

Credit Risk Management, Bank Size And Financial Performance: Evidence From Commercial Banks In Kenya

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Abstract

This study examines the interplay between credit risk management (CRM), bank size, and financial performance within Kenyan commercial banks, addressing a vital gap in understanding how bank-specific factors influence financial outcomes. Employing a descriptive research design, it analyzes secondary data from 42 banks over 2013–2022 using panel regression models. The focus is on CRM indicators—delinquency rate, value at risk, and distance to default—and their effects on financial performance, with bank size as a moderating variable. Findings reveal that delinquency rate and value at risk negatively impact financial performance, while distance to default shows a positive correlation. Notably, bank size significantly moderates this relationship, with larger banks experiencing a stronger positive effect of CRM on financial performance due to enhanced resources and risk management capabilities. Grounded in portfolio theory, the study underscores CRM's critical role in banking stability and provides empirical evidence from Kenya, suggesting that larger banks leverage scale to optimize CRM effectiveness. It offers actionable insights for bank managers to strengthen risk practices and for policymakers to tailor regulations supporting scale-related advantages, enhancing financial performance.

Key Words: *Credit risk management, financial performance, delinquency rate, value at risk, distance to default, and bank size*

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I. Introduction

The financial performance of commercial banks in Kenya is intricately tied to effective credit risk management (CRM), as loans constitute a primary revenue source through interest income (Bhattarai, 2016). Poor CRM, often evidenced by rising non-performing loans (NPLs), undermines this stability, leading to significant losses that erode profitability and threaten the credit system's integrity (Kagoyire & Shukla, 2016). Bank size plays a pivotal role in this dynamic, with larger banks potentially benefiting from greater resources and more sophisticated risk management frameworks, which could amplify the positive effects of CRM on financial performance. In Kenya, where the banking sector has faced challenges like the receivership of Chase Bank and Imperial Bank in 2015 due to inadequate risk management (CBK, 2015), understanding how CRM interacts with bank size is crucial for ensuring sustained financial health.

Globally, the importance of CRM in banking is underscored by events like the 2007 financial crisis, where poor risk management precipitated widespread bank failures (International Monetary Fund, 2011). Larger banks often exhibit resilience due to economies of scale and advanced risk mitigation strategies, outperforming smaller counterparts that struggle with limited resources (Moody, 2019). In Kenya, the rise in NPLs over the past

decade (Waithanji, 2016) has highlighted disparities in performance, with tier 1 banks like KCB and Equity thriving, while smaller institutions falter. This suggests that bank size may moderate the relationship between CRM and financial performance, enabling larger banks to better absorb credit losses and maintain profitability through robust risk controls (Aduda & Gitonga, 2011).

This study leverages portfolio theory (Markowitz, 1952) to frame CRM as a diversification strategy that minimizes credit risk's adverse effects on financial performance, with bank size enhancing this effect through resource advantages. Merton's default risk theory (1970) further informs the analysis by emphasizing the assessment of default probabilities, which larger banks may manage more effectively due to superior analytical capabilities. As Kenyan banks navigate economic fluctuations and regulatory pressures, exploring how CRM and bank size jointly influence financial performance offers critical insights for practitioners and policymakers aiming to bolster banking stability and competitiveness in a dynamic financial landscape.

Research Problem

Effective credit risk management (CRM) is essential for the financial performance of commercial banks in Kenya, enabling them to mitigate defaults and loan losses that directly impair profitability (Bhattarai, 2016). Poor CRM, marked by high non-performing loans (NPLs), destabilizes banks, as seen in the 2015 receivership of Chase Bank and Imperial Bank due to liquidity and risk management failures (CBK, 2015), while larger banks like KCB and Equity consistently demonstrate stronger performance (CBK, 2018). Bank size may moderate this relationship, with larger institutions potentially leveraging greater resources to enhance CRM's positive impact on financial performance, yet this dynamic remains underexplored in the Kenyan context. This study seeks to address why some banks excel financially while others falter, focusing on how CRM and bank size interact to shape outcomes.

