Mortgage Financing And Financial Performance Of Commercial Banks In Kenya

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Abstract
There is a high demand for housing in Kenya. This is due to continuous growth in population. Mortgages from banks are crucial in fulfilling this demand. The main objective of this study was to investigate how mortgage financing influences the financial performance of commercial banks in Kenya. It specifically aimed to understand the impact of interest rates, borrower income levels, and repayment periods on the financial performance of Kenyan banks. The paper was underpinned by Keynes's liquidity preference, absolute income, and title and lien theories. Causal research design was used. Thirty-one mortgage offering commercial banks were the data sources. Secondary data was used. The target commercial banks yearly financial data, Central Bank of Kenya, and Kenya Banker's Association provided the secondary data. The analysis involved using descriptive statistics to summarize the data and panel regression to explore relationships between variables. The findings revealed a coefficient of determination of 0.4369. They further showed a negative relationship between mortgage lending banks performance and interest rate, natural logarithm of income level of borrowers positively and significantly affected the financial performance of mortgage issuing Kenyan banks and mortgage loan repayment period had a positive impact on mortgage offering Kenyan banks. The study comes to the conclusion that mortgage lending significantly improves Kenyan mortgage selling banks' financial performance. The ever-increasing demand for houses encourages individuals to take mortgages and improves the financial efficiency of Kenyan banks when default rate is low. This study thus recommends that Kenyan banks offering mortgages should encourage the culture of saving among their customers as this will increase their liquidity to offer mortgage loans which will in turn positively influence their financial performance.

I.   Introduction

Kenya has an upsurge in population that has led to an upward trend in the demand for houses. This upward trend has made it necessary for investors to rely on commercial banks for mortgages (Abdulrehman & Nyamute, 2018). There are also few public resources to fully meet the economic and social needs of individuals (Gatauwa, 2020). Mortgage financing by commercial banks play a vital role in facilitating home ownership. In most developed countries, investment in real estate is facilitated by the use of securities in form of stocks and bonds but in Kenya, it is mainly done through mortgages offered by commercial banks (Kigomo, 2016). Cities with many growing industries face larger housing demand and higher house prices. City-level differences in housing demand also correlate with supply elasticity. Housing consumption is mainly affected by the prices charged on real estate property (Liebersohn, 2017).

The rates charged on mortgages has an impact on the uptake of mortgages. According to Ozdemir and Altinoz (2013) monetary policy and regional factors are the main determinants of rates charged on mortgages. Fixed rate and adjustable rates are determined by different factors. Adjustable-rate mortgages are influenced more by regional factors as compared to fixed rate mortgages. In UK, investors prefer bigger and well-known banks to smaller banks for their mortgage needs (Anu, 2016). A study done by Taltavull, McCord, McGreal and Davis (2011) found that the probability of bank clients being able to take on a mortgage is determined by deregulation of mortgage industry leading to higher house prices and affordability pressures.

Mortgage financing is not as advanced in the African countries as it is globally. Home ownership and investment in real estate in less developed nations faces many obstacles. Housing delivery in Nigeria is constrained by various factors which include absence of effective real estate financial framework, unstable macroeconomic setting, problem in getting land that has a safeguarded period, expensive building materials, non-proficient labor and poor infrastructural facilities (Mukhtar, Amirudin & Mohamad 2016). In Kigali Rwanda mortgage finance affordability is low. The low affordability is due to various factors like the type of model used for loan amortization schedule (Iyandemye, Barayandema & Gasheja 2018). Most households in Tanzania rely on funds from friends, family and revenue from business to purchase real property. Mortgages are the least utilized methods of financing (Millanzi, 2019).

From the yearly report of the Central Bank (2018), the Kenyan mortgage market is constrained by the increased cost of houses, high prices of land used to build houses, increased costs associated with the mortgage process and low accessibility to long term finance. The capability of those who borrow money to repay the loan and the security used to obtain the loan are also some of the factors limiting the growth of mortgage lending (CBK, 2019). Credit ratings, borrower's risk profiles, access to mortgages, and the level of income have a direct relationship with mortgage volumes in Kenya (Kigomo, 2016). This paper focuses on mortgage financing and financial performance of commercial banks using interest rate on mortgages, income level of borrowers, and the repayment period as the study variables.

II.   Literature Review
Theoretical Review

The study was rooted in Keynes's liquidity preference theory, the title and lien theory of mortgages, and the absolute income theory. Keynes liquidity preference theory (1936), posits that interest rate levels are influenced by individuals' inclination to hold money in cash or highly liquid states, as well as the total money supply in the economy. It argues that money market controls the interest rate levels making it relevant to the study since interest rate is among the study variables.

According to Werner and Kratovil (1981), there are two distinct ways a borrower can secure a mortgage, as outlined in the Title and Lien Theory of mortgages. When a borrower obtains a mortgage to purchase real property, the mortgage is considered a transfer of legal title from the borrower to the lender. The lender holds the deed until the mortgage is completely paid off. This arrangement serves as a deterrent against borrower default and assures the lender that the loan will be repaid. This theory of mortgages connects mortgage financing and profitability since it reduces the rate of default.

Keynes (1936) Absolute Income Theory states that as the income level of an individual goes up, the person tends to increase his/ her consumption though not as much as the increase in the level of income. This theory blends with this study as it deals with the income level of borrowers which is one of the study variables.

Empirical Review
Interest Rate and Financial Performance

Mutemi and Makori (2019) did research to assess how interest rates affect financial institutions' ability to manage their finances in Kenya. They targeted forty Kenyan banks and used secondary data for analysis, employing the ordinary least squares technique. They concluded that capping positively affected banks' efficiency. However, Shawar and Siddiqui (2019) found that interest rates did not have any significant impact on the efficiency of companies offering insurance in Pakistan. This research was analyzing the determinants of financial efficiency of 5 insurance firms. Panel regression was used for analysis.

Ahmed, Rehan, Chhapra and Supro (2018) researched on how interest changes affect the functions of Pakistan banks. Twenty banks were used for the study and the study period was seven years. Market share and return were used to choose the target group. The ones with the highest intake were prioritized. The analysis on how interest rate changes, advances and loans, earnings per share, and deposits with other banks affected profitability of banks was conducted using regression and correlation methods. Interest rate had a negative impact on profitability.

