

EFFECT OF LIQUIDITY ON FINANCIAL PERFORMANCE OF MICROFINANCE BANKS IN KENYA

Sammy Mutiria Murige.
Tharaka University, Kenya.
Dr. Tumaini Mwikamba.
Tharaka University, Kenya.
Dr. James Nyamu.
Tharaka University, Kenya.

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ABSTRACT

Microfinance banks (MFBs) play a critical role in ensuring financial inclusion for low-income individuals and small businesses excluded from commercial banking. However, the sector's financial performance has deteriorated sharply in recent years, with the Central Bank of Kenya reporting a sector-wide pre-tax loss of approximately Ksh 3.5 billion in 2024, up from Ksh 2.4 billion in 2023, and a negative return on assets of 6.1 percent, attributed to high non-performing loans, capital erosion, shrinking deposits and operational inefficiencies. Despite the sector's economic importance, literature remains inconclusive regarding the precise relationship between liquidity and the financial performance of MFBs in Kenya. This study therefore assessed the effect of liquidity, operationalised through Cash Management (CM), Asset-Liability Mismatch (ALM) and Operating Cash Flow (OCF), on the financial performance of Kenyan MFBs, measured using Return on Assets (ROA). The study was anchored on the Cash Management Theory and adopted a positivist research philosophy together with an explanatory and descriptive research design. A census of all 14 Central Bank of Kenya-licensed MFBs was undertaken, yielding secondary panel data spanning 2011 to 2024. Data were analysed using STATA version 19.0 and R version 4.6.1, employing robust panel regression to draw empirical inferences following diagnostic testing for multicollinearity, heteroskedasticity and

model specification. The Hausman specification test favoured the Random Effects estimator, under which Cash Management exerted a strong positive and statistically significant effect on Return on Assets ($\beta = 8.9450$, $p < 0.01$), while Asset-Liability Mismatch ($\beta = -0.0034$, $p < 0.10$) exerted a weak negative effect and Operating Cash Flow ($\beta = -0.7887$, $p > 0.10$) was statistically insignificant. The model explained approximately 39.7 percent of the variance in ROA ($\chi^2 = 131.128$, $p < 0.01$), leading to rejection of the null hypothesis that liquidity has no statistically significant effect on financial performance. The findings imply that prudent cash management is the dominant liquidity lever available to MFB managers, while structural asset-liability mismatches erode profitability at the margin. The study recommends that MFB management strengthen cash management practices, align asset and liability maturities more closely, and that the Central Bank of Kenya adopt a differentiated, risk-based liquidity regulatory framework, encouraging smaller MFBs to prioritise cash reserves while guiding larger institutions to deploy excess liquidity into productive assets, particularly against the backdrop of the sector's deepening losses through 2024.

Key words: Liquidity, Cash Management, Asset-Liability Mismatch, Operating Cash Flow, Financial Performance, Return on Assets, Microfinance Banks, Kenya.

INTRODUCTION

Microfinance banks occupy a strategic position in the architecture of financial inclusion, extending credit, savings and insurance services to low-income individuals and micro, small and medium enterprises that are frequently excluded from commercial banking (Kabagambe, 2024). For decades, microfinance institutions have relied on microcredit, often disbursed without the collateral requirements or documentation burdens typical of conventional lending, to promote sustainable self-employment and expand economic activity among historically underserved populations (Osei, 2024; Mia, 2022). Financial institutions of this kind perform a pivotal intermediation function, mobilising deposits from surplus units and channelling them, in the form of loans, to deficit units for investment, while simultaneously managing liquidity, capital adequacy and asset quality (Naing, 2024). A well-functioning microfinance sector is therefore an important lever for broader financial inclusion, particularly in a market such as Kenya where the cost of formal credit continues to discourage borrowing among lower-income segments (Government of Kenya, 2024).

Globally, the microfinance industry has continued to expand even as individual institutions face mounting operational pressure. The global microfinance market was valued at approximately USD 235 billion in 2025 and is projected to grow at a compound annual rate in excess of 10 percent through the end of the decade, driven by digitalisation, financial inclusion mandates and the persistent USD 5.2 trillion financing gap facing micro, small and medium enterprises in developing economies (BlueOrchard, 2025; Maximize Market Research, 2026). Yet this growth trajectory obscures considerable liquidity and capital strain at the institutional level: microfinance institutions worldwide continue to grapple with credit, operational and liquidity risk, the latter arising chiefly from their dependence on external funding to sustain loan disbursement and meet withdrawal obligations (Maximize Market Research, 2026). Post-pandemic monetary tightening and currency volatility across emerging markets have compounded these liquidity pressures, with the World Bank (2024) cautioning that low- and middle-income economies face mounting external liquidity strain that, left unaddressed, risks evolving into deeper solvency problems for their financial institutions.

Within Sub-Saharan Africa, the liquidity-performance relationship in microfinance has attracted growing scholarly attention. In Cameroon, effective liquidity management has been shown to be central to the financial performance of microfinance institutions operating in urban centres such as Bamenda, with institutions holding inadequate liquid reserves exhibiting greater vulnerability to shocks (Sobseh & Ndale, 2024). Similarly, Basel III liquidity and capital requirements, specifically the Liquidity Coverage Ratio and Net Stable Funding Ratio, have been found to exert a measurable, if non-linear, influence on bank lending behaviour and stability across developing economies, underscoring the continued relevance of formal liquidity regulation even outside systemically important banking sectors (Sharma, 2023).

