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The Impact of Credit Risk Management and Bank-Specific Drivers on the Financial Performance of Commercial Banks in Tanzania

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Abstract

This study investigates the impact of credit risk and bank-specific drivers on the financial performance of commercial banks in Tanzania over ten years, from 2012 to 2022. Secondary data were collected from 25 commercial banks: ten large, ten medium-sized, and five small and regional banks. The Generalized Method of Moments (GMM) was employed to estimate coefficients and address potential endogeneity concerns. Credit risk was assessed through Non-Performing Loans (NPLs), Loan Loss Provisions (LLP), and Default Rates (DR), while asset quality, management efficiency (cost-to-income ratio, CER), and bank Liquidity Ratio (LR) were considered as bank-specific drivers. Return on Assets (ROA) was used as the measure of financial performance. The results revealed that NPLs and DR significantly affect ROA, while LLP exerts a significant positive impact. Furthermore, all bank-specific drivers were found to be significantly associated with ROA. These findings suggest that bank management should adopt effective strategies for managing credit risk and controlling bank-specific drivers to enhance financial performance. Financial regulators should also foster a stable financial environment by implementing monetary policies that lower NPL ratios and maintain strong liquidity positions, thus ensuring the competitiveness and resilience of commercial banks in Tanzania. The study provides empirical insights into the relationships among credit risk, bank-specific drivers, and financial performance in Tanzanian commercial banks.

Keywords: *Bank-specific drivers, Commercial banks, Credit risk, Financial performance,*

1. Introduction

The financial performance of commercial banks is a crucial component of economic development, particularly in emerging economies such as Tanzania, where the banking sector plays a vital role in mobilizing savings, providing credit, and fostering investments (Levine, 2005). Commercial banks are exposed to various risks, with credit risk being among the most significant risks. Credit risk refers to the possibility that borrowers may default on their loan obligations, which can result in financial losses for the bank (Basel Committee on Banking Supervision, 2000). Consequently, effective Credit Risk Management (CRM) is essential to ensure these institutions' stability, profitability, and sustainability (Kolapo, Ayeni & Oke, 2012). Additionally, bank-specific factors, such as capital adequacy, liquidity management, asset quality, and operational efficiency, are critical in shaping financial performance (Athanasoglou, Brissimis & Delis, 2008).

This paper explores the relationship between credit risk management practices and bank-specific drivers and their combined impact on the financial performance of commercial banks in Tanzania. Despite the CRM's growing significance, existing studies often overlook the

interconnectedness of these factors within the Tanzanian context. As a result, a comprehensive analysis that integrates CRM strategies with internal bank dynamics is needed to offer deeper insights into their combined influence on financial performance.

Tanzania's banking sector has witnessed considerable growth over the past decade, spurred by the liberalization of the financial market, thus attracting domestic and foreign investors (Massawe, 2014). The sector consists of various commercial banks varying in size, scope, and ownership structure (Bank of Tanzania, 2018). The Bank of Tanzania (BOT) has introduced a regulatory framework that emphasizes the importance of sound credit risk management practices to mitigate systemic risks (BOT, 2016). However, as competition intensifies, banks are increasingly pressured to adopt strategies that manage risks and enhance profitability (Biekpe, 2011). Credit risk is intrinsically linked to the core activities of banks, particularly lending, which constitutes a significant portion of their revenue streams. As such, the efficient management of this risk is imperative for the survival of commercial banks. Banks that fail to assess and manage effectively the credit risks will likely to experience elevated levels of Non-Performing Loans (NPLs), directly impacting their profitability and liquidity (Ongore & Kusa, 2013). Empirical studies suggest that in countries like Tanzania, where banks operate in relatively volatile economic environments, managing credit risk effectively is a key determinant of financial success (Nyamsogoro, 2010).

While there is a good number of studies conducted on various aspects of credit risk management, few studies have focused on the combined effect of CRM practices and bank-specific drivers on financial performance within the Tanzanian banking sector (see, for example, Ngare, 2020). The existing literature typically concentrates on either external macroeconomic determinants or individual internal factors without addressing the complex relationship between credit risk management and these internal drivers (Mwakajumilo, 2011; Kithinji, 2010). This gap highlights the need for a more thorough investigation into how credit risk management strategies interact with factors influencing financial performance in Tanzanian commercial banks.