Vervliet and Bikker (2018) concluded that reduced rates impact negatively on the performance of US banks and lowers net margins while Kamau, Gatauwa, and Mwambia (2018) came to a conclusion that operational risks negatively affect the financial performance of commercial banks. Egbunike and Ekerekeoti (2018) researched about the impact of macroeconomic elements and company characteristics on the efficiency of publicly traded companies dealing with manufacturing. Their research used non-probability sampling method. Multiple regression method was used for hypothesis. Interest and exchange rates had no consequential impact on banks' performance.

Claessens, Coleman and Donnelly (2018) stated that any reduction of interest rate leads lower interest margin therefore reducing profitability margins of the commercial banks from forty-seven countries. Umuro (2017) did research on interest rate charged and loan uptake that showed that there exists some connection between the interest charged and loan uptake. From his findings, interest capping led to a reduced loan uptake. During the first, second and third quarters of 2016, the loan growth was 17.65%, 4.61% and -1.72% respectively and -0.83%, 3.96% and 1.75% in 2017 during the same quarters. It found out that banks are shying away from clients who are considered to be high risk. This, consequently, negatively affected banks' profitability.

For Aruwa and Musa (2014) who carried out a study in Nigeria on the various components of risks affecting profit levels of deposit taking banks, interest risk negatively affected profitability. All deposit taking banks were the target population and ordinary least squares method with descriptive statistics were used.

Obondy (2013) concluded that the rates of interest significantly affect mortgage sales. This research used regression method and targeted 30 financial institutions. Any change in the rate of interest directly impacts on mortgage sales and financial efficiency.

Income Level of Borrowers and Financial Performance

Income level is the total amount of money that a person earns as salary or from engaging in any income generating activity. It determines whether an individual is granted a loan or not. According to Rashidi (2020) who researched how income source diversification affects financial efficiency of Lebanese banks, a positive correlation exists between non-interest income and profitability. This study was carried out between 2011 and 2015 using secondary data. ROE and ROA were used to measure financial efficiency. Herfindahl Hirschman Index was used for income source diversification. Hoang, Nguyen, Tran and Hoang (2020) analyzed how income diversification impacts financial efficiency and liquidity of Vietnamese banks. Secondary data from twenty-one commercial banks was collected from 2007-2017.

The results indicated that income diversification adversely influences the financial efficiency of privately-owned banking institutions, while it positively affected state-owned banking institutions' efficiency. Banks with long operation history benefited from diversification compared to banks which had been in the market for a shorter period. Being in existence for longer periods means that a bank increases in size. Firm factors including bank size affects the financial performance of commercial banks (Ngoboka & Gatauwa, 2020). Mortgage financing is positively correlated with gross national income which implies that mortgage financing encourages an efficient financial system which in turn facilitates economic growth. This is according to a study done by Lee, McGowan, and Asabere (2016). The study aimed to explore how mortgage financing affects economic growth in Africa.

According to Makori and Memba (2015) who carried out research on the factors affecting mortgage financing, employment level of bank customers had an impact on mortgage financing of commercial banks in Kisii County. Higher income earners had a high probability of taking a mortgage than the low-income earners and the unemployed. Income of the clients significantly affects bank profitability. This is according to Karanja (2013) who researched on mortgage financing and profitability. The independent variables included core savings, income, and economic factors. The study aimed to ascertain if income influences the efficiency of Kenyan-banking institutions. Eighty six percent of the respondents agreed that income indeed impacts the profitability of these banks, while 14.1% held a differing view. Using private equity may also boost a bank's financial performance (Gatauwa, 2022).

Repayment Period and Financial Performance

Repayment period is the total time taken by a borrower to fully repay the loan. Murage (2021) studied how repayment period impacts the efficiency of SMEs in the Kenyan informal settlements. The study focused on SMEs located in the Mathare slums. Data was gathered from 120 such SMEs using questionnaires. Both descriptive and inferential statistics were used. The results indicated that the loan application process is significantly influenced by the repayment period, with borrowers showing a preference for longer repayment periods over shorter ones.
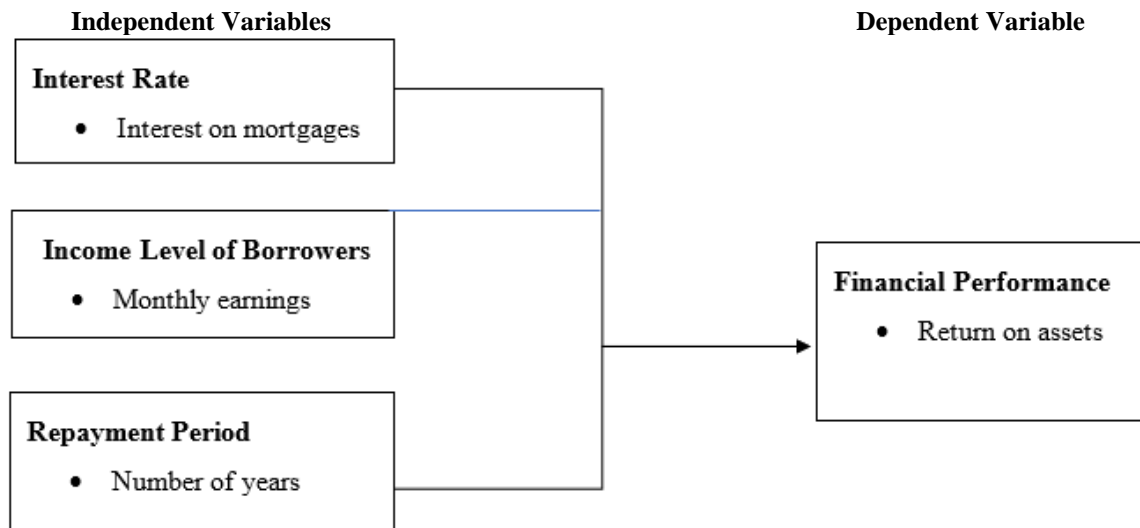
Muthama and Warui (2021) analyzed the effects how lending conditions impact loan performance. The target population was Kenya Women microfinance banks in Kisii County. Credit period, loan standards, and collateral value were the research variables. Credit period positively affected loan performance. Longer repayment periods increase the probability of repaying.

Longer repayment periods may however create liquidity problems to the banks. According to Ngoboka and Gatauwa (2020), liquidity management problems negatively affect the financial performance of commercial banks. They carried out a study on CAMEL rating system and the financial efficiency of Rwandan banks.

