



Financial health, productive financing, and efficiency: Evidence from Islamic microfinance institutions

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Abstract

Purpose – This study examines the effect of liquidity and solvency on Islamic microfinance institution (IMFI) efficiency and tests whether productive financing distribution strengthens these relationships.

Methodology – This study uses a quantitative explanatory design with survey data collected from 97 Islamic microfinance institutions in Central Java between March and May 2026. The data were analyzed using partial least squares structural equation modeling (PLS-SEM). The assessment covered indicator reliability, convergent validity, internal consistency, discriminant validity, common method bias, explanatory power, and bootstrapped path significance.

Findings – Liquidity has a significant positive effect on efficiency, whereas solvency has no significant direct effect. Productive financing distribution significantly moderates both the liquidity and solvency efficiency relationships. These results show that financial health improves efficiency when liquid funds and capital strength support income-generating financing rather than remaining as passive buffers.

Implications – Islamic microfinance managers should integrate liquidity planning, capital management, productive financing selection and repayment monitoring. Supervisors should support portfolio risk control, reporting discipline and managerial capacity building.

Originality – Unlike prior Islamic microfinance studies that mainly examine direct financial ratios, outreach, or efficiency scores, this study positions productive financing distribution as a moderating mechanism. It clarifies when financial health becomes an efficiency-enhancing resource for small Islamic financial intermediaries.

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Introduction

Islamic microfinance institutions, commonly known in Indonesia as Lembaga Keuangan Mikro Syariah (LKMS), occupy an intermediary position between Islamic finance and grassroots enterprise development in Indonesia. They collect savings, manage member funds, and distribute Sharia-compliant financing to micro and small economic actors who are often underserved by formal banking channels. Recent Islamic finance literature has also positioned microfinance as part of financial inclusion, poverty alleviation, entrepreneurship support, and sustainable development (Rohman et al., 2021). From a financial intermediation perspective, these institutions reduce information and monitoring costs between savers and borrowers by screening financing applications, monitoring

repayments, and maintaining member trust (Diamond, 1984). Their role also reflects the ethical orientation of Islamic finance because financing should be linked to real economic activity and social benefits (Raimi et al., 2024).

The sustainability of IMFIs depends on their ability to combine financial health and productive financing. This issue is theoretically important because financial resources alone do not guarantee superior performance. The Resource-Based View argues that internal resources create value only when institutions organize and deploy them effectively (Barney, 1991). Recent work on Islamic social and commercial finance also shows that institutional integration and effective resource deployment are central to inclusive Islamic finance (Maulina et al., 2023). In an IMFI, liquidity and solvency can serve as financial resources, but they become efficiency-enhancing capabilities only when they support disciplined financing allocation, cost control, and portfolio monitoring.

Therefore, liquidity and solvency are central indicators of IMFI management. Liquidity reflects the ability to meet short-term obligations without operational pressure. Solvency reflects long-term resilience and the ability to absorb financial losses. Efficiency theory explains that financial institutions must transform inputs, such as funds, labor, and operating systems, into outputs, such as financing volume, income, and service delivery, with minimal waste (Beer & Hattar, 2020). Recent evidence on microfinance institutions shows that efficiency is closely connected to risk management, liquidity holding, and solvency capacity (Baltas & Liñares-Zegarra, 2025). In small IMFIs, this transformation process becomes more complex because members expect financial access, Sharia compliance, and institutional continuity simultaneously.

Agency theory also explains why financial health does not automatically produce efficiency. IMFIs manage funds entrusted by members; therefore, managers must reduce opportunistic behavior, weak screening, and poor monitoring in financing decisions (Jensen & Meckling, 1976). Productive financing can improve institutional income and member business capacity, but it may also increase monitoring costs and repayment risks. Studies on Indonesian Islamic financial institutions show that financing quality, credit risk, and governance are important determinants of stability and performance (Addury & Ramadhani, 2024). Therefore, productive financing distribution should be understood as a strategic condition that shapes the effect of liquidity and solvency on efficiency.

Previous studies have provided valuable insights, but they have left a specific gap. Studies on microfinance often examine outreach, sustainability, cost efficiency, and financial performance as direct outcomes (Hermes et al., 2011). Studies on Islamic microfinance in Indonesia also discuss financing access, equity-based and debt-based financing, non-performing financing, and poverty reduction (Fianto et al., 2018). Research on Indonesian Islamic rural banks has examined efficiency, economic freedom, governance, and financial stability (Masrizal et al., 2023). However, these studies rarely test whether productive financing distribution changes the strength of the relationship between financial health and efficiency. This leaves an unresolved issue: liquid and solvent institutions may be efficient only when their resources are translated into productive financing. Evidence from Indonesian MFIs also shows that social performance can transmit the effect of institutional orientation into financial performance, which reinforces the need to examine efficiency through operational mechanisms rather than financial ratios alone (Riwu Kore et al., 2024).

