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Examining Factors Affecting Non-Performing Loans in Commercial Banks in Uganda

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ABSTRACT:

Purpose -This study examines the factors affecting non-performing loans in Uganda, addressing a gap by examining the effect of credit risk management, interest rates and liquidity on Non-Performing Loans of commercial banks in Uganda.

Design/methodology/approach – The study utilizes both descriptive and correlational research designs to ascertain the effect of credit risk management, interest rates and liquidity on Non-Performing Loans of commercial banks in Uganda. Data were secondary in nature collected from Financial Soundness Indicators, Bank of Uganda. The study utilized quantitative data covering a period ranging between January 2000 to December 2024. The study population include commercial banks registered and regulated by Bank of Uganda during the same period.

Findings- Results reveal that credit risk management has a negative significant effect on non-performing loans (β = -0.0982, $p<0.05$). Similarly, Bank liquidity has a negative significant effect on non-performing loans (β = -0.0308, $p<0.05$). However, findings further revealed that interest rates by commercial banks have a positive significant effect on non-performing loans (β = 0.1812, $p<0.01$). Findings also revealed that inflation has a negative significant effect on non-performing loans while the effect of both unemployment rate and bank rate is positive but not significant.

Practical Implications-Regulators and financial institutions must ensure that credit risk management practices are effective and robust. This includes implementing proper underwriting standards, monitoring borrower creditworthiness, and implementing loan loss reserve policies.

Originality/value- Evidently, a lot of scholarly attention has been directed on exploring the effect of interest rates, inflation and credit risk management on Non-Performing Loans in different economies. However, it is important to note that while some have found evidence of positive effect of interest rates, inflation and credit risk management on Non-Performing Loans, others have not, hence the need for the study.

KEYWORDS-Non-performing loans**,** credit risk management**,** interest rates**,** liquidity.

INTRODUCTION

Non-Performing Loans (NPL) in commercial banks are an important indicator of the health of financial status of banks in any country. According to Szarowska (2018), a loan is "classified as non-performing when payment of interest and/or principal is past due by 90 days or more, or the loan is considered to be in default or in breach of contract. Non-Performing Loans ratio measures the percentage of loans in a bank's Loan portfolio that are in default or close to default. A low NPL proportion demonstrates that a large portion of the loans are predicted to be repaid. This implies that the bank is financially sound. This results in increased earnings and increased trust from stakeholders. On the other hand, a high NPL ratio indicates a shortage of creditworthiness within a financial institution's lending portfolio. This suggests that a considerable part of the loans is not anticipated to be recovered which may have a negative influence on the commercial bank's profitability and overall financial performance (Singh et al., 2021).

Non-performing loans cause harm to several stakeholders including commercial banks because they decrease their earnings and resources which finally impacts on their financial performance (Lihawa & Ngaruko, 2021a; Ninson et al., 2021; Singh et al., 2021).It also affects the customers, as they are likely to be charged higher interest rates and fees (Kar & Swain, 2014; Siddiqui, 2018). Furthermore, bad loans have the potential to lower confidence in the public within the banking industry. These can result in a reduction of capital investment within the economy. Non-performing loans, therefore, have an adverse impact on the bank's capital and performance and could also threaten the survival of the institution. A high ratio of non-performing loans has been found to be an indicator of poor financial performance of banks since it shows that borrowers are having difficulties in paying back their loans (Blasko & Sinkey, 2006). A big number of Non-Performing Loans of one financial institution may

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spill over to other financial sectors leading to financial distress and instability. This deterioration in Non- performing loans creates systematic risks, panic which can lead to bank runs. As such, any delays or non-repayments of such loans is detrimental to the bank's loan portfolio performance (Akram & Rahman, 2018).

An analysis of the global banking performance shows that Non-Performing Loans in emerging market economies grew two and half times more during the period from 2009 to 2019, reaching $692 billion and accounting for almost 40% of the global total in 2019 (International Monetary Fund Financial Soundness Indicators, 2022). Furthermore, Sub-Saharan Africa exhibits the highest incidence of Non-Performing Loans (NPLs) relative to other global regions. An analysis of data from the Financial Soundness Indicators (FSI) database shows that the median NPL ratio (11.7%) in Sub-Saharan Africa is twice that of other regions except South Asia (8%) (International Monetary Fund, 2021). This poses a significant risk to the banking sector. For instance, an increase in non-performing loans can lead to a reduction of net interest income and consequently resulting into credit losses that impact the performance of commercial banks. Furthermore, an increase in NPLs has been cited to erode the capital base of a bank, increase credit risk and damage the reputation of a banking sector in an economy.