Worokinasih and Potipiroon (2019) researched on microfinance repayment levels of SMEs of Indonesia. Two hundred and fifteen SMEs were the target population. From the findings, loan terms and policies determine whether the entrepreneurs would repay the loan on the stipulated time. Flexible repayment periods increased the probability of borrowing. Duncan, Tirimba, and Njeru (2015) analyzed how loan repayment affects financial efficiency with the target population being Mount Kenya Saccos. Secondary and primary data were used. A strong relationship of 0.786 between the dependent and independent variable was found.

Conceptual Framework

This framework graphically illustrates the correlation among study variables. The framework displays both dependent and independent variables.

Independent Variables   **Dependent Variable**

Interest Rate

- Interest on mortgages

Income Level of Borrowers

- Monthly earnings

Financial Performance

- Return on assets

Repayment Period

- Number of years

III. Research Methodology

Some of the common designs include but not limited to quantitative, qualitative, applied, descriptive, causal, experimental, panel and longitudinal designs. The current study used causal design. This resulted from the fact that causal designs, which concentrate on the examination of a specific problem, reveal the patterns of interactions between variables (Kothari, 2004).

The CBK report (2019) states that Kenya has a total of forty-two commercial banks. Among these, 31 banks provide mortgage services. A comprehensive study was conducted, focusing solely on the commercial banks that offer mortgages. This research utilized data from secondary resources such as the annual summaries of the CBK, Kenya Bankers Association, and the target commercial banks.

The procedures give the steps which were followed in collecting data. The investigator got an introduction letter from the university and research authorization from The National Commission for Science, Technology, and Innovation (NACOSTI). Panel data from 2016 to 2020 was then collected from the yearly summaries of CBK, Kenya Bankers Association, and target commercial banks. A model was created using panel regression analysis. As the data was analyzed over a five-year period, panel regression was used. Analyzed data was displayed in graphs and tables. Here's the regression equation showing the correlation between independent and dependent variables:

$$Y_{it} = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \varepsilon_{it}$$

Where;

Y_{it} is the financial performance given by the ROA at time t

t = time

α = Regression constant

β_1 β_2 and β_3 are the independent variable coefficients.

X_{1t} = Interest rate at time, t.

X_{2t} = Income level of borrowers at time, t.

$X3t$ = Repayment period at time, t.

ε_{it} = Error term

IV. Data Analysis

Descriptive Statistics

Table 4.1 gives the analytical data related to how mortgage financing influences the financial outcomes for the Kenyan banking institutions during the period from 2016-2020.

Table 4.1: Descriptive Statistics

| Variable	Obs.	Minimum	Maximum	Mean	Std. Deviation
ROA	155	-14.14000	7.550000	1.9718710	3.1043800
Interest Rate	155	.10100000	0.2455000	0.1364277	0.0210532
Level of Income	155	71,972.00	991,367.00	545,128.10	262521.40
Repayment Period	155	5.000000	30.000000	17.987100	6.3111810

Source: Researcher (2024)

The analytical data in the table above indicates there was a lowest return on assets observed by Kenyan banking institutions from 2016 to 2020 was -14.14, whereas the highest was 7.55. The average ROA was 1.9718710, and the standard deviation was 3.10438. There was a positive average profitability suggesting that the banking institutions offering mortgages had a higher stability during this period. Additionally, the lowest mortgage interest rate charged by the banks was 10.1%, while the highest was 24.6%. The average interest rate was 13.64%, and the standard deviation was 2.11%, suggesting that Kenyan banking institutions that offer mortgages were charging high interest rates on mortgage loans from 2016 to 2020. Furthermore, the data shows that the lowest income level for the borrowers was KES 71,972, while the highest was KES 991,367.

The mean income level was found to be KES 545,128.10, while the standard deviation was KES 262,521.40. Finally, the results depicts that the minimum loan repayment period set by the mortgage offering commercial banks between the year 2016 and 2020 was 5 years, while the maximum repayment period was 30 years. The mean repayment period was 18 years with standard deviation of 6.31 years.
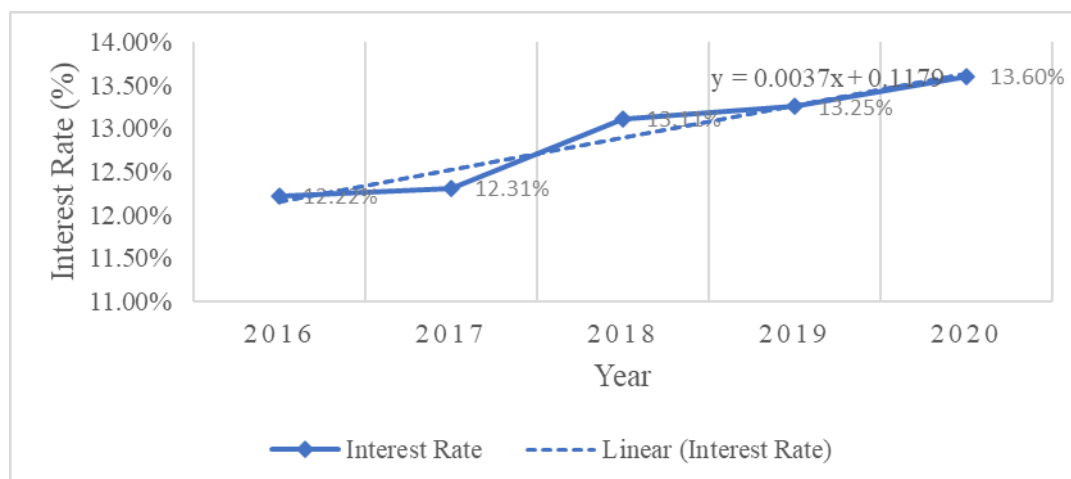
Trend Analysis

