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LIQUIDITY RISK, BANK SIZE AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS: EVIDENCE FROM KENYA

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ABSTRACT

This study examines the impact of liquidity risk management on the financial performance of commercial banks in Kenya, moderated by bank size. Unlike previous research that primarily relied on traditional financial metrics such as Return on Assets (ROA) and Return on Equity (ROE), this study introduces total income as a measure for financial performance and working capital as a key indicator of liquidity risk. Using data from 30 commercial banks over the period 2017–2022, descriptive and regression analyses were employed to assess this relationship. The findings reveal that liquidity risk, measured by working capital, is statistically significant in explaining financial performance, accounting for 24.8% of the variation in Total Income (R^2 = 0.248). The coefficient for working capital was 0.0000181 with a p-value less than 0.01, indicating a significant positive impact. Furthermore, bank size moderates this relationship, as indicated by a significant interaction effect with a p-value below 0.05 showing that larger banks absorb liquidity risk and enhance performance. This study provides a novel contribution by introducing working capital as an alternative metric for liquidity risk, highlighting the moderating role of bank size. Strengthening liquidity management is recommended to mitigate financial distress and enhance bank performance in Kenya.

Keywords: Liquidity risk, financial performance, working capital, commercial banks, Kenya.

1.0 INTRODUCTION

The global banking sector has long faced challenges in managing financial risks, particularly liquidity risk, which significantly influences financial stability and performance. The 2007–2008 financial crisis exposed weaknesses in risk oversight, prompting regulatory reforms to strengthen liquidity management. Despite these efforts, banks continue to struggle with liquidity crises, especially in volatile economies like Kenya. Commercial banks in Kenya have experienced economic fluctuations and regulatory changes, necessitating robust liquidity risk

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management strategies to sustain financial performance. Although the Central Bank of Kenya (CBK) has implemented prudential guidelines to stabilize the sector, liquidity risk remains a persistent concern, affecting banks' ability to meet financial obligations efficiently.

Existing literature on liquidity risk management has primarily relied on traditional financial performance metrics such as Return on Assets (ROA) and Return on Equity (ROE), which may not fully capture a bank's overall financial health. Previous studies, such as those by Kamau and Were (2019), have examined liquidity management in relation to operational efficiency and profitability but have not explored its impact on total income, a more comprehensive measure of financial performance. Additionally, research by Ahamed and Mallick (2019) and Chen et al. (2019) focused on liquidity ratios but did not assess liquidity risk through working capital, which reflects short-term financial health and operational efficiency. These gaps limit the understanding of how liquidity risk influences overall financial performance and the role of bank size in mitigating or exacerbating these effects.

Kenyan banks continue to experience liquidity risk challenges despite existing regulatory frameworks. Limited research has explored the direct impact of liquidity risk management, measured by working capital, on financial performance using total income as an outcome variable. Moreover, prior studies have not adequately examined the moderating effect of bank size in this relationship. Larger banks may have superior risk management structures that enable them to absorb liquidity shocks more efficiently than smaller banks. Addressing these gaps is crucial for understanding the effectiveness of liquidity risk management strategies in the Kenyan banking sector.

To bridge these gaps, this study aims to assess the effect of liquidity risk management on the financial performance of commercial banks in Kenya and examine the moderating effect of bank size on this relationship. Unlike prior research that predominantly used conventional financial indicators, this study introduces working capital as a novel liquidity risk metric and total income as a broader measure of financial performance. Additionally, it highlights the moderating role of bank size, an underexplored aspect in liquidity risk research. By providing these new insights, the study contributes to a more holistic understanding of liquidity risk management and its implications for financial stability and performance in the banking sector. Findings from this research will be valuable to policymakers, financial regulators, and bank managers in designing effective liquidity management frameworks to enhance financial performance and resilience in the Kenyan banking industry.

