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The impact of financial technology adoption on economic empowerment in Islamic microfinance

Munirah[1], Putri Rohayanti[2], Adzkiya Salsabila Azzahra[3]
[1]STAI Al-Muhajirin, Email: munirasari2507@gmail.com
[2]STAI Al-Muhajirin, Email: prohayanti@gmail.com
[3]STAI Al-Muhajirin, Email: adzkyasalsabilazahra@gmail.com

Abstract
This study aims to analyze the impact of financial technology (fintech) adoption on economic empowerment within Islamic microfinance institutions, with financial inclusion acting as a moderating variable. The research employed the Partial Least Squares Structural Equation Modeling (PLS-SEM) method, gathering data from 75 respondents through a Likert-scale-based questionnaire. The findings reveal that fintech adoption has a significant impact on economic empowerment, while financial inclusion strengthens this relationship, although its influence is relatively smaller compared to fintech itself. The implications of this research highlight the necessity of improving financial literacy, digital infrastructure, and supportive regulations to ensure optimal benefits of fintech within Islamic microfinance.

Keywords: Fintech; Islamic microfinance; economic empowerment; financial inclusion; PLS-SEM

INTRODUCTION

The advancement of financial technology (fintech) has brought substantial transformation to the financial sector, including Islamic microfinance institutions. Fintech serves as an innovative solution to bridge financial access gaps, enabling individuals previously excluded from traditional financial services to access more efficient, faster, and affordable financial solutions. Hidajat (2020) notes that fintech has reshaped the Islamic finance industry through mobile payments, peer-to-peer lending, and sharia-compliant crowdfunding, thereby expanding financial inclusion. In addition, research by Shaikh (2020) indicates that the integration of fintech into Islamic microfinance can improve service efficiency and scalability, with a significant impact on the economic empowerment of communities.

In the context of Islamic microfinance, fintech adoption not only enhances operational efficiency but also strengthens the ability of institutions to empower low-income communities. Tripalupi *et al.* (2021) emphasize that the digitalization of Islamic microfinance services can enhance competitiveness through technology-based innovation and digital marketing strategies. Kakembo *et al.* (2021) also found that Islamic microfinance adoption addresses financial challenges faced by small and medium enterprises (SMEs), especially in developing countries. Thus, integrating fintech into Islamic microfinance services is a strategic step toward achieving inclusive and sustainable economic empowerment.

Despite the great potential of fintech in Islamic microfinance, its adoption still faces several challenges. One of the primary obstacles is the low level of financial inclusion among the target communities of Islamic microfinance institutions. Financial

inclusion refers to individuals' ability to access and effectively utilize financial services. According to Shaikh (2020), fintech can serve as an innovative tool to increase financial inclusion by integrating financial technology into Islamic microfinance operations, thereby expanding service outreach. However, Abdullahi and Othman (2021) note that attitudes, subjective norms, and perceived behavioral control remain major barriers to adopting *sharia*-compliant financial services in some developing countries.

Furthermore, Hayat and Hameed (2024) found that the compatibility and trialability of Islamic fintech innovations play a vital role in enhancing Islamic financial inclusion, though their effects are more pronounced when coupled with widespread fintech adoption. Kassim and Hassan (2018) identified challenges such as low financial literacy and distrust in technology as key obstacles in implementing financial inclusion through Islamic fintech. Tripalupi *et al.* (2021) underscore the importance of technology-driven development strategies to enhance competitiveness and improve access to *sharia*-based microfinance services. Therefore, without improvements in financial inclusion, fintech adoption may not fully impact economic empowerment, particularly for financially vulnerable communities.

Financial inclusion not only serves as a core goal of Islamic microfinance institutions but also acts as a crucial link between fintech adoption and economic empowerment. With improved financial inclusion, communities can access *sharia*-compliant services such as Islamic microfinance, *takaful* (Islamic insurance), and Islamic savings. Ismamudi *et al.* (2023) note that *sharia*-based fintech can expand access to financial services for underserved communities, promoting economic empowerment through greater accessibility. Moreover, Shinkafi *et al.* (2019) highlight the importance of financial literacy, financial infrastructure, and policy support as key factors in achieving financial inclusion within the Islamic finance sector.