According to Bank of Uganda (2019), Uganda's banking sector is epitomized by a high level of non-performing loans indicated by an upsurge in the NPL ratio of from 2.7% in 2018 to 3.6% in 2019. This poor performance can be attributed to many factors but primarily, the combination of interest rates, inadequate credit risk management practices, bank liquidity and inflation (Pop et al., 2018a; Serwadda, 2018; Szarowska, 2018).

High interest rates impair the ability of borrowers to repay their loans in a timely manner thereby compromising the profitability and credibility of the commercial bank (Eke et al., 2016; Kar & Swain, 2014; Qaisi, 2020; Siddiqui, 2018). High interest rates exacerbates repayment difficulties for borrowers. This increases the financial burden on borrowers and, consequently, result in an increase in non-performing loans. Research also indicate that deficient credit risk management practices heighten loan delinquencies and provisions for bad debts, consequently, increasing commercial banks' non-performing loans. Hence, banks exercise prudent lending toward high-risk borrowers, potentially constraining their access to credit (Agwu, 2018; Olabamiji & Michael, 2018; Zhongming et al., 2019). For liquidity, Sivarajan et al. (2023), states that due to excess cash resulting from commercial banks need to preserve liquidity, banks are normally willing to supply a high number of loans regardless of borrowers borrowing characteristics. This is done to utilize excess liquidity but ultimately resulting into increase in non-performing loans.

Furthermore, inflation's role in influencing commercial banks' non-performing loans show that rising inflation decreases the value of loan assets yet increases deposit liabilities. This squeeze increase non-performing loans as borrowers struggle with inflated living costs and mounting debt burdens (Aimola & Odhiambo, 2021; Ali & Ibrahim, 2018; Fahlevi, 2019; Sunday et al., 2019). Additionally, increase in inflation prompts further loan defaults due to unaffordable debt servicing. To offset inflation, banks may hike loan interest rates, indirectly depressing lending activity. Evidently, a lot of scholarly attention has been directed on exploring the effect of interest rates, inflation and credit risk management on Non-Performing Loans in different economies (Akram & Rahman, 2018; Ali & Ibrahim, 2018; Eke et al., 2016; Kar & Swain, 2014; Olanike & Abass, 2014; Serwadda, 2018). However, it is important to note that while some have found evidence of positive effect of interest rates (Kar & Swain, 2014; Kavwele et al., 2018; Qaisi, 2020), inflation (Topani Suzulia et al., 2020) and credit risk management on Non-Performing Loans, others have not (Alaoui Mdaghri, 2021; Theophilus, 2021). This study seeks to fill this gap by examining the effect of credit risk management, interest rates and liquidity on Non-Performing Loans of commercial banks in Uganda.

LITERATURE REVIEW AND THEORETICAL FOUNDATIONS

The Financial Accelerator theory

The Financial Accelerator theory, proposed by Bernanke & Gertler (1989) and further developed by Bernanke et al. (1998), highlights the role of credit markets in amplifying and propagating economic shocks. According to this theory, information asymmetry between lenders and borrowers can lead to unpattern behavior in credit markets, where small shocks can have a significant impact on lending and borrowing activities of organizations. As a result of these shocks, borrowers may face difficulties in obtaining external finance, making it harder for them to repay their loans, and increasing the probability of default. The Financial Accelerator theory offers insights into how these credit market imperfections can contribute to increase in non-performing loans, especially during periods of increase in inflation where borrowers face increased costs of borrowing and repayment. For instance, if inflation were to increase, monetary policymakers might raise interest rates and restrict access to credit. This may increase the cost of financing, making it more difficult for debtors to satisfy their loan obligations. This may ultimately lead to an increase in non-performing loans.

Loanable Funds Theory

According to Saunders (2010), the loanable funds theory postulates that; Ceteris Paribus, the supply of loanable funds increase as interest rates increase. This means that the supply of funds increases as the reward for supplying these funds increases. On the consumer side, however, the demand for loans increase as interest rates fall (Saunders, 2010). This indicates that the supply and demand of funds, and consequently the interest rates depend on whether you are a provider of funds, which requires a higher rate, or a borrower/consumer, which requires a lower rate. According to Adoah (2015), the theory builds on traditional interest rate theory by placing a greater emphasis on the money supply's effect on savings and investment. The price paid in the credit market for loanable money is determined by the supply and demand of funds. A decrease in the supply of loanable funds or excess reserve occurs from an increase in the supply of loanable funds or excess reserve. The supply of loanable funds increases as expected savings increases. This is due to a rise in expected income, which is accompanied by an increase in the rate of return. In the context of interest rates and Non-Performing Loans, the loanable funds theory could be used to explain the implication of interest rates on the Non-Performing Loans as follows; when interest rates are low, it stimulates higher borrowing by consumers and businesses. This often facilitate increased financing of risky investments and speculative borrowing. Prolonged periods of cheap and easily available credit contribute to deterioration in credit quality and a build-up of vulnerabilities in loan books, as imprudent borrowers take on excessive debts that eventually turn non-performing when economic conditions decline. However, higher interest rates depress borrowing appetites while increasing incentives for saving, reducing speculative demand for loans. This reduces the accumulation of non-performing loans on commercial banks' balance sheets.