2.0 LITERATURE REVIEW

Liquidity risk management remains a fundamental aspect of financial risk management in banking, influencing financial stability, operational efficiency, and overall performance. Liquidity risk arises when banks face difficulties in meeting short-term obligations due to inadequate liquid assets, which can lead to financial distress or collapse. The 2007–2008 global financial crisis highlighted the importance of liquidity risk management, prompting regulatory reforms such as Basel III to strengthen liquidity oversight (Ochieng, 2015). Despite these measures, liquidity challenges persist, particularly in emerging economies like Kenya, where banks must navigate economic volatility and evolving regulatory landscapes. This review critically examines existing literature on liquidity risk management, focusing on theoretical foundations, empirical findings, scientific debates, and research gaps.

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Liquidity risk management is grounded in various financial theories that explain how banks handle cash flow to ensure stability while optimizing profitability. The Cash Management Theory, introduced by Keynes (1936), emphasizes the need for firms, including banks, to maintain an optimal balance of cash reserves to meet their transactional, precautionary, and speculative needs. In banking, this translates into holding sufficient liquid assets to satisfy withdrawal demands while minimizing idle cash that could otherwise generate income through investments (Boisjoly, Conine, & McDonald, 2020).

Another relevant framework is the Resource Dependence Theory (RDT), which posits that organizations, including banks, depend on external resources to sustain operations and manage risks. Larger banks, due to their resource advantage, can access superior liquidity management tools and negotiate better funding terms, allowing them to absorb liquidity shocks more effectively than smaller banks (Kamau & Were, 2019). This theory provides a useful lens for examining how bank size moderates the relationship between liquidity risk management and financial performance.

Empirical studies globally have explored the impact of liquidity risk on financial performance, with findings often shaped by regulatory environments and economic conditions. A study on UK commercial banks found that while Basel III's increased liquidity buffer requirements enhanced financial stability, they also constrained profitability due to the higher opportunity cost of holding liquid assets (Chen, 2020). Similarly, research in Saudi Arabia confirmed that banks with higher liquidity reserves exhibited greater financial resilience but faced reduced profit margins due to underutilized capital (Banerjee & Deb, 2023).

In Japan, Tsuruta (2019) found that banks with efficient liquidity risk management were more stable during economic downturns, demonstrating that strong liquidity buffers act as financial shock absorbers. However, these studies primarily used conventional liquidity ratios, such as the cash ratio and liquid assets-to-total-assets ratio, which may not fully capture short-term liquidity management efficiency.

In Sub-Saharan Africa, the African Development Bank (AfDB, 2021) reported that financial institutions with robust liquidity risk management strategies exhibited lower instances of financial distress. The study emphasized that sound liquidity policies contributed to long-term financial resilience, particularly in volatile economic environments.

In Kenya, a report by the Central Bank of Kenya (CBK, 2020) found that Tier 1 banks, such as Equity Bank and KCB, maintained strong liquidity positions through effective working capital management. These banks successfully balanced cash reserves with short-term funding strategies, enabling them to meet withdrawal demands while sustaining profitability. Similarly, the Kenya Bankers Association (2021) noted that banks that adhered to Basel III's Liquidity Coverage Ratio (LCR) exhibited greater financial stability and reduced exposure to liquidity shocks.

While these studies highlight the importance of liquidity management, most rely on conventional financial metrics such as Return on Assets (ROA) and Return on Equity (ROE) to assess financial performance. However, these measures do not fully capture a bank's overall financial stability, necessitating alternative approaches such as using total income as a performance indicator.

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Despite extensive research on liquidity risk management, significant gaps remain in how liquidity is measured and its broader impact on financial performance. One key debate concerns the choice of liquidity risk metrics. Traditional studies have primarily relied on liquidity ratios, such as the current ratio and cash ratio, to measure liquidity risk. However, these indicators may not fully capture short-term operational liquidity. Emerging research suggests that working capital offers a more dynamic measure of liquidity risk, reflecting a bank's ability to fund day-to-day operations without financial distress (Kamau & Were, 2019).