Hidayat *et al.* (2023) show that Islamic microfinance institutions play a vital role in reducing poverty and enhancing economic well-being by providing financial services aligned with *sharia* principles. On the other hand, Haidar (2021) developed a fintech-micro model for *Baitul Maal wa Tamwil* (BMT) that integrates social and commercial functions to support financial inclusion and expand the Islamic finance network. Mohd *et al.* (2024) also revealed that Islamic fintech in Malaysia prioritizes the empowerment of SMEs and vulnerable communities to broaden financial inclusion. Therefore, without effective strategies to enhance financial inclusion, the potential of fintech adoption to economically empower communities may not be fully realized.

Economic empowerment through Islamic microfinance institutions plays a significant role in supporting sustainable economic development. By strengthening access to *sharia*-based financial services, communities can achieve financial independence, reduce reliance on conventional financial institutions, and operate businesses aligned with Islamic values. According to Shaikh (2020), fintech integration in Islamic microfinance can improve operational efficiency and expand service outreach to low-income populations. Ismamudi *et al.* (2023) also note that Islamic fintech can broaden financial inclusion through technological innovations that support sustainable economic empowerment.

Furthermore, research by Tripalupi *et al.* (2021) shows that developing technology-based strategies can enhance the competitiveness of Islamic microfinance institutions, particularly through digital services and partnerships with Islamic fintech platforms. Shinkafi *et al.* (2019) emphasize the importance of adequate financial literacy,

robust financial infrastructure, and policy support to achieve optimal financial inclusion in the Islamic finance sector. Hidajat (2020) also asserts that *sharia*-compliant financial technology, such as mobile payments and peer-to-peer lending, offers innovative solutions to foster economic growth through more inclusive wealth distribution. Hence, understanding how fintech adoption contributes to economic empowerment through the moderating role of financial inclusion is essential.

The adoption of financial technology in Islamic microfinance holds great potential for enhancing economic empowerment, particularly for communities previously excluded from formal financial services. However, the success of economic empowerment through Islamic microfinance also heavily depends on the degree of financial inclusion, namely the extent to which people can access and utilize *sharia*-compliant financial services. The Qur'an teaches that economic justice, equitable distribution of wealth, and ease of access to financial resources are fundamental principles for building a sustainable financial system (QS. *Al-Ḥashr*: 7).

This study aims to analyze the impact of fintech adoption on economic empowerment in Islamic microfinance institutions, with financial inclusion serving as a mediating variable. Referring to Islamic economic principles in the Qur'an, this research also highlights the role of fintech in fostering a financial system that is more just, transparent, and free from *ribā*, as encouraged in QS. *Al-Ḥashr*: 7 regarding fair distribution of wealth and QS. *Al-Baqarah*: 275 concerning lawful and just financial transactions. This study is expected to make a significant academic contribution and provide strategic recommendations for Islamic microfinance institutions and policymakers in optimizing fintech to support financial inclusion and economic empowerment, while ensuring that financial services remain consistent with *sharia* principles and promote the economic well-being of the *ummah*.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Financial Technology Adoption

The adoption of financial technology (fintech) has become a catalyst for innovation in financial services, including in Islamic finance. Fintech enables greater operational efficiency, accessibility, and transparency, particularly for those without access to conventional banking services. In the Islamic finance context, fintech adoption supports compliance with *sharia* principles, such as the prohibition of *ribā* and *gharār*, thereby fostering user trust. Previous studies show that the use of fintech in Islamic financial institutions enhances financial inclusion by opening access to financing services for previously unbanked populations (Ahmed & Akhter, 2022).

However, some studies indicate that fintech adoption does not always produce significant positive outcomes for economic empowerment. Barriers such as low digital literacy, dependence on limited technological infrastructure, and high implementation costs remain major challenges, especially in rural areas. In addition, cultural resistance to using technology in Islamic financial services persists due to concerns about its compatibility with religious values (Vasylieva *et al.*, 2021).

Hypothesis H1: Financial technology adoption significantly influences economic empowerment in Islamic microfinance.

