measurements in the remainder of the population. They discovered that short-term interest rates play an unexpectedly substantial function as a determinant of property values, particularly outside the United States. Our opinion is that this shows the significance of the macroeconomic policy mechanism of mortgage lending in determining house price volatility, particularly in nations where privatization of mortgage loans is less common. Furthermore, we detect significant inertia in home prices and discover that fluctuations in lending rates and other variables affect property prices progressively rather than abruptly. This means that moderate policy rate reduction is unlikely to spark fast gains in housing prices. Finally, we discover that US interest rates appear to influence property values outside of the US.

2.3 Conceptual Framework

Independent Variables **Dependent Variable**

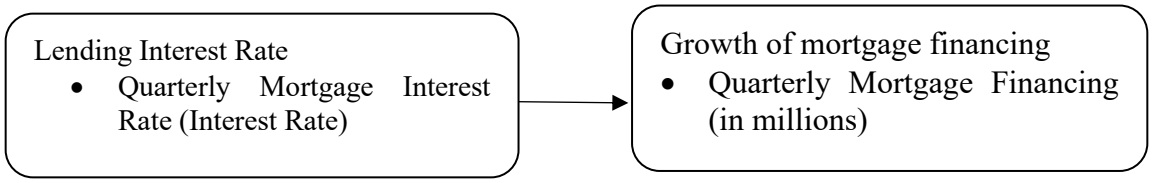


FIGURE 1: Conceptual framework

Source: (Author, 2025).

3.0 RESEARCH METHODOLOGY

The study adopted a descriptive research design, which provided a systematic framework for data collection, analysis, and interpretation of statistical information related to the growth of mortgage financing in Kenya between 2002 and 2021. This design enabled the researcher to analyze the trend and relationship between mortgage financing and key macroeconomic variables such as lending interest rate.

The target population comprised quarterly time-series data from the Central Bank of Kenya (CBK) for the 20-year period. Data collected included quarterly records of mortgage financing, and average lending interest rates. Since the unit of analysis was Kenya as a whole, no sampling was conducted; instead, a census survey was applied to include all available data points within the study period.

The research relied entirely on secondary data, collected through a structured time-series data template. The data were extracted directly from CBK's quarterly statistical reports and verified for completeness and consistency before analysis. Data analysis involved multiple time-series regression analysis using STATA version 14.0. The general model used was:

$$Y_t = \alpha + \beta t X_t + \mu_t$$

Where:

Y_t = Mortgage Financing

X_t = Lending Interest Rate

μt = Error Term.

To ensure reliability, several diagnostic and econometric tests were performed:

i. Unit Root Test: The Augmented Dickey-Fuller (ADF) test was conducted to determine the stationarity of the data series. Stationarity ensures that the statistical properties such as mean and variance remain constant over time, preventing misleading results. The null hypothesis assumed that each series had a unit root (non-stationary).

ii. Lag Length Selection: The optimal lag length was determined using the Akaike Information Criterion (AIC) to minimize errors in model specification. A lag length of two was generally preferred for Granger causality analysis to capture short-term dynamics between variables.

iii. Co-integration Test: The Engle-Granger and Johansen co-integration tests were applied to assess whether a long-term equilibrium relationship existed among the variables. The null hypothesis stated that no co-integration existed.

iv. Error Correction Model (ECM): When co-integration was confirmed, an ECM was developed to capture both short-run and long-run relationships. The ECM corrected deviations from equilibrium by linking past imbalances with current adjustments. The Vector Autoregressive (VAR) model and Engle-Granger two-step method were employed to estimate dynamic interrelationships among the variables.

v. Vector Error Correction Model (VECM): In cases of co-integration, the VECM was used to model short-run adjustments while maintaining long-run equilibrium relationships. The model incorporated differences and lagged variables to reflect the temporal interactions among mortgage financing, and interest rates.

Post-estimation tests included:

- Granger Causality Test: To determine whether one variable could predict another. The null hypothesis posited no causality between the series.
- Impulse Response Function (IRF): To assess how a shock or sudden change in one variable (e.g., interest rate) influences others over time.

Thus, the study's robust methodological framework combined descriptive research design, comprehensive time-series econometric modeling, and multiple diagnostic tests to examine both short-term and long-term determinants of mortgage financing growth in Kenya between 2002 and 2021.

