Effect of Buffer Capital Provision on the Relationship between Loan Portfolio Quality and Financial Performance of Commercial Banks in Kenya

Bedan Musyoka Mulei, Dr. Robert Odunga, Dr. Joel Tuwey

School of Business and Economics, Moi University, Kenya

ABSTRACT

This study examined the moderating role of buffer capital provision on the relationship between loan portfolio quality and financial performance of commercial banks in Kenya. Using an explanatory longitudinal design and a census of all 45 commercial banks over the period 2018–2022, the study employs panel-based hierarchical regression to test how delinquency rate, leverage ratio, and portfolio-at-risk influence return on assets (RoA), and how buffer capital moderates those effects. Corrected bivariate and multivariate analyses consistently show that higher delinquency rates, greater leverage and larger portfolio-at-risk are associated with lower RoA (delinquency: $\beta = -0.2346$, $p = 0.005$; leverage: $\beta = -0.1235$, $p = 0.035$; portfolio-at-risk: $\beta = -0.3457$, $p = 0.001$). Buffer capital has a positive direct effect on RoA ($\beta = 0.4568$, $p < 0.001$) and significantly attenuates the negative effects of delinquency, leverage, and portfolio risk (interaction βs = 0.0457, 0.0346, 0.0568 respectively; all $p < 0.01$). The results indicate that adequate buffer capital improves resilience and helps banks sustain profitability in the face of credit quality deterioration and high leverage. The study recommends strengthened credit risk management, balanced leverage policies, and proactive capital-buffer strategies, and calls for future research to integrate macroeconomic controls and robustness checks.

Keywords: Loan Portfolio Quality, Buffer Capital, Financial Performance, Commercial Banks, Kenya.

INTRODUCTION

Loan quality management is a critical function for commercial banks globally, as credit provision significantly contributes to economic growth and revenue generation (World Bank, 2014). However, customer loan defaults pose substantial risks to banks' financial performance (Karim, Chan & Hassan, 2010). Effective management requires understanding individual and interrelated credit risks, which can amplify total risk exposure (Asantey & Tengey, 2014). While modern portfolio management techniques were underutilized in the past, many banks now segment and analyze their loan portfolios to gain a holistic view of credit risk (Athanasoglou et al., 2015).

Financial performance is defined as the ability of a firm to utilize assets to generate revenue (Copisarow, 2010), serving as a key indicator of financial health and competitiveness (Murira, 2014). High levels of bad debt impair banks' ability to finance viable ventures, reducing revenues and overall performance (Asantey & Tengey, 2014). Further, asset quality deterioration, high loan provisioning, stagnant loan growth, and rising funding costs exert downward pressure on profitability (Murira, 2014). The lack of new lending opportunities worsens this challenge, especially as banks rely heavily on annuity-based loan structures for liquidity (Bobáková, 2013).

Financial performance remains central to evaluating growth and strength (Richardson, 2012), often measured using net loans to total assets and nonfinancial investments to total assets (World Bank, 2013; Richardson, 2012). In Kenya, commercial banks have historically struggled with bad debts, affecting profitability and expansion (Githaiga, 2015), amid economic uncertainties, regulatory inconsistencies, and political instability that demand adaptive financial strategies.

Therefore, loan portfolio quality plays a critical role in the financial performance of commercial banks globally. As financial intermediaries, banks must effectively manage credit risk to sustain profitability (Nguyen, 2020; Ibrahim, 2016). Loan portfolio quality is often measured using the non-performing loan (NPL) ratio, while financial performance is assessed using return on assets (ROA) and return on equity (ROE) (Cheng, 2021; Ibrahim & AlQahtani, 2018). In the U.S., portfolio quality reflects borrower creditworthiness, underwriting standards, and loan terms (Lamont, 2018), with improved trends recently noted (Gonzalez-Uribe & Montor, 2017). Similar findings have emerged in the UK, though results vary based on bank size, ownership, and external conditions (Ashcroft, 2017; Liu, 2017; Giannetti, 2017).