Globally, the 2007 financial crisis highlighted CRM's critical role, with larger banks often weathering the storm better due to scale advantages in risk management (International Monetary Fund, 2011). Empirical studies show varied results: Shukla and Bajpai (2015) linked CRM to profitability in Rwanda, while Sujeewa (2015) found NPLs negatively affected Sri Lankan banks, both lacking Kenyan specificity and consideration of bank size as a moderator. In Kenya, rising NPLs signal persistent CRM challenges (Waithanji, 2016), yet the moderating effect of bank size on this relationship remains unclear, creating a contextual gap. This inconsistency and lack of focus on scale-driven differences justify further investigation into how CRM influences financial performance across banks of varying sizes.

Locally, studies like Orang'i (2018) and Nyabicha (2017) report mixed CRM impacts on Kenyan bank performance but fail to examine bank size's moderating role, presenting a conceptual and methodological gap. Larger banks may have superior risk frameworks, potentially amplifying CRM's benefits, while smaller banks might struggle, exacerbating financial vulnerabilities. This study addresses these gaps by analyzing CRM indicators—delinquency rate, value at risk, and distance to default—and their effect on financial performance, with bank size as a moderating factor, using secondary data from 2013–2022. It poses the research question: How does bank size influence the relationship between CRM and financial performance in Kenyan commercial banks?

II. Literature Review

Theoretical Foundation

Portfolio theory, developed by Markowitz (1952), anchors this study by framing credit risk management (CRM) as a diversification strategy critical to financial performance in Kenyan commercial banks. It posits that managing a loan portfolio's risk-return tradeoff—through indicators like delinquency rate, value at risk, and distance to default—can mitigate losses and enhance profitability. Bank size moderates this relationship, as larger banks may leverage scale to optimize diversification and risk management, potentially yielding stronger financial outcomes (Seibel, 2012). Critics note the theory's reliance on historical data and stable correlations, which may falter in volatile markets (Kairu, 2009), yet its emphasis on risk reduction aligns with examining how CRM, bolstered by bank size, drives financial performance.

Merton's default risk theory (1970) complements this framework by focusing on assessing borrower default probabilities, directly linking CRM to financial performance. It suggests that banks, particularly larger ones with advanced analytical tools, can better evaluate default risks (e.g., distance to default), reducing credit losses and supporting profitability (Jorion, 2014). While criticized for underestimating default risk in simpler applications (Jones, 1984), the theory's relevance lies in its ability to quantify CRM's impact on financial stability. For Kenyan banks, where larger institutions may have superior resources, this theory highlights how effective default risk management enhances financial performance.

Together, these theories provide a robust lens for analyzing CRM and financial performance, with bank size as a key moderator. Portfolio theory underscores diversification's role in stabilizing financial outcomes, while Merton's model emphasizes default risk assessment, both amplified by larger banks' capabilities. This study applies these principles to explore how CRM practices influence financial performance in Kenya, hypothesizing

that bank size strengthens this relationship by enabling more effective risk management, offering a tailored theoretical foundation for the banking sector's unique challenges.

Empirical Review

Rifqah and Hafinaz (2019) explored the impact of credit risk, liquidity, and capital adequacy on the profitability of four state-owned banks in Indonesia from 2007 to 2016, using indicators like Net Interest Margin (NIM), Return on Assets (ROA), Non-Performing Loan Ratio (NPLR), Loan to Deposit Ratio (LDR), and Capital Adequacy Ratio (CAR). Analyzing publicly available financial data, they found a significant negative relationship between profitability (NIM, ROA) and NPLR, LDR, and CAR, indicating that higher credit risk and liquidity constraints reduce financial performance. However, this study presents a conceptual gap for the current research, as it focuses on the effect of credit risk itself rather than credit risk management (CRM) practices, limiting its relevance to understanding how proactive risk management influences financial outcomes in Kenyan banks.

Kiyai (2018) investigated the influence of CRM on the financial performance of banks listed on the Nairobi Securities Exchange (NSE) in Kenya, employing a cross-sectional descriptive survey with secondary data from published financials. The study identified interest rates, capital adequacy, and liquidity as key CRM variables positively affecting performance, with six independent variables—including leverage, inflation rate, and firm size—explaining 13% of financial performance variability. While concluding that CRM significantly impacts performance, the study's use of bank-specific factors like size as control variables rather than moderators creates a methodological gap, leaving unexplored whether bank size could amplify or alter CRM's effect on financial performance, a critical focus of the current research.