4.0 FINDINGS AND DISCUSSION

4.1 Summary of the descriptive statistics

This section presents the summary and describes the features of the data collected with regard to the Growth of mortgage financing and Lending interest rate. The findings are as presented in Table 1.

TABLE 1: Summary of the descriptive statistics of the variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Growth of mortgage financing	80	5.729406	2.36876	2.408013	9.365625
Lending interest rate	80	14.75494	2.198961	11.94462	20.08653

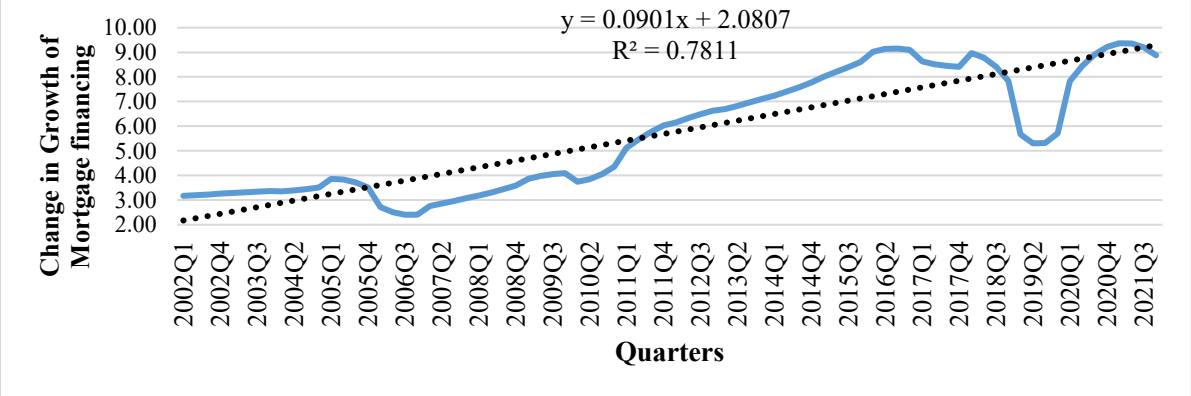
Source: Research Data (2022)

Table 1 revealed that the mean growth of mortgage financing in Kenya between the year 2002 and 2021 was 5.729 (S.D = 2.36876) while the mean lending interest rate in the same period was 14.755 (S.D = 2.198961). Their respective trend values across the years are as shown in the next section.

4.2 Trend Analysis

The following section presents the trend patterns of the macroeconomic variables surveyed and the growth of mortgage financing.

4.2.1 Trend analysis for Growth of mortgage financing



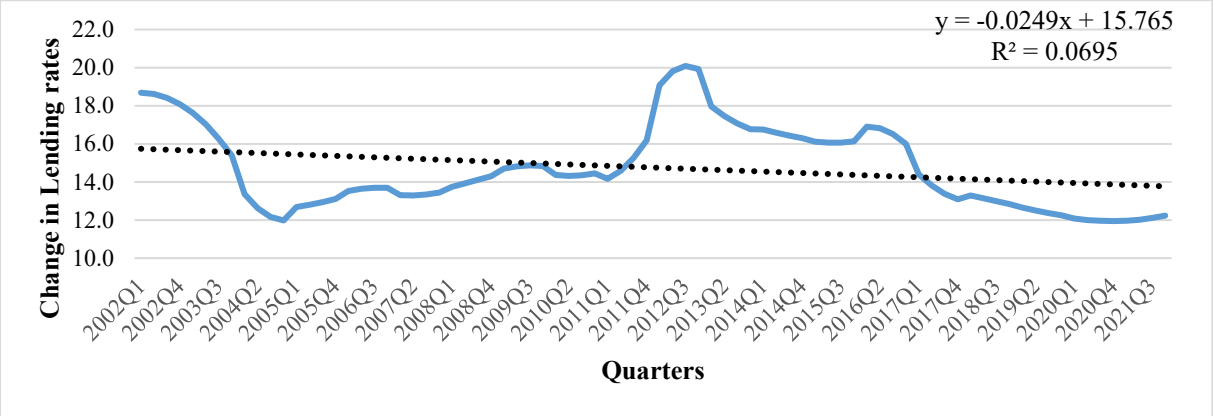
Journal of Finance and Accounting
ISSN: 2790-0541
Vol. 5, Issue No. 1, pp 1- 19, 2025
www.edithcowanjournals.org

Source: Research Data (2022)

FIGURE 2: Trend analysis for Growth of mortgage financing

Figure 2 above indicates an increasing trend in the growth of mortgage financing from the year 2002 to the year 2021 as evidenced by the positive beta coefficient of 0.0901.