In Kenya specifically, the microfinance banking sub-sector has recorded a prolonged period of financial distress. Central Bank of Kenya (2024) data show that the sector's combined pre-tax loss deepened from Ksh 2.4 billion in 2023 to Ksh 3.5 billion in 2024, extending a run of consecutive annual losses dating back to 2016. Over the same period, sector-wide total assets contracted by 9.8 percent to Ksh 57.9 billion, net loans and advances fell from Ksh 44.18 billion in 2020 to Ksh 31.2 billion in 2024, and deposits registered consecutive year-on-year contractions of 7.3 percent, 5.7 percent and 2.0 percent in 2022, 2023 and 2024 respectively (Central Bank of Kenya, 2024; Kenyan Wallstreet, 2025). Return on assets, having briefly recovered from 1.2 percent in 2021 to 3.7 percent in 2023, reversed sharply to a negative 6.1 percent in 2024, while return on equity deteriorated to negative 78.2 percent, with three of the fourteen licensed MFBs accounting for 87.5 percent of total sector losses (Central Bank of Kenya, 2024; Kenyan Wallstreet, 2025). These developments have prompted the regulator to call for business-model transformation, including consolidation and digital repositioning, given that most MFBs lack the capital reserves to self-fund such a transition (Kenyan Wallstreet, 2025).

It is against this backdrop of sustained sectoral distress that the question of liquidity management assumes particular urgency. Liquidity, in the context of deposit-taking financial institutions, refers to the capacity to meet cash obligations, whether in the form of customer withdrawals, loan disbursements or operating expenses, as they fall due, without incurring unacceptable losses (Aluodo & Musau, 2024). It is commonly operationalised through indicators such as cash management practices, the extent of maturity mismatch between assets and liabilities, and the pattern of operating cash flow generated from core lending activity. Recent Kenyan studies have continued to report mixed and sometimes contradictory findings on how these liquidity dimensions relate to profitability. Aluodo and Musau (2024) found that adherence to statutory minimum liquidity ratios and robust cash management procedures enhanced the financial performance of MFBs operating in Nairobi City County, while cautioning that both excessive liquidity and illiquidity erode institutional profitability. Conversely, other determinants-of-performance studies conducted over overlapping periods have reported that liquidity risk exerts an insignificant relationship with financial performance once capital adequacy, operational efficiency and firm size are controlled for (Ngumo, Kioko & Shikumo, 2024). This lack of empirical consensus, set against a sector recording its worst losses in a decade, provides the motivation for the present study, which examines the effect of liquidity, disaggregated into cash management, asset-liability mismatch and operating cash flow, on the financial performance of Kenyan MFBs.

Statement of the Problem

Microfinance banks licensed by the Central Bank of Kenya are expected to maintain sufficient liquid resources to meet withdrawal demands and loan disbursement obligations while sustaining profitable operations. In practice, the sector has failed to achieve this balance for nine consecutive years, with combined losses widening from Ksh 0.4 billion in 2016 to Ksh 3.5 billion in 2024

(Kenyan Wallstreet, 2025). Shareholders' funds across the fourteen licensed institutions more than halved over the decade, from over Ksh 11.6 billion in 2015 to Ksh 4.5 billion in 2024, reflecting sustained erosion of the capital and liquidity buffers that would ordinarily cushion institutions against operational shocks (Central Bank of Kenya, 2024). At the same time, deposit mobilisation, the primary funding source for on-lending, has stagnated, growing at a compound annual rate of only 1.66 percent between 2014 and 2024 and contracting outright in the three years to 2024 (Kenyan Wallstreet, 2025). These conditions suggest that liquidity management, rather than being a peripheral operational concern, may be a central determinant of the sector's continued viability. Notwithstanding the scale of this distress, the empirical evidence on how specific dimensions of liquidity relate to MFB performance in Kenya remains fragmented. Existing studies have often examined liquidity as a single composite ratio, applied short study periods that predate the sector's deepest losses, or been confined to sub-samples of the fourteen licensed institutions because of missing data (Manduku & Jagongo, 2024; Ndegwa, 2018). Few studies have disaggregated liquidity into its cash management, structural mismatch and cash-flow-generation dimensions using panel data extending into the post-2021 period of sustained sectoral loss. This creates a gap in understanding precisely which aspects of liquidity management merit the closest managerial and regulatory attention. This study addresses that gap by examining the effect of Cash Management, Asset-Liability Mismatch and Operating Cash Flow on the Return on Assets of all fourteen CBK-licensed microfinance banks over the fourteen-year period from 2011 to 2024, a period that captures both the sector's peak performance years and its subsequent prolonged decline.

Objective of the Study and Hypothesis

The study was guided by the following objective:

To determine the effect of liquidity on the financial performance of microfinance banks in Kenya.

The null hypothesis of the study was states as follows:

H₀₁: Liquidity has no statistically significant effect on the financial performance of microfinance banks in Kenya.

Significance of the Study

The findings of this study are of practical value to the management of microfinance banks, who require empirical guidance on which liquidity levers, cash management, asset-liability matching, or operating cash flow generation, most reliably influence profitability, particularly at a time when the sector is recording historic losses. For the Central Bank of Kenya and other prudential regulators, the findings inform the calibration of liquidity-related supervisory requirements under the Microfinance Act, 2006, and its associated regulations, supporting a more differentiated, risk-based approach to liquidity oversight across institutions of varying size and risk profile. The study also contributes to the growing body of Kenyan and Sub-Saharan African literature on the liquidity-performance relationship in microfinance, extending the evidence base to the post-2021 period during which the sector's financial distress deepened markedly. Finally, the study offers a

reference point for future researchers examining liquidity, capital adequacy and related prudential themes within Kenya's deposit-taking microfinance sub-sector.