Moreover, recent economic challenges, coupled with global financial uncertainties exacerbated by the COVID-19 pandemic, have further complicated the operating environment for Tanzanian banks. Many banks have encountered difficulties in maintaining loan quality, with the post-pandemic period witnessing a surge in non-performing loans. This has underscored the importance of effective credit risk management and the resilience of internal bank factors in sustaining financial performance (Beck & Cull, 2020). Consequently, understanding the impact of CRM and internal drivers is crucial for informing policy recommendations and guiding strategic decision-making in the banking sector.

This paper examines the effect of credit risk management practices and bank-specific factors on Tanzanian commercial banks' financial performance. By doing so, it aims to offer valuable insights to inform the development of more robust risk management frameworks and strategic policies that enhance profitability, sustainability, and resilience in the banking sector. The significance of this study lies in its potential to provide a comprehensive understanding of how Tanzanian commercial banks can improve their financial performance by effectively balancing credit risk management with strong internal controls. The study's findings will be particularly beneficial to bank managers, policymakers, and regulators by providing empirical evidence on the most effective strategies for managing credit risk while ensuring optimal financial performance. Additionally, the research will contribute to the broader literature by addressing the unique characteristics and challenges facing the Tanzanian banking sector.

2. Literature Review

2.1. Theoretical Literature Review

Credit Risk Management (CRM) is essential for ensuring the financial stability of commercial banks, especially in developing economies such as Tanzania. Several bank-specific factors, such as capital adequacy, liquidity, and asset quality, are critical in influencing a bank's performance. To understand the CRM's impact on financial performance, this section reviews key theories, including Credit Risk Modelling Theory, Monitoring Credit Risk Theory, Agency Theory, and Stakeholder Theory (Brown, 2020; Smith & Davis, 2021).

The Credit Risk Modelling Theory focuses on the quantitative assessment of credit risk using statistical and mathematical models to estimate default likelihood and assist banks in determining appropriate pricing, provisions, and reserves. Notable models include JP Morgan's Credit Metrics, which uses historical default probabilities, and the Merton Model, which applies option pricing theory to estimate a firm's default risk (Morgan, 1997; Merton, 1974). These models help banks to optimize loan portfolios and allocate capital effectively, thus ensuring financial stability. Adapting these models to local conditions can enhance risk predictions in Tanzania, where market inefficiencies and information asymmetry are common. However, critics argue that these models often oversimplify the complex realities of credit risk in developing markets like Tanzania, and implementation is hindered by technological limitations and a shortage of skilled personnel (Duffie & Singleton, 2003). The Monitoring Credit Risk Theory underscores the importance of continuously assessing a borrower's creditworthiness throughout the loan lifecycle. Rather than relying solely on upfront evaluations, this theory advocates for ongoing monitoring to mitigate risks before they fully materialize. Regular monitoring allows banks to detect early signs of distress and take corrective actions, such as renegotiating loan terms (Diamond, 1984). This approach can significantly reduce non-performing loans and improve overall financial performance, which is crucial in the Tanzania's volatile economic environment.

However, monitoring is resource-intensive, requiring substantial investments in technology and skilled personnel, often unaffordable for smaller Tanzanian banks. Excessive monitoring can also strain customer relationships and increase operational costs, potentially reducing profitability (Stiglitz & Weiss, 1981). The Agency Theory addresses the conflicts of interest between shareholders and management, particularly when bank managers engage in risky lending to achieve short-term gains by jeopardizing long-term stability. Jensen and Meckling (1976) suggest that appropriate governance mechanisms, such as performance-based incentives and regulatory oversight, can help to align management's interests with those of shareholders. However, this theory may not fully account for broader institutional challenges in developing countries like Tanzania, where regulatory mechanisms are often weak. Furthermore, it tends to overlook the role of external stakeholders, such as regulators and borrowers, in influencing CRM practices (Hart & Moore, 1990). The Stakeholder Theory expands on traditional views by advocating for banks to manage credit risks while considering the interests of all stakeholders, including borrowers, employees, and regulators. Donaldson & Preston (1995) argue that sustainable financial performance is achieved by balancing these interests. However, in highly competitive environments like Tanzania, prioritizing stakeholder interests over profitability could hinder financial performance (Freeman, 1984). Additionally, balancing conflicting stakeholder interests makes implementation of this theory challenging.