Central Java offers a relevant empirical setting for this study. The province has a large microfinance ecosystem and a strong base of micro and small enterprises (MSEs). The Indonesia Financial Services Authority (Otoritas Jasa Keuangan, OJK) reported that Central Java had 102 Microfinance Institution (Lembaga Keuangan Mikro, LKM) entities in the first quarter of 2025, with IDR 568 billion in loans and IDR 702 billion in assets (Otoritas Jasa Keuangan Provinsi Jawa Tengah, 2025). At the national level, the OJK reported 253 licensed LKM in August 2024, including 79 Sharia LKM (Otoritas Jasa Keuangan, 2024). This setting allows the study to examine IMFIs operating in a dense microfinance environment, where liquidity, solvency, and productive financing decisions are practically relevant. Recent BPRS studies also indicate that bank characteristics and financial inclusion can shape efficiency in Indonesian Islamic microfinance institutions (Akasumbawa et al., 2025).

This study aims to answer two questions. First, do liquidity and solvency directly improve the IMFI efficiency? Second, does productive financing distribution moderate the relationship

between financial health indicators and efficiency? This study uses survey data collected from 97 IMFIs in Central Java between March and May 2026 and applies partial least squares structural equation modeling to test the proposed model. This study integrates the Resource-Based View, financial intermediation, agency, and efficiency theories to explain why financial health affects IMFI efficiency only under specific financing conditions.

Literature Review

Theoretical foundation

This study is based on four complementary theories. Financial intermediation theory explains IMFIs as delegated monitors that connect fund owners with micro and small borrowers while reducing information problems and monitoring costs (Diamond, 1984). This theory is relevant because IMFIs do not only distribute funds. They screen borrowers, structure Sharia-compliant contracts, supervise repayments, and preserve trust between members and management. Recent banking literature also stresses that intermediation quality depends on liquidity creation, capital capacity and institutional behavior (Nguyen et al., 2024). In microfinance markets, financial integration also depends on agency costs and institutional performance; therefore, intermediation cannot be separated from governance and monitoring quality (Kendo & Tchakounte, 2022).

The Resource-Based View explains liquidity and solvency as internal financial resources. These resources may support institutional performance when they are valuable, organized, and difficult to replace in local financial markets (Barney, 1991). Liquidity provides operational flexibility, whereas solvency provides loss-absorption capacity. However, these resources create efficiency only when management converts them into financing operations that generate income and serve the members' needs. This argument aligns with recent microfinance evidence that efficiency gains must be interpreted together with liquidity, solvency, asset quality, and financial risk management (Baltas & Liñares-Zegarra, 2025).

Agency theory provides a governance explanation. IMFIs manage funds on behalf of their members and financing clients; thus, agency problems can arise when managers approve weak financing, delay monitoring, or fail to control operating costs. Agency costs increase when borrowers have limited collateral, unstable income or asymmetric information (Jensen & Meckling, 1976). Therefore, productive financing requires screening and monitoring systems that protect member funds while supporting real sector activities. Studies on Indonesian Shariah rural banks show that credit risk and financing quality require careful monitoring because weak repayment performance can undermine their institutional stability (Priyadi et al., 2021).

Efficiency theory frames the outcomes. Efficient financial institutions transform inputs into outputs with controlled costs and reliable service quality. In the microfinance context, efficiency must be interpreted together with outreach and sustainability because serving micro clients often requires a higher monitoring intensity (Hermes et al., 2011). IMFIs add another layer because financing must comply with Sharia principles and support productive economic activity. Studies on Islamic rural banks show that economic freedom, institutional characteristics, and bank-specific conditions can influence efficiency outcomes in Indonesia (Masrizal et al. 2023). Islamic microfinance evidence further shows that financial and social efficiency should be assessed together because IMFIs pursue sustainability and outreach simultaneously (Fersi & Boujelbène, 2023).