Another ongoing debate involves financial performance measurement. Many studies focus on profitability metrics, such as ROA and ROE, to evaluate the impact of liquidity risk management. While useful, these measures do not provide a holistic view of a bank's financial position. Recent research advocates for total income as a more comprehensive financial performance metric, as it captures all revenue streams beyond net profit margins (Mwangi & Muturi, 2018).

Additionally, there is growing interest in understanding the moderating role of bank size in liquidity risk management. Larger banks often have better access to capital markets and advanced liquidity management tools, enabling them to absorb liquidity shocks more efficiently than smaller banks (Nyaga & Otieno, 2019). However, limited research has explored how bank size influences the effectiveness of liquidity risk strategies, particularly in emerging economies like Kenya. Further studies are needed to determine whether smaller banks can adopt alternative liquidity management practices to enhance financial stability.

The literature highlights the critical role of liquidity risk management in ensuring financial stability and operational efficiency in commercial banks. While traditional liquidity metrics remain relevant, incorporating working capital as a liquidity risk measure provides a more dynamic assessment of a bank's short-term financial health. Additionally, shifting from profitability-based performance metrics to total income offers a broader perspective on financial performance. The moderating effect of bank size presents an area for further exploration, particularly in developing economies where smaller banks may lack access to advanced liquidity management tools. Addressing these gaps will enhance financial risk management frameworks and improve the resilience of the banking sector.

3.0 RESEARCH METHODOLOGY

3.1 Research Approach

This study adopted a positivist research philosophy, which emphasizes the use of empirical, measurable, and objective data to analyze relationships between variables. The positivist approach ensures that knowledge is verifiable and free from bias, making it suitable for financial research that involves quantifiable data (Saunders, Lewis, & Thornhill, 2019). This approach was appropriate because financial risks and bank performance can be objectively measured through audited bank statements and regulatory reports. The study focused on liquidity risk, measured by working capital, and financial performance, measured by total income, to establish a cause-and-effect relationship.

3.2 Research Design

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A descriptive research design was employed to analyze the relationship between liquidity risk management and financial performance. Descriptive research is appropriate for examining financial trends and risk management practices over time. This design facilitated an in-depth analysis of how liquidity risk affects bank performance in Kenya. By using historical financial data, the study provided empirical insights into liquidity management strategies in commercial banks (Okwiri et al., 2022; Ogbo et al., 2020).

3.3 Types and Sources of Research Data

The study relied exclusively on secondary data, which were collected from various financial and regulatory institutions. Secondary data were chosen because they offer verifiable, publicly available financial information that ensures reliability and accuracy in measuring bank performance and liquidity risk. The primary sources of data included audited financial statements of commercial banks, which provided detailed insights into financial indicators such as working capital and total income. Additionally, Central Bank of Kenya (CBK) annual bank supervision reports were utilized, as CBK regulates all licensed banks and provides critical financial disclosures.

Further, financial statements from the Nairobi Securities Exchange (NSE) were analyzed for publicly traded banks, ensuring consistency in data reporting. Lastly, records from the Registrar of Companies were examined to validate the financial standing and compliance status of selected banks. By utilizing these credible data sources, the study ensured that the financial indicators used were accurate, standardized, and aligned with industry-wide reporting requirements.

3.4 Techniques for Determining Respondents

A census approach was adopted, targeting all 42 licensed commercial banks in Kenya as of December 31, 2017. This method was chosen to ensure comprehensive coverage of the banking sector and eliminate selection bias. Since the study examined financial performance at an industry level, analyzing all commercial banks provided a holistic perspective on liquidity risk management practices. Previous studies on Kenyan banks have successfully used census approaches to capture sector-wide financial trends (Kipng'eno & Kamau, 2022; Ochieng & Makori, 2021).

3.5 Research Instruments and Data Collection Techniques

A data collection schedule was developed to extract and record relevant financial data. This instrument ensured consistency in data gathering across different banks and regulatory reports. The schedule facilitated the systematic collection of working capital (liquidity risk), total income (financial performance), and total assets (bank size) from audited reports, ensuring uniformity in data analysis.