2.2 Empirical Literature Review

In this paper, the empirical literature review has been divided mainly into two sub-sections; the first section consists of an empirical literature review related to the effect of credit risk on financial performance. The other section is the empirical literature review on bank-specific drivers' effect on financial performance. In the hypothesis development, this paper employed the profitability of commercial banks, which is measured by Return On Assets (ROA), to present the financial performance of commercial banks (Siddique, Ahmed, & Kashif, 2021).

2.2.1 Credit Risk Management and Financial Performance

The relationship between Credit Risk Management (CRM) and the financial performance of commercial banks has been extensively examined in both developed and developing economies. In Tanzania, empirical studies have primarily focused on how CRM practices and bank-specific drivers such as capital adequacy, liquidity, and asset quality affect the financial performance of commercial banks. Numerous empirical studies support the claim that effective CRM significantly enhances financial performance. For example, Adeusi, Kolapo & Aluko (2014) conducted a study to examine Nigerian banks, and they found that CRM practices like loan monitoring and credit risk modeling were positively correlated with improved financial performance, as measured by ROA. Similarly, Al-Tamimi & Al-Mazrooei (2007) demonstrated that UAE banks with strong CRM systems, such as regular credit assessments and risk diversification, had significantly lower Non-Performing Loans (NPLs), positively impacting their profitability.

In the Tanzanian context, Kimei (2017), in his study, revealed that effective credit risk management strategies significantly reduce NPL ratios thus improving commercial banks' profitability. Magesa and Gwahula (2021) also found that banks with robust CRM practices recorded higher profit margins due to reduced loan defaults. However, despite the positive association, some researchers argue that the relationship between CRM and financial performance may be more complex. For instance, Mwenda (2018) suggested that overemphasis on CRM could result in excessive conservatism in lending, potentially hindering growth opportunities.

2.2.2 Bank-Specific Drivers and Financial Performance

Bank-specific factors like capital adequacy, liquidity, and asset quality have been identified as critical determinants of a bank's financial performance. According to Basel III guidelines, capital adequacy ensures that banks have sufficient capital buffers to absorb potential losses. In their study on East African banks, Muriithi, Muathe & Kilika (2016) found that higher capital adequacy ratios positively influence financial performance by providing stability and confidence during economic downturns. Liquidity, another key driver, ensures that banks can meet short-term obligations. In their study, Kashif, Ahmad & Siddique (2021) found a positive relationship between liquidity ratios and profitability in Pakistani banks, concluding that liquidity management is crucial in maintaining operational efficiency. Similar results were reported by Ndunguru (2019) in Tanzania, who discovered that banks with higher liquidity ratios outperformed their less liquid counterparts.

Asset quality, typically measured by the proportion of Non-Performing Loans (NPLs) to total loans, is a significant indicator of a bank's financial health. Studies by Muriithi, Ngugi & Mwaura (2016) and Bessis (2011) have shown that poor asset quality negatively impacts profitability by increasing the cost of provisioning for bad debts. In Tanzania, a study by

Tumaini and Venance (2020) found that banks with lower NPL ratios experienced better financial outcomes due to lower default risks.

Based on the empirical literature review, the following hypotheses are proposed.

H_4: There is a negative and significant relationship between asset quality and commercial banks' financial performance.

H_5: There is a negative and significant relationship between management efficiency and commercial banks' financial performance.

H_6: There is a positive and significant relationship between liquidity ratio and commercial banks' financial performance.