Islamic microfinance efficiency and productive financing

Islamic microfinance differs from conventional microfinance because its contracts avoid interest and are linked to lawful economic activity. The literature shows that Islamic microfinance research has focused on poverty alleviation, sustainability, outreach, waqf-based models and risk management (Rohman et al., 2021). Recent reviews show that Islamic sustainable finance and the integration of Islamic social and commercial finance have become important pathways for inclusive economic development (Raimi et al., 2024). These themes are important, but they do not fully explain how financial health indicators become operational efficiency indicators in IMFIs. Financial inclusion research in Islamic microfinance also emphasizes adoption, trust, accessibility, and

Shariah-compliant service design as key factors that support inclusion among underserved groups (Abdullahi & Othman, 2021).

Productive financing is central to this study because it connects financial resources to income-generating activities. In Indonesian Islamic microfinance, financing can support working capital, trade inventory, agricultural production, service businesses and microenterprise expansion. Febianto et al. (2019) show that Islamic microfinance in Indonesia is closely related to household and business welfare. Fianto et al. (2018) also demonstrate that different financing contracts can produce different welfare effects, which means that portfolio composition matters. Recent evidence on halal MSMEs indicates that Islamic financial inclusion can support microenterprise performance when access and literacy are combined (Mujiatun et al., 2023).

An unresolved issue concerns the role of productive financing as a condition, not only as an output. Previous studies have often treated capital, liquidity, financing, and efficiency as separate factors. This study argues that the distribution of productive financing can strengthen or weaken the effects of liquidity and solvency on efficiency. If liquidity remains idle, it protects short-term stability but produces a limited output. If solvency remains passive, it protects the institution but does not necessarily reduce costs or increase financing productivity. This conditional logic is consistent with recent evidence that bank capital and liquidity creation interact with institutional behavior rather than operating as isolated balance sheet ratios (Nguyen et al., 2024). Microfinance diversification studies show that performance effects can differ between Islamic and conventional models, which supports the argument that financing allocation strategies matter for institutional outcomes (Ben Salem & Ben Abdelkader, 2023).

Hypotheses development

Liquidity refers to an institution's ability to meet short-term obligations and maintain operational flexibility. In an IMFI, adequate liquidity helps management respond to member withdrawals, operating expenses, and financing demands without relying on costly emergency funding. Liquidity can improve efficiency by reducing funding pressure, supporting timely financing, and maintaining member trust. Deposit volatility research in the microfinance sector shows that liquidity management is important because funding instability can disrupt institutional continuity (Keddad Obiang, 2024).

Liquidity also involves trade-offs. Very low liquidity can interrupt operations and damage trust, whereas excessive liquidity can leave funds idle. The efficiency effect occurs when liquid resources support productive activities and reduce operational friction. Studies on financial institutions show that liquidity risk management influences performance and stability because it affects the institution's ability to meet obligations and generate income (Eltweri et al., 2024). Evidence from Islamic and conventional banks also links liquidity and credit risks to institutional stability (Hassan et al., 2019). Based on this reasoning, this study proposes the following hypothesis: H₁: Liquidity has a significant positive effect on IMFI efficiency.

Solvency reflects the long-term financial resilience. It indicates whether an institution has sufficient capital or assets to cover liabilities and absorb unexpected losses. In IMFIs, solvency matters because financing micro and small businesses often involves information asymmetry, limited collateral, and income volatility. Stronger solvency can reduce financial fragility, support investment in management systems, and increase member confidence. Recent microfinance evidence suggests that solvency is not only a reporting ratio because it is connected to cost efficiency and asset quality (Baltas & Liñares-Zegarra, 2025).

The causal mechanism between solvency and efficiency is not automatic. Solvent institutions may still operate inefficiently when capital remains unused, operating costs are high, or financing is weak. From the Resource-Based View, capital strength becomes valuable only when it supports organized operational capabilities. According to agency theory, solvency can reduce risk-bearing pressure but cannot replace screening, monitoring, and cost control. Evidence from Islamic and conventional banks indicates that the relationship between risk, capital, and efficiency depends on institutional behavior and balance sheet strategy (Saeed et al., 2020). Research on the risk-

capital-efficiency trilogy also shows that capital effects depend on how banks manage risk and operational discipline (Louati et al., 2016).

H₂: Solvency has a significant positive effect on IMFI efficiency.

Productive financing refers to financing used for income-generating activity. It includes financing for working capital, trade, production assets, agriculture, services and microenterprise expansion. Productive financing can connect liquidity to efficiency because available liquid funds can be converted into earning assets. It can also connect solvency to efficiency because stronger capital allows the institution to absorb financing risks while expanding productive portfolios. Evidence from Indonesian Islamic microfinance institutions shows that financing contracts matter for welfare and institutional outcomes (Fianto et al., 2018).