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Therefore, the loanable funds theory posits that higher interest rates diminish non-performing loans by discouraging speculative borrowing, while low interest rates tend to increase non-performing loans by promoting credit booms and riskier debt accumulation.

Empirical evidence

Credit risk management and non-performing loans

Nikolaidou & Vogiazas (2014) describe credit risk management as the mix of coordinated activities for controlling risks faced by a company by incorporating important risk management techniques in relation to the company objectives. It is vital to highlight that risk management strategies are not designed to remove all risks, but rather to control the opportunities and dangers that may lead to risk (Bezzina et al., 2014). According to Ross et al.(2020), risk management techniques ensure that financial institutions must have a robust and logical framework for decision making in order to achieve the company's objectives.

Despite the importance of credit risk management, literature on the link between credit risk management and Non-Performing Loans among several commercial banking institutions is mixed. While some studies have found a positive effect of credit risk management on Non-Performing Loans, others have found a negative effect. For Instance; Using secondary data for a sample of 20 commercial banks in Uganda. Serwadda, (2018) examined the impact of credit risk management on the performance of commercial banks from 2006 to 2015.The findings of the study revealed that the performance of the commercial banks was negatively affected by non-performing loans, potentially exposing the institution to significant amounts of illiquidity and financial disaster. Obae & Jagongo (2022), examined the effect of credit risk management practices on the Non-Performing Loans covering all the 38 commercial banks in Kenya. The study discovered that client appraisal practice, debt collection practice and credit rationing practices have significant effect on the Non-Performing Loans of commercial banks in Kenya.

In Pakistan, Ahmed & Malik (2015) assessed the impact of credit risk management practices on Non-Performing Loans, using credit terms, client appraisal, collection policy, and credit risk control as credit risk management practice characteristics. The investigation revealed that credit conditions and customer assessment have a positive and significant effect on Non-Performing Loans, but collection policy and credit risk management had a positive but insignificant effect. The report recommended that management improve Non-Performing Loans by concentrating on the dimensions of the credit risk management techniques examined.

In Bangladesh, Mohammad & Onni (2015) examined the Credit Risk Grading Model and Non-Performing Loans of Commercial Banks. The study's findings indicate that while the duration of loan payback increases the likelihood of default, the frequency of loan reviews and credit approval considerations lessens the likelihood of default, resulting in reduced loan loss provisions. The report advised that banks provide thorough paperwork before to distribution and that they ensure effective supervision, monitoring, and follow-up on each credit to minimize the risk of non-performing loans. In Uganda, Agaba et al. (2022) examined the relationship between Credit Risk Management Practices and Non-Performing Loans of Commercial Banks in Mbarara City covering 19 banks. The study found a significant positive relationship between credit risk identification and Non-Performing Loans; credit risk assessment and Non-Performing Loans; credit risk monitoring and Non-Performing Loans; and credit risk control and Non-Performing Loans.

In summary, the literature highlights credit risk management as an influential driver for reducing non-performing loans in financial institutions across global contexts. However, methodological and contextual differences have yielded some conflicting results, underscoring the need for further investigation. Moreover, despite Uganda's growing financial sector, limited empirical research exists, with existing studies relying on constrained primary data. More rigorous analyses utilizing comprehensive secondary data sources would provide enhanced evidence in regards to factors affecting Ugandan banks' non-performing loans.

Interest rates and non-performing loans in commercial banks

Interest rate is the cost to the borrower for the usage of money borrowed from a lender/financial institution, or the fee paid on borrowed assets (Crowley, 2007). It measures both the price at which borrowers are prepared to pay capital owners and the price at which lenders are willing to lend their money to enterprises in exchange for consumption. The effect of interest rates on Non-performing loans is negative if the borrowers are unable to make principal and interest payments, resulting inloan defaults (Sangwan et al., 2022). As such, a number of studies have empirically looked at the impact of interest rate on Non-Performing Loans of commercial banks in different countries.