2.2.4 Research Gaps

Previous studies have demonstrated positive effects of Credit Risk Management (CRM) and bank-specific drivers on financial performance, but several gaps persist in the literature. Firstly, the majority of empirical research has concentrated on developed economies, with limited exploration of these relationships in the Tanzanian context (see, for example, Muriithi, Muathe & Kilika, 2016); Kimei, 2017). Additionally, many existing studies treat CRM and bank-specific drivers as separate entities thus failing to address the potential interaction effects between these variables (Al-Tamimi & Al-Mazrooei, 2007; Adeusi, Kolapo & Aluko, 2014). Another notable gap is the scarcity of longitudinal studies assessing CRM's long-term effects on financial performance, particularly during economic instability, such as the COVID-19 pandemic (Kashif, Ahmad & Siddique, 2021). Lastly, there is a pressing need to investigate the impact of technological advancements on CRM practices, especially in Tanzania, where digital banking is rapidly gaining ground (Mwenda, 2018).

3. Methodology

The methodology section of this study is designed to systematically examine the relationship between credit risk management, bank-specific drivers, and the financial performance of Tanzanian commercial banks. The research adheres to rigorous academic and ethical standards to ensure the credibility of the results. The study is underpinned by positivism, utilizes a deductive approach, and applies quantitative methods thus allowing for empirical testing of hypotheses.

3.1 Study Philosophy

This study adopts a positivist research philosophy, which posits that reality is objective and can be empirically measured. Positivism is well-suited to studies that quantify relationships between variables, such as the current investigation into credit risk, bank-specific drivers, and financial performance. This philosophical stance supports using observable data to derive knowledge and it ensures that findings are replicable and reliable. Saunders, Lewis & Thornhill (2019) assert that positivism is ideal for researches relying on quantitative data to explain phenomena, as is the case with this study. By adhering to this philosophy, the study ensures that the focus remains on objective measurement and that empirical evidence forms the basis of conclusions.

3.2 Research Design and Approaches

A deductive research design is employed in this study, wherein hypotheses are derived from existing theoretical frameworks and tested through empirical observation. The deductive approach is advantageous as it allows the study to build on established theories in credit risk

management and bank-specific drivers while contributing new insights specific to Tanzanian commercial banks (Bryman, 2016). This design provides a structured framework that guides the research process, thus ensuring that the study is grounded in prior knowledge and that its findings are theoretically sound and practically relevant.

A quantitative research method aligns with the study's positivist philosophy and deductive approach. This method involves collecting and analyzing numerical data and facilitating the testing of hypotheses related to the effects of credit risk management and bank-specific drivers on financial performance. Quantitative methods are preferred in this context due to their ability to produce generalizable findings, which can be applied to other similar settings (Creswell, 2018). The study employs a panel data set, which allows tracking of variables over time. However, challenges such as endogeneity and autocorrelation are acknowledged. To address these issues, the study uses the Generalized Method of Moments (GMM**)** model, which offers advantages over Ordinary Least Squares (OLS) regression by controlling for heterogeneity and correcting endogeneity through the use of instrumental variables (Siddique, Khan & Khan, 2022). The application of the GMM model thus enhances the robustness of the study's findings.

3.4 Model Specification

This study employs a panel data regression model because it provides more degrees of freedom, greater informational content, and less multicollinearity compared to cross-sectional or time-series models (Gujarati, 2004). The panel data regression model is as shown below:

$$Yit = ai + \mu 1\, x1t + \mu 2x2t + \mu 3\, x3t + \mu 4\, x4t + \mu 4\, x4t + \cdots + \text{e} \dots\dots\dots (3.1)$$

Where Y_{it} symbolizes the dependent variable for bank i in the time t. The equation parameter for bank i is denoted by a $x_{it,}$ which signifies the explanatory variables, μ signifies the coefficients among the banks, and e symbolizes the error term. The FEM model is given as follows.

$$Yit = \beta 0 + \beta 1Xit + \alpha i + uit \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. (3.2)$$

Where –αi (i=1....n) is the unidentified intercept for each bank (n credit risk level intercepts).
Yit is resenting the dependent variable, where i= bank and t= time.
X_{it} denotes one explanatory variable, β denotes the coefficient and u_{it} denotes the error term.
Therefore, by substituting the variables in the model, the following equations become the econometric models that were used to estimate the influence of credit risk and bank-specific factors on the financial performance (ROA) of commercial banks. The equations are illustrated as shown in equations (3.3) and (3.4) for ROA as dependent variables respectively.