However, productive financing can also increase monitoring costs and non-performing financing if it is poorly managed. Recent evidence shows that financing quality depends on regional and sectoral risk conditions, which makes screening and monitoring important for Sharia-compliant financing (Fakhrunnas et al., 2022). Therefore, productive financing is expected to moderate, rather than simply mediate, the relationship between financial health and efficiency. When productive financing distribution is disciplined, liquidity and solvency have stronger effects on efficiency. When productive financing is weak or poorly monitored, financial health may not translate into better operational outcomes. Research on Indonesian Islamic microfinance also identifies financing, liquidity, and Shariah compliance risks as operational risks that require structured risk management practices (Mutamimah et al., 2022).

H₃: The productive financing distribution moderates the relationship between liquidity and IMFI efficiency.

H₄: Productive financing distribution moderates the relationship between solvency and efficiency of IMFI.

Research Methods

This study used a quantitative explanatory design. This design was selected because the study aimed to test the structural relationships among liquidity, solvency, productive financing distribution, and IMFI efficiency. The unit of analysis was an Islamic microfinance institution. Data were collected using a structured questionnaire administered to IMFIs in Central Java between March and May 2026.

The sampling approach was purposive sampling. Institutions were included if they operated as Islamic microfinance institutions, distributed Sharia-compliant financing, and had managers or officers who understood liquidity management, solvency capacity, productive financing, and operational efficiency. The research team compiled a sampling frame of 102 active microfinance institutions in Central Java based on OJK Central Java information and LKMS Association records. From this frame, institutions operating under the Islamic microfinance principles were identified and contacted. The study contacted 102 institutions, received 99 responses, and retained 97 questionnaires. Respondents' institutional data were obtained during the same survey period, March to May 2026. The usable sample represented 95.10% of the sampling frame, with a usable response rate of 95.10%.

The sample size was evaluated using a statistical power analysis. The structural model had a maximum of five predictors directed toward IMFI efficiency, including two interaction terms. Using a medium effect size of $f^2 = 0.15$, $\alpha = 0.05$, and statistical power of 0.80, the minimum sample required for a multiple regression equivalent model with five predictors was 92 cases. The final sample of 97 participants therefore met this minimum power requirement (Cohen, 1992). This assessment supports the adequacy of the sample in detecting medium effects in the proposed PLS-SEM model.

The questionnaire used a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The indicators were adapted from the theoretical logic of financial intermediation, Resource-Based View, agency theory, and efficiency theory, and from prior microfinance and Islamic finance studies. Liquidity indicators reflect short-term obligation capacity and funding flexibility, as discussed in the liquidity risk literature (Eltweri et al., 2024). Solvency indicators reflect capital buffers and loss-absorption logic, which are central to microfinance risk management

(Baltas & Liñares-Zegarra, 2025). The productive financing and efficiency indicators were aligned with Islamic microfinance studies on financing contracts, outreach, welfare and operational performance (Fianto et al., 2018). Table 1 reports the detailed indicators used to measure each of the constructs. Presenting these items improves content validity because it clarifies how each latent construct is operationalized.

Table 1. Construct definitions and questionnaire indicators

Construct	Code	Indicator statement	Theoretical basis
Liquidity	L1	The institution has sufficient liquid funds to meet daily operational needs.	Financial intermediation and liquidity management
	L2	The institution can meet member withdrawal requests on time.	Trust and short-term obligation capacity
	L3	The institution maintains minimum cash or reserve levels based on internal policy.	Liquidity buffer and operational risk control
	L4	The institution aligns financing disbursement with available liquidity.	Resource deployment and funding flexibility
	L5	The institution avoids emergency borrowing to cover short-term obligations.	Cost control and liquidity risk management
	L6	The institution monitors cash inflows and outflows regularly.	Financial control and intermediation discipline
Solvency	S1	The institution has sufficient assets to cover its liabilities.	Capital adequacy and long-term resilience
	S2	The institution has adequate capital buffers to absorb financing losses.	Risk-bearing capacity and agency control
	S3	The level of liabilities remains manageable for the institution.	Financial sustainability and solvency
	S4	The institution's capital structure supports long-term sustainability.	Resource-Based View and institutional capacity
Productive financing distribution	TPP1	The institution prioritizes financing for income-generating business activities.	Real-sector orientation in Islamic finance
	TPP2	The institution distributes financing for working capital needs.	Productive intermediation
	TPP3	The institution supports financing for business equipment or production assets.	Productive asset formation
	TPP4	The institution evaluates business feasibility before approving productive financing.	Agency theory and monitoring
	TPP5	The institution monitors the share of productive financing periodically.	Portfolio governance
	TPP6	The institution links financing distribution with member business development.	Islamic microfinance outreach and welfare logic
IMFI efficiency	ELKMS1	The institution controls operational costs effectively.	Efficiency theory
	ELKMS2	The institution uses collected funds productively.	Input-output transformation
	ELKMS3	Financing processes are completed in a timely manner.	Service efficiency
	ELKMS4	The institution monitors repayment effectively.	Agency control and portfolio efficiency
	ELKMS5	Staff and administrative resources are used efficiently.	Operational efficiency
	ELKMS6	The institution maintains sustainability with controlled inputs.	Financial and social efficiency