In Nigeria, Ogundipe et al. (2020) examined the effect of interest rates and Non-Performing Loans of deposit money banks. The findings indicate that there is a strong association between interest rates and loan repayment, as assessed by the non-performing loan ratio. This means that an increase in interest rates will almost certainly result in an increase in credit quality. Additionally, it shows that even a little shift in lending rates will result in an increase in non-performing loans. In Kenya, Kavwele et al. (2018)examined the effect of interest rate capping on the financial performance of commercial banks, using non-interest income and interest expense as variables for interest rate capping, profit before tax and exceptional items for financial performance of commercial banks. The results revealed a statistically significant negative effect of interest rates on the performance of commercial banks implying that increase in interest rates lead to increase in non-performing loans. In Ghana, Ninson et al. (2021) examined the relationships between non-performing loans, lending rates, and financial performance across commercial banks. Using empirical analysis, they found evidence of simultaneous interdependencies among these three variables.

Bank liquidity and non-performing loans

Liquidity in commercial banks imply that they have funds available for lending and borrower are regularly meeting their obligations. Mdaghri (2022) assert that bank liquidity creation has a negative significant effect on non-performing loan. Implying that non-performing loans decrease with banks increased liquidity. However, Sivarajani et al. (2023) and Turan, Nguyen and Doung (2022) assert that commercial banks credit creation increase liquidity and funds available to borrowers which may increase non-performing loans.

Inflation and non-performing loans

Inflation is a period of generally rising prices for goods and production factors. Inflation is undesirable in any economy due to the specific economic costs associated with it. The effect of inflation indicators on the level of Non-Performing Loans is the subject of a number of research studies, as it can be both negative and positive. For instance, studies indicate a negative relationship between inflation and Non-Performing Loans (Lihawa & Ngaruko, 2021b; Long et al., 2020). These findings could partly be explained by the fact that higher inflation could boost the

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solvency of borrowers by reducing the actual value of their outstanding debt, and that inflation should theoretically reduce the real cost of debt if nominal interest rates remain constant thereby facilitating debt servicing, which, in turn, will lead to a reduction in non-performing loans. Studies also suggest the existence of a positive association between Non-Performing Loans and inflation (Koskei, 2020; Lihawa & Ngaruko, 2021a; Rahbar et al., 2021). As such, the relationship between inflation rates and Non-Performing Loans might be significant, insignificant, positive, or negative, as demonstrated in the empirical review below;

A study by Arham et al. (2020) examined the impact of macroeconomic cyclical indicators and country governance on bank non-performing loans in emerging Asia from 2007 - 2017 while employing panel regression analysis methods to examine the relationship between the variables. The findings showed that inflation rate has a negative impact on the non-performing loans for 10 countries in emerging Asia.Singh et al. (2021) examined the effect of Non-Performing loans on profitability from the period 2015-2019 using multiple regression analysis. The output revealed that macro-economic variable such as inflation has a positive and significant effect on non-performing loans. Therefore, the existing research underscores inflation's role in influencing financial institutions' non-performing loans globally, yet methodological and contextual differences have produced some mixed findings, highlighting the need for further investigation.

Identified gaps and hypotheses

The literature highlights credit risk management, interest rates and bank liquidity as influential drivers for non-performing loans in financial institutions across global contexts. However, methodological and contextual differences have yielded some conflicting results, underscoring the need for further investigation. Moreover, despite Uganda's growing financial sector, limited empirical research exists, with existing studies relying on constrained primary data. More rigorous analyses utilizing comprehensive secondary data sources would provide enhanced evidence in regards to factors affecting Ugandan banks' non-performing loans. The existing research also underscores inflation's role in influencing financial institutions' non-performing loans globally, yet methodological and contextual differences have produced some mixed findings, highlighting the need for further investigation. To address these gaps, the following hypotheses are tested;

H1: Credit risk management has a negative significant effect on non-performing loans of commercial banks in Uganda.

H2: Interest rates have a positive significant effect on non-performing loans of commercial banks in Uganda.

H3: Bank liquidity has a negative significant influence on non-performing loans of commercial banks in Uganda

3.METHODOLOGY

The study population include commercial banks registered and regulated by Bank of Uganda for the period from 2000 to 2024. One challenge of utilizing all the commercial banks in the study is that the composition of commercial banks in Uganda's banking system may change over time, which might affect the results of this study. As such, the study was only able to capture changes in the composition of commercial banks over time by using aggregated monthly data (Financial Soundness Indicators) for the period. This helped to ensure the results are not biased by the variance in the composition of commercial banks in any given month. The study population and sample size were the same.