$$ROA_{it} = \beta_0 + \beta_1 NPL_{it1} + \beta_2 LLP_{it2} + \beta_3 DR_{it3} + \beta_4 CAR_{it4} + \beta_5 LogA_{it5} + \beta_6 AGE_{it6} + uit \dots\dots\dots\dots\dots\dots\dots\dots\dots (3.3)$$

$$ROA_{it} = \beta_0 + \beta_1 NPL_{it1} + \beta_2 CER_{it2} + \beta_3 LR_{it3} + \beta_4 CAR_{it4} + \beta_5 LogA_{it5} + \beta_6 AGE_{it6} + uit \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.4)$$

where
β_0 =intercept β_1-β_6= estimated coefficient of independent variables and control variables.

uit = represents error terms for those variables that are omitted or added intentionally/unintentionally.

The GMM estimator effectively mitigates potential biases from unobserved heterogeneity and endogeneity, ensuring that the coefficients reflect the true relationships among the variables (Siddique, Khan & Qamar, 2021).

3.5 Data Collection

The study utilizes secondary data drawn from audited annual reports of Tanzanian commercial banks. These reports provide comprehensive data on credit risk management, bank-specific drivers, and financial performance indicators. The use of secondary data is justified by its relevance, accessibility, and the depth of insight it offers into the banks' operations. Secondary data also allow for examining trends over time thus strengthening the study's longitudinal analysis (Johnston, 2017). By focusing on audited reports, the study ensures that the data are accurate and reliable, further enhancing the validity of the findings.

3.6 Sampling Strategy and Sample Size

A purposive sampling strategy is employed, selecting 25 Tanzanian commercial banks based on their size, age, and availability of comprehensive financial data. This method ensures that the selected banks are representative of the broader population and provide the necessary data for an in-depth analysis. Purposive sampling is appropriate in this context because it targets institutions with relevant characteristics. It ensures that the findings can be generalized to the Tanzanian banking sector (Etikan, Musa & Alkassim, 2016). The sample comprises ten large banks, ten medium banks, and five small or regional banks, thus representing a wide range of financial institutions within Tanzania.

3.7 Data Analysis Techniques

Multiple regression analysis is used to explore the relationships between credit risk management, bank-specific drivers, and financial performance. This technique is selected for its ability to handle multiple independent variables simultaneously, thus allowing the study to examine the combined effects of different drivers on financial performance (Field, 2018). In addition to multiple regression, descriptive statistics, and correlation analyses are performed to summarize the data and investigate preliminary relationships among the variables. This comprehensive approach to data analysis ensures that the study's findings are robust and provide meaningful insights into the factors influencing the financial performance of Tanzanian commercial banks.

3.8 Operational Variables Definition

The key variables in this study include credit risk, bank-specific drivers, and financial performance. Credit risk is defined as the potential for a borrower to default on their loan obligations, with Non-Performing Loans (NPLs) and Loan Loss Provisions (LLPs) serving as proxies for this risk (Siddique et al., 2022). Bank-specific drivers refer to internal factors such as asset quality, management efficiency, and liquidity (Chimkono, Goma & Simataa, 2016). Financial performance is measured using the Return On Assets (ROA**)** ratio, which reflects a bank's ability to generate profit from its assets (Ahmed, 2009). The operationalization of these variables is critical in order to ensure that the study accurately captures the dynamics of the banking sector.

Table 1: Summary of explanatory variables and dependent variable

		Name of Variable	Symbol	Measurement	Sign
Dependent variable	Financial performance	Return on Asset	ROA	Net income/TA	N/A
Independent variable	Credit risk	Non-Performing Loans	NPLs	TNPLs/TL	-
		Loans loss provision	LLP	LLP/CL	-
		Default rate	DR	% L. outstanding	-
	Bank specific drivers	Bank Asset quality	NPLs	TNPLs/TL	-
		Mgt. efficiency	CER	TOC/TR	-
		Bank liquidity	LR	TL/TD	+
	Control Variable	Capital adequacy	CAR	RWA/TE	
		Bank size	Log A	Log (TA)	
		Age	Age	Age of banks	

Source: Author compilation

3.9 Ethical Considerations

This study adheres to strict ethical guidelines by ensuring that the confidentiality and anonymity of data are maintained. Since the research relies on secondary data, there is minimal direct ethical risk. However, the study has ensured that all data used are publicly available and that the findings are reported truthfully and without bias. Ethical considerations are paramount in ensuring that the study maintains integrity and adheres to best practices in research (BCBS, 2008).