This part of the study provides an examination of the variable trends. It shows the progression of variables from 2016 to 2020. Figure 4.1 displays the trend analysis for financial efficiency (ROA) for the mortgage offering commercial banks between the years 2016 and 2020.
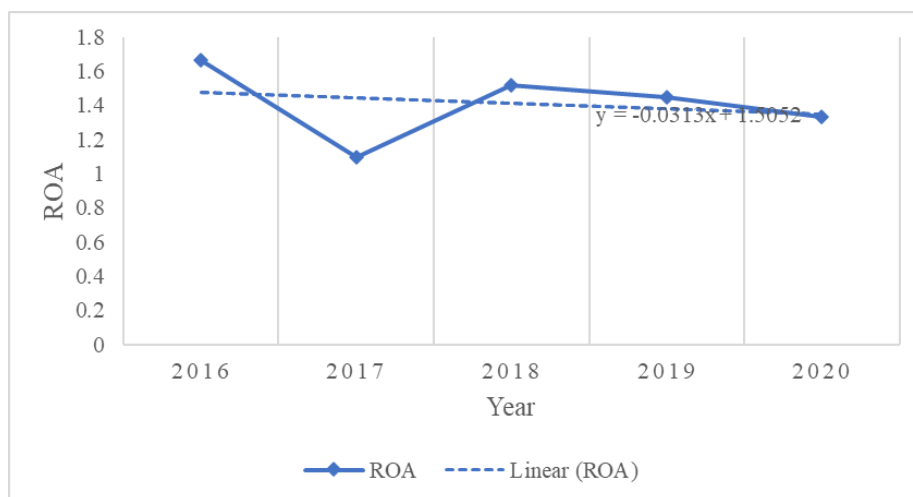
Figure 4.1: Trend Analysis for Financial Performance

From figure 4.1, banks exhibited an erratic financial performance between the years 2016 and 2020 as depicted by constantly fluctuating ROA. Commercial banks recorded an average ROA of 1.66323 in the years 2016, which dropped to 1.097 in the year 2017 before shooting to an average of 1.51613 in the years 2018. In the year 2019, the average ROA for mortgage issuing banks loan stood at 1.4503226, which then dropped slightly to 1.3301 in the year 2020. Figure 4.2 shows the trend analysis for interest rate charged on mortgages between the years 2016 and 2020.

Figure 4.2: Trend Analysis for Interest Rate

As depicted by Figure 4.2, average mortgage interest stood at 12.22% in 2016, in 2017 the rate increased slightly to an average of 12.31% and increased further to an average of 13.11% in 2018. In the year 2019, the interest rate charged on mortgage stood at an average of 13.25% before shooting further to an average rate of 13.60% in the year 2020. The trend line analysis implies that between 2016 and 2020, commercial banks in Kenya offering mortgages kept increasing the interest rates charged on mortgage. Figure 4.3 shows the trend analysis for the income level of mortgage borrowers between the years 2016 and 2020.
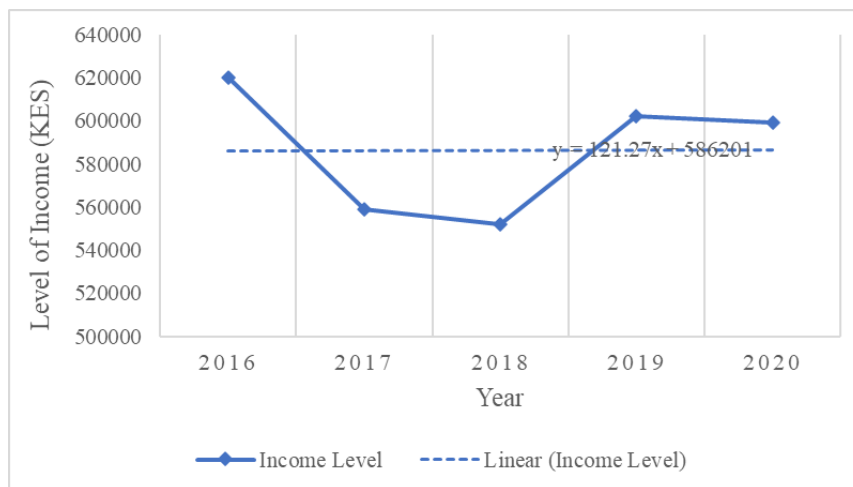

Figure 4.3: Trend Analysis for Income Level for Borrowers

As shown on Figure 4.3, the average income for clients seeking mortgages from commercial banks in 2016 was KES 620,172.40. This figure dropped in the following year 2017 to an average income of KES 559,130.82, which dropped further to an average of KES 551,953.29 in 2018. In 2019, the average income level was KES 602,445.50, which dropped slightly to an average of KES 599,121.40 in the year 2020. The results imply that the income levels for clients taking mortgages from commercial banks in Kenya between 2016 and 2020 was erratic. Figure 4.4 shows the trend analysis for mortgage loan repayment period among commercial banks issuing mortgage in Kenya between the years 2016 and 2020.
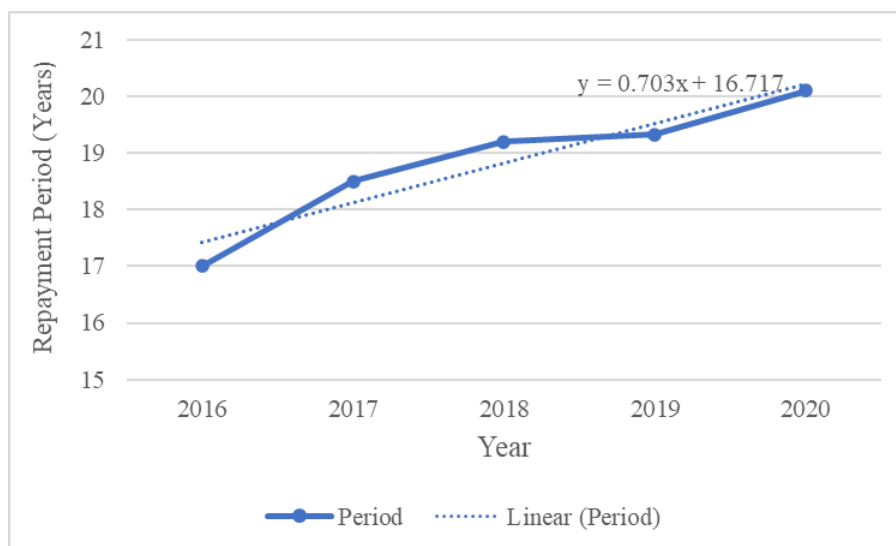

Figure 4.4: Trend Analysis for Loan Repayment Period

As depicted by trend analysis on Figure 4.4, mortgage loan repayment period was consistently on an upward trajectory between 2016 and 2020. In the year 2016 the average payment period was 17 years, went up to an average of 18.5 years in 2017 before shooting to an average of 19.2 years in the year 2018. The results show that the average loan repayment period in 2019 was 19.33 years and in 2020 it stood at an average of 20.1 years. This implies that most of the clients taking mortgages between 2016 and 2020 were preferring longer loan repayment periods because with the longer time frame, their monthly payment would be significantly lower hence easing pressure on their finances.