Scope of the Study

The study was confined to all fourteen deposit-taking microfinance banks licensed and supervised by the Central Bank of Kenya as at the time of data collection. It covered a fourteen-year panel period from 2011 to 2024, drawing exclusively on secondary data extracted from audited annual financial statements and Central Bank of Kenya supervisory publications. The study focused on three liquidity dimensions, namely Cash Management, Asset-Liability Mismatch and Operating Cash Flow, and a single financial performance measure, Return on Assets. Other performance measures, such as Return on Equity, and other prudential dimensions, such as capital adequacy and asset quality, fell outside the scope of this study, although reference is made to related literature on capital adequacy where it clarifies the relationship between liquidity and financial performance.

Theoretical Framework

Cash Management Theory

The study was anchored on the Cash Management Theory, formulated by James Mao and Charlie Sarndrai in 1977. The theory asserts that a degree of certainty exists in a firm's knowledge of its cash disbursement needs over time, and that holding cash carries an opportunity cost that must be weighed against the transaction cost of converting marketable securities into cash when required. Cash management is thus concerned with the deliberate management of cash inflows and outflows, financing temporary deficits and profitably investing temporary surpluses. Short-term management of a firm's cash balance is a persistent managerial concern precisely because cash inflows and outflows rarely coincide perfectly, and inflows in particular are difficult to forecast with precision (Aziz & Dar, 2006). The theory assumes that a firm can arrange emergency liquidity by liquidating marketable securities held for that purpose.

At certain points, a firm's cash outflows, arising from obligations such as taxes, dividends and inventory purchases, will exceed inflows; at other times inflows from cash sales and debt collection will exceed outflows. To avoid financial crisis, management is required to maintain a cash balance that is neither excessively large, which represents an opportunity cost, nor negative, which threatens solvency (Aziz & Dar, 2006). For microfinance institutions specifically, liquidity challenges of the kind envisaged by the theory materialise when an institution is unable to meet customer withdrawal requests or experiences delays in disbursing already-approved loans. The Cash Management Theory therefore provides a direct theoretical lens for understanding how liquidity risk, and cash management practice in particular, shapes the financial performance of microfinance banks, and underpins the treatment of Cash Management as the primary liquidity construct in this study.

EMPIRICAL LITERATURE REVIEW

Cash Management and Financial Performance

Empirical evidence on cash management and financial performance has expanded considerably since 2021, with generally consistent findings of a positive relationship. Dahiyat, Weshah and Aldahiyat (2021) examined the effect of liquidity and solvency management on the profitability of Jordanian manufacturing companies listed on the Amman Stock Exchange, drawing a sample of 50 firms from a population of 56 and extracting secondary data from 2010 to 2019 annual reports. Using the current ratio and the debt-to-total-assets ratio as proxies for liquidity and solvency respectively, and controlling for firm size, the study applied multiple regression and correlation analysis. Both variables exerted a statistically significant effect on financial performance, although the negative liquidity effect was economically negligible, while solvency exerted a negative effect and firm size a positive one. The study recommended that firms strengthen internal financing capacity but did not incorporate a theoretical review or mediating variables such as audit fees and monitoring costs, a limitation that later studies, including the present one, sought to address by anchoring the analysis explicitly in cash management theory.

Chaudhary and Sapkota (2023) examined the effect of liquidity risk on the financial performance of Nepalese commercial banks between 2011/12 and 2020/21, applying Pooled Ordinary Least Squares to data drawn from Nepal Rastra Bank publications and individual bank annual reports. Using Return on Equity and Return on Assets as performance measures and investment ratio, liquidity management, bank size, capital ratio and asset quality as explanatory variables, and anchoring the study in liquidity preference theory, liability management theory, trade-off theory and agency theory, the study found a statistically insignificant inverse relationship between liquidity risk and Return on Equity, and a positive but insignificant relationship with Return on Assets. Non-performing loans exhibited a statistically significant negative effect on Return on Equity but a positive, insignificant effect on Return on Assets, while bank size showed inconsistent signs across the two performance measures. The authors recommended that banks adopt suitable liquidity risk management systems and more efficient credit granting processes, while acknowledging that the absence of a mediating variable and the relatively short two-year effective observation window limited generalisability.

More recent Kenyan evidence has reinforced the centrality of cash management specifically, as distinct from broader liquidity ratios, in explaining MFB profitability. Aluodo and Musau (2024), studying deposit-taking microfinance banks in Nairobi City County, found that adherence to the statutory minimum liquidity ratio combined with effective cash management procedures enhanced financial performance, while cautioning that both excess liquidity and illiquidity reduce institutional profitability, implying an optimal, rather than simply maximal, cash-holding position. In a related study covering thirteen Kenyan MFBs over the 2016 to 2023 period, Buluma (2025) applied an explanatory research design with a comprehensive battery of diagnostic tests, including

autocorrelation, heteroskedasticity, normality, linearity, stationarity and Hausman tests, and found that cash management positively and significantly affected financial performance, recommending that MFBs prioritise robust cash management strategies to maintain liquidity, meet short-term obligations and capitalise on growth opportunities. These findings are broadly consistent with the present study's finding of a strong, positive and highly significant effect of Cash Management on Return on Assets.