Economic Empowerment in Islamic Microfinance

Economic empowerment in Islamic microfinance aims to promote economic justice, financial inclusion, and social welfare through a *sharia*-compliant financial system. The core principle of Islamic microfinance is to provide financial access to the underprivileged or those excluded from formal financial services, while upholding Islamic values such as fairness, transparency, and prohibition of *ribā*. The Qur'an emphasizes equitable economic distribution and social responsibility as the foundation of a sustainable financial system (QS. *Al-Ḥashr*: 7; QS. *Al-Baqarah*: 275).

Economic empowerment is one of the main objectives of Islamic microfinance, focusing on improving community welfare through access to *sharia*-compliant financing. Previous research indicates that combining microfinancing with Islamic entrepreneurship training can enhance the economic capacity of beneficiaries. This enables them to build sustainable small businesses and reduce dependence on external assistance (Khan *et al.*, 2020).

On the other hand, some studies reveal that not all Islamic microfinance initiatives succeed in achieving economic empowerment. Lack of oversight on fund utilization and insufficient guidance for beneficiaries can lead to inefficient resource use and minimal socioeconomic impact. Furthermore, many Islamic microfinance institutions face liquidity constraints that limit their capacity to serve more clients (Ahmed & Akhter, 2022).

Hypothesis H2: Financial technology adoption significantly influences financial inclusion.

The Role of Financial Inclusion

Financial inclusion in Islam is a concept that ensures all segments of society, including the poor and underserved, have access to financial services that are fair, transparent, and aligned with *sharia* principles. Financial inclusion within the Islamic system goes beyond banking access—it encompasses broader economic opportunities, social equity, and community well-being. The Qur'an advocates economic justice, equitable wealth distribution, and the elimination of exploitative financial practices, including the fair distribution principle outlined in QS. *Al-Ḥashr*: 7.

Financial inclusion is considered a critical pillar of economic empowerment, especially in countries with low financial penetration. In the Islamic finance context, financial inclusion ensures that communities have equitable access to financing services that conform to *sharia* principles. Research has shown that *sharia*-based financial inclusion not only reduces poverty but also strengthens economic stability in the served communities (Ahmed & Akhter, 2022).

Nevertheless, critiques of financial inclusion's effectiveness in enhancing empowerment do exist. Some studies suggest that financial inclusion often stops at providing access, without sufficient training or support to help users utilize financial services productively. In certain cases, access without adequate financial literacy can lead to overreliance on financing and increase the risk of default, which ultimately worsens recipients' economic conditions (Khan *et al.*, 2020).

Hypothesis H3: Financial inclusion significantly influences economic empowerment in Islamic microfinance.

Hypothesis H4: Financial inclusion moderates the relationship between financial technology adoption and economic empowerment in Islamic microfinance.

METHODOLOGY

Research Model

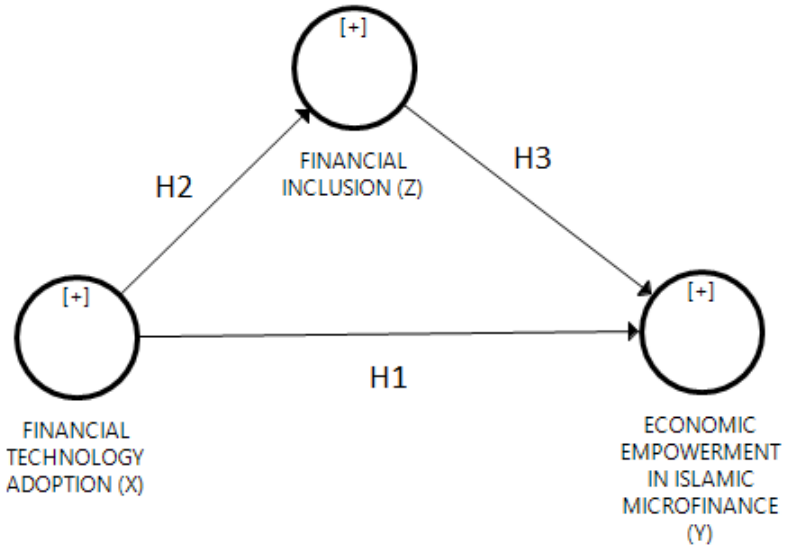

Figure 1 Research Model

This study developed four research hypotheses:

1. **H1**: Financial technology adoption significantly affects economic empowerment in Islamic microfinance.
2. **H2**: Financial technology adoption significantly affects financial inclusion.
3. **H3**: Financial inclusion significantly affects economic empowerment in Islamic microfinance.
4. **H4**: Financial inclusion mediates the relationship between financial technology adoption and economic empowerment in Islamic microfinance.