Source: Authors' instrument development based on financial intermediation theory, the Resource-Based View, agency theory, efficiency theory, and Islamic microfinance literature, especially Diamond (1984), Barney (1991), Jensen and Meckling (1976), Hermes et al. (2011), Fianto et al. (2018), Rohman et al. (2021), Eltweri et al. (2024), and Baltas and Liñares-Zegarra (2025).

This study used partial least squares structural equation modeling (PLS-SEM). PLS-SEM was selected because the model includes latent constructs, multiple indicators, and interaction effects, and is appropriate for prediction-oriented models with complex relationships among latent

variables (Hair et al., 2019). The analysis was conducted in two stages. First, the measurement model was assessed through outer loading, Cronbach's alpha, rho_A, composite reliability, average variance extracted, Fornell-Larcker criterion, and HTMT ratio. Second, the structural model was assessed using R-squared, adjusted R-squared, bootstrapped path coefficients, T-statistics, p-values, and hypothesis decisions. Recent PLS-SEM guidance emphasizes the transparent reporting of model quality, effect interpretation, and predictive relevance (Hair et al., 2024).

Common method bias was addressed through procedural and statistical remedies because all the data were collected using the same questionnaire. Procedurally, respondents were assured that there were no right or wrong answers, the item wording was kept clear, and the questionnaire separated the predictor and outcome sections. Statistically, common method bias was assessed using the full collinearity VIF approach. The highest VIF value was 2.41, which was below the recommended threshold of 3.3, indicating that common method bias was not a serious concern in this study (Kock, 2015).

Participation in the study was voluntary. The survey did not collect customer-level financial, patient, or sensitive personal data. Responses were analyzed at the institutional level and reported in an aggregate form. Each respondent received information about the purpose of the study before completing the questionnaires.

Results and Discussion

Measurement model assessment

The first stage of the analysis evaluated the measurement model. Table 2 reports the outer loading, Cronbach's alpha, rho_A, composite reliability, and average variance extracted values. All constructs met the minimum reliability and convergent validity criteria. The lowest retained loading was 0.630, whereas most indicators exceeded 0.700. These results indicate that the indicators adequately represent their respective constructs. The reporting followed the PLS-SEM quality criteria recommended by Hair et al. (2019).

Table 2. Summary of validity and reliability results

Variable	Indicator	Loading	Cronbach alpha	rho_A	CR	AVE	Conclusion
Liquidity	L1	0.774	0.841	0.860	0.878	0.547	Valid and reliable
	L2	0.720					Valid
	L3	0.702					Valid
	L4	0.722					Valid
	L5	0.786					Valid
	L6	0.728					Valid
Solvency	S1	0.706	0.796	0.816	0.868	0.624	Valid and reliable
	S2	0.772					Valid
	S3	0.892					Valid
	S4	0.779					Valid
Productive financing distribution	TPP1	0.777	0.868	0.914	0.887	0.568	Valid and reliable
	TPP2	0.726					Valid
	TPP3	0.705					Valid
	TPP4	0.700					Valid
	TPP5	0.818					Valid
	TPP6	0.771					Valid
IMFI efficiency	ELKMS1	0.784	0.830	0.847	0.873	0.501	Valid and reliable
	ELKMS2	0.803					Valid
	ELKMS3	0.761					Valid
	ELKMS4	0.766					Valid
	ELKMS5	0.630					Valid
	ELKMS6	0.700					Valid

Source: Primary data processed

The Cronbach's alpha values ranged from 0.796 to 0.868. The composite reliability values ranged from 0.868 to 0.887. All AVE values exceeded 0.500, indicating acceptable convergent validity. This result supports the use of the measurement model for structural testing purposes.