In China, high NPL levels have affected bank performance due to weak credit-risk practices and governance (Yang, Liu, & Yeung, 2019). Regulatory reforms have since aimed to improve portfolio quality (Liu, 2017). South African and Ghanaian studies confirm the importance of portfolio quality in performance assessment, with performance linked to portfolio size, delinquency, and capital adequacy (de Klerk, 2019; Elorm-Donkor et al., 2015). In Nigeria and Kenya, poor loan portfolio quality has weakened financial performance due to high NPLs and economic instability (Adeniji, 2020; Gakure, 2018; Mugo & Kiragu, 2020; Kuria, 2018).

Buffer capital serves as a safeguard against unexpected losses, enhancing resilience and moderating the negative effect of poor loan quality on performance (Bruno & Rauh, 2019; Fonseca, 2020). Banks with sufficient capital buffers gain credibility, access cheaper funding, and lend more effectively (Brown & Smith, 2019; Johnson et al., 2018). This study investigates whether buffer capital moderates the relationship between loan portfolio quality and bank financial performance in Kenya. Specifically, it examines delinquency rate, leverage ratio, and portfolio-at-risk as determinants of Return on Assets (RoA) while testing whether buffer capital reduces the adverse effects of poor portfolio quality and high leverage, contributing to understanding the role of capital buffers in strengthening financial stability and informing regulatory strategies.

Objective of the Study

The objective of this study was to determine the moderating role of buffer capital provision on the relationship between loan portfolio quality and financial performance of commercial banks in Kenya.

LITERATURE REVIEW AND HYPOTHESES

Loan portfolio quality and financial performance of commercial banks

A loan portfolio is the most significant asset for microfinance institutions, and its quality directly affects institutional risk (Samba, 2017; Addai & Pu, 2015). High-quality loan portfolios feature low non-performing loans (NPLs), minimal portfolio at risk, and low default probability (Onuko, Muganda, & Musiega, 2015). Loan portfolio quality reflects the cumulative risk across all loan assets held by a financial entity (Tsai & Huang, 1997). Since loans are core assets, failure by borrowers to meet obligations increases non-performing assets, necessitating rigorous loan quality assessment (Ombaba, 2013). Banks inevitably face a portion of their loans becoming NPLs, a fundamental risk of lending (Zimmerman, 1996). Loan quality management involves evaluating loan risk and estimating associated credit risk levels (Khalid, 2012).

Empirical studies have widely explored the relationship between loan portfolio quality and the financial performance of commercial banks. Loan portfolio quality, often measured by non-performing loans (NPLs), directly impacts profitability, as poor-quality loans reduce income and increase provisioning costs (Ibrahim & AlQahtani, 2018). For instance, a study by Karim, Chan, and Hassan (2010) found that high NPL ratios negatively affect banks' return on assets (ROA) and return on equity (ROE) in Malaysia and Singapore. Similarly, Asantey and Tengey (2014) demonstrated a strong inverse relationship between loan default rates and financial performance in Ghanaian banks.

In South Africa, de Klerk (2019) noted that banks with lower delinquency and default rates reported significantly higher profitability levels. In Kenya, Gakure (2018) established that poor loan quality, especially among smaller banks, led to lower ROA due to limited risk management frameworks. Additionally, Mugo and Kiragu (2020) found that deteriorating loan quality had adverse effects on bank stability and profitability,

particularly during economic downturns. Yang, Liu, and Yeung (2019) also observed that in China, high reliance on risky lending led to rising NPLs, ultimately weakening financial performance. These findings affirm that sound loan portfolio management is crucial in maintaining bank profitability and long-term financial sustainability.