Sample and Data Collection

The minimum sample size was determined using Slovin's formula with a 5% margin of error. This study targeted 100 respondents, with 75 valid responses collected through returned questionnaires. The data were gathered using both online and offline questionnaires, employing a five-point Likert scale (from 1 = strongly disagree to 5 = strongly agree), with items designed based on established theoretical frameworks.

Variable Measurement

1. **Financial Technology Adoption** was measured using the Technology Acceptance Model (TAM) developed by Davis (1989), which includes dimensions such as perceived ease of use, trust in security and *sharia* compliance, and frequency of service usage.
2. **Economic Empowerment in Islamic Microfinance** was assessed using Empowerment Theory (Zimmerman, 1995), covering dimensions such as business income improvement, economic self-reliance, and business capacity development.
3. **Financial Inclusion** was measured using the Financial Inclusion Framework by Demirguc-Kunt *et al.* (2015), with indicators such as access to *sharia*-compliant financial services, utilization of services, and the level of Islamic financial literacy.

Data Analysis

Data were analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method with SmartPLS software. The analysis included:

1. **Instrument validity and reliability testing**, using **Composite Reliability (CR)** and **Average Variance Extracted (AVE)**;
2. **Structural model evaluation**, to identify direct effects of financial technology adoption on economic empowerment, as well as the **moderating role** of financial inclusion.

This methodological approach aims to provide empirical evidence on the role of financial technology and financial inclusion in enhancing economic empowerment within the Islamic microfinance sector.

RESULTS

Measurement Model Evaluation (Outer Model)

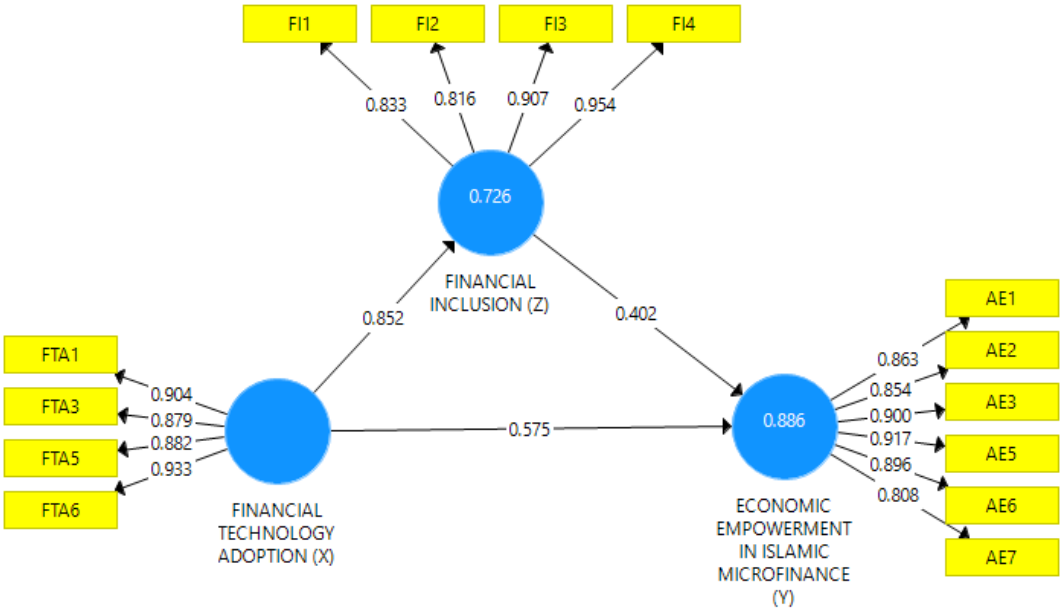

Figure 2 Outer Model Test Results

Convergent Validity

Convergent validity was assessed by examining the outer loadings (factor loadings) of each indicator on its respective construct.