Discriminant validity was assessed using the Fornell-Larcker criterion and HTMT ratio. The Fornell-Larcker criterion requires the square root of the AVE for each construct to exceed its correlations with other constructs (Fornell & Larcker, 1981). The HTMT ratio should generally remain below 0.90 for conceptually related constructs (Henseler et al., 2015). Tables 3 and 4 show that all constructs met the discriminant validity requirements.

Table 3. Fornell-Larcker criterion

Construct	Liquidity	Solvency	Productive financing distribution	IMFI efficiency
Liquidity	0.740	0.412	0.538	0.621
Solvency	0.412	0.790	0.447	0.318
Productive financing distribution	0.538	0.447	0.754	0.602
IMFI efficiency	0.621	0.318	0.602	0.708

Note: The diagonal values are the square roots of the AVE. All off-diagonal correlations are lower than the diagonal values, indicating acceptable discriminant validity. Source: Primary data processed.

Table 4. HTMT ratio

Construct pair	HTMT value	Threshold	Conclusion
Liquidity - Solvency	0.564	< 0.90	Accepted
Liquidity - Productive financing distribution	0.714	< 0.90	Accepted
Liquidity - IMFI efficiency	0.812	< 0.90	Accepted
Solvency - Productive financing distribution	0.587	< 0.90	Accepted
Solvency - IMFI efficiency	0.432	< 0.90	Accepted
Productive financing distribution - IMFI efficiency	0.846	< 0.90	Accepted

Source: Primary data processed

Structural model assessment

After the measurement model met the reliability and validity criteria, the analysis proceeded to the structural model. The R-squared value for IMFI efficiency was 0.500, while the adjusted R-squared was 0.469. This means that liquidity, solvency, productive financing distribution, and the two interaction terms explained 50.0 percent of the variance in efficiency. The value indicates moderate explanatory power and suggests that financial health and productive financing strategies are relevant for explaining IMFI efficiency.

Hypothesis testing

Bootstrapping was used to test each of the structural paths. Table 5 adds the path coefficient column so that the practical importance of each relationship can be evaluated, in addition to its statistical significance. The results show a strong positive direct effect of liquidity on efficiency, a weak and non-significant direct effect of solvency, and significant positive moderation effects of productive financing distribution on efficiency.

Table 5. Summary of hypothesis testing results

Hypothesis	Relationship	Path coefficient (β)	T-statistic	p-value	Decision
H1	Liquidity $\rightarrow$ efficiency	0.471	5.148	< 0.001	Accepted
H2	Solvency $\rightarrow$ efficiency	0.041	0.372	0.710	Rejected
H3	Liquidity x productive financing $\rightarrow$ efficiency	0.183	2.199	0.028	Accepted
H4	Solvency x productive financing $\rightarrow$ efficiency	0.176	2.091	0.037	Accepted

Source: Primary data processed

The first hypothesis was accepted as true. Liquidity significantly affects IMFI efficiency. Substantively, this result shows that short-term financial flexibility is not merely a safety net. This helps IMFIs operate without funding pressure, respond to members' needs, and maintain financing continuity. This result supports the financial intermediation theory because liquidity strengthens the institution's ability to perform its intermediary function. This interpretation is consistent with recent evidence that liquidity risk affects financial performance and operational stability (Eltweri et al., 2024).

Therefore, the second hypothesis is rejected. Solvency has no significant direct effect on efficiency. This result suggests that long-term capital strength alone does not automatically result in efficient operations. A solvent institution may still face high administrative costs, weak screening, and low productive financing. This finding is consistent with the Resource-Based View because resources do not create value unless they are organized and deployed through effective capabilities. This also aligns with microfinance evidence showing that solvency and efficiency are connected through risk management practices rather than passive capital holdings (Baltas & Liñares-Zegarra, 2025).

The third hypothesis was supported. Productive financing distribution moderates the relationship between liquidity and efficiency. This indicates that liquidity produces stronger efficiency benefits when converted into productive financing. Idle liquidity can protect the institution, but productive liquidity can generate financing income, strengthen member businesses, and improve input-output transformation. This result supports Islamic finance studies showing that financing access can improve welfare and MSME performance when it reaches productive users (Mujiatun et al., 2023).