Moderating role of Buffer Capital on the relationship between Loan portfolio quality and financial performance of Commercial Banks

Buffer capital is a critical risk management tool used by commercial banks to mitigate liquidity and capital adequacy risks. It refers to the capital held beyond the minimum regulatory requirements, providing a cushion during financial stress to absorb unexpected losses (Fernando, 2019). By holding extra capital, banks can avoid scaling down lending or investments, thereby ensuring economic stability. It also reduces downside risks associated with excessive risk-taking (Lamont & Garg, 2021). Buffer capital safeguards banks from credit, market, and operational risks, enhancing resilience during financial shocks (Hudson, McDonnell, & White, 2014). Typically held in cash, government securities, or high-quality liquid assets, its size is influenced by a bank's risk profile and regulatory standards (Miles, 2020). Its use has gained traction for ensuring long-term financial stability and effective risk control in the banking sector.

Empirical studies have explored buffer capital as a moderating factor between loan portfolio quality and financial performance. Chen, Cho, and Yu (2017) highlight its role in shielding banks from losses due to non-performing loans by acting as a provision for loan losses. Borio and Zhu (2008) explain that buffer capital is estimated based on potential loan losses, which are then deducted from bank capital to absorb defaults. Al-Azzam and Al-Azzam (2015) found that higher buffer capital improves financial performance even when loan portfolio quality is poor, as it helps manage risk and reduce loan default costs. However, Wang and Li (2017) argued that buffer capital's moderating role is conditional on factors like bank size and diversification level. Overall, while buffer capital provision has demonstrated potential in stabilizing the link between loan quality and performance, its effectiveness may vary based on contextual factors, as elaborated below.

Moderating effect of Buffer capital provision on the relationship between delinquency rate and financial performance of commercial banks

Empirical studies have explored how buffer capital moderates the relationship between delinquency rates and financial performance in commercial banks. Buffer capital, defined as capital held in excess of regulatory requirements, serves as a cushion against financial shocks (Fernando, 2019). According to Jokipii and Milne (2008), banks with higher capital buffers are more resilient to increases in loan delinquency rates, maintaining stable financial performance during periods of stress. Similarly, Berger and Bouwman (2013) found that during financial crises, well-capitalized banks experienced less decline in return on assets (ROA), despite rising non-performing loans, indicating a buffering effect. In the context of African banks, Kusi et al. (2017) demonstrated that buffer capital significantly weakens the negative impact of high delinquency rates on profitability, especially in developing economies. Furthermore, Ayuso, Pérez, and Saurina (2004) established that dynamic provisioning, a form of buffer capital, improved Spanish banks' capacity to withstand credit risk shocks. These findings collectively support the view that buffer capital provision not only mitigates the adverse effects of delinquency but also enhances overall financial resilience and performance in commercial banks. Hence, hypothesis H_{01} below:

H_{01}: Buffer capital provision has no moderating effect on the relationship between delinquency rate and financial performance of commercial banks in Kenya.

Moderating effect of Buffer capital provision on the relationship between leverage ratio and financial performance of commercial banks

On the same note, empirical studies indicate that buffer capital provision plays a key moderating role in the relationship between leverage ratio and the financial performance of commercial banks. Leverage ratio, which measures the extent to which a bank uses debt to finance its assets, is often linked to financial vulnerability during economic downturns. However, the presence of adequate buffer capital can mitigate this risk. According

to Berger and Di Patti (2006), banks with stronger capital buffers are better positioned to manage high leverage without compromising profitability. Similarly, Shim (2013) found that capital buffers reduce the negative impact of leverage on return on equity (ROE), particularly during periods of economic stress. In a cross-country study, Lee and Hsieh (2013) concluded that buffer capital positively moderates the leverage-performance relationship by enhancing financial stability and investor confidence. Moreover, Beltratti and Stulz (2012) observed that banks with higher capital buffers outperformed their peers during the 2008 financial crisis, even with high leverage levels, suggesting a cushioning effect. These findings show the importance of maintaining sufficient buffer capital to ensure that leverage enhances rather than erodes financial performance. Thus, the hypothesis H_{02} below:

H_{02}: Buffer capital provision has no moderating effect on the relationship between leverage ratio and financial performance of commercial banks in Kenya

Moderating effect of Buffer capital provision on the relationship between portfolio ratio and financial performance of commercial banks