Criteria:

1. Loading factor > 0.70 → Valid
2. Average Variance Extracted (AVE) > 0.50 → Construct has good validity

Table 1 Factor Loadings Evaluation

Construct	Indicator	Loading Factor	Interpretation
Financial Inclusion (Z)	FI1	833	Valid
	FI2	816	Valid
	FI3	907	Valid
	FI4	954	Valid
Financial Technology Adoption (X)	FTA1	904	Valid
	FTA3	879	Valid
	FTA5	882	Valid
	FTA6	933	Valid
Economic Empowerment (Y)	AE1	863	Valid
	AE2	854	Valid
	AE3	900	Valid
	AE5	917	Valid
	AE6	808	Valid
	AE7	896	Valid

Conclusion: All indicators have loading values above 0.70, indicating that convergent validity is achieved.

Construct Reliability (Composite Reliability & Cronbach's Alpha)

Construct reliability was evaluated using:

1. Composite Reliability (CR) > 0.70 → indicates internal consistency
2. Cronbach's Alpha > 0.70 → indicates reliability of the construct

Table 2 Composite Relabilitydan AVE

Construct	CR	Cronbach's Alpha
Economic Empowerment (Y)	0.951	0.938
Financial Inclusion (Z)	0.931	0.901
Financial Technology Adoption (X)	0.944	0.921

Conclusion: All constructs have Composite Reliability and Cronbach's Alpha values above 0.70, demonstrating strong internal consistency and construct reliability.

Convergent Validity (Average Variance Extracted – AVE)

Table 3 Average Variance Extracted (AVE)

Construct	AVE
Economic Empowerment (Y)	0.764
Financial Inclusion (Z)	0.773
Financial Technology Adoption (X)	0.809

Interpretation:

The AVE values for all constructs exceed the recommended threshold of 0.50, with values above 0.70 indicating excellent convergent validity. This confirms that the indicators effectively represent their respective latent constructs.

Discriminant Validity (Heterotrait-Monotrait Ratio – HTMT)

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT), which evaluates the extent to which constructs are distinct from one another.

Recommended Thresholds:

1. **HTMT < 0.85** → Discriminant validity established (conservative threshold)
2. **HTMT < 0.90** → Still acceptable (moderate threshold)
3. **HTMT > 0.90** → Indicates possible discriminant validity issues (constructs may overlap)

Table 4 HTMT Values

Constructs	EE (Y)	FI (Z)	FTA (X)
Economic Empowerment (Y)	—	0.962	0.984
Financial Inclusion (Z)	0.962	—	0.926
Financial Technology Adoption (X)	0.984	0.926	—

Interpretation: All HTMT values exceed 0.90, suggesting that discriminant validity is not fully established and that there may be high correlations or overlaps between constructs. This could indicate multicollinearity or conceptual redundancy between constructs.

Conclusion of Measurement Model Evaluation:

1. **Convergent validity**: Achieved (loading > 0.70; AVE > 0.50)
2. **Reliability**: Achieved (CR & Cronbach's Alpha > 0.70)
3. **Discriminant validity**: Not fully achieved (HTMT > 0.90)

This suggests that although the model is reliable and valid in most aspects, careful consideration is needed regarding the distinctiveness of constructs, especially between financial technology adoption and economic empowerment.

Structural Model Evaluation (Inner Model)