4. Findings and Discussion

The paper provides empirical evidence on the effect of credit risk and bank internal factors on the financial performance of commercial banks in Tanzania. To analyze the dataset, first, the paper employs descriptive analysis to identify the big picture of the data used in this paper, then the correlation section, and finally, the regression results are discussed.

4.1 Descriptive Statistics

The descriptive statistics in Table 2 provide key insights into the impact of credit risk management and bank-specific drivers on the financial performance of Tanzanian commercial banks. The mean Return On Assets (ROA) is -0.0172, signaling overall negative profitability across banks, with a moderate dispersion (Std. Dev. = 0.0327). This suggests the need for improved credit risk management to enhance financial performance. The Non-Performing Loans (NPL) ratio averages 7.65%, indicating credit risk concerns, with significant variability (Std. Dev. = 0.0969), highlighting that some banks struggle with loan defaults while others manage

risk more effectively. The Loan Loss Provision (LLP) ratio averages 75%, reflecting the banks' substantial provisioning against potential loan losses, though the standard deviation (0.1237) shows varying provisioning strategies across banks. The Default Rate (DR) has a mean of 6.88%, but its high variability (Std. Dev. = 0.1839) suggests that certain banks face severe default issues, threatening their financial stability. Capital Expenditure Ratio (CER) and Liquidity Ratio (LR) display moderate averages (0.5465 and 0.4781, respectively), yet variability across banks suggests differences in capital investment and liquidity management. The Capital Adequacy Ratio (CAR) averages 17.41%, with variability that could impact banks' ability to absorb shocks. The average bank size (Log A) and age show substantial differences across banks, as reflected by the high standard deviations, suggesting that larger and older banks may be better positioned to manage credit risks. These findings emphasize the importance of tailored credit risk management strategies and highlight variability in bank-specific drivers that can impact financial performance.

Table 2: Descriptive statistics

Variable	Mean	Maximum	Std. Dev	Minimum	Observations
ROA	-0.0172	-0.09	0.0327	-0.14	250
NPL	0.07649	0.534	0.0969	0.271	250
LLP	0.7508	0.9909	0.1237	0.11	250
DR	0.0688	0.14	0.1839	0.9	250
NPL	0.07649	0.534	0.0969	0.271	250
CER	0.5465	0.1045	0.1041	0.6761	250
LR	0.4781	0.5621	0.3861	0.2581	250
CAR	0.1741	0.57	0.0621	0.09	250
Log A	25.5655	29.51	1.7658	21.5	250
AGE	20.5657	74	18.1508	1	250

Source: Author computation

4.2 Correlation Matrix Results

The correlation matrix and VIF results offer important insights into the relationships between the variables and potential multicollinearity issues in the study of credit risk management and bank-specific drivers affecting the financial performance of Tanzanian commercial banks. The correlation matrix reveals a moderate negative relationship between ROA and NPL (-0.404), indicating that higher levels of non-performing loans are associated with lower profitability. This suggests that effective management of NPLs could improve bank performance. A positive correlation exists between ROA and LLP (0.446) and DR (0.625), which implies that higher loan loss provisions and default rates tend to accompany increased profitability. However, this relationship may reflect cautious credit risk management practices aimed at mitigating financial losses. The correlation between DR and NPL is notably high (0.827), signaling that banks with higher non-performing loans also tend to experience greater default rates, reinforcing the need for robust credit risk management strategies. CER shows a moderate negative correlation with ROA (-0.336), indicating that increased capital expenditure could be linked to lower profitability, possibly due to higher operational costs.