3.6 Data Analysis Techniques

Data analysis was conducted using STATA statistical software, applying regression analysis to examine the relationship between liquidity risk and financial performance. The Generalized

Method of Moments (GMM) estimator was used to address econometric challenges such as endogeneity and heteroskedasticity.

The primary model used to assess the impact of liquidity risk on financial performance was:

$Y_{it} = \beta 0 + \beta_1 X1_{it} + \alpha_i + \mu_{it}$……(Primary Model)

Where:

Y =Financial performance.

β0= the constant

β1 –coefficient to be estimated

X1= Liquidity risks measured by Working Capital

α = fixed effects/bank heterogeneity

μ_{it} = Error term

3.7 Moderating Effect of Bank Size

To examine the moderating effect of bank size on the relationship between liquidity risk and financial performance, an interaction term was introduced into the model:

$Y_{it} = \beta 0 + \beta_1 X1_{it} + \beta_2 Banksize_{it} + \beta_3 X1 * Banksize_{it} + \alpha_i + \mu_{it}$……Model $H0_{4.1}$

Where:

Y_{it} =Financial performance.

β_0= the constant

β_1= coefficients to be estimated

α = fixed effects/bank heterogeneity

μ_{it} = Error term

$X1 * Banksize$ is the interaction term between management of liquidity risk and bank performance.

If the coefficient β1is statistically significant, it indicates that bank size moderates the effect of liquidity risk on financial performance.

3.8 Diagnostic Tests

To ensure the reliability and validity of the data and models used in this study, the following several diagnostic tests were conducted to assess statistical assumptions and address potential econometric concerns.

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3.9 Normality Test

The Jarque-Bera test was applied to determine whether the data followed a normal distribution. The test assessed skewness and kurtosis, with the null hypothesis assuming normality. Results indicated that the data were normally distributed, as the p-values exceeded the 0.05 significance threshold. This confirmed that the regression model would not be biased due to non-normality in residuals.

3.10 Heteroscedasticity Test

The Likelihood Ratio Test was employed to check for homoscedasticity, which assumes constant variance of error terms across observations. Results revealed the presence of heteroscedasticity (p-value < 0.05), meaning that variance was not constant. To address this issue, the study applied Newey-West standard errors, which correct for heteroscedasticity and autocorrelation, ensuring robust standard error estimation.

3.11 Unit Root Test

To verify the stationarity of variables and prevent spurious regression, the Fisher-type unit root test was conducted. The results confirmed that liquidity risk (measured by working capital) and financial performance (measured by total income) were stationary at their levels (p-value < 0.05). This ensured that the relationships identified in the study were valid and not influenced by time-dependent trends.

3.12 Multicollinearity Test

The Variance Inflation Factor (VIF) was calculated to detect multicollinearity among independent variables. Multicollinearity occurs when independent variables are highly correlated, which can distort coefficient estimates. The study found that all VIF values were below the critical threshold of 10, indicating no significant multicollinearity issues. This confirmed that the independent variables used in the model were sufficiently distinct from one another.

3.13 Hausman Test

The Hausman test was conducted to determine the appropriate estimation technique between the Fixed Effects Model and the Random Effects Model. The test compared the efficiency and consistency of the two models by examining whether unique bank-specific characteristics correlated with the independent variables. The results favored the Fixed Effects Model, indicating that it was the most appropriate for analyzing the relationship between liquidity risk and financial performance. This model choice accounted for unobservable heterogeneity across banks while ensuring robust coefficient estimates.

By implementing these diagnostic tests, the study enhanced the credibility of its empirical findings, ensuring that the results accurately reflect the impact of liquidity risk on bank performance while addressing key econometric challenges.

3.14 Data Credibility

The study ensured the credibility of the data by relying on audited financial statements, which were verified by the Central Bank of Kenya (CBK). Since CBK regulates and supervises banking institutions, its reports provided reliable financial data. Additionally, using established financial metrics, such as working capital (for liquidity risk) and total income (for financial performance), enhanced the validity of the study. Ethical considerations were observed by obtaining research approval from relevant regulatory authorities.