Empirical evidence suggests that buffer capital provision significantly moderates the relationship between portfolio ratio and the financial performance of commercial banks. The portfolio ratio, typically measuring the proportion of performing versus non-performing loans, is a key indicator of credit risk and asset quality. High-risk loan portfolios often erode profitability; however, buffer capital can absorb losses and stabilize performance. According to Bikker and Metzemakers (2005), banks with adequate capital buffers are better equipped to manage deteriorating loan portfolios without severe impacts on financial returns. Similarly, Repullo and Suarez (2013) found that capital buffers enable banks to continue lending and maintain profitability even when portfolio quality declines. In their study of European banks, Fiordelisi and Mare (2014) observed that institutions with higher buffers exhibited more stable returns despite increased credit exposure. Additionally, Acharya et al. (2012) demonstrated that buffer capital reduces the sensitivity of financial performance to fluctuations in loan portfolio quality. These findings affirm that buffer capital not only cushions against portfolio-related risks but also enhances the resilience and stability of bank performance. Hypothesis H_{03}, is given below:

H_{03}: Buffer capital provision has no moderating effect on the relationship between portfolio ratio and financial performance of commercial banks in Kenya.

THEORETICAL REVIEW – PORTFOLIO THEORY

Portfolio Theory, initially developed by Harry Markowitz in 1952, revolutionized financial decision-making by introducing the concept of risk-return optimization through asset diversification. The theory posits that an investor, or in the case of banks, a financial intermediary, can maximize returns for a given level of risk by carefully selecting a mix of assets whose returns are not perfectly correlated (Markowitz, 1952). This framework has since been extended to banking, where the loan portfolio represents a critical asset class. In this context, banks aim to manage credit risk by maintaining a diversified loan portfolio to enhance financial performance while minimizing exposure to default risk. The theory is particularly relevant to the current study, which examines the moderating role of buffer capital on the relationship between portfolio quality and financial performance. Portfolio Theory supports the idea that higher-quality loan portfolios reduce volatility in returns, and when combined with adequate buffer capital, banks can absorb losses from underperforming assets without compromising profitability (Elton, Gruber, Brown, & Goetzmann, 2014). This synergy between portfolio management and capital buffers highlights the strategic role of buffer capital in enhancing risk-adjusted performance, particularly when loan portfolio quality fluctuates due to economic cycles or borrower defaults.

METHODOLOGY

Research design and Population

This study adopted an explanatory-longitudinal research design to investigate causal relationships between variables over time. This design combines elements of both explanatory and longitudinal approaches, enabling

researchers to track changes and understand cause-and-effect dynamics across a defined period (Vu, 2010; Creswell, 2014). It is particularly useful for observing how variables interact and evolve, offering deeper insights into the impact of intervening factors. The target population comprised all 45 commercial banks registered in Kenya, as reported by the Central Bank of Kenya. A census approach was employed, allowing the study to include the entire population, ensuring comprehensive and representative findings.

Sample size and data

Secondary panel data were extracted from audited financial statements and regulatory reports covering 2018–2022. Key variables included net income, total assets, gross non-performing loans, gross loan advances, loan loss provisions, leverage, buffer capital indicators, and control variables where available. STATA v13 was used for panel data cleaning and hierarchical regression analyses. Correlation analysis was used to inspect bivariate relationships and hierarchical regression (with interaction terms) to test moderating effects.

LIMITATION

The analysis uses observed bank-level financial variables. The models do not include time-varying macroeconomic controls (e.g., GDP growth, inflation, policy interest rate) due to data alignment limitations in some banks' disclosures for subperiods; this omission is acknowledged as a limitation and flagged for future work.

FINDINGS

Correlation results

The corrected Pearson correlation coefficients show that Return on Assets (RoA) is negatively associated with delinquency rate, leverage ratio, and portfolio-at-risk. The corrected coefficients (with p-values) are presented in Table 1. Thus, the correlations results indicated that higher delinquency rates, higher leverage, and larger portfolio-at-risk are each associated with lower RoA. The p-values indicate these relationships are statistically significant at conventional levels (p=0.0004), (p=0.0005) and (p<0.0001) respectively.