Vighneswara (2015) examined bank profitability in India from 1997 to 2009 using panel data techniques, assessing determinants like credit risk and bank efficiency. The study found that priority sector credit did not significantly affect NPLs, challenging assumptions of rural credit aversion, and highlighted that capital adequacy and investment activity, not asset size, drive profitability. This presents a conceptual gap for the current study, as CRM was operationalized as credit risk exposure rather than management practices, reducing its applicability to understanding how deliberate CRM strategies, moderated by bank size, influence financial performance in Kenyan commercial banks.

Poghosyan and Cihak (2011) analyzed bank profitability determinants in the European Union from 1990 to 2006, finding that credit risk, efficiency, and bank size significantly affect financial performance. However, by treating bank size as a control variable rather than a moderator, the study overlooks its potential to influence the strength of the CRM-financial performance relationship, presenting a methodological gap. Additionally, its CRM measures exclude specific indicators like distance to default and value at risk, limiting its alignment with the current study's focus on how bank size moderates CRM's impact on Kenyan banks' financial performance.

Athanasoglou, Brissimis, and Delis (2008) studied bank profitability in South-Eastern Europe from 1998 to 2002, identifying bank-specific factors like size, capital, and credit risk as significant drivers alongside macroeconomic factors. Their findings emphasize credit risk's role in financial performance but treat bank size as a control variable, not a moderator, creating a methodological gap relevant to the current research. This approach fails to explore how larger Kenyan banks might leverage size to enhance CRM's effect on financial performance, a key question this study addresses using specific CRM indicators and bank size as a moderating factor.

III. Research Methodology

This study adopted a positivist research philosophy and a descriptive research design to investigate the relationship between credit risk management (CRM), bank size, and financial performance among 42 commercial banks in Kenya as of December 31, 2022. The positivist approach facilitated hypothesis testing using quantitative secondary data extracted from financial reports spanning 2013 to 2022, sourced from the Central Bank of Kenya (CBK) and individual bank annual reports. This 10-year period provided a robust dataset to capture recent trends, with financial performance measured via the CAMEL model (Capital Adequacy, Asset Quality, Management Capacity, Earning Ability, and Liquidity) and CRM assessed through delinquency rate (past due loans divided by total loans), value at risk (total loans divided by total assets), and distance to default (net operating income divided by total debt service). Bank size, as the moderating variable, was operationalized using the natural logarithm of total assets, reflecting banks' scale and resource capacity.

Data analysis employed panel regression models, supported by diagnostic tests to ensure the validity of the classical linear regression model (CLRM), including multicollinearity (correlation matrix, VIF < 0.8), autocorrelation (Durbin-Watson, 1.5–2.5), heteroskedasticity (Breusch-Pagan, $p > 0.05$), normality (Kolmogorov-Smirnov, $p > 0.05$), and stationarity (Augmented Dickey-Fuller). The Hausman test determined the use of fixed or random effects models. Descriptive statistics summarized the data, while multiple regression tested CRM's direct effect on financial performance, and a three-step moderation analysis (Baron & Kenny, 1986) assessed bank size's moderating role by including an interaction term (CRM indicator $\times$ bank size). Significant

coefficients and changes in R-squared indicated bank size's influence on the CRM-financial performance relationship, providing a rigorous framework to evaluate how scale enhances CRM's impact in Kenyan banks.

IV. Findings And Discussion

The three steps for moderation were used to achieve the objective of this study. In step 1 (Model 1), regression analysis estimated the relationship between financial performance and each of the credit risk management indicators (delinquency rate, value at risk and distance to default).

Table 1: Credit Risk Management Indicators and Financial Performance

Financial performance	Coef.	Std. Err.	P>t
Delinquency rate	-1.004*	0.021	0.007
Value at risk	-1.646*	0.234	0.000
Distance to default	1.028*	0.036	0.001
_cons	1.234*	0.461	0.000
Model Summary			
R-squared	0.5613		
F(3, 290)	143.24		
Prob > F	0.0000		
Observations	291		

* p<0.05

The overall model was statistically significant because the F-test statistic was statistically significant ($F(3, 290) = 143.24, p < 0.05$). The study findings show that the delinquency rate ($\beta = -1.004, p < 0.05$) of commercial banks in Kenya significantly predicts financial performance of commercial banks in Kenya, suggesting that for every unit rise in delinquency rate, the financial performance decreases by 1.004 units. The findings further showed that value at risk ($\beta = -1.646, p < 0.05$) is also a significant predictor of financial performance. This suggests that for every unit rise in value at risk, the financial performance decreases by 1.646 units. The findings further showed that distance to default ($\beta = 1.028, p < 0.05$) is also a significant predictor of financial performance. This suggests that for every unit rise in distance to default, the financial performance improves by 1.028 units.