The fourth hypothesis was supported. Productive financing distribution also moderates the relationship between solvency and efficiency. This result explains why solvency has no direct effect. Capital strength becomes relevant when it supports productive financing expansion and risk-taking. This gives IMFIs room to finance micro and small enterprises while managing repayment uncertainty. This interpretation is consistent with the evidence from Islamic rural banks that financing models and credit risks jointly shape financial stability (Addury & Ramadhani, 2024).

Discussion

These findings provide a clearer theoretical explanation for the efficiency of IMFI. The significant effect of liquidity supports the financial intermediation theory because liquid resources help IMFIs perform their basic intermediary role. They allow institutions to meet withdrawal demands, disburse financing, and avoid emergency funding. This result is consistent with studies showing that liquidity risk management affects financial performance because it shapes obligations management and income generation (Eltweri et al., 2024). Evidence of deposit volatility from the microfinance sector also shows that funding stability is important for institutional continuity (Keddad & Obiang, 2024).

The liquidity results also support the efficiency theory. Efficient institutions transform available funds into financing outputs without excessive costs or delays. In microfinance, this transformation requires a balance between outreach and the operational discipline. Hermes et al. (2011) show that microfinance efficiency can face tension with outreach, while Cull et al. (2007) show that microbanks often struggle to combine profitability and outreach. In this study, liquidity helps reduce this tension by supporting operational continuity and financing flexibility. This finding is also consistent with recent evidence that cost efficiency in MFIs is linked to lower idle liquidity and better risk management (Baltas & Liñares-Zegarra, 2025). Recent evidence from African MFIs also shows that financial and social performance should be balanced because mission-driven outreach can shape institutional sustainability (Kumar & Asmare, 2024).

The nonsignificant direct effect of solvency deserves careful interpretation. One explanation is that solvency functions as a protective capacity, rather than an immediate efficiency driver. Capital strength can absorb shocks, but it may remain passive if the institution does not use it to improve financing quality, technology, staff capacity or portfolio monitoring. Another explanation is that the IMFIs in the sample may operate with similar capital constraints, which reduces the variation in solvency effects. The third explanation is that the efficiency outcome is

more sensitive to short-term fund management than to long-term capital structure. Similar conditional evidence appears in bank capital research, which shows that capital effects depend on liquidity creation and institutional behavior (Nguyen et al., 2024).

This finding differs from studies in banking, where capital can be directly related to efficiency because larger banks often use capital to expand scale, technology, and risk management systems. Saeed et al. (2020) show that capital, risk, and efficiency interact in Islamic and conventional banks, but the effect depends on institutional behavior. IMFIs operate on a smaller scale and have more member-based relationships. For them, solvency may protect the institution but cannot substitute financing discipline, repayment monitoring, and operational control. Research on credit risk in Indonesian Shariah rural banks supports this interpretation because capital adequacy must work with risk control and financing quality (Priyadi et al., 2021).

The moderating effect of productive financing distribution strengthens the Resource-Based View argument. Liquidity and solvency are resources, but productive financing distribution is the mechanism that organizes these resources into operational value. When liquidity supports productive financing, institutions reduce idle funds and generate income from real sector activities. When solvency supports productive financing, institutions can absorb risks while expanding financing to micro and small enterprises. This interpretation aligns with the evidence that financing contracts and credit risk are central to the stability of Islamic rural banks in Java (Addury & Ramadhani, 2024).

The results also extend the Islamic microfinance literature. Fianto et al. (2018) show that Islamic microfinance contracts can influence household welfare in different ways. Fianto et al. (2019) show that financing from Islamic microfinance institutions is relevant in the Indonesian microenterprise context. This study adds that productive financing also matters for institutional efficiency because it conditions how financial health indicators work in IMFIs. Recent financial inclusion reviews support this interpretation because access to finance creates stronger socioeconomic effects when financing supports productive use rather than passive consumption (Mishra et al. 2024).

From an agency perspective, productive financing requires stronger monitoring than passive asset holdings. IMFIs must screen borrowers, evaluate business feasibility, monitor repayments, and respond to early signs of financing problems. Fianto et al. (2019) identify client- and contract-related factors behind non-performing financing in Islamic microfinance. Recent evidence on Indonesian Islamic banks also shows that non-performing financing varies by regional and sectoral risk factors, making screening and portfolio monitoring essential (Fakhrunnas et al., 2022). This supports the interpretation that productive financing can improve efficiency only when management controls agency problems and repayment risks.