4.2.2 Trend analysis for Lending interest rate



Source: Research Data (2022)

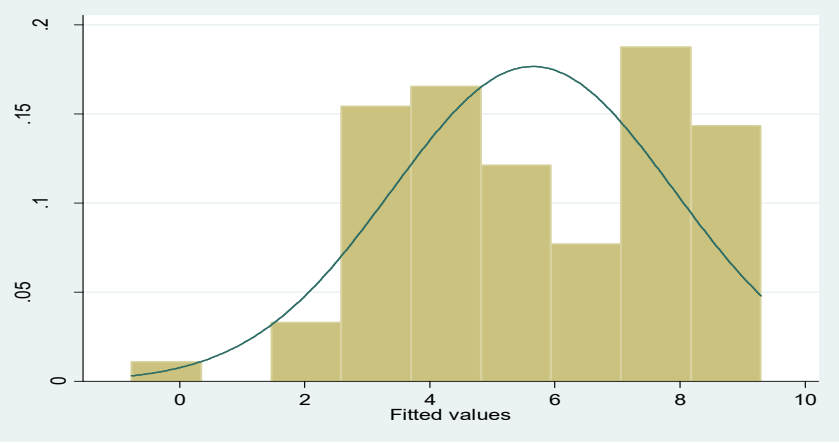
FIGURE 3: Trend analysis for lending interest rate

Figure 3 above indicates a decreasing trend in lending interest rate from the year 2002 to the year 2021 as evidenced by the negative beta coefficient of -0.0249.

4.3 Diagnostic testing

4.3.1 Testing for Normality of Residuals

In this study, normality was diagnosed using a histogram of regression standardized residuals as well as the Jarque-Bera test. Standardization is important to determine if the information given by the dependent variable is normally spread. The null hypothesis (**Ho**) states that the residuals are normally distributed. Where the probability value is greater than 0.05, the data is then considered to be normally distributed (Table 2 & Figure 4).



Source: Research Data (2022)

FIGURE 4: Normality Test for the residuals

Journal of Finance and Accounting
ISSN: 2790-0541
Vol. 5, Issue No. 1, pp 1- 19, 2025
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TABLE 2: Summary of the Details of the residuals

Thresholds	Percentiles	Smallest	Fitted values	Statistics
1%	-0.77345	-0.77345		
5%	2.665128	1.98346		
10%	2.801902	2.53022	Obs	81
25%	3.850593	2.53195	Sum of Wgt.	81
50%	5.595806		Mean	5.649124
		Largest	**Std. Dev.**	**2.257953**
75%	7.849475	8.589404		
90%	8.413531	8.616703	Variance	5.09835
95%	8.580446	8.701281	Skewness	-0.23453
99%	9.296947	9.296947	Kurtosis	2.074686
			Jarque-Bera test	3.632000
			P-value	0.162700

Source: Research Data (2022)

Table 3 shows the absence of abnormality as shown by the Jarque-Bera statistic of *3.632* and the probability value (*0.1627*) which was greater than 0.05. this has been complemented by the shape of the histogram in Figure 4.6. Therefore, the null hypothesis was upheld and therefore, the data is normally distributed.

4.3.2 Unit Root test

To determine the root unit requirements of the time series in this study, a unit root test was performed using the Augmented Dickey-Fuller (ADF) approach, with the null hypothesis being that the series under examination is non-stationary or has a unit root. First running the normal regression model helps us to show the relationship between R squared and the Durbin Watson. Therefore, stationarity testing was conducted in Table 3 using the Augmented Dickey-Fuller (ADF) testing.