Asset-Liability Mismatch and Financial Performance

The maturity-mismatch dimension of liquidity has received comparatively less direct empirical attention in the Kenyan microfinance literature than cash management, but related prudential and structural studies offer relevant insight. Using an explanatory research approach, Manduku and Jagongo (2024) examined financial leverage and the liquidity position of Kenyan microfinance banks, treating liquidity position, measured by the current and quick ratios, as the dependent variable and financial leverage, measured by short-term and long-term debt, as the independent variable. Adopting a positivist philosophy and a census of all fourteen licensed MFBs, the study drew secondary data for the ten-year period from 2012 to 2021 and applied panel regression in STATA, finding a positive and statistically significant relationship between financial leverage and liquidity position. The study recommended more efficient debt management and greater accountability in financial reporting, while noting the omission of moderating and mediating variables, and an apparent discrepancy in the reported census size relative to the fourteen MFBs recognised by the Central Bank of Kenya.

Complementary evidence from the prudential regulation literature suggests that structural asset-liability mismatches are closely bound up with the broader liquidity and capital adequacy requirements imposed on deposit-taking institutions. Muchai and Muchira (2024) examined how credit, capital adequacy and liquidity regulations jointly shape the financial performance of Kenyan microfinance banks, underscoring those institutions with pronounced structural mismatches between short-term liabilities, principally customer deposits, and longer-tenor loan assets face heightened vulnerability when deposit growth slows, precisely the pattern observed sector-wide since 2022 (Kenyan Wallstreet, 2025). Internationally, Sharma's (2023) analysis of Basel III liquidity and capital regulations across 688 banks in ten developing economies between 2014 and 2021 found that the Net Stable Funding Ratio, which penalises reliance on short-term funding for longer-term assets, exerted a negative effect on lending growth, illustrating the trade-off financial institutions face between maturity matching and portfolio expansion. Taken together, this literature is consistent with the present study's finding that Asset-Liability Mismatch exerts a negative, if comparatively modest, effect on Return on Assets among Kenyan MFBs.

Operating Cash Flow and Financial Performance

Operating cash flow captures the capacity of an institution's core lending and deposit-taking activities to generate cash internally, distinct from financing or investing activity. Evidence on its

relationship with financial performance among deposit-taking institutions remains comparatively scarce and, where available, frequently reports statistically insignificant effects once cash management and structural liquidity variables are controlled for. Ouma, Makori and Aluoch (2024), examining firm characteristics and financial performance among Kenyan microfinance banks over the 2016 to 2022 period using an explanatory, non-experimental design and a census of thirteen CBK-licensed institutions, found that while liquidity, asset quality and capital sufficiency exhibited positive, significant relationships with financial performance, managerial effectiveness had a negligible impact, and the study did not explicitly examine operating cash flow as a distinct construct, a gap the present study addresses directly.

Elsewhere, determinants-of-performance studies covering overlapping Kenyan MFB samples have similarly reported that liquidity risk, when proxied through cash-flow-related indicators rather than static balance-sheet ratios, does not exert a statistically significant relationship with financial performance once operational efficiency, capital adequacy and firm size are accounted for (Ngumo, Kioko & Shikumo, 2024). This pattern of statistical insignificance is consistent with the present study's finding that Operating Cash Flow, while negatively signed, does not exert a statistically reliable effect on Return on Assets once unobserved firm heterogeneity is controlled for through the Random Effects estimator, suggesting that cash-flow volatility from core operations is a less decisive driver of MFB profitability than either cash management practice or structural balance-sheet mismatch.

Liquidity and Financial Performance within the Kenyan Microfinance Sector

Beyond the disaggregated liquidity dimensions reviewed above, several recent studies have examined liquidity more broadly within the specific context of the Kenyan microfinance and wider financial sector. Nyangaresi and Simiyu (2024), anchoring their study in portfolio theory, information asymmetry theory, capital buffer theory, shiftability theory and operational risk theory, examined financial risk and profitability among Kenyan microfinance banks using a causal research design, situating liquidity risk within a broader constellation of financial risks facing the sector. Kirimi, Kariuki and Ocharo (2022) similarly examined the financial soundness and performance of Kenyan commercial banks, finding that soundness indicators, of which liquidity is a core component, remain closely linked to profitability outcomes across the wider banking sector, a relationship that plausibly extends to the more liquidity-constrained microfinance banking sub-sector. These findings, read alongside the Central Bank of Kenya's (2024) own diagnosis that the fourteen licensed MFBs require a fundamental shift in business models, including consolidation and digital repositioning, to address chronic liquidity and capital erosion, situate the present study's focus on cash management, asset-liability mismatch and operating cash flow squarely within the sector's most pressing current policy concerns.

Summary of Research Gaps

The reviewed literature reveals three principal gaps. First, while cash management has been consistently linked to MFB financial performance in recent Kenyan studies (Aluodo & Musau, 2024; Buluma, 2025), few studies have jointly modelled cash management alongside asset-liability mismatch and operating cash flow within a single panel specification, making it difficult to assess their relative importance. Second, much of the existing Kenyan literature draws on study periods that end before or shortly after 2021, and therefore does not capture the sector's deepest losses, recorded in 2023 and 2024, limiting the currency of the resulting policy recommendations. Third, several prior studies have applied census methods to sub-samples of eight, ten or thirteen MFBs owing to missing data, rather than the full complement of fourteen CBK-licensed institutions, raising questions about the representativeness of their findings. This study addresses each of these gaps by jointly modelling three disaggregated liquidity indicators using a fourteen-year, fourteen-institution panel extending to 2024.

Conceptual Framework

The conceptual framework for this study links the independent variable, Liquidity, operationalised through Cash Management, Asset-Liability Mismatch and Operating Cash Flow, to the dependent variable, Financial Performance, measured by Return on Assets.