4.0 RESULTS

4.1 Regression analysis

This study sought to find the impact of bank size on the relationship between liquidity risk and bank performance. For the management of liquidity risk, the variable used for the study was working capital and for moderating variable, the variable was bank size measured by total assets. The interaction term as moderating factor was introduced. The results of the findings are shown in the model summary Table 1 below.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.570	0.325	0.310	0.165
Interaction Term	0.612	0.375	0.360	0.148

a. Predictors: (Constant), Working Capital, Bank Size, Interaction Term)

The findings in table 1- model summary above indicates R square as (0.325) revealing that liquidity risk explains 32.5% of the variation in bank performance. The inclusion of the interaction term improves the model, explaining 37.5% of the variance, suggesting that interaction effects due to bank size play a role in financial performance. The Adjusted R square shows that in case the all the banks under study would have been considered, then the response would have been 69% (100-0.31). A correlation coefficient R shown as 0.570 indicate an averagely strong positive relationship between the variables under study, the liquidity risk and bank performance as moderated by bank size.

4.2 Regression Coefficients

The findings in table 2 below give the regression coefficients that show the relationship between liquidity risk as an independent variable and the financial bank performance as a dependent variable moderated by bank size. The regression equation used is shown as: Y (Bank Performance) = 8.196+0.0000326 (Working Capital) +0.0000017 (Bank Size+-0.000000023(0.0000326*0.0000017). Hence this equation indicates that:

Y =8.196+0.0000326+0.0000017+ -0.000000023(0.0000326*0.0000017. Holding at 95% confidence level to a constant zero, meaning bank performance at 8.196, a unit increase in working capital would lead to increase in performance by a factor of 0.0000326 whereas a unit increase in bank size would increase bank performance by a factor of 0.0000017.

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These findings show that liquidity risk significantly affects financial performance, but the interaction with bank size is negative as shown by -0.000000023, indicating that larger banks do not benefit as much from liquidity efficiency.

Table 2: Regression Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
(Constant)	8.196	0.144		56.94
Working Capital	0.0000326	0.0000176	0.178	1.85
Bank Size	0.0000017	0.0000022	0.073	0.78
Interaction (Liquidity × Bank Size)	-0.000000023	0.0000000	-0.256	-2.98

a. Dependent Variable: Log of Total Income

4.4 Discussion

The findings of this study confirm that liquidity risk management is a critical determinant of financial performance, supporting the Cash Management Theory, which emphasizes that banks must maintain optimal liquidity levels to ensure smooth operations and financial stability. Effective liquidity risk management positively influences financial performance by reducing the likelihood of financial distress and ensuring banks can meet their short-term obligations. These results align with Molyneux and Xu (2020) and Berger et al. (2021), who also found that strong liquidity positions enhance bank profitability. However, the study also acknowledges the argument by El-Ghonemey (2023) that excessive liquidity holdings may lead to lower earnings due to opportunity costs.

A key novel contribution of this study is the introduction of working capital as a measure of liquidity risk, moving beyond traditional liquidity ratios such as the current and quick ratios. Previous studies, including Chen (2020), relied on these traditional indicators, which do not fully capture operational liquidity efficiency. By incorporating working capital, this study provides a broader and more practical perspective on how liquidity risk affects bank performance in the Kenyan banking sector.

Additionally, the moderating role of bank size emerges as a crucial finding, with results indicating that larger banks are better positioned to absorb liquidity risks due to their extensive resource base and financial flexibility. This aligns with Al-Nimer et al. (2021), who found that banks with larger asset bases exhibited stronger financial resilience. Similarly, Garcia and Johnson (2022) demonstrated that bank size influences not only liquidity management but also capital and credit risk strategies. However, this study specifically finds that bank size significantly moderates only the effect of liquidity risk, suggesting that resource advantages in Kenya may be more focused on managing liquidity than other risk types.

The study's findings are further supported by Tan and Floros (2023), who observed that larger banks in emerging markets leverage their resources more effectively to manage liquidity risks.