TABLE 3: Stationarity Test for the Variables at various differences

Differences (Lags)	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Growth of mortgage financing				
ADF at level	-2.936	-4.088	-3.472	-3.163
ADF at first difference	-4.258	-4.091	-3.47%	-3.164
Lending Interest Rate				
ADF at level	-4.114	-4.088	-3.472	-3.163

Note: The values are used as absolute and signs are ignored

Source: Research Data (2022)

Table 3, revealed that the lending interest rate was stationary at level since the absolute test statistics of -4.114 was greater than the respective absolute critical values at 1%, 5% and 10%. However, growth of mortgage financing was found to be non-stationary at level but stationary after the first difference since the absolute test statistic (-4.258) was greater than the absolute critical values at 1%, 5% and 10%. Therefore, for the study to perform a regression that is stationarity, the study used the following stationary time series: growth of mortgage financing at 1st difference and lending interest rate at level.

4.3.3 Lag Length Selection

Furthermore, if the sequence is determined to be static, the Akaike Information Criterion is used to find an optimal time series quantity to prevent the miscalculation/misspecification of the error term. Notwithstanding, because the Granger causality test is very susceptible to the total count of time series used, the appropriate time series proposed is usually 2. This dictates how far a variation in one parameter can be determined in the other. Table 4.4 presents the findings of each variable's optimum lag length selected.

TABLE 4: Lag Length Selection - Selection-order criteria

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
Growth of mortgage financing								
0	-43.274				0.191	1.181	1.193	1.212
1	-34.321	17.905	1	0.000	0.154	0.969	0.993	1.030
2	-34.296	0.050	1	0.823	0.158	0.995	1.032	1.087
3	-33.294	2.005	1	0.157	0.158	0.994	1.044	1.118
4	-19.040	28.507	1	0.000	0.111	0.641	0.703	0.796
Lending Interest Rate								
0	-162.962				4.379	4.315	4.327	4.345
1	-104.947	116.03	1	0.000	0.977	2.814	2.839	2.876
2	-104.393	1.109	1	0.292	0.988	2.826	2.863	2.918
3	-104.165	0.455	1	0.500	1.009	2.846	2.895	2.969
4	-104.118	0.095	1	0.758	1.034	2.872	2.933	3.025

Source: Research Data (2022)

Table 4 indicates that from the test of lag length selection, the appropriate lags to be selected will be four for each of the variables/series under study.

4.3.4 Co-integration Test

The Engle granger test and the Johansen maximum likelihood test were used to assess this test (Brooks, 2008; Engle and Granger, 1987; Godfrey, 1978). The null hypothesis is that there is no co-integration (Godfrey, 1978). Once the trace values are higher than the critical values, the study rejects the null hypothesis and thus, there is co-integration. This was used to establish the long-run relationship between the variables as shown in Table 4.5 (using the 4 lags identified in Table 5).

TABLE 5: Co-integration Test

Maximum rank	Parms	LL	Eigenvalue	Trace statistic	5% critical value
0	80	-430.28808	.	109.3305	68.52
1	89	-408.44782	0.43715	65.65	47.21
2	96	-391.42793	0.36103	31.6102	29.68
3	101	-380.78709	0.24423	10.3285*	15.41
4	104	-375.73256	0.12455	0.2195	3.76
5	105	-375.62282	0.00288		

Source: Research Data (2022)

Table 5 above indicates that in the rank 0 – where there is no co-integration equation, the trace statistic (109.3305) is greater than the critical value (68.52). Likewise, in rank 1, the trace statistic (65.65) is greater than the critical value (47.21). In rank 2, the trace statistic (31.6102) is greater than the critical value (29.68). Therefore, the study rejects the null hypothesis and

thus there is co-integration of the variables in the 2 null hypotheses/maximum ranks. However, there are 3 co-integrating equations in the model.

4.3.5 Vector Error Correction Model

Since the VAR variables were found to be co-integrated, a vector error correction model was applied (instead of error correction modelling). As a result, a VECM was used to ascertain short relationships between co-integrated variables, limiting long interactions of factors via co-integrated connections, whereas a VAR model is used where there is no co-integration. The VEC model offers a systematic approach to representing the complexities that interconnect the factors under consideration.