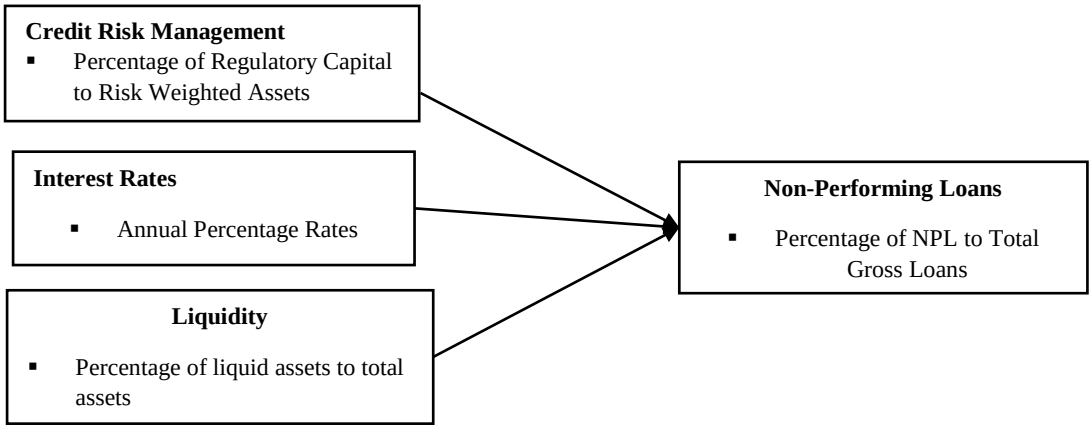
Data were secondary in nature collected from Financial Soundness Indicators, Bank of Uganda. The study utilized quantitative data covering a period ranging between January 2000 to December 2024.The choice of the period is justified by the fact that it provides a more comprehensive analysis of the overall banking sector over a 25 -year period.

Data Analysis was carried out using the SPSS programming package (24 version) and E-views (12 version). Data was coded and entered into the SPSS programming package to generate descriptive statistics, correlations and regressions.

Study design

The study utilizes both descriptive and correlational research designs to ascertain the effect of credit risk management, interest rates and liquidity on Non-Performing Loans of commercial banks in Uganda. A descriptive research design is typically a research method used to describe the existing phenomena as accurately as possible (Atmowardoyo, 2018). This design is appropriate because it helps to identify the variables of interest and provide a foundation for the correlational research design that will subsequently be used to explore the relationships between the variables. A correlation design, on the other hand, is one which describes the relationship between study variables (Kothari, 2004). The study uses a quantitative approach where statistical data is obtained for further analysis. This approach also allows for generalization of the results to a larger population, making it possible to identify trends, make predictions and draw conclusions that have wider applicability (Adams & McGuire, 2023; Cooper & Schindler, 2014).

Conceptual framework



Source: Self constructed through literature review.

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The above conceptual model illustrates the relationship between the dependent and independent variables. The model shows credit risk management is measured by regulatory capital to risk weighted assets as in (Chen et al., (2011), interest rates measured by lending rates as in Abrar (2019) and liquidity measured by the proportion of liquid assets to total assets

Model specification

The study used an econometric model expressing Non-Performing Loans as a function of credit risk management, interest rates and bank liquidity. Mathematically, this can be expressed as follows;

$NPL_t=\beta_0 + \beta_1 CRMt + \beta_2 IR_t + \beta_3 LIQ_t + \varepsilon$ …… (1)

When other macro-economic factors such as unemployment, bank rate and inflation are incorporated:

$NPL_t=\beta_0 + \beta_1 CRM + \beta_2 IR_t + \beta_3 LIQ_t + \beta_4 INFt + \beta_5 BR_t + \beta_6 UNEMP_t + \varepsilon$ …… (2)

Where:

NPL is Non-Performing Loans measured by NPL to Total Gross Loans Ratio

β_0 is the Constant

β_1INF is Inflation measured by Monthly averages for the period

β_2IR is Interest Rates measured by Annual Percentage Rate

β_3CRM is Credit Risk Management measured by Regulatory Capital to Risk Weighted Assets

β_4INFt is the inflation measured by monthly inflation rates

$\beta_5 BR_t$ is the bank rate to commercial banks

$\beta_6 UNEMP_t$ is the unemployment rate

ε is the error term

The above model illustrates the effect of firm and macro factors on Non-Performing Loans.

Table 1: Operationalization of variables

Notation	Variable	Measurement	Author supported
NPL	Non-Performing Loans	Percentage of NPL to Total Gross Loans	(Chen et al., (2011)
CRM	Credit Risk Management	Percentage of Regulatory Capital to Risk Weighted Assets	(Chen et al., (2011)
IR	Interest Rates	Annual Percentage Rates	(Abrar ,2019)
LIQ	Liquidity	Percentage of liquid assets to total assets	(Abrar ,2019)

Source: Literature review

Diagnostic testing

Normality tests

Normality tests are carried out to establish whether data is normally distributed and whether parametric tests like t-tests, ANOVA, and linear regression analysis should be used. Using heavily skewed data without normal distribution is likely to give inaccurate results of p-values, confidence intervals and research findings. For this study, Shapiro-Wilk test was carried out to test for normality.