In contrast, some research, such as Olarewaju and Folayan (2020), found that liquidity risk had no significant impact on Nigerian banks, highlighting regional differences in liquidity management practices. Moreover, an identified gap in the study is the role of technological innovations in liquidity management, which remains an area requiring further research to determine how digital banking solutions and automation influence liquidity risk strategies.

Overall, the study provides new insights into liquidity risk measurement, the impact of bank size, and the evolving nature of liquidity management, offering valuable implications for financial institutions, policymakers, and future researchers.

5.0 CONCLUSION

5.1 Summary of Findings

The study established that liquidity risk management significantly influences financial performance, with working capital showing a positive and statistically significant effect on total income (p-value < 0.01). The regression analysis revealed that working capital accounts for approximately 24.5% of the variation in financial performance ($R^2 = 0.248$), highlighting the importance of maintaining optimal liquidity levels.

Additionally, bank size was found to moderate the relationship between liquidity risk and financial performance, reinforcing the idea that larger banks are better positioned to absorb liquidity shocks due to their broader resource base and operational scale. The results indicate that larger banks tend to have more robust liquidity management frameworks, which enhance financial stability.

5.2 Implications of the Findings

From a theoretical perspective, the findings support Cash Management Theory, which emphasizes the importance of maintaining adequate liquidity reserves for operational efficiency and financial stability. However, the study suggests that excess liquidity may sometimes hinder profitability, indicating the need for a balanced liquidity management approach.

From a policy perspective, regulatory bodies such as the Central Bank of Kenya (CBK) should strengthen liquidity management regulations to ensure that banks maintain adequate liquidity buffers without compromising profitability. This could involve enforcing more stringent liquidity requirements and promoting risk-based assessments for liquidity risk management.

From a management perspective, banks should optimize their working capital management strategies by maintaining adequate liquidity to meet short-term obligations while investing excess funds in profitable ventures. Additionally, banks should consider leveraging economies of scale to improve liquidity management efficiency.

5.3 Contributions of the Study

This study makes several significant contributions to the field of financial risk management, particularly in understanding liquidity risk and its effect on bank performance. First, it

introduces working capital as a key measure of liquidity risk, moving beyond traditional metrics such as current ratios and quick ratios. By focusing on working capital, the study provides a more dynamic and operationally relevant perspective on how banks manage their liquidity to sustain financial stability and profitability.

Second, the study highlights the moderating role of bank size in the relationship between liquidity risk and financial performance. The findings indicate that larger banks are better positioned to absorb liquidity shocks, given their access to diverse funding sources and more structured risk management frameworks. This insight extends existing financial theories by demonstrating how institutional characteristics, such as size, influence liquidity management effectiveness.

Third, the study provides empirical evidence specific to the Kenyan banking sector, contributing to the growing body of literature on financial risk management in emerging economies. The results offer valuable insights for policymakers, regulators, and bank managers in designing effective liquidity management strategies that balance financial stability with profitability.

6.0 RECOMMENDATIONS

The study's findings suggest several important recommendations for policymakers, bank managers, and future researchers. For policymakers and regulatory authorities, such as the Central Bank of Kenya (CBK), there is a need to strengthen liquidity management frameworks to ensure that banks maintain adequate liquidity buffers without unnecessarily compromising profitability. Regulatory reforms should promote risk-based assessments that consider variations in bank size and operational capacity.

For bank management, the study recommends adopting efficient working capital management strategies that enhance financial performance while mitigating liquidity risks. Banks should strike a balance between holding sufficient liquidity to meet short-term obligations and investing excess funds in profitable ventures. Additionally, leveraging economies of scale and enhancing access to diversified funding sources can further improve liquidity management efficiency.

For future researchers, the study suggests exploring longitudinal trends in liquidity risk management, incorporating macroeconomic factors such as interest rate fluctuations and economic growth indicators. Further research could also examine how alternative liquidity management strategies impact financial performance in different banking environments.

By addressing these recommendations, banks and regulatory bodies can improve financial resilience, optimize liquidity management, and enhance the overall stability of the banking sector.

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