TABLE 6: Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
_ce1						
Growth of mortgage financing	1	.	.	.	.	.
Lending interest rate	0.62195	0.09292	6.69	0.000	0.4398	0.8041
_cons	-6.24036	.	.	.	.	.

Note: when reporting the coefficients of the Johansen normalization report, the signs are reversed (Hamilton, Waggoner & Zha, 2007).

Source: Research Data (2022)

Table 6 indicates that, in the long run, lending interest rate ($\beta = 0.62195$, $p= 0.000$) has a long-run negative and significant effect on the growth of mortgage financing in Kenya. Therefore, lending interest rate has asymmetric effects on the long-run growth of mortgage financing in Kenya; that is to predict changes/movements in the growth of mortgage financing. Therefore, the long-run error correction term (ECT) is as follows:

$$ECT_{t-1} = 1.000\ Y_{t-1} + 0.62195X_t\ -6.24036$$

Where: Y_t = Mortgage financing

X_{1t} = Lending interest rate

μ_t = Error term in time series

t = periods under study (20 years)

4.4 Correlation Analysis between Macro-economic Factors and Growth of Mortgage Financing in Kenya

Given that all the variables were confirmed to be stationary, the study, therefore, conducted the Pearson correlation to establish the correlation between the dependent and the independent variables. The Pearson correlation coefficient was used to determine the association between the variables which is denoted by **r**. A correlation between 0.81 and 1.00 is considered very strong, between 0.61 and 0.8 is considered strong, between 0.41 to 0.6 moderate between 0.21 to 0.40 weak and between 0.00 - 0.20 no relationship (Gogtay, & Thatte, 2017).

TABLE 7: Correlation Matrix

Correlations	Growth of mortgage financing	Lending interest rate
Growth of mortgage financing	1	
Lending interest rate	-0.7495*	1
	0.0000	

Source: Research Data (2022)

Table 7 showed that there is a significant negative link between lending interest rate and the growth of mortgage financing in Kenya (r= -0.7495, p=0.000). This implies a strong collinearity between lending interest rate and the growth of mortgage financing in Kenya. These findings agree with Xu (2017) and Alper et al. (2020) that the interest rate control scheme has resulted in a breakdown of loans to SMEs, a dwindling of micro-financial institutions' loan books, and lower debt facilitation. They show that the negative consequences may be avoided particularly if the threshold (cap) was fixed higher enough to enable lending to somewhat high-risk depositors, and that substitute attempts to alleviate the high cost of borrowing could be desired. Omondi (2017) also found that mortgage risk had a negative impact on mortgage funding in Kenyan financial institutions. The survey indicated that mortgage volatility has a negative influence on mortgage financing, and that a significant degree of mortgage volatility decreases mortgage financing.

4.5 Regression analysis between Lending Interest Rate and Growth of Mortgage Financing in Kenya

This section presents the findings of the regression that sought to determine the extent and magnitude of the cause-effect of lending interest rate on the growth of mortgage financing. The results are presented in Table 8.

TABLE 8: Relationship between Lending Interest Rate and Growth of Mortgage Financing in Kenya

Source	SS	df	MS	Number of obs	79	
				F (4, 75)	82.79	
Model	371.174	5	74.235	Prob > F	0.000	
Residual	65.455	73	0.897	R-squared	0.8501	
				Adj R-squared	0.8398	
Total	436.630	78	5.598	Root MSE	0.94692	
Growth of mortgage financing	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf.**	**Interval]**
ECT (β_4)	1.016	0.051	19.82	0.000	0.914	1.118
Lending interest rate	-0.265	0.111	-2.38	0.020	-0.486	-0.043
_cons	-0.102	0.312	-0.33	0.745	-0.724	0.520

Source: Research Data (2022)

In table 8 above the model R- squared was 0.8501, implying that the goodness of fit of the model explains 85.01% of the variation in the growth of mortgage financing in Kenya. This is further supported by a significant F statistic [F (4, 75) = 82.79] at 0.05 significance level where the Prob (F-statistic), Prob > F= 0.000. This implies the time series linear model is statistically significant.