Table 2: Shapiro–Wilk W test for normality

Variable	SW-Wstat	SW p-val	KS-Dstat	KS -pval
Npl	0.9497	0.0008	0.0993	0.2779
Crm	0.9836	0.2509	0.0467	0.9812
Lrate	0.9326	0.0001	0.1284	0.0739
Liq	0.9247	0.0000	0.1404	0.0387
Brate	0.9374	0.0001	0.1492	0.0233
Unemp	0.9186	0.0001	0.1848	0.0022
Inf	0.9033	0.0000	0.1651	0.0086

Source: Author's estimation (2026)

Results from table 2 reveal instances of non-normality for the variables except credit risk management where SW p>0.05. However, the results of Skewness and kurtosis given in table 1 show that the data for all variables is not heavily skewed. This is based on the studies made by Suleyman (2022), Hair et al. (2010) and Kline (2011) who stated that heavily skewed data have skewness of ±3 and kurtosis of ±7.

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Test for multi-collinearity

Table 3: Multi-collinearity Tests

Variable	VIF	1/VIF
Lrate	1.3	0.768318
Liq	1.26	0.793
Inf	1.17	0.851176
Brate	2.34	0.427722
Crm	1.15	0.868168
Unemp	1.04	0.963541

Source: Authors' estimation (2026)

Variance Inflation Factors (VIF) and tolerance values (1/VIF) assess multi-collinearity among independent variables. VIF values below 5 indicate low multi-collinearity; values above 10 are considered severe. All independent variables in table 6 have VIF values ranging from 1.04 (unemp) to 2.34 (brate), well within the acceptable threshold, and tolerance values all exceed 0.40. This confirms that multi-collinearity is not a concern in this model and that standard errors are not inflated by linear dependence among independent variables)

4. RESULTS

Descriptive statistics

Table 4. Descriptive Statistics of Study Variables

	Mean	Std. Dev.	Min	Median	Max	Skewness	Kurtosis	N
Npl	4.829	1.195	0.602	4.846	7.411	0.755	4.5305	300
Crm	21.623	2.304	14.161	21.775	26.074	-0.405	3.1395	300
Lrate	20.656	2.228	17.020	20.160	27.243	0.900	3.2740	300
Liq	31.569	7.763	14.311	31.056	54.082	0.144	4.0956	300
Brate	15.219	4.209	6.757	15.000	28.000	0.791	3.8501	300
Unemp	0.031	0.005	0.019	0.031	0.038	-0.687	2.5091	300
Inf	5.957	3.981	-0.288	5.210	6.564	1.021	3.4348	300
N	300	300	300	300	300	300	300	

Source: Authors' compilation (2026). npl = Non performing loans ratio (% of NPL to Total Gross loans); crm = capital adequacy ratio (% of risk-weighted assets to total assets); lrate = commercial bank lending rate (%); liq = liquid assets/total assets (%); brate = bank rate to commercial banks (%); unemp = unemployment rate (%); inf = inflation rate (%). Skewness: |value|>1 = substantial asymmetry. Kurtosis: value=3 (normal); >3 = heavy tails (leptokurtic). N = 300 monthly observations.

The results above show that the mean statistics of variables (npl, crm, lrate, liq, brate, unemp and inf) were 4.83%, 21.62%, 20.66% and 31.57%, 15.22%, 0.031% and 5.96% for Non-Performing Loans, credit risk management, lending rates, liquidity, bank rate, unemployment rate and inflation rate, respectively for the 300 observations considered in this study. The mean statistics indicate a challenging lending climate where both the bank rate and lending rates are high (above 15%) with a high average rate of capital adequacy ratio of 21.6% (percentage of risk-weighted assets). This possibly lead to moderate non-performing loans at 4.83%. This points to rising delinquencies and credit risk, lower profit margins, and repayment stress despite tightened lending standards. However, an average for credit risk management levels of 20.9% provides loss absorption. In this difficult lending environment, the banking institutions need prudent mechanisms for credit management, cost controls, and close monitoring to manage risks and loan performance.