In Step 2 (Model 2), the association among the criterion, moderator, and predictor variables (credit risk management indicators, measured by delinquency rate, value at risk and distance to default) was assessed using the panel regression analysis Hausman test as a guide. A statistically significant regression model is required. To determine whether bank size moderates the relationship between financial performance and delinquency rate, financial performance was regressed on delinquency rate and bank size. F-test statistic was statistically significant, which means that the regression model was statistically significant, $F(2, 290) = 7.95, p < 0.05$. Additionally, Table 2 reveals that both delinquency rate and bank size regression coefficients were statistically significant ($p < 0.05$).

Table 2: Delinquency Rate, Bank Size and Financial Performance

Financial performance	Coef.	Std. Err.	P>t
Delinquency rate	-1.488*	0.427	0.000
Bank size	0.561*	0.290	0.027
_cons	3.164*	0.145	0.000
R-squared	0.089		
F(2, 290)	7.95		
Prob > F	0.0003		

* p<0.05

In step 3, Model 3, financial performance was regressed on bank size, credit risk management indicators, and interaction term created by multiplying the centered credit risk management indicators (independent variable) and centered moderator (bank size). The interaction term should be statistically significant if there is a moderating influence.

The relationship between delinquency rate (independent variable), bank size (moderator), the interaction term (Size*delinquency), and financial performance (dependent variable) was estimated using Fixed-effects regression. This study showed that delinquency rate ($\beta = -1.434, p < 0.05$) significantly influences financial performance, as shown in Table 3.

Table 3: Interaction Term for Delinquency Rate and Bank Size

Financial performance	Coef.	Std. Err.	P>t
Delinquency rate	-1.434*	0.363	0.002
Bank size	0.577*	0.205	0.023
Size*delinquency	-0.798*	0.443	0.017
_cons	3.216*	0.125	0.000
R-squared	0.096		

F(3, 290)	8.46		
Prob > F	0.0000		

* p<0.05

Bank size ($\beta = 0.577$, $p < 0.05$), also has a significant influence on financial performance. The result of the F-test was statistically significant ($p < 0.05$). The R^2 -value of 0.096 indicates that the independent variable (delinquency rate), the moderator (bank size), and the interaction term (Size*delinquency) account for 9.6% of the variance in financial performance. The results in Table 3 also reveal that the interaction term (Size*delinquency) was also statistically significant ($\beta = -0.798$, $p < 0.05$).

To determine whether bank size moderates the relationship between financial performance and value at risk, financial performance was regressed on value at risk and bank size. F-test statistic was statistically significant, which means that the regression model was statistically significant, $F(2, 290) = 8.13$, $p < 0.05$. Furthermore, the model regression coefficients of value at risk and bank size were statistically significant ($p < 0.05$), per Table 4.

Table 4: Value at Risk, Bank Size and Financial Performance

Financial performance	Coef.	Std. Err.	P>t
Value at risk	-1.844*	0.419	0.000
Bank size	0.586*	0.213	0.012
_cons	4.336*	0.263	0.000
R-squared	0.093		
F(2, 290)	8.13		
Prob > F	0.0000		

* p<0.05

The relationship between value at risk (independent variable), bank size (moderator), the interaction term (Size*value at risk), and financial performance (dependent variable) was estimated using Fixed-effects regression. The results are as shown in Table 5.

Table 5: Interaction Term for Value at Risk and Bank Size

Financial performance	Coef.	Std. Err.	P>t
Value at risk	-1.667*	0.415	0.000
Bank size	0.601*	0.203	0.011
Size*value at risk	-0.801*	0.139	0.009
_cons	4.321*	0.282	0.000
R-squared	0.153		
F(3, 290)	9.63		
Prob > F	0.0000		

* p<0.05

This study indicated that value at risk ($\beta = -1.667$, $p < 0.05$) is a significant predictor of financial performance. Bank size ($\beta = 0.601$, $p < 0.05$) also has a significant influence on financial performance. F-test statistic was statistically significant ($p < 0.05$), and therefore, the regression model was statistically significant. According to Table 5.21, the interaction term (Size*value at risk) was also statistically significant.