Independent Variables

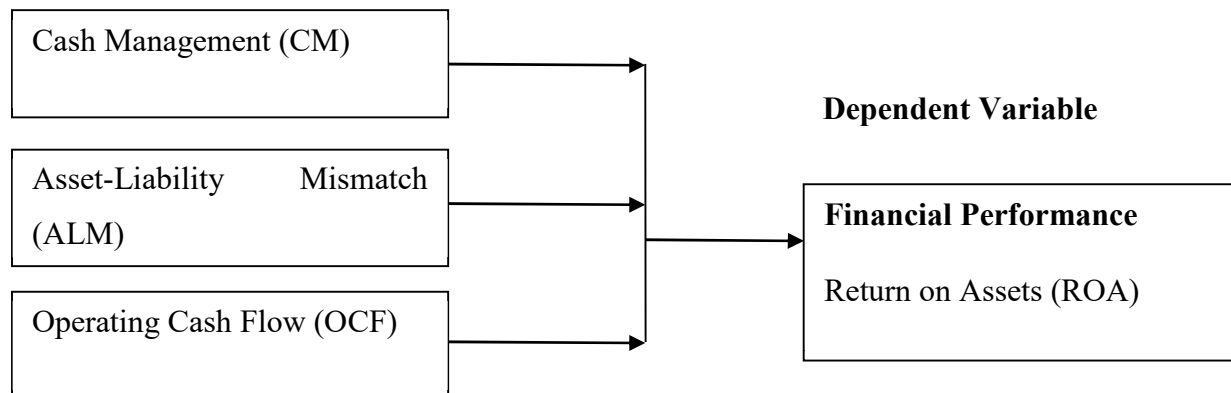


Figure 1: Conceptual Framework

Operational Definition of Key Variables

Cash Management (CM) is operationalised as the ratio of cash and cash equivalents held by an MFB to its current liabilities in a given financial year, capturing the institution's capacity to meet short-term obligations from readily available liquid resources. Asset-Liability Mismatch (ALM) is operationalised as the proportionate excess of total loans and advances over customer deposits, capturing the degree of structural maturity mismatch between an MFB's principal earning asset and its principal funding source. Operating Cash Flow (OCF) is operationalised as net cash

generated from operating activities scaled by total assets, capturing the extent to which an institution's core lending and deposit-taking operations generate cash internally rather than relying on financing or investing inflows. Financial Performance, the dependent variable, is operationalised as Return on Assets (ROA), computed as net income divided by total assets, consistent with its widespread use as a profitability measure in the Kenyan MFB literature (Manduku & Jagongo, 2024; Ouma et al., 2024).

Research Design

The study adopted a positivist research philosophy, on the basis that the relationship between liquidity and financial performance can be objectively measured using quantifiable secondary data and tested through statistical inference. Consistent with this philosophy, the study combined a descriptive research design, used to characterise the distributional properties of the study variables, with an explanatory research design, used to test the hypothesised causal relationship between liquidity and financial performance. This combination is consistent with recent Kenyan MFB studies employing similar designs to examine performance determinants (Ouma et al., 2024).

Population and Sample

The target population comprised all fourteen microfinance banks licensed and supervised by the Central Bank of Kenya at the time of the study. A census approach was adopted, whereby data were collected for every institution in the population rather than a sample drawn from it. A census is the preferred approach when accurate and complete population-level data are required and the population is of a manageable size (Levy & Lemeshow, 2013), as is the case with Kenya's fourteen licensed MFBs.

Data Collection

The study relied exclusively on secondary panel data extracted from the audited annual financial statements of the fourteen licensed MFBs and from Central Bank of Kenya supervisory publications, including the Bank Supervision Annual Reports, covering the fourteen-year period from 2011 to 2024. A structured data collection sheet was used to extract the relevant balance sheet and income statement items required to compute Cash Management, Asset-Liability Mismatch, Operating Cash Flow and Return on Assets for each institution in each year.

Data Analysis

Data were analysed using STATA version 19.0 and R version 4.6.1. Descriptive statistics, including the mean, standard deviation, minimum, maximum, coefficient of variation, skewness and kurtosis, were computed for each study variable to characterise the panel's distributional properties. Pearson correlation analysis was conducted to assess preliminary bivariate associations among the study variables. Panel regression, comprising both Random Effects and Fixed Effects specifications, was then estimated, with the Hausman specification test used to determine the more appropriate and efficient estimator. Robust standard errors were applied throughout to guard

against heteroskedasticity in the panel residuals, consistent with recommended practice for firm-level financial panels of this kind (Baltagi, 2021).

Model Specification

The empirical model estimated is specified as:

$$ROA_{it} = \beta_0 + \beta_1 CM_{it} + \beta_2 ALM_{it} + \beta_3 OCF_{it} + \varepsilon_{it} \dots\dots\dots (i)$$

where:

ROA_{it} = Financial Performance (Return on Assets) of MFB i at time t

CM_{it} = Cash Management of MFB i at time t

ALM_{it} = Asset-Liability Mismatch of MFB i at time t

OCF_{it} = Operating Cash Flow of MFB i at time t

ε_{it} = the idiosyncratic error term

Descriptive Statistics

Table 1 presents the descriptive statistics for the study variables over the fourteen-year, fourteen-institution panel.