The findings revealed that lending interest rate and growth of mortgage financing in Kenya are negatively and significantly related (β = -0.265, p=0.020). This implies that an increase in lending interest rate results in a decrease in the growth of mortgage financing by 0.419 units and vice versa. These findings are consistent with La Cava (2016) that the decline in lending rates during the 1980s and 1990s increased requirements for housing and drove the prices of houses and rents in supply-limited areas. Guyo (2017) also showed that the relationship was negative thus showing that the capping on interest rates led to a major decline in the supply of loans by the commercial bank. According to Gakuo (2018), loan rates have an impact on

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lending quality because the higher the price of mortgages, the more expensive the loan affecting the uptake of mortgages. Ariso (2015) also found a very modest positive association between mortgage interest rates and mortgage lending growth. Thus, it was noted that when interest rates fell by 9 per cent in 2013, existing loans grew by 13 per cent, a tiny shift relative to the 19 per cent growth in loans existing when rates of interest fell by 3.5 percent. This suggests that mortgage interest rates have a small influence driving mortgage growth. Thus, the time series model can be stated as follows:

$$\Delta y_{t-1} = -0.102 - 0.265\Delta X_{t-1} + 1.016 + \mu_{t-1}$$

Where:

Y_{t-1} = Growth of Mortgage Financing
X_{t-1} = Lending Interest Rate
Δ = the difference operator
μ_{t-1} = Error term in time series
t = periods under study (20 years)

4.6 Post Estimation Tests

4.6.1 Causality Test

The test was used to determine whether a time series quarterly growth of mortgage financing will granger cause quarterly average lending interest rate and if its values give statistically significant results in the future. A Vector Autoregressive (VAR) procedure was estimated using the Two-step Engle-Granger test (Granger causality Wald test) to determine whether or not long-run or balance interactions do exist between the possible factors (Godfrey, 1978).

TABLE 9: Granger causality Wald tests for the variables

Equation	Excluded	chi2	df	Prob > chi2
Growth of mortgage financing				
Growth of mortgage financing	Lending interest rate	10.075	2	0.006
Lending Interest Rate				
Lending interest rate	Growth of mortgage financing	13.097	2	0.001

Source: Research Data (2022)

Table 9 indicates that lending interest rate granger causes growth of mortgage financing thus, the null hypothesis was rejected since (p-value = 0.006< 0.05). Furthermore, the growth of mortgage financing granger causes lending interest rates thus, the null hypothesis was rejected since (p-value = 0.044< 0.05).

4.6.2 Impulse Response Function

This test describes the behaviour of the independent variables at the time of the distress for a given period. It is a dynamic multiplier that represents the present and any consequent influence on every parameter as a result of an unexpected transformation in one of the parameters. In the study, the impulse response function (IRF) was used to examine the relationship between lending interest rates and mortgage financing. The following are the results.

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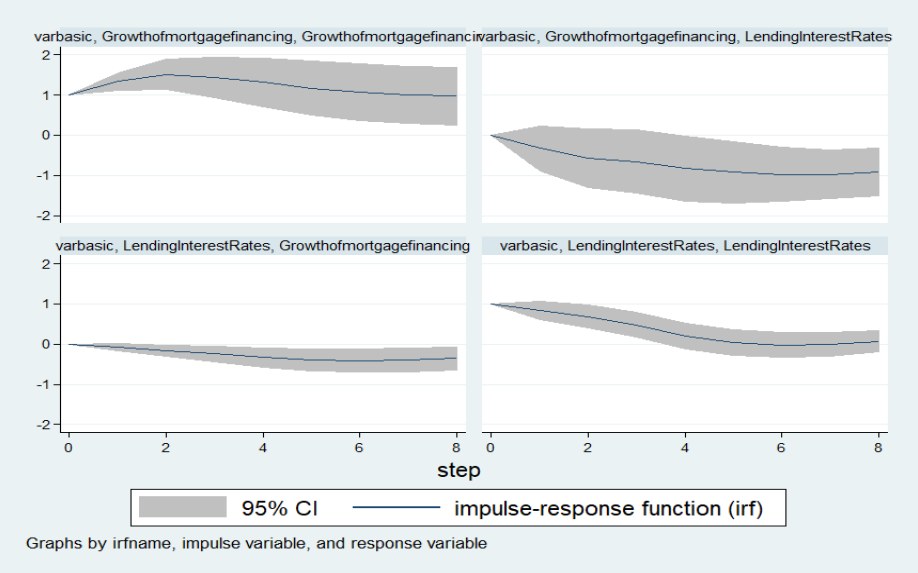