Correlation Analysis

This research carried out a correlation analysis on banks to demonstrate how financial performance relates to the independent variables of commercial banks that offer mortgages, which was evaluated using return on assets. Table 4.2 presents the correlation matrix showing the relationship between the independent variables and financial performance.

Table 4.2: Correlation Matrix

	Return on Assets	Interest Rate	Income Level	Repayment Period
Return on Assets	1.0000			
Interest Rate	-0.3127*	1.0000		
Income Level	0.3010*	-0.3454*	1.0000	
Repayment Period	0.2744*	-0.0890	0.1290	1.000

Source: Researcher (2024).

The data in Table 4.2 indicates a significant and negative relationship (-0.3127*) existing between the interest applied to loans and the financial performance, as measured by ROA. This aligns with the research conducted by Ahmed, Rehan, Chhapra, and Supro (2018), which found that changes in interest rates negatively impacted the financial efficiency of Pakistan banking institutions, reducing their profitability. Similarly, Vervliet and Bikker (2018) found low rates adversely affected the financial efficiency of banking institutions in the United States, and hence reduced net margins.

These research results also indicate that the logarithm of the borrowers' income level had a positively and significantly impacted the performance of Kenyan banking institutions that offer mortgages (0.3010*). The results align with the findings of Makori and Memba (2015), who concluded that individuals with higher incomes are more likely to take out a mortgage than those with lower incomes or who are unemployed. Furthermore, Karanja (2013) found, while studying how mortgage financing affects profitability of banking institutions, that income of bank clients significantly influences the banks' profits. In fact, 85% of the respondents believed that income levels and profitability are positively correlated.

These findings therefore illustrate a positive and significant correlation (0.2744*) between the length of the loan payback period and Kenya's commercial banks' financial performance that provide mortgages. This concurs with the assertions by Worokinasih and Potipiroon (2019) that, loan terms and policies determine whether the entrepreneurs would repay the loan on the stipulated time and flexible repayment periods encouraged increased the probability of borrowing. Furthermore, Muthama and Warui (2021) conducted an analysis to show how loan conditions affect loan performance of microfinance firms in Kisii. They found that these variables have a positive relationship, with a longer repayment period increasing the probability of repayment. This matches the results of the present research.

Diagnostic Testing

In order to make sure the panel regression model's assumptions were upheld and to determine which models would be best for analysis in the event that they were, the research conducted a number of diagnostic tests. Therefore, before executing a regression model, both post-estimation and pre-estimation tests were performed. Multicollinearity test was the pre-estimation tests while autocorrelation, heteroscedasticity, Hausman specification test, and normality tests were the post-estimation tests. These tests were conducted to prevent misleading regression outcomes.

Stationarity Test

The investigator carried out Unit root tests utilizing the Levin–Lin–Chu test to show stationarity and non-stationarity of variables. Carrying out this test ensured that there were no misleading regression outcomes from non-stationary series. Here are the findings:

Table 4.3: Stationarity Test

Variable	Adjusted t-Statistic	P-value	Comment
Financial Performance	-5.8294	0.0000	Stationary
Interest	-4.9376	0.0000	Stationary
Log of Income Level	-7.3617	0.0000	Stationary
Repayment Period	-3.2243	0.0006	Stationary

Source: Researcher (2024)

The results in Table 4.3 show that financial performance (ROA), interest rate applied to mortgage loans, the logarithm of the borrowers' income level, and the loan repayment duration were all stationary (i.e., they did not have unit roots) at a 5% significance level. Consequently, the study concludes that no variable had unit roots and were thus used at all levels. The results are therefore not misleading according to Gujarati (2003).

Normality Test

Normality assumption (ut ~ N (0, σ2)) was necessary in performing individual and combined hypothesis testing on model dimensions (Brooks, 2008). The table below gives the findings of the Kurtosis and skewness tests to determine normality on commercial banks.

Table 4.4: Normality Test

Skewness/Kurtosis tests for Normality					
Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	adj. chi2(2)	Prob>chi2
ROA	155	0.24240	0.2212	41.81	0.1106
Interest Rate	155	0.15068	22.650	39.62	0.0971
Log of Income Level	155	0.38614	14.705	39.32	0.1840
Repayment Period	155	0.63430	5.0540	11.25	0.2799

Source: Researcher (2024).

The results show that P-values in all variables was above the critical P-value (0.05). The data therefore, adhered to a normal distribution.

Multicollinearity Test

A situation where there is an exact (or nearly perfect) linear relationship between two or more explanatory variables is known as multicollinearity (Hawking & Pendleton, 1983). It represents a high variable correlation. When there is a perfect correlation, unique least squares solution cannot be determined for predictor variables (Field, 2009). Multicollinearity leads to unstable coefficient estimates for individual predictors by increasing the standard errors and confidence intervals (Belsley et al., 1980). This study evaluated multicollinearity using variance inflation factors (VIF). Field (2009) proposes that multicollinearity is present when the VIF value is more than 10.

Here are the Multicollinearity results:

Table 4.5: Multicollinearity Test

Variable	VIF	1/VIF
Interest	1.14	0.878664
Log of Income Level	1.15	0.870942
Repayment Period	1.02	0.981126

Source: Researcher (2024).

The findings presented in Table 4.5 suggest that Multicollinearity is not present, as every variable's VIF is less than 10.

Heteroscedasticity Test

To ascertain whether the variance of the error terms is constant for every observation, a heteroscedasticity test was performed. If heteroscedasticity is not present, then we have homoscedasticity. The Breusch-Pagan test aided inn checking heteroscedasticity. In this test, the null hypothesis was that homoscedasticity would be shown by the error terms having a constant variance. Table 4.6 gives the outcomes.

Table 4.6: Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for Homoscedasticity
Ho: Constant variance
Variables: fitted values of Financial Performance (ROA)
chi2(1)   =   1.21
Prob > chi2 = 0.2718

Source: Researcher (2024).

Table 4.6 indicates that the error terms are homoscedastic, given that the p-value (0.2718) is higher than the significance level of 0.05. This indicates that the data utilized was homoscedastic (without heteroscedasticity), signifying that the data employed in the regression had consistent variance, and thus, the results of the analysis can be deemed reliable.