The Variance Inflation Factor (VIF) results indicate no significant multicollinearity issues, as all values remain below the threshold of 10, with the highest VIF being 1.3 for AGE. This suggests that multicollinearity among the independent variables is minimal and it is unlikely to distort the

regression analysis results. Overall, the findings highlight the importance of managing non-performing loans, default rates, and capital expenditures to enhance the financial performance of commercial banks in Tanzania.

Table 3: Correlation Matrix Figures

Variables	ROA	NPL	LLP	DR	NPL	CER	CAR	LR	Log A	AGE	VIF
ROA	1										
NPL	-0.404	1									1.0
LLP	0.446	0.143	1								1.1
DR	0.625	0.827	0.11	1							1.1
NPL	-0.404	1	0.41	-0.403	1						1.0
CER	-0.336	-0.178	0.20	-0.058	-0.407	1					1.1
LR	0.066	0.041	0.41	0.231	0.308	0.356		1			1.0
CAR	0.021	0.032	0.02	0.494	0.402	0.448	1	0.433			1.1
Log A	0.005	0.007	0.45	0.001	0.023	0.034	0.034	0.023	1		1.0
AGE	0.166	0.07	0.04	0.399	0.241	0.189	0.268	0.189	0.238	1	1.3

Source: Author computation

4.3 Regression Results and Discussion

The regression results presented in Table 4 offer valuable insights into the relationship between credit risk management, bank-specific factors, and the financial performance of Tanzanian commercial banks. The model, estimated using the fixed effects Generalized Method of Moments (GMM), reveals a R-squared value of 0.633 and an adjusted R-squared value of 0.612, indicating that the independent variables account for approximately 61.2% of the variation in bank performance, as measured by ROA. The diagnostic tests, including the Ramsey RESET Test ($p = 0.132$), Shapiro-Wilk Test ($p = 0.079$), Breusch-Pagan Test ($p = 0.088$), and Durbin-Watson statistic (1.942), show that the model does not suffer from issues of misspecification, non-normality, or heteroscedasticity, and there is no evidence of autocorrelation in the residuals.

The negative and significant coefficient for Non-Performing Loans (NPL) (-1.418, $p < 0.01$) suggests that an increase in non-performing loans negatively impacts bank profitability. This result aligns with previous studies, such as Muriithi, Ngugi & Mwaura (2016) and Ozili (2019), which found that higher levels of NPLs tend to erode profitability due to the heightened risk of credit losses. Similarly, Loan Loss Provisions (LLP) show a negative and statistically significant effect on ROA (-0.122, $p < 0.05$), consistent with the findings of Beck, Jakubik & Piloiu (2013), who demonstrated that greater provisioning for loan losses reduced profitability.

Interestingly, the Default Rate (DR) exhibits a significant positive relationship with ROA (0.121, $p < 0.05$). This counterintuitive result suggests that banks may experience higher profitability despite rising defaults, potentially due to risk-adjusted pricing or effective collateral management

strategies. This complexity echoes the findings of Dimitrios, Konstantinos & Vassilis (2016), who noted the intricate dynamics of default risk and its influence on bank profitability.

The Capital Expenditure Ratio (CER) shows a significant negative coefficient (-1.035, $p < 0.01$), indicating that increased capital investments may reduce profitability due to elevated operational costs associated with capital projects. This outcome supports observations by Staikouras and Wood (2011). Conversely, the Capital Adequacy Ratio (CAR) demonstrates a positive influence on ROA (1.261, $p < 0.05$), suggesting that well-capitalized banks are better able to absorb shocks and enhance profitability, a finding consistent with Berger & Bouwman (2013).

Both the Liquidity Ratio (LR) and the natural logarithm of total assets (Log A) exhibit positive coefficients, although only LR is statistically significant at the 5% level (0.464, $p < 0.05$). This suggests that higher liquidity levels may contribute to increased profitability, as supported by Bourke (1989). Additionally, Log A's significance at the 5% level indicates that larger banks benefit from economies of scale, thus enhancing profitability.

Finally, Bank Age (AGE) does not appear to have a significant effect on ROA (3.981, $p = 0.846$), implying that a bank's age does not necessarily lead to improved financial performance. This finding contrasts with studies such as Căpraru and Ihnatov (2014), which suggested that older banks tend to be more resilient.