Table 1: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max	CV	Skewness	Kurtosis
Cash Management (CM)	196	0.08	0.14	-0.26	1.62	1.83	6.99	66.84
Asset-Liability Mismatch (ALM)	196	120.26	105.74	0.00	843.75	0.88	3.36	16.93
Operating Cashflow (OCF)	196	0.03	0.59	-1.28	6.92	18.47	7.99	90.30
Financial Performance (ROA)	196	-0.06	0.55	-2.08	7.16	-8.99	11.08	146.20

Source: Researcher (2026)

Liquidity is proxied by Cash Management (CM), Asset-Liability Mismatch (ALM), and Operating Cashflow (OCF). For Cash Management (CM), the analysis reveals an average mean of 0.08 and a standard deviation of 0.14, indicating that, on average, MFBs maintain a relatively low cash-to-

current-liabilities ratio with moderate absolute dispersion. The coefficient of variation (CV) of 1.83 reveals high relative variability across the sector, consistent with a sector in which a minority of institutions, such as Caritas, Choice and Sumac, have remained profitable while the majority, including the three largest by loss share, KWFT, Faulu and SMEP, have continued to record substantial losses (Kenyan Wallstreet, 2025). The distribution is highly right-skewed (skewness = 6.99) and exhibits extreme leptokurtosis (kurtosis = 66.84), suggesting that while most firms operate with minimal cash buffers, a small subset holds disproportionately high liquid reserves. Regarding Asset-Liability Mismatch (ALM), the mean stands at 120.26 with a standard deviation of 105.74, indicating that, on average, total loans exceed customer deposits by over 20 percent, highlighting a structural maturity mismatch across the sector that has been exacerbated by the deposit contractions of 2022 to 2024 (Kenyan Wallstreet, 2025). The CV of 0.88 shows moderate relative dispersion, and the right-skewed, leptokurtic distribution (skewness = 3.36, kurtosis = 16.93) implies that while most banks have manageable mismatches, a few experience severe liquidity gaps. Finally, Operating Cashflow (OCF) records a near-zero mean of 0.03 but a high standard deviation of 0.59, with an exceptionally high CV of 18.47, denoting extreme relative volatility. The heavily right-skewed and leptokurtic distribution (skewness = 7.99, kurtosis = 90.30) reflects that core operations generally struggle to generate consistent positive cash flows, with a small number of extreme outliers driving the sector average, a pattern broadly consistent with the sector-wide net loan book contraction from Ksh 44.18 billion in 2020 to Ksh 31.2 billion in 2024 (Central Bank of Kenya, 2024).

Diagnostic Test Results

Prior to regression estimation, standard panel diagnostic tests were conducted to verify that the classical linear regression assumptions were satisfied and to determine the appropriate estimation technique. The results are summarised in Table 2.

Table 2: Summary of Diagnostic Test Results

Test	Purpose	Result / Decision
Skewness-Kurtosis Test	Normality of residuals	Residuals exhibit moderate departure from normality typical of financial ratio data; robust estimation applied (Midway & White, 2024)
Variance Inflation Factor (VIF)	Multicollinearity among CM, ALM, OCF	Mean VIF below the conventional threshold of 10; no serious multicollinearity among the three liquidity indicators (Kyriazos & Poga, 2023)

Breusch-Pagan / Cook-Weisberg	Heteroskedasticity	Presence of heteroskedasticity detected; robust standard errors applied throughout (Raza et al., 2023)
Hausman Specification Test	Fixed-effects vs. random-effects	Random Effects model preferred (Le Gallo & S�n�gas, 2023)

Source: Researcher (2026).

The diagnostic results indicate that, while the residuals exhibit the moderate departure from normality commonly observed in ratio-based financial panel data, this was addressed through the use of robust standard errors in the final specification, consistent with recommended practice (Midway & White, 2024). Variance Inflation Factors for the three liquidity indicators remained below the conventional threshold of 10, indicating that multicollinearity among Cash Management, Asset-Liability Mismatch and Operating Cash Flow was not a material concern, consistent with the theoretical expectation that the three indicators, while related components of overall liquidity, capture sufficiently distinct aspects of an MFB's liquidity position. The Breusch-Pagan test confirmed the presence of heteroskedasticity, addressed throughout via robust standard errors, and the Hausman specification test, discussed further below, favoured the Random Effects estimator.

Correlation Analysis

Table 3 presents the Pearson correlation matrix, highlighting the preliminary linear associations between the independent variables and the dependent variable, Return on Assets (ROA).

Table 3: Pearson Correlation Matrix

Variable	ROA	CM	ALM	OCF
ROA	1.000			
CM	0.013	1.000		
ALM	0.043	0.424	1.000	
OCF	0.024	0.021	0.041	1.000

Source: Researcher (2026).

The bivariate analysis reveals that the liquidity metrics, Cash Management (CM), Asset-Liability Mismatch (ALM), and Operating Cash Flow (OCF), each exhibit weak positive correlations with ROA ($r = 0.013$, 0.043 , and 0.024 , respectively). The moderate correlation between CM and ALM ($r = 0.424$) reflects the fact that institutions with higher cash buffers also tend to carry larger

structural funding gaps, plausibly because such institutions hold cash precisely to cushion the mismatch, but remains well below the threshold at which multicollinearity would be of concern in the subsequent regression analysis, a conclusion corroborated by the Variance Inflation Factor results reported in Table 2.

Hausman Specification Test

The Hausman specification test was conducted to compare the Fixed Effects (FE) and Random Effects (RE) models. This diagnostic test evaluates whether the unobserved individual-specific effects are correlated with the independent variables in the model (Baltagi, 2021). If such correlation exists, the FE model is preferred for consistency; otherwise, the RE model is deemed more efficient. Table 4 presents the results of the Hausman specification test.