Autocorrelation Test

Panel regression models assume that the model's errors are independent (not correlated). In time-series research, the mistakes are deemed dependent or autocorrelated if this supposition is not satisfied. In order to determine whether autocorrelation existed in the data—more specifically, whether the residuals were serially correlated across time—this study used the Wooldridge test. Table 4.7 displays the results.

Table 4.7: Autocorrelation

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F (1, 4) =   2.530
Prob >F =   0.1869

Source: Researcher (2024)

With one and four degrees of freedom, the F-test is the test statistic that was provided. Its value is 2.530. The F-test's P-value of 0.1869 indicates that, at the 5% level, the test is not statistically significant. As a result, the conclusion that there is no autocorrelation in the residuals is supported by the null hypothesis.

Model Specification Test

The Hausman's specification test (1978) was used in this study to determine which random and fixed effect models to use. In Random Effects Model, each study's estimated true impact is unique, and these impacts follow a normal distribution. The Fixed Effects Model is suitable when it's reasonable to assume that all studies have a single shared effect. Table 4.8 shows the outcomes.

Table 4.8: Model Specification Test

Variable	(b) Fixed	(B) Random	(b-B) Difference
Interest Rate	-34.79673	-33.62131	-1.17542
Log of Income Level	.8934822	.9147734	-.0212912
Repayment Period	.1062176	.1112179	-.0050003
chi2(3)	0.52		
Prob>chi2	0.0000		

Source: Researcher (2024)

Table 4.8 presents the findings, which show that the p-value was 0.0000, or less than 0.05. This implies that the random effects model is less preferred than the fixed effect model.

Panel Regression Analysis

In order to ascertain the statistically significant correlation between mortgage financing characteristics and the financial performance of Kenyan commercial banks, this study performed a panel regression analysis. Regression analysis is a statistical technique used to estimate the correlations among variables (Rencher & Schaalje, 2009). It includes a wide range of methods for describing and evaluating multiple variables, especially where the connection between dependent and independent variables is of interest (Mbuthia & Gatauwa, 2022). Table 4.10 presents the panel regression analysis's findings.

Table 4.10: Panel Regression Analysis

Dep Var: ROA	Coef. (β)	Std. Err.	Z	P>|z|
Interest Rate	-33.62131	11.53055	-2.92	0.004
Log of Income Level	.9147734	.373174	2.45	0.014
Repayment Period	.1112179	.036506	3.05	0.002
Constant	-.6478237	3.092161	-0.21	0.834
R ²	0.4369			
R ²Adjusted	0.4152			
F statistic	35.69			
P-value	0.0000			

Source: Researcher (2024).

$$Y_{it} = -0.6478237 - 33.62131X_{1it} + 0.9147734X_{2it} + 0.1112179X_{3it}$$

Where:

Y_{it} = Dependent variable i at time t

$X_{1\ it}$ = Interest rate i at time t

$X_{2\ it}$ = Log of income level of borrowers i at time t

$X_{3\ it}$ = Payment period on loan i at time t

Table 4.10 displays the panel regression results, which show that the coefficient of determination (R^2) is 0.4369. This means the interest rate applied to a mortgage loan, the borrowers' income level, and the mortgage loan repayment period collectively account for 43.69% of the variance in the financial efficiency of Kenyan mortgage-offering banks, as measured by ROA. This means these factors influence 43.69 percent of the difference in financial efficiency, as quantified by ROA. The panel regression model used in this investigation significantly

explained the link between the independent factors and the dependent variable, ROA, as indicated by the p-value of 0.0000.

The results show that the bank's interest rate significantly and negatively affected the financial health of Kenyan commercial banks that offered mortgages (β = -33.62131, p = 0.004<.05).

This implies that a 33.62131 unit drop in financial performance results from an increase in the banks' mortgage loan interest rate. It suggests that a rise in the interest rate associated with a mortgage deters many prospective borrowers from applying for the loan because of the high interest, which lowers ROA. However, these results contradict the findings of a study by Egbunike and Ekerekeoti (2018), which concluded that the exchange rate and interest rate had no appreciable effect on financial performance. Furthermore, Claessens, Coleman, and Donnelly (2018) concluded that a decrease in interest rate results in a lower net interest and reduced profitability of banking institutions from forty-seven countries. However, these results align with the conclusion by Ahmed, Rehan, Chhapra, and Supro (2018) that commercial banks' profitability is negatively impacted by interest rates.

The results also show that the financial performance of Kenyan commercial banks that offer mortgages was positively and significantly impacted by logarithm of the borrowers' income level (β =0.947734, p=0.014<.05). This means an increase in income level among mortgage loan borrowers results in an enhancement in the banks' financial performance by 0.9147734 units. This supports the findings by Makori and Memba (2015) who carried out research on the factors affecting mortgage financing, the employment status of bank clients affected mortgage performance among banking institutions in Kisii County and concluded that higher income earners had a high probability of taking a mortgage than the low-income earners and the unemployed.

In conclusion, the analysis results indicate that the mortgage the length of the loan payback duration significantly and favorably affected the mortgage-granting commercial banks' financial performance in Kenya (β =0.1112179, p =0.002<.05). This indicates that a 0.1112179-unit improvement in financial performance results from extending the loan repayment time. This also implies that more flexible, longer repayment periods increase the likelihood of borrowing, thereby improving the banks' profitability. The findings regarding the repayment period align with those of a study by Murage (2021), which examined the consequences of repayment schedules on the SMEs' financial performance in Kenya's urban informal communities and discovered that repayment period significantly influences the loan application process, with borrowers favoring longer repayment periods over shorter ones.

V. Discussion Of Findings

Interest Rate and Financial Performance

Evaluating the effect of interest rates on Kenyan commercial banks' financial performance was the main goal of the study. The study found the lowest interest rate charged by the banks on mortgages was 10.1%, while the highest was 24.6%. The average interest rate was 13.64%, and the standard deviation was 2.11%. Correlation analysis showed a significant and negative association (-0.3127*) in mortgage interest and bank performance, given by ROA. This aligns with the findings of a study by Ahmed, Rehan, Chhapra, and Supro (2018), which found that changes in interest rates negatively impacted the financial efficiency of Pakistan banking institutions, reducing profitability. Bikker & Vervliet (2018) also concluded that a low-interest-rate environment adversely affects the financial efficiency of banking institutions in the United States, thus reducing net margins. Furthermore, the panel regression results indicated that the interest rate charged by the bank had a notable and negative impact on Kenya's mortgage-offering banks' financial performance (β =-33.62131, p=0.004<.05).