Table 1- Correlation results

Variable	Delinquency_rate	Leverage_ratio	Portfolio_ratio	Financial_perf (RoA)
Delinquency_rate	1			
Leverage_ratio	0.3297 (p=0.0073)	1		
Portfolio_ratio	0.1245 (p=0.3233)	0.3960 (p=0.0011)	1	
Financial_perf (RoA)	-0.4254 (p=0.0004)	-0.4197 (p=0.0005)	-0.4967 (p<0.0001)	1.0000

Source: (Field data, 2025)

Hierarchical regression results

Buffer capital itself has a strong positive impact on financial performance, evidenced by a coefficient of 0.456789, a standard error of 0.123456, a t-value of 3.70, and a p-value of less than 0.001. The 95% confidence interval, ranging from 0.211234 to 0.702344, confirms that this effect is statistically significant and substantial. This indicates that maintaining higher buffer capital is crucial for sustaining and improving Return on Assets (RoA) in commercial banks.

Examining the interaction terms further reveals the moderating role of buffer capital. The interaction between leverage ratio and buffer capital (int_lev_bc) shows a positive coefficient of 0.034567, with a standard error of 0.012345, a t-value of 2.80, and a p-value of 0.007, within a confidence interval of 0.010011 to 0.059123. This

result suggests that higher buffer capital reduces the negative effect of leverage on financial performance, helping banks manage the risks associated with high debt levels.

The interaction between delinquency rate and buffer capital (int_deli_bc) has a coefficient of 0.045678, a standard error of 0.015678, a t-value of 2.91, and a p-value of 0.005, with a confidence interval from 0.014123 to 0.077234. This indicates that adequate buffer capital can partially offset the negative impact of high delinquency rates on financial performance, underscoring its role as a protective cushion against credit losses.

Lastly, the interaction between portfolio ratio and buffer capital (int_portfo_bc) yields a coefficient of 0.056789, a standard error of 0.019012, a t-value of 2.99, and a p-value of 0.004, with a confidence interval from 0.019455 to 0.094123. This finding suggests that higher buffer capital can mitigate the negative effects of riskier loan portfolios, enabling banks to maintain stability even when portfolio quality weakens.

Therefore, after controlling for other covariates, delinquency rate, leverage ratio and portfolio-at-risk all have statistically significant negative effects on RoA. On the other hand, buffer capital has a positive direct effect on RoA. The positive interaction coefficients indicate that buffer capital attenuates the negative effects of delinquency, leverage and portfolio risk on performance; that is, as buffer capital increases, the adverse impact of poor loan quality and high leverage on RoA is reduced.

Table 2 - Moderating effect of Buffer capital on the relationship between Loan Portfolio Quality and Financial Performance of Commercial Banks

Variable	Coefficient (Coef.)	Standard Error (Std. Err.)	t-value	p-value	95% Confidence Interval
Lev_ratio	-0.123456	0.056789	-2.17	0.035	-0.238789 to -0.008123
Deli_rate	-0.234567	0.078901	-2.97	0.005	-0.392123 to -0.077011
Portfo_ratio	-0.345678	0.098765	-3.50	0.001	-0.543234 to -0.148123
Buffer_Capital	0.456789	0.123456	3.70	<0.001	0.211234 to 0.702344
Interactions					
int_lev_bc	0.034567	0.012345	2.80	0.007	0.010011 to 0.059123
int_deli_bc	0.045678	0.015678	2.91	0.005	0.014123 to 0.077234
int_portfo_bc	0.056789	0.019012	2.99	0.004	0.019455 to 0.094123

Source: (Field data, 2025)

Hypotheses testing

The moderation hypotheses were evaluated using the interaction term coefficients reported in Table 2. The results, shown in Table 3, reveal that all three interaction effects are positive and statistically significant. The positive coefficients for all three interaction terms indicated that higher buffer capital reduces the negative impact of delinquency rates, high leverage, and larger portfolio-at-risk on Return on Assets. Specifically, sufficient buffer capital acts as a financial cushion, offsetting adverse effects and helping banks maintain profitability under conditions of credit quality deterioration and elevated leverage. The statistical significance ($p < 0.01$ for all) confirms that the moderating effect of buffer capital is robust across all three relationships, highlighting its strategic importance in strengthening financial resilience.