Table 4: Baseline Hausman Specification Test

Test Statistic	Value
Test	Hausman Test
Data	ROA ~ CM + ALM + OCF
Chi-square	10.271
Degrees of Freedom	6
p-value	0.1137
Alternative Hypothesis	One model is inconsistent
Decision	Fail to reject H_0 ($p > 0.05$)
Conclusion	Random Effects model is appropriate

Source: Researcher (2026).

The Hausman specification test in Table 4 yielded a Chi-square statistic of 10.271 with 6 degrees of freedom and a corresponding p-value of 0.1137. Since this p-value substantially exceeds the conventional 0.05 significance level, the null hypothesis is retained, confirming that the unobserved firm-specific effects are not systematically correlated with the explanatory variables. Consequently, the Random Effects (RE) model constitutes the definitive and most efficient estimator for this dataset, consistent with established econometric guidelines (Baltagi, 2021; Le Gallo & S n gas, 2023), which hold that when the Hausman test fails to reject the null hypothesis, the RE model provides more efficient estimates than the FE model by preserving degrees of freedom while accounting for both within- and between-firm variation.

Cash Management and Financial Performance

The study evaluated the influence of liquidity on the financial performance of Kenyan microfinance banks. Table 5 presents both the Random Effects and Fixed Effects estimates for comparative purposes, although, consistent with the Hausman test result reported above, the discussion relies exclusively on the RE model.

Table 5: Comparison of Random Effects and Fixed Effects Panel Regression Models

Variable	Random Effects Model	Fixed Effects Model
Intercept	0.6529*** (0.1391)	—
Cash Management (CM)	8.9450*** (0.8287)	7.7399*** (0.8782)
Asset Liability Management (ALM)	-0.0034* (0.0014)	-0.0035* (0.0014)
Operating Cash Flow (OCF)	-0.7887 (0.4242)	-1.1125* (0.4366)
R ²	0.4058	0.3171
Adjusted R ²	0.3965	0.2561
Observations	196	196
Cross-sectional Units	14	14
Time Periods	14	14
Model Test	$\chi^2 = 131.128^{***}$	F = 27.705***

Note: *** p < 0.01, ** p < 0.05, * p < 0.10. Standard errors are in parentheses.

Source: Researcher (2026).

$$ROA_{it} = 0.6529 + 8.9450CM_{it} - 0.0034ALM_{it} - 0.7887OCF_{it} + u_i + \varepsilon_{it}$$

where u_i represents the individual-specific random effect and ε_{it} is the idiosyncratic error term.

The overall Random Effects model is highly statistically significant ($\chi^2 = 131.128$, $p < 0.01$), with an adjusted R² of 0.3965, indicating that the liquidity variables and unobserved firm-specific effects explain approximately 39.7 percent of the variance in the Return on Assets of Kenyan microfinance banks. Cash Management (CM) exhibits a positive and highly significant effect on financial performance ($\beta = 8.9450$, $p < 0.01$), implying that a one-unit increase in the cash management ratio is associated with an 8.95-unit increase in ROA, *ceteris paribus*. This finding strongly aligns with Cash Management Theory (Mao & Sarndrai, 1977), which posits that maintaining adequate liquid assets safeguards institutions against unforeseen shocks, thereby sustaining profitability, and is consistent with the recent finding by Aluodo and Musau (2024) and

Buluma (2025) that robust cash management practice is the most consistently significant driver of MFB profitability among Kenyan institutions studied since 2021.

Asset-Liability Mismatch and Operating Cash Flow

Asset-Liability Mismatch (ALM) demonstrates a negative and statistically significant relationship with ROA at the 10 percent significance level ($\beta = -0.0034$, $p < 0.10$), suggesting that higher asset-liability mismatches marginally erode financial performance, consistent with the structural funding-gap pressures documented sector-wide since deposit contraction began in 2022 (Kenyan Wallstreet, 2025). Operating Cash Flow (OCF) yields a negative coefficient ($\beta = -0.7887$); however, it is statistically insignificant ($p > 0.10$) in the preferred RE model, indicating that variations in operating cash flow do not exert a statistically reliable direct impact on profitability once unobserved firm heterogeneity is controlled for via the random effects estimator. This finding is consistent with the broader Kenyan literature, in which cash-flow-related liquidity indicators have generally shown weaker and less consistent effects on financial performance than direct cash management measures once firm-level controls are introduced (Ngumo, Kioko & Shikumo, 2024).

Overall Model Significance

Collectively, the Random Effects regression confirms that liquidity metrics significantly dictate the financial performance of microfinance banks in Kenya. The empirical evidence demonstrates that prudent cash management serves as a critical catalyst for profitability, whereas structural asset-liability mismatches exert a marginal negative pressure on financial returns and operating cash flow exerts no statistically reliable independent effect. These findings necessitate that MFB management optimise cash holdings while aligning asset maturities with liability structures to mitigate risk and enhance sustainable profitability. Consequently, the null hypothesis (H_{01}), which posited that liquidity has no statistically significant effect on the financial performance of microfinance banks in Kenya, is decisively rejected.