Income Level of Borrower and Financial Performance

The second objective of the study was to investigate the effects of borrower income levels on financial performance of Kenyan mortgage-lending banks. Analysis revealed the borrowers' income ranged from a minimum of KES 71,972 to a maximum of KES 991,367. The average income of mortgage loan borrowers was found to be KES 545,128.10, with a standard deviation of KES 262521.40. The correlation analysis indicated that the logarithm of the borrowers' income level had a significantly and positively impacted on performance of Kenyan banks offering mortgages (0.3010*). This aligns with Makori and Memba's (2015) conclusion that individuals with higher incomes are more likely to take out a mortgage than those with lower incomes or who are unemployed. Lastly, the regression analysis demonstrated that the logarithm of the borrowers' income levels significantly positively affected the financial efficiency of banks issuing mortgages (β =0.9147734, p=0.014<.05). An increase in the income level among mortgage loan borrowers therefore results in a 0.9147734-unit improvement in the banks' financial performance.

Repayment Period and Financial Performance

Evaluating how the length of the loan repayment affects the financial stability of Kenyan banks was the third goal of the study. The study discovered that during the period 2016-2020, the shortest loan repayment term

set by the banks offering mortgages was five years, while the longest was 30 years. The average repayment term was 18 years, with a standard deviation of 6.31 years. A strong and positive association (0.2744*) was found by correlation analysis between the length of the loan repayment period and the financial health of Kenyan mortgage-offering banks. This supports Worokinasih and Potipiroon (2019) claim that loan terms and policies influence whether entrepreneurs will repay the loan on time, and that flexible repayment terms increase the likelihood of borrowing. Additionally, the panel regression model showed that the mortgage loan repayment duration had a favorable and noteworthy effect on Kenyan mortgage-lending banks' financial wellness (β =0.1112179, p=0.002<.05), suggesting that a longer loan repayment term improves financial performance by 0.1112179 units.

VI. Conclusion

The research concludes that commercial banks in Kenya, which offer mortgages, charge higher interest rates on loans. These loans are a significant asset for these banks. Mortgages, a part of the loan portfolio, enable borrowers to become homeowners. The study proves that these institutions' financial performance is greatly improved by mortgage lending. People are more likely to choose mortgages as a result of the rising housing demand, which helps banks financially, particularly when default rates are low. The study also reveals that the banks' financial performance is considerably enhanced by raising the borrowers' income levels and engaging in other actions that raise the total amount of mortgage loans they provide. According to Gatauwa, Aluoch, and Adhing'a (2024), such actions could include using financial technology to boost their corporate sustainability and attract more customers.

The study goes on to conclude that these banks' interest rates have a detrimental effect on their ability to make money. Interest rates and bank financial performance are related, with higher interest rates being advantageous to banks. By utilizing the difference between the interest, they receive from investments and the interest they give to clients, banks can increase their earnings through higher interest rates. Higher interest rates, however, discourage prospective customers from applying for mortgages, which lowers financial performance. The study also reveals a positive relationship between mortgage borrowers' income and the banks' financial success. As a result, the study recommends that commercial banks take the borrowers' income level into account when evaluating loan applications. This would enable them to concentrate on the borrowers' capacity to repay the loan—which is normally established by providing evidence of income—and their propensity to do so, which is usually decided by their credit score.

Finally, the study concludes that repayment period positively influences mortgage-offering banks financial wellness. Longer-term mortgages are less costly per month as the repayments are spread over a longer period. However, this means that the overall cost of the mortgage for clients will be higher as they will be charged more interest over a longer period. Conversely, this enhances the banks' financial performance.

References

[1] Abdulrehman, A. & Nyamute, W. (2018). Effect Of Mortgage Financing On Financial Performance Of Commercial Banks In Kenya, Journal Of International Business, Innovation And Strategic Management, 1(6), 91 – 122

[2] Ahmed, A., Rehan, R., Chhapra, I. U., & Supro, S. (2018). Interest Rate And Financial Performance Of Banks In Pakistan. International Journal Of Applied Economics, Finance And Accounting, 2(1), 1-7.

[3] Anu, E. T. (2016). Investigating The Changes In Mortgage Loan In The Uk Retail Banking Sector: A Review Of The Financial Crisis In The Resulting Implications On Households (Doctoral Dissertation, University Of Wales Trinity Saint David).

[4] Aruwa, S. A., & Musa, A. O. (2014). Risk Components And The Financial Performance Of Deposit Money Banks In Nigeria. International Journal Of Social Sciences And Entrepreneurship, 1(11), 514-522.

[5] Asabere, P. K., Mcgowan, C. B., & Lee, S. M. (2016). A Study Into The Links Between Mortgage Financing And Economic Development In Africa. International Journal Of Housing Markets And Analysis, 9(1), 2-19.

[6] Belsley, D. A. (1980). On The Efficient Computation Of The Nonlinear Full-Information Maximum-Likelihood Estimator. Journal Of Econometrics, 14(2), 203-225.

[7] Bikker, J. A., & Vervliet, T. M. (2018). Bank Profitability And Risk-Taking Under Low Interest Rates. International Journal Of Finance & Economics, 23(1), 3-18.

[8] Brooks, C. (2008). Rats Handbook To Accompany Introductory Econometrics For Finance. Cambridge Books.

[9] Central Bank. (2018). Bank Supervision Annual Report. Nairobi: A Publication Of The Central Bank Of Kenya.

[10] Central Bank. (2019). Bank Supervision Annual Report. Nairobi: A Publication Of The Central Bank Of Kenya.

[11] Claessens, S., Coleman, N., & Donnelly, M. (2018). "Low-For-Long" Interest Rates And Banks' Interest Margins And Profitability: Cross-Country Evidence. Journal Of Financial Intermediation, 35, 1-16.

[12] Duncan, N. M., Njeru, A., & Tirimba, O. I. (2015). Effect Of Loan Repayment On Financial Performance Of Deposit Taking Saccos In Mount Kenya Region. International Journal Of Innovation And Applied Studies, 10(4), 1238.

[13] Egbunike, C. F., & Okerekeoti, C. U. (2018). Macroeconomic Factors, Firm Characteristics And Financial Performance. Asian Journal Of Accounting Research.