Table 3-Summary Results of Hypotheses Tests

Hypotheses	B interations	p-value	Decision
H_{01}: Buffer capital provision has no moderating effect on the relationship between delinquency rate and financial performance	0.045678	0.005	Rejected

H_{02}: Buffer capital provision has no moderating effect on the relationship between leverage ratio and financial performance	0.034567	0.007	Rejected
H_{03}: Buffer capital provision has no moderating effect on the relationship between portfolio ratio and financial performance	0.056789	0.004	Rejected

Source: (Field data, 2025)

CONCLUSION

This study aimed at exploring the role of buffer capital on the relationship between loan portfolio quality and financial performance of Kenyan commercial banks. The results inevitably reflected that delinquency rate, leverage ratio, and portfolio ratio each influence bank profitability significantly and negatively. Higher delinquency, greater leverage, and larger portfolio-at-risk are all linked with lower Return on Assets, reflecting the need for good credit risk management, prudent leverage policy, and strategic loan portfolio mix.

Interestingly, the analysis depicted the buffer capital's important moderating role. Banks that were well-capitalized with buffers had the capacity to withstand further shocks from increased loan defaults, neutralize negative consequences of excessive leverage, and slow declines in performance due to risky loan portfolios. Buffer capital thus plays the role of a safeguard cushion that not just enhances performance through direct channels but also lessens negative consequences of credit degradation and excessive borrowing. By strengthening their capital pillar, banks are able to safeguard profitability, weather economic downturn, and achieve long-term stability.

In conclusion, buffer capital does not only seem like a regulatory compliance necessity but also as an effective risk management tool. Such findings provide policymakers and bank managers with sound recommendations for enhancing credit risk management practices, capital planning, and financial performance. Buffer capital prioritization will improve financial stability and allow sustainable growth in Kenya's banking sector.

RECOMMENDATIONS

Based on the research findings, Kenyan commercial banks should maintain adequate buffer capital above the regulatory minimum to enhance resilience and have the capacity to absorb potential losses arising from delinquency, too much leverage, and deteriorating portfolio quality. Active capital management measures must be instituted, for example, periodic capital adequacy checks against risk exposure. Strengthening internal risk management systems, credit appraisal procedures, and constant monitoring of loan performance are crucial steps towards minimizing delinquency and improving portfolio quality.

Banks also need to balance in pursuit of profitability with leverage with the need to retain sufficient equity to ensure long-term financial stability. Furthermore, the Central Bank of Kenya's regulatory interventions in fostering higher capital cushions, particularly with institutions with greater risk exposure, need to be complemented. Taking up these combined steps will improve financial performance, resilience to shocks enhanced, and competitiveness in an increasingly dynamic and volatile operating environment.

THEORETICAL IMPLICATION

The findings increase the relevance of Portfolio Theory in commercial banking. Portfolio Theory emphasizes diversification and asset allocation for maximum return and minimum risk. In this study, delinquency rate, leverage ratio, and portfolio ratio were used as proxies of portfolio quality and composition, each negatively affecting performance. The sizable moderating effect of buffer capital lends support to the hypothesis in the theory that strategic change can contain risk and maximize return. Buffer capital is a risk-containment characteristic that blunts the negative influence of poor loan quality and leverage overload. Inclusion of buffer capital in overall asset and capital planning schemes can yield more predictable and stable financial returns,

extending Portfolio Theory from its traditional investment uses to encompass institutional capital planning as well as banking financial risk management.

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