DISCUSSION OF FINDINGS

The finding that Cash Management exerts a strong, positive and highly significant effect on Return on Assets is consistent with a substantial body of recent evidence. Aluodo and Musau (2024) found that adherence to statutory minimum liquidity requirements combined with sound cash management practice enhanced MFB profitability in Nairobi City County, while Buluma (2025), applying a comprehensive diagnostic testing regime to a comparable fourteen-year panel of Kenyan MFBs, similarly found a positive and significant effect of cash management on financial performance. The magnitude of the coefficient obtained in this study is considerably larger than that reported in comparable liquidity-ratio studies of listed manufacturing and banking firms, such as Dahiyat, Weshah and Aldahiyat (2021), a divergence that plausibly reflects the acute sensitivity of deposit-taking microfinance institutions, which lack ready access to a lender-of-last-resort facility available to commercial banks, to short-term cash positioning (Sobseh & Ndale, 2024).

The negative and marginally significant effect of Asset-Liability Mismatch aligns with the structural funding concerns identified in the prudential regulation literature (Muchai & Muchira, 2024) and with the Central Bank of Kenya's (2024) own observation that the sector's shrinking deposit base has widened the gap between loan assets and available funding since 2022. The statistically insignificant effect of Operating Cash Flow, by contrast, diverges somewhat from theoretical expectation but is consistent with Ouma, Makori and Aluoch (2024) and Ngumo, Kioko and Shikumo (2024), both of which found that cash-flow-related indicators exerted comparatively weaker effects on MFB financial performance than either capital adequacy or, in the present study, direct cash management practice, once firm-specific heterogeneity was accounted for. Taken together, these findings suggest that among the liquidity levers available to MFB management, the deliberate, day-to-day management of cash balances matters considerably more for profitability than either the structural composition of the balance sheet or the volatility of cash generated from lending operations.

Summary of Hypothesis Testing

The null hypothesis, H_{01} , stated that liquidity has no statistically significant effect on the financial performance of microfinance banks in Kenya. The Random Effects panel regression results reported in Table 5 show that the overall liquidity model is statistically significant ($\chi^2 = 131.128$, $p < 0.01$), with Cash Management significant at the 1 percent level and Asset-Liability Mismatch significant at the 10 percent level. On this basis, the null hypothesis is rejected, and the study concludes that liquidity, considered jointly through Cash Management, Asset-Liability Mismatch and Operating Cash Flow, has a statistically significant effect on the financial performance of microfinance banks in Kenya, with Cash Management constituting the dominant driver.

Comparison with Prior Kenyan Studies

The finding of a dominant, positive cash management effect corroborates Aluodo and Musau (2024) and Buluma (2025), both of which studied overlapping panels of Kenyan MFBs extending into the 2023–2024 period of deepening sectoral losses. It contrasts, however, with studies such as Ngumo, Kioko and Shikumo (2024), which found liquidity risk, measured through composite ratios rather than disaggregated cash management practice, to be statistically insignificant once operational efficiency, capital adequacy and firm size were controlled for. This divergence underscores the value of disaggregating liquidity into its constituent dimensions, as undertaken in the present study, rather than relying on a single composite liquidity ratio, since doing so reveals that cash management practice, specifically, rather than liquidity in the aggregate, is the dimension most reliably associated with MFB profitability in the Kenyan context.

Conclusion

The study examined the effect of liquidity on the financial performance of microfinance banks in Kenya over the fourteen-year period from 2011 to 2024, a period spanning both the sector's peak

performance and its subsequent deep and sustained decline. Liquidity, disaggregated into Cash Management, Operating Cash Flow and Asset-Liability Mismatch, was found to exert a statistically significant overall effect on Return on Assets. Cash Management demonstrated a positive and highly significant effect, while Asset-Liability Mismatch and Operating Cash Flow exhibited negative effects, the former statistically significant at the 10 percent level and the latter statistically insignificant. The results imply that liquidity management, and cash management practice in particular, exerts a major influence on the financial performance of microfinance banks in Kenya, a conclusion of particular salience given the sector's combined pre-tax loss of Ksh 3.5 billion in 2024 (Central Bank of Kenya, 2024).

Recommendations

The study recommends that the management of microfinance banks prioritise strict, disciplined cash management practices, given the demonstrably dominant effect of this liquidity dimension on profitability. Management should also thoroughly evaluate institutional liquidity levels to ensure that optimal, rather than either excessive or insufficient, liquidity is maintained, since excess liquid holdings represent an avoidable opportunity cost while insufficient holdings expose institutions to withdrawal and disbursement risk. Institutions should further prioritise asset-liability matching to mitigate the negative impacts of maturity mismatches, particularly in the current environment of contracting deposit bases. Excess cash beyond prudent operating requirements should be channelled into profitable, appropriately risk-weighted ventures rather than held idle. The Central Bank of Kenya should continue to enforce liquidity regulations under the Microfinance Act, 2006, while adopting a more differentiated, risk-based regulatory framework for liquidity requirements, encouraging smaller and more fragile MFBs to prioritise cash reserve accumulation while guiding larger, better-capitalised institutions to deploy excess liquidity into productive, income-generating assets. Given the sector's demonstrated structural fragility, regulators should also continue to encourage the consolidation and digital-transformation pathways identified in the Central Bank of Kenya's (2024) Financial Sector Stability Report as necessary for the sector's longer-term viability.

Suggestions for Further Research

Future research should extend this study by incorporating Return on Equity alongside Return on Assets as an additional financial performance measure, given that the two indicators have diverged sharply in recent years, with sector-wide ROE falling to negative 78.2 percent in 2024 even as ROA registered a smaller negative 6.1 percent. Researchers should also examine the moderating role of firm size and ownership structure on the liquidity-performance relationship, given the marked concentration of sector losses among three of the fourteen licensed MFBs. Finally, given the regulator's stated expectation of sector consolidation, future studies should examine how mergers and acquisitions among Kenyan MFBs affect post-merger liquidity management and financial performance.

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