Table 4: Results of Regression Model Fixed Effect GMM)

Variable	Coefficient	Std. Error	t. Statistic	Prob.
Cons	16.229	36.654	- 0.407	0.685
NPL	-1.418	0.327	-4.337	0.000*
LLP	-0.122	0.322	-4.234	0.012**
DR	-0.121	0.328	4.761	0.000**
NPL	-0.178	0.823	-3.678	0.021*
CER	-1.035	0.564	-4.867	0.000*
LR	-0.464	0.438	-0.674	-0.463**
CAR	1.261	0.876	3.456	0.003**
Log A	0.010	0.264	1.784	0.038
AGE	3.981	0.784	0.874	0.846
R^2	0.633			
Adjusted R^2	0.612			
S.E of Regression	32.44			
Ramsey RESET Test (p-value)	0.132			
Shapiro-Wilk Test (p-value)	0.079			
Breusch-Pagan test (p-value)	0.088			
Durbin–Watson stat	1.942			
P-value (χ^2)	0.000			

Note(s): *Indicates significance at 1% level, ** Indicates significance at 5% level.

Source: Author computation

5. Conclusion and Policy Implications

5.1 Conclusion

The study concludes that credit risk management and bank-specific drivers significantly impact the financial performance of commercial banks in Tanzania. Non-Performing Loans (NPLs) and Loan Loss Provisions (LLP) are found to negatively affect the Return On Assets (ROA), suggesting that high levels of credit risk erode profitability. Conversely, a strong Capital Adequacy Ratio (CAR) and Liquidity Ratio (LR) positively influence bank performance, implying that well-capitalized and liquid banks are more resilient. These findings align with previous literature that emphasizes the importance of effective risk management in enhancing financial stability and performance.

5.2 Theoretical Implications

Aligned with the Credit Risk Modelling Theory and Monitoring Credit Risk Theory, this study provides empirical evidence supporting both frameworks' core tenets. Credit Risk Modelling Theory suggests that the accurate modeling of risk exposures allows banks to anticipate potential credit losses, which is consistent with the observed negative relationship between NPLs and ROA. The Monitoring Credit Risk Theory highlights the importance of consistent oversight and management of credit exposures, which is supported by the finding that better capitalized and liquid banks perform better financially. The study reinforces the idea that managing and monitoring credit risk is critical for maintaining bank profitability.

5.3 Practical Implications

From a practical standpoint, the study offers valuable insights for bank managers and practitioners. The negative impact of NPLs and LLP on profitability underscores the need for banks to enhance their credit risk management practices. This can be achieved through more stringent loan approval processes, better monitoring of borrowers, and enhanced provisioning strategies. According to Credit Risk Modelling Theory, improved predictive models should be adopted to reduce the likelihood of credit defaults. Monitoring Credit Risk Theory suggests that continuous oversight and real-time assessments of credit portfolios will mitigate potential losses. Banks should also strengthen their capital and liquidity buffers to safeguard against unexpected credit shocks.

5.4 Policy Implications

The findings suggest several policy recommendations. Regulators should focus on enforcing stricter capital adequacy and liquidity requirements to enhance the resilience of commercial banks against credit shocks. Policies that encourage the adoption of advanced credit risk models, particularly in predicting defaults and provisioning, would help to improve the financial system's stability. Additionally, there should be a focus on improving regulatory frameworks that ensure that banks regularly monitor credit exposures and adjust capital requirements based on the level of credit risk.

5.5 Limitations and Area for Further Study

The study, while comprehensive, has limitations that warrant further research. First, the analysis is restricted to Tanzanian commercial banks, which may limit the generalizability of the results to other contexts. Future research could extend the scope to include banks across different countries in East Africa or other emerging markets. Additionally, the study focuses primarily on bank-specific drivers, with less emphasis on macroeconomic factors that could influence credit

risk. Subsequent studies could explore how macroeconomic conditions, such as inflation and interest rates, interact with bank-specific drivers to affect financial performance. Lastly, further investigation into the role of digital transformation and financial technology (fintech) in mitigating credit risk could provide valuable insights into modern risk management practices.

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