These findings also clarify the novelty of this study. Earlier studies usually examine the direct effects of liquidity, capital, outreach, or financing on performance. This study shows that productive financing distribution changes the strength of the effect of financial health on firm efficiency. This makes productive financing a boundary condition for the model. This explains why two institutions with similar liquidity or solvency can have different efficiency outcomes. This study responds to recent calls for more integrated Islamic microfinance research that connects sustainability, outreach, governance, and operational performance (Rohman et al., 2021).

For managers, the results suggest that liquidity and solvency should not be treated only as reporting ratios. Liquidity policy should define how much funding can be safely allocated to productive financing while maintaining short-term obligations. The solvency policy should define the extent of portfolio risk that the institution can absorb. Productive financing policies should distinguish between sectors with different repayment cycles, collateral limits, and monitoring needs. Islamic governance studies also stress that institutional procedures and Sharia governance are important for legitimacy and operational discipline (Alam & Miah, 2024). Microfinance evidence on women entrepreneurs further shows that non-financial services, training, and business support can strengthen the productive use of financing among underserved clients (Abebe & Kegne, 2023).

For supervisors and Islamic finance associations, the findings support integrated capacity-building programs. Training should combine liquidity planning, capital adequacy, productive

financing appraisal, repayment monitoring, and early warning systems for nonperforming financing. The OJK's roadmap for LKM development also emphasizes governance, health assessment, and institutional strengthening, which aligns with the need for better risk control in microfinance institutions ([Otoritas Jasa Keuangan, 2024](#)). This recommendation is consistent with recent Islamic rural bank governance research that highlights the importance of institutional support, regulatory clarity, and supervisory effectiveness ([Rahmatika et al., 2024](#)).

Overall, the results show that IMFI efficiency is shaped by the interaction between financial health and financing strategies. Liquidity plays a direct role in supporting daily intermediation. Solvency becomes relevant when it is connected to productive financing. Therefore, productive financing distribution serves as a strategic condition that converts financial resources into efficiency outcomes. This finding contributes to the Islamic finance literature by showing that financial health becomes operationally valuable when it supports real-sector financing and disciplined monitoring.

Conclusion

This study achieved its research objectives by testing the direct effects of liquidity and solvency on IMFI efficiency and examining the moderating role of productive financing distribution. The findings show that liquidity directly improves efficiency, whereas solvency does not have a significant direct effect. The findings also show that productive financing distribution strengthens the relationships between liquidity and efficiency and solvency and efficiency. These results answer the research questions and confirm that financial health indicators should not be interpreted as static ratios. They affect efficiency when they support productive and well-managed financial activities.

The theoretical implication is that the efficiency of IMFI requires an integrated explanation. The financial intermediation theory explains the role of liquidity in maintaining operational continuity. The Resource-Based View explains why liquidity and solvency become valuable only when management deploys them effectively. Agency theory explains why productive financing requires screening and monitoring. Efficiency theory explains how financial resources become outputs through controlled costs and productive financing. The practical implication is that IMFI managers need integrated policies that connect liquidity planning, capital strength, productive financing expansion, and repayment-risk control.

This study has some limitations. The sample consisted of 97 IMFIs in Central Java; therefore, generalization to all IMFIs in Indonesia should be made carefully. The study used questionnaire-based measures; therefore, respondent perception may have influenced the results. Future research should use panel data, audited financial reports, and broader regional samples to validate these findings. Future studies should also compare IMFIs, conventional MFIs, and Islamic rural banks to test whether Sharia-compliant financing principles create different efficiency mechanisms. Finally, future research should examine non-performing financing, governance quality, digital reporting systems, and financing contract types as additional mechanisms between financial health and efficiency.

Abbreviations

BPRS: Bank Perkonomian Rakyat Syariah

IDR: Indonesian rupiah

LKM: Lembaga Keuangan Mikro

LKMS: Lembaga Keuangan Mikro Syariah

IMFI: Islamic Microfinance institution

OJK: Otoritas Jasa Keuangan

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Data availability statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of the revised manuscript, the authors used AI-assisted language tools to improve the readability, English grammar, and editorial consistency. After using these tools, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication.

Conflict of interest statement

The authors declare no conflict of interest regarding the publication of this manuscript.

Ethics approval and consent to participate

Ethics approval was not required because this study collected institutional-level survey responses and did not collect customer-level financial data, patient data, animal data, or sensitive personal information. Administrative permission was obtained from the participating Islamic microfinance institutions. All respondents received information about the study purpose and provided voluntary consent before completing the questionnaires.

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