[14] Gatauwa, J.M., Aluoch, M.O. & Adhing'a, D.C. (2024). Fintech Services And Corporate Sustainability In Commercial Banks In Kenya. (Eds. Jafar, S.H., Hemachandran, K., Akhtar, S., Khan, P.A., & Elchaarani, H.) In Adoption Of Fintech: Companion And Antagonist, Crc Press, Taylor And Francis Group.

[15] Gatauwa, J. M. (2022). Private Equity Financing And Financial Performance: A Critical Review Of The Literature. African Development Finance Journal, 1(2), 95 – 103.

[16] Gatauwa, J. M. (2020). Does Fiscal Policy Stance Affect Public Expenditure: Evidence From Kenya, International Journal Of Public Finance, 5(2), 295-310.

[17] Gujarati, D. (2003). Basic Econometrics. Fourth Edition. Singapura: Mcgraw-Hill. Survival Manual In Spss. Open University Press.
[18] Hakizakubana Ngoboka, J. P., & Gatauwa, J. (2020) Camel Rating System And Financial Performance Of Rwandan Commercial Banks. Iosr Journal Of Economics And Finance, 11(6), 1 – 13.
[19] Hoang, C., Nguyen, L., Tran, M., & Hoang, T. (2020). The Impact Of Income Diversification On Liquidity Creation And Financial Performance Of Vietnamese Commercial Banks. Accounting, 6(4), 553-568.
[20] Iyandemye, S., Barayandema, J., & Gasheja, F. (2018). Mortgage Finance Market And Housing Affordability In Urban Areas In Rwanda: A Case Of Kigali City.
[21] Kamau, R. W. (2018). The Effect Of Operational Risk Management On Financial Performance Of Commercial Banks: A Case Of Tier Two And Three Commercial Banks In Kenya (Masters Dissertation, Kemu).
[22] Karanja, A. W. (2013). Mortgage Financing And Profitability Of Commercial Banks In Kenya (Doctoral Dissertation, Kenyatta University).
[23] Keynes, J.M. (1936). The General Theory Of Employment, Interest And Money. New York: Harcourt, Brace.
[24] Kigomo, J. (2016). Mortgage Rates In Kenya: Implications For Homeownership. International Academic Journal Of Economics And Finance, 2(1), 31-40.
[25] Kothari, C. (2004). Research Methodology: Methods And Techniques (2nd Edition). New Delhi: New Age International (P) Ltd.
[26] Liebersohn, C. (2017). Housing Demand, Regional House Prices And Consumption. Regional House Prices And Consumption (April 24, 2017).
[27] Makori, J. O., & Memba, F. (2015). Factors Influencing Performance Of Mortgage Financing Among Commercial Banks In Kisii Town, Kenya. International Journal Of Economics, Commerce And Management, 3(3), 1-15.
[28] Mbuthia, J.N. & Gatauwa, J. M. (2022). Corporate Sustainability Practices And Financial Performance Of Firms Listed In The Nairobi Securities Exchange, Kenya. International Academic Journal Of Economics And Finance, 3(8), 89 – 112.
[29] Millanzi, E. (2019). Methods Of Housing Finance In Urban Tanzania (No. Eres2019_45). European Real Estate Society (Eres).
[30] Mukhtar, M. M., Amirudin, R. & Mohamad, I. (2016). Housing Delivery Problems In Developing Countries: A Case Study Of Nigeria. Journal Of Facilities Management, 14(4), 315-329.
[31] Murage, M. (2021). Mobile Loan Frequency Of Repayment As A Predictor Of The Financial Performance Of Smes In Urban Informal Settlements In Kenya. African Journal Of Empirical Research, 2(2), 97-113.
[32] Mutemi, K., & Makori, D. (2019). Interest Rate Capping And Financial Performance Of Commercial Banks In Kenya. International Journal Of Current Aspects, 3(Iv), 119-130.
[33] Muthama, K. M., & Warui, F. (2021). Influence Of Lending Terms On Loan Performance Of Microfinance Institutions In Kisii County (Case Study; Kenya Women Microfinance Bank). International Academic Journal Of Economics And Finance, 3 (7), 21, 44, 2.
[34] Obondy, S. (2013). The Effect Of Interest Rates On The Supply Of Real Estate Finance In Nairobi County.
[35] Ozdemir, N., & Altinoz, C. (2013). The Role Of Regional Factors In Determining Mortgage Interest Rates In The Us. Research In Business And Economics Journal, 8, Pp. 1.
[36] Pallant, J. (2007). Spss Survival Manual—A Step By Step Guide To Data Analysis Using Spss For Windows (3rd Ed.). Maidenhead: Open University Press.
[37] Rashidi, H. A. (2020). The Effect Of Income Source Diversification On Financial Performance Of Commercial Banks In Lebanon.
[38] Shawar, K., & Siddiqui, D. A. (2019). Factors Affecting Financial Performance Of Insurance Industry In Pakistan. Shawar, K. And Siddiqui, Da (2019). Factors Affecting Financial Performance Of Insurance Industry In Pakistan. Research Journal Of Finance And Accounting, 10(5), 29-41.
[39] Shults, J. (2009). A Review Of: "Linear Models In Statistics, By Ac Rencher And Gb Schaalje" And "A Primer On Linear Models, By Jf Monahan, Boca" Hoboken: Wiley.
[40] Ssekiziyivu, B., Bananuka, J., Nabeta, I. N., & Tumwebaze, Z. (2018). Borrowers' Characteristics, Credit Terms And Loan Repayment Performance Among Clients Of Microfinance Institutions (Mfis): Evidence From Rural Uganda. Journal Of Economics And International Finance, 10(1), 1-10.
[41] Taltavull, P., Mccord, M., Mcgreal, S., Berry, J., Haran, M., & Davis, P. (2011). The Implications Of Mortgage Finance On Housing Market Affordability. International Journal Of Housing Markets And Analysis.
[42] Umuro, G. A. (2017). The Effect Of Interest Rate On The Uptake Of Loans: The Case Of Commercial Banks In Kenya.
[43] Werner, R. J. & Kratovil, R. (1981). Modern Mortgage Law And Practice. New York: Prentice Hall Ptr.
[44] Worokinasih, S., & Potipiroon, W. (2019). Microfinance Repayment Performance Of Smes In Indonesia: Examining The Roles Of Social Capital And Loan Credit Terms. The Journal Of Behavioral Science, 14(1), 28-45.