Source: Research Data (2022)

FIGURE 5: Impulse Response of Growth of Mortgage Financing to Lending Interest Rate

Figure 5 (graph 2) indicates a decreasing trend in the slope where the growth of mortgage financing responds to standard deviation shock to lending interest rate. It can, therefore, be concluded that the response of growth of mortgage financing responds to standard deviation shock to lending interest rate is a decrease in the short run and a slight increase in the long run (0-2 = short run; 7-8 = long run).

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the result findings

The study finds that there is a significant negative link between lending interest rate and the growth of mortgage financing in Kenya. Regression findings also acknowledge that lending interest rate and growth of mortgage financing in Kenya are negatively and significantly related. This implies that an increase in lending interest rate results in a decrease in the growth of mortgage financing. These findings are consistent with La Cava (2016) that the decline in lending rates during the 1980s and 1990s increased requirements for housing and drove the prices of houses and rents in supply-limited areas. Guyo (2017) also showed that the relationship was negative thus showing that the capping on interest rates led to a major decline in the supply of loans by the commercial bank. According to Gakuo (2018), loan rates have an impact on lending quality because the higher the price of mortgages, the more expensive the loan affecting the uptake of mortgages.

5.2 Conclusion

The study indicate that the lending interest rate has a negative and statistically significant relationship with the growth of mortgage financing in Kenya ($\beta = -0.265$, $p = 0.020$). The high coefficient of determination ($R^2 = 0.8501$) suggests that 85.01% of the variations in mortgage financing growth can be explained by changes in the lending interest rate and other included variables. The significant F-statistic ($F = 82.79$, $p < 0.05$) confirms that the overall model is a

good fit for the data, implying that the lending interest rate plays a crucial role in influencing mortgage market performance. Specifically, the findings suggest that an increase in lending rates leads to a reduction in the uptake and growth of mortgage financing, as higher borrowing costs discourage potential homeowners and reduce the affordability of housing loans.

These findings are consistent with empirical studies by La Cava (2016), Guyo (2017), Gakuo (2018), and Ariso (2015), which similarly observed that higher interest rates constrain credit supply and dampen housing demand. The results reinforce the importance of maintaining stable and affordable lending rates to encourage long-term borrowing and support mortgage market growth. Lower interest rates not only make mortgages more accessible but also stimulate housing development, investment, and overall economic activity. Therefore, for Kenya to achieve sustained growth in its mortgage sector, monetary and fiscal authorities should prioritize interest rate stability and adopt policies that promote affordable credit, financial inclusion, and housing market development.

5.3 Recommendations for practice

Given the long-run negative effects of lending interest rates on the growth of mortgage financing in Kenya, the study recommends that the Central Bank of Kenya (CBK) should develop and implement policy frameworks aimed at stabilizing and minimizing inflationary pressures, which often trigger increases in interest rates. By maintaining low and predictable lending rates, the CBK can help ensure that commercial banks offer affordable lending rates, thereby improving access to mortgage financing. High lending rates not only make borrowing more expensive but also erode the purchasing power of citizens, reducing their ability to qualify for or sustain mortgage repayments. Consequently, sustained increases in interest rates discourage home ownership and slow down the development of the real estate sector. To address this, the CBK should consider adopting accommodative monetary policies that encourage credit expansion for housing development, while simultaneously strengthening financial regulations to safeguard against excessive risk-taking by lenders. Additionally, collaboration with financial institutions to design innovative and flexible mortgage products with lower interest margins could stimulate demand and promote inclusive growth in Kenya's mortgage market.

5.4 Acknowledgement

I extend my appreciations to my supervisor Dr Peter Kariuki for his continued scholarly motivation and support towards my research process. He has played a pivotal role given his experience in matters research to push me to greater academic heights. I also acknowledge the support from my family, friends and all those who have been with me while undertaking this course, God bless you abundantly. Above all, I glorify the Almighty God for the strength and inspiration throughout the entire period of my studies.

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Vol. 5, Issue No. 1, pp 1- 19, 2025
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