A comparison of the means with the medians of the respective variables (4.85%, 21.78%, 20.16%, 31.06%, 15% and 5.2% for npls, crm, lrate, liq, brate and inf respectively), indicates that the mean is relatively close to the median. This implies that the data sets are fairly normally distributed. Normality of the datasets can also be revealed by the skewness of the respective distributions. Tables 1 indicates skewness values of -0.405 for crm as well as positive skewness values of +0.755, +0.900, +0.144, +0.791 and -0.686 for npl, Irate, liquidity, bank rate and unemployment respectively. This shows that while crm was skewed to the left, npls, inf and Irate were skewed to the right. Another observation here is that the skewness for all variables is tending to zero indicating that the datasets are fairly normally distributed. The peakedness of the distributions as measured by kurtosis values indicate less than substantial departure from normality (7.1<Kurtosis value<7.1) confirming that the distributions are fairly normal (mesokurtic distributions).

The standard deviations of variables were 2.766760, 2.156049, 5.253258, and 2.217629 for NPLs, CRM, INF, and IR respectively. Compared to the maximum and minimum values; it is clear that the standard deviations of all the variables are relatively low indicating that the data does not spread over a wide range of values, and therefore does not vary greatly from the arithmetic means.

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Correlation Analysis

This was carried out to establish the relationship between the factors affecting non-performing loans. Spearman's rank correlation analysis was carried out based on non-normality assumptions of the data.

Table 5. Spearman's Rank Correlation Matrix

	npl	crm	lrate	liq	brate	unemp	inf
Npl	1						
Crm	-0.3675*	1					
Lrate	0.3427**	-0.1773	1				
Liq	-0.2085*	-0.0273	-0.4832*	1			
Brate	0.2122*	-0.4634*	0.5660**	-0.157	1		
Unemp	0.0644	0.0033	0.0914	-0.1548	-0.1642	1	
Inf	-0.1862*	-0.4463*	0.1159	-0.1102	0.4100*	-0.0273	1

Source: Author's compilation (2026). Pairwise Spearman's rank correlations. N=300 monthly observations. npl=NPL ratio; crm=capital adequacy; lrate=lending rate; liq=liquidity ratio; brate=bank rate; unemp=unemployment; inf=inflation. |r|>0.50 = strong association; |r|>0.80 = multicollinearity risk (see Table 8).* p < 0.05, ** p < 0.01, *** p < 0.001.

Results from Table 3 indicate that the correlation between Credit Risk Management and Non-Performing loans is negative and significant (r =-0.3675, p<0.05). This implies that as Regulatory Capital to Risk Weighted Assets ratio increases, the Non-Performing loans ratio decreases. Findings further reveal a significant positive relationship between interest rates and non-Performing loans (r = 0.3427, p<0.01) and a significant negative relationship between bank rate and non-performing loans (r =0.2122, p<0.05). this indicates that as interest rates increase, non-Performing loans also increase. These findings agree with Tham et al. (2022) whose study documented that interest rates were one of the most significant factors affecting non-performing loans. The relationship between liquidity, inflation and non-performing loans is negative and significant. However, the study revealed that the relationship between unemployment and non-performing loans is positive but not significant.

Auto- correlation

Table 6. Durbin-Watson Test for First-Order Serial Correlation

Specification	DW Statistic	Decision
Model 1 — Baseline	.418916	Present
Model 2 — Full Controls	.4727621	Present

Source: Authors' estimation (2026)

The Durbin-Watson (DW) statistic tests for first-order serial correlation in OLS residuals. Values close to 2.0 indicate no autocorrelation; values below 1.5 indicate positive autocorrelation. Both models return DW statistics well below 1.5, confirming the presence of positive serial correlation. This validates the use of Newey-West HAC standard errors (lag= monthly) applied in Table 6, which correct for this without altering the coefficient estimates.

Table 7. Breusch-Godfrey LM Test — Model 2 (Full Controls)

Lag (p)	χ^2(p)	p-value	Decision
1	54.952	0.0000	
2	55.372	0.0000	
4	56.426	0.0000	

Source: Authors' estimation (2026)

The Breusch-Godfrey (BG) Lagrange Multiplier test is a more general test for serial correlation than the Durbin-Watson, accommodating higher lag orders and lagged dependent variables. H0: no serial correlation up to lag p. All three lag orders (1, 2, and 4) return chi-squared statistics exceeding 54 with p-values of 0.0000, decisively rejecting the null of serial independence at all conventional significance levels. This confirms that autocorrelation is present and persistent across consecutive, semi-annual, and annual horizons, further validating the Newey-West HAC correction applied in Table 6.

