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Determinants of Micro-Enterprise Resilience: A Bibliometric Analysis and Empirical Evidence on The Mediating Role of Innovation Capability in the Relationship Between Human Capital and Islamic Financing

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ABSTRACT

Purpose: This study aims to analyze the determinants of micro-enterprise resilience, emphasizing the roles of human capital, Islamic financing, and innovation capability as mediating variables.

Design/Method/Approach: The study employed a mixed-methods approach, combining bibliometric analysis and quantitative approaches. Bibliometric analysis was conducted to map the development, trends, and intellectual structure of research using Scopus data. In contrast, a quantitative approach was used to test causal relationships among variables using PLS-SEM, based on data from micro-enterprises in Purwakarta Regency.

Findings: The results showed that human capital had a positive and significant effect on innovation capability and micro-enterprise resilience, and innovation capability had a significant effect on resilience. Islamic financing has a significant effect on innovation capability, but not a direct effect on resilience. Furthermore, innovation capability was shown to mediate the relationship between human capital and Islamic financing on micro-enterprise resilience.

Originality/Value: The implications of this study emphasize the importance of strengthening human resource quality and enhancing innovation capabilities as key strategies in enhancing micro-enterprise resilience, as well as the need to optimize Islamic financing to encourage innovation and business sustainability.

INTRODUCTION

Micro-enterprises are among the main pillars of the national economy due to their significant contributions to employment and economic growth. Aspects of global dynamics characterized by economic uncertainty, crises, and the acceleration of digital transformation, business capabilities, and micro to survive and adapt, known as resilience, are a crucial factor. Microbusiness resilience reflects not only the ability to withstand shocks but also the capacity to adapt through innovation, digital transformation, and strengthening business strategies to maintain business sustainability.[1,2]

Furthermore, various studies show that digitalization, digital literacy, and innovation capabilities play a crucial role in increasing micro-enterprises' resilience to external pressures and strengthening their long-term economic resilience.[3,4] Furthermore, adaptive strategies such as product diversification, business model adjustments, and resource optimization are also key determinants in dealing with crises and rapidly changing business environments.[5,6] Therefore, studies on business resilience in Micro-Enterprises are increasingly important for ensuring business sustainability amid external pressures and growing global disruptions.

Conceptually, the business resilience of micro-enterprises is influenced by several fundamental factors, including human resources and access to adequate financing. From a management theory perspective, competent and adaptive human resources play a crucial role in enhancing innovation capabilities and a business's ability to respond dynamically to changes in the business

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[1] Hamed Hokmabadi, Seyed M. H. S. Rezvani, and Celso Augusto De Matos, 'Business Resilience for Small and Medium Enterprises and Startups by Digital Transformation and the Role of Marketing Capabilities—A Systematic Review', *Systems*, 12.6 (2024), p. 220, doi:10.3390/systems12060220.

[2] Nikolina Koporcic and others, 'Resilience of Small and Medium-Sized Enterprises in Times of Crisis: An Umbrella Review', *Review of Managerial Science*, 20.1 (2026), pp. 301–29, doi:10.1007/s11846-025-00883-0.

[3] Sabil Sabil and others, 'Sustainable Innovation, Digitalization, and Economic Resilience: A Systematic Literature Review on SMEs', *Dinasti International Journal of Economics, Finance & Accounting*, 6.4 (2025), pp. 3637–46, doi:https://doi.org/10.38035/dijefa.v6i4.

[4] Sri Handari Wahyuningsih, Alni Rahmawati, and Marsudi Endang, *Resilience Of Sme Business: Lesson Learn From Creative Climate, Digital Literacy, And Innovation Capability*, n.d.

[5] Imam Jayanti, Inda Permata Anggraeni, and Rahmad Puja Safitransyah, 'Resilience of SMEs in Facing Economic Crises: Business Model Adaptation, Product Diversification, and Resource Optimization', *Journal of Contemporary Administration and Management (ADMAN)*, 3.1 (2025), pp. 616–23, doi:https://doi.org/10.61100/adman.v3i1.260.