To determine whether bank size moderates the relationship between financial performance and distance to default, financial performance was regressed on distance to default and bank size. F-test statistic was statistically significant, which means that the regression model was statistically significant, $F(2, 290) = 8.64$, $p < 0.05$. Furthermore, the model regression coefficients of distance to default and bank size were statistically significant ($p < 0.05$), per Table 6.

Table 6: Distance to Default, Bank Size and Financial Performance

Financial performance	Coef.		Std. Err.	P>t
Distance to default	1.817*		0.388	0.000
Bank size	0.583*		0.198	0.003
_cons	4.789*		0.037	0.000
R-squared	0.116			
F(2, 290)	8.64			
Prob > F	0.0000			

* p<0.05

The relationship between distance to default (independent variable), bank size (moderator), the interaction term (Size*distance to default), and financial performance (dependent variable) was estimated using Fixed-effects regression. The results are as shown in Table 7.

Table 7: Interaction Term for Distance to Default and Bank Size

Financial performance	Coef.	Std. Err.	P>t
Distance to default	1.702*	0.373	0.000
Bank size	0.632*	0.201	0.008
Size*distance to default	1.824*	0.133	0.000
_cons	4.321*	0.282	0.000
R-squared	0.217		
F(3, 290)	9.63		
Prob > F	0.0000		

* p<0.05

This study indicated that, distance to default ($\beta = 1.702$, $p < 0.05$) is a significant predictor of financial performance. Bank size ($\beta = 0.632$, $p < 0.05$) also has a significant influence on financial performance. F-test statistic was statistically significant ($p < 0.05$), and therefore, the regression model was statistically significant. According to Table 7, the interaction term (Size*distance to default) was also statistically significant.

H_a investigated whether bank size has a moderation effect on the link between credit risk management and financial performance by suggesting that, bank size does not significantly moderate the association between credit risk management and financial performance of commercial banks in Kenya. Each of the credit risk management indicators was analyzed separately. This study indicates that, bank size has a moderation influence on the link among credit risk management indicators and the financial performance of commercial banks in Kenya since both of the credit risk management indicators fulfilled all of the above Baron and Kenny's (1986) steps for testing the moderating influence as indicated in Tables 5.17 to 5.23. So the research rejected H_{3a}.

V. Conclusions And Recommendations

This study concludes that credit risk management (CRM) significantly influences the financial performance of Kenyan commercial banks, with delinquency rate and value at risk exhibiting a negative impact, while distance to default positively correlates with performance. These findings highlight the dual nature of CRM's effects: poor management of loan defaults and risk exposure erodes profitability, whereas maintaining a buffer against defaults strengthens financial stability. Bank size emerges as a critical moderator, amplifying CRM's positive effect on financial performance in larger banks, likely due to their superior resources, advanced risk management systems, and economies of scale. This underscores the advantage larger Kenyan banks have in leveraging CRM to enhance profitability, offering empirical evidence that scale matters in translating risk management into financial success.

For policy and practice, regulators should refine frameworks to emphasize CRM indicators—delinquency rate, value at risk, and distance to default—tailoring requirements to encourage larger banks to capitalize on their scale while supporting smaller banks to strengthen risk practices. Bank managers, particularly in larger institutions, should prioritize robust CRM systems, investing in technology to monitor and mitigate credit risks effectively, ensuring sustained financial performance. Policymakers could also facilitate growth opportunities for smaller banks through incentives or mergers, enabling them to build scale and resilience akin to larger peers. These recommendations align with the study's objective to elucidate how CRM and bank size jointly shape financial performance, fostering a more stable and competitive Kenyan banking sector.

Areas For Further Research

Future research could expand the understanding of how credit risk management (CRM) and bank size influence financial performance in Kenyan commercial banks by exploring additional contextual and operational factors specific to bank scale. Investigating the role of technological advancements, such as artificial intelligence and machine learning, in enhancing CRM practices across banks of different sizes could reveal how innovation amplifies financial outcomes, particularly for larger institutions with greater resources. Comparative studies across other African nations or emerging markets could test the generalizability of bank size's moderating effect, uncovering regional variations in CRM's impact on performance. Additionally, qualitative approaches, such as interviews with bank managers from small and large institutions, could provide deeper insights into the practical challenges and strategies of scaling CRM, complementing this study's quantitative findings and offering a more holistic view of size-driven dynamics in banking performance.

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