Model Fit Assessment

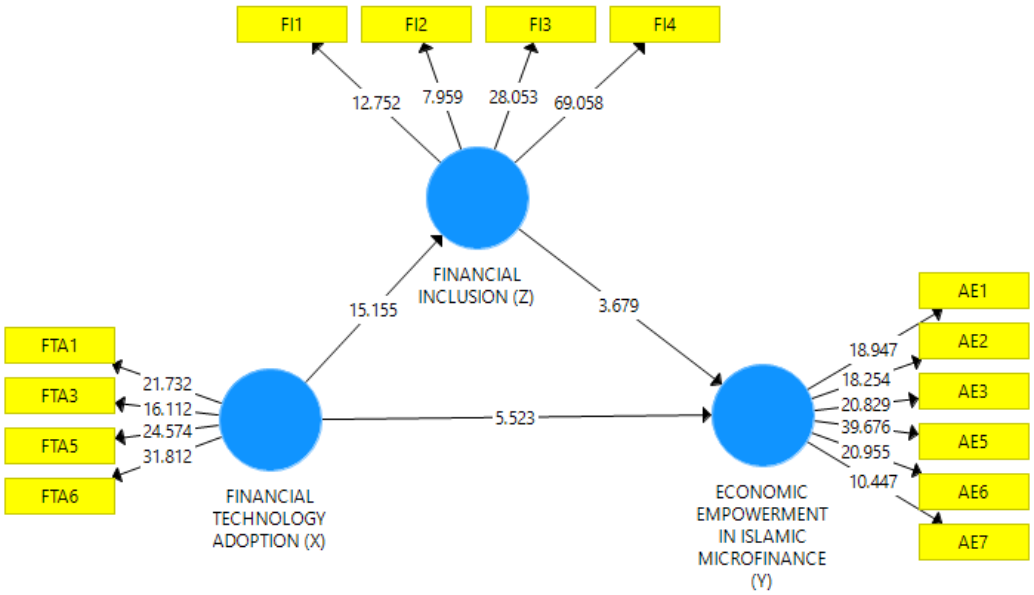

Figure 3 Collinearity Test (VIF) (VIF < 5 to avoid multicollinearity)

The model fit was evaluated using the Standardized Root Mean Square Residual (SRMR) and other fit indices. A good model fit is typically indicated by an SRMR value below 0.08.

Table 5 Model Fit Summary

Fit Index	Saturated Model	Estimated Model
SRMR	0.065	0.065
d_ULS	0.448	0.448
d_G	0.741	0.741
Chi-Square	256.962	256.962
NFI	0.800	0.800

Conclusion: The SRMR value of 0.065 indicates a **good model fit**, as it is below the conservative threshold of 0.08. The Normed Fit Index (NFI) value of 0.800 also supports acceptable model quality.

R-Square (R^2) – Coefficient of Determination

The R^2 values indicate how much variance in the dependent variable is explained by the independent variables.

Table 6 R-Square Values

Dependent Variable	R^2	Adjusted R^2
Economic Empowerment (Y)	0.886	0.882
Financial Inclusion (Z)	0.726	0.723

Interpretation:

a. **Financial Inclusion (Z):** 72.6% of its variance is explained by Financial Technology Adoption (X), indicating a **strong** predictive power.
b. **Economic Empowerment (Y):** 88.6% of its variance is explained by Financial Inclusion (Z) and Financial Technology Adoption (X), suggesting a **very strong** model.

Effect Size (f^2)

Effect size (f^2) measures the impact of one variable on another within the model.

Table 7 Effect Size (f^2)

Predictor → Outcome	Effect Size (f^2)
Financial Inclusion (Z) → Economic Empowerment (Y)	0.386
Financial Technology Adoption (X) → Economic Empowerment (Y)	0.791
Financial Technology Adoption (X) → Financial Inclusion (Z)	2.654

Interpretation:

1. All effect sizes are in the **large to very large** category (based on Cohen's guideline: 0.35 = large).
2. The strongest effect is observed between Financial Technology Adoption (X) and Financial Inclusion (Z), with an f^2 of 2.654.

Hypothesis Testing (Path Coefficients & P-Values)

The path coefficients show the direction and strength of the relationships between constructs, while t-statistics and p-values determine their statistical significance.

Significance criteria:

1. t-statistic > 1.96 (for significance at $\alpha = 0.05$)
2. p-value < 0.05 → significant

Table 8 Path Coefficients and Hypothesis Testing

Path	t-Statistic	p-Value	Interpretation
Financial Technology Adoption → Economic Empowerment	5.523	0.000	Significant
Financial Technology Adoption → Financial Inclusion	15.155	0.000	Significant
Financial Inclusion → Economic Empowerment	3.679	0.000	Significant

Conclusion:

All three direct paths are **statistically significant**, confirming that:

1. Fintech adoption significantly influences economic empowerment
2. Fintech adoption significantly influences financial inclusion
3. Financial inclusion significantly influences economic empowerment

Mediation Analysis

To test the **indirect effect** of fintech adoption on economic empowerment through financial inclusion (mediation), indirect path analysis was conducted.