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Table 8. OLS Regression Results — Determinants of the Non-performing loans

	Model 1: Baseline	Model 2: Full Controls
Credit Risk Management	-0.0982**	-0.0577
	(2.08)	(1.19)
Lending Rate	0.1812***	0.2065***
	(3.36)	(3.87)
Liquidity Ratio	-0.0308**	-0.0280*
	(-2.01)	(-1.86)
Inflation — inf (%)		-0.0728**
		(-2.56)
Unemployment Rate		17.6382
		(0.90)
Bank Rate		0.1053
		(2.89)
Constant	-2.0672	-1.9071
	(-1.10)	(-0.98)
N	300	300
R^2	0.230	0.284
adj. R^2	0.206	0.246
AIC	300.2986	297.0310
BIC	310.7193	312.6620

Source: Authors' estimation (2026). Newey-West HAC standard errors (lag= monthly) in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Dependent variable: npl = NPL ratio (% of NPL to Total Gross loans). Model 1 includes core regressors only; Model 2 adds macroeconomic controls as control variables. * p < 0.10, ** p < 0.05, *** p < 0.01

Results given in table 8, Model 1 reveal that credit risk management has a negative significant effect on Non-performing loans (β = -0.0982, p<0.05). The findings support the hypothesis and are consistent with Lawrence et al. (2020) and Agaba et al. (2022) that strong credit risk management techniques help banks to reduce occurrence of non-performing loans. However, when macro-economic factors such as inflation, unemployment rate and bank rate are incorporated (as shown in Model 2), the effect of credit risk management is still negative but not significant. Similarly, Bank liquidity has a negative significant effect on Non-performing loans (β = -0.0308, p<0.05). This is consistent with the assertion by Mdaghri (2022) that increased bank liquidity creation reduces Non-performing loans but contrary to the view that increased liquidity creation increases funds available to borrowers and ultimately lead to increase in non-performing loans. However, findings further revealed that lending rates by commercial banks have a positive significant effect on Non-performing loans (β = 0.1812, p<0.01). Consistent with empirical results by Adelina, Saranda & Bajrami (2022), findings also revealed that inflation has a negative significant effect on Non-performing loans while the effect of both unemployment rate and bank rate is positive but not significant.

5.0 CONCLUSIONS AND IMPLICATIONS OF THE STUDY

Based on findings of the study, it is concluded that for commercial banks to reduce non-performing loans and improve on profitability and performance, they have to develop effective credit risk management mechanisms to ensure that loanable funds are only given to borrowers with capacity to pay. The study further concludes that higher interest rates make the cost of borrowing expensive and lead to increase in non-performing loans. The study further concludes that bank liquidity reduces non-performing loans contrary to the view that liquidity creation increases loanable funds which ultimately leads to increase in non-performing loans. Inflation increases cost of borrowing hence reducing loanable funds and non-performing loans.

The results of this study have important implications for policymakers, regulators, and financial institutions as they aim to help maintain financial stability and promote economic growth. For instance, the central bank can use interest rates as a tool to regulate the economy and reduce the number of non-performing loans. However, the central bank must also consider the impact of interest rate changes on inflation and credit risk management.

Policymakers must prioritize inflation control measures to maintain financial stability and promote economic growth. This includes implementing fiscal and monetary policies to manage inflation and ensuring price stability.

Regulators and financial institutions must ensure that credit risk management practices are effective and robust. This includes implementing proper underwriting standards, monitoring borrower creditworthiness, and implementing loan loss reserve policies.

6.0 RECOMMENDATIONS

The study recommends the need for commercial banks to build capacity at the bank to equip its loan officers' capacity in order to improve on the advisory services it offers to its clients prior to loan approval and subsequent disbursement of funds. When developing their business plans/proposals, loan applicants frequently overlook or disregard a number of crucial factors due to a lack of banks' management skills. The advisory services should encompass financial discipline measures, monitoring and evaluation of the performance of borrowers' projects, as well as extension services. The advisory services should be provided throughout the term of the loan facility, rather than only when the client has

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begun to default on payments. This would enable them significantly lower the cost of mitigating unanticipated conditions that arise during the loan's term.

Furthermore, the study recommends that the commercial banks invest in frequent training of credit and loans officers in areas such as credit management, risk management, and financial analysis. This would sharpen the knowledge and abilities of credit officers in order to increase the quality of credit evaluation, prevent delayed loan approvals, enable credit officers to understand the need to comply with credit policy, and further enhance credit monitoring. Through training programs, the credit personnel will be able to undertake effective analyses of their branches' loan portfolio structures and pay close attention to loans with warning signals.

Finally, the study recommends putting more emphasis on inflation control measures to maintain financial stability and reduce the number of non-performing loans. This includes implementing fiscal and monetary policies to manage inflation and ensuring price stability as well as consumer protection laws to protect borrowers from the adverse effects of inflation on non-performing loans. This includes requiring transparent loan terms and protecting consumer data privacy.

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