Table 9 Indirect Effect (Mediation)

Mediation Path	t-Statistic	p-Value	Interpretation
Fintech Adoption → Financial Inclusion → Economic Empowerment	3.428	0.001	Significant mediation

Conclusion:

The indirect effect is statistically significant (**t = 3.428**, **p = 0.001**), confirming that:

Financial inclusion mediates the relationship between fintech adoption and economic empowerment.

This implies that fintech adoption leads to increased financial inclusion, which in turn enhances economic empowerment in Islamic microfinance.

Table 10 Total Effects

Relationship	Total Effect
Financial Technology Adoption → Economic Empowerment	0.917
Financial Inclusion → Economic Empowerment	0.402
Financial Technology Adoption → Financial Inclusion	0.852

These total effects reaffirm that **fintech adoption has the greatest overall impact**, both directly and indirectly, on economic empowerment.

Table 11 Summary of Hypothesis Testing

Hypothesis	Statement	Result
H1	Fintech adoption significantly affects economic empowerment	Accepted
H2	Fintech adoption significantly affects financial inclusion	Accepted
H3	Financial inclusion significantly affects economic empowerment	Accepted
H4	Financial inclusion mediates the relationship between fintech adoption and economic empowerment	Accepted

DISCUSSION

The findings of this study demonstrate that the adoption of financial technology (fintech) within Islamic microfinance significantly contributes to economic empowerment. Fintech enhances the accessibility of *sharia*-compliant financial services, enabling communities previously excluded from the formal banking sector to obtain microfinancing. Moreover, fintech improves the competitiveness of Islamic microfinance institutions by increasing operational efficiency and facilitating digital service delivery.

However, certain challenges remain—particularly the low levels of financial literacy and limited technological infrastructure—which may hinder the full optimization of fintech benefits. These barriers highlight the need for supportive interventions, such as education programs and infrastructure development, to ensure equitable and sustainable financial access.

Financial inclusion serves as a moderating factor that strengthens the relationship between fintech adoption and economic empowerment, although its effect size is smaller than the direct impact of fintech itself. Improved financial inclusion

expands access to *sharia*-compliant financial services such as microfinancing, *takaful*, and Islamic savings schemes. Nonetheless, the effectiveness of financial inclusion depends heavily on external factors, including regulatory frameworks, public trust, and levels of financial literacy.

These results affirm the strategic importance of integrating fintech into Islamic microfinance operations. Yet, to fully realize its benefits, fintech development must be supported by inclusive policies, capacity-building initiatives, and a regulatory environment that fosters innovation while maintaining compliance with *sharia* principles. This integration will not only promote economic empowerment for underserved communities but also contribute to the broader goals of inclusive and ethical financial development in Muslim-majority societies.

CONCLUSION

This study concludes that financial technology adoption plays a critical role in enhancing financial inclusion and economic empowerment within the context of Islamic microfinance. All indicators met the criteria for convergent validity and reliability, with strong internal consistency across constructs. Although discriminant validity was not fully achieved, the model exhibited a good overall fit, supported by high R^2 values—0.726 for financial inclusion and 0.886 for economic empowerment—indicating strong predictive power.

The path analysis confirmed that fintech adoption has a significant and direct effect on both financial inclusion and economic empowerment. Furthermore, financial inclusion was shown to significantly affect economic empowerment and mediate the relationship between fintech adoption and empowerment outcomes. However, the mediating effect was smaller compared to the direct impact of fintech itself.

From a practical perspective, the adoption of fintech in Islamic microfinance institutions should be supported by strategies aimed at improving digital infrastructure, enhancing *sharia*-compliant financial literacy, and formulating regulatory frameworks that foster trust and innovation. While fintech has proven effective in broadening access to Islamic financial services, the empowerment impact will be maximized only when financial inclusion is systematically strengthened as part of the digital transformation process.

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