[6] Roziana Febrianita and others, 'Digital Innovation And Business Strategy for SMEs: Building Resilience In The Society 5.0 Era', *Journal of Governance and Administrative Reform*, 4.2 (2023), pp. 107–22, doi:10.20473/jgar.v4i2.51806.

environment.[7,8] Furthermore, the quality of human capital is a key determinant of business resilience, particularly in the face of crises and economic uncertainty.[9]

From a financial perspective, access to inclusive and sustainable financing is a key factor in supporting micro-enterprises' operations and expansion, thereby improving business performance and sustainability.[10] In the context of Islamic economics, sharia financing not only provides access to capital but also prioritizes fairness, transparency, and profit-sharing mechanisms that have been proven to improve the performance, stability, and sustainability of micro-enterprises.[11,12,13] Thus, ideally, micro-enterprises will have greater resilience if supported by high-quality human resources and an inclusive, adaptive, and sustainability-oriented financing system.

However, empirically, there are still many efforts that micro-enterprises face various limitations in developing their businesses. The quality of human resources in micro-enterprises remains relatively low, particularly in managerial skills, digital literacy, and innovation capabilities, which ultimately hinders technology adoption and the improvement of business performance.[14] Furthermore, access to financing remains a major obstacle due to strict requirements imposed by financial institutions and low financial literacy among business actors, thereby limiting micro-enterprises' ability to obtain adequate

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[7] Minna Saunila, 'Innovation Capability in SMEs: A Systematic Review of the Literature', *Journal of Innovation & Knowledge*, 5.4 (2020), pp. 260–65, doi:10.1016/j.jik.2019.11.002.

[8] Leo Aldianto and others, 'Toward a Business Resilience Framework for Startups', *Sustainability*, 13.6 (2021), p. 3132, doi:10.3390/su13063132.

[9] Fabian Eggers, 'Masters of Disasters? Challenges and Opportunities for SMEs in Times of Crisis', *Journal of Business Research*, 116 (2020), pp. 199–208, doi:10.1016/j.jbusres.2020.05.025.

[10] George Okello Candiya Bongomin and others, 'Financial Intermediation and Financial Inclusion of Poor Households: Mediating Role of Social Networks in Rural Uganda', *Cogent Economics & Finance*, 5.1 (2017), p. 1362184, doi:10.1080/23322039.2017.1362184.

[11] Nakanwagi Baina, Nyakundi Andrew, and Manyange Micheal, 'Exploring the Impact of Islamic Finance Principles on Micro and Small Enterprise Performance: A Literature Review', *Asian Journal of Economics, Business and Accounting*, 25.1 (2025), pp. 245–51, doi:10.9734/ajeba/2025/v25i11646.

[12] Peter Wanke and others, 'Application of a Distributed Verification in Islamic Microfinance Institutions: A Sustainable Model', *Financial Innovation*, 8.1 (2022), p. 80, doi:10.1186/s40854-022-00384-z.

[13] Galuh Widitya Qomaro, Nasrulloh Nasrulloh, and Nurdeng Deuraseh, 'Sharia Compliance and Economic Resilience of Women-Led SMEs in Madura Indonesia', *Journal of Islamic Civilization*, 6.2 (2024), pp. 107–22, doi:10.33086/jic.v6i2.6600.

[14] Rita Rahayu and John Day, 'Determinant Factors of E-Commerce Adoption by SMEs in Developing Country: Evidence from Indonesia', *Procedia - Social and Behavioral Sciences*, 195 (2015), pp. 142–50, doi:10.1016/j.sbspro.2015.06.423.

funding.[15] The low level of financial inclusion in developing countries exacerbates this condition and impacts the limited ability of micro-enterprises to maintain business stability and sustainability.[16]

On the other hand, although Islamic financing has significant potential as a more stable and equitable alternative, its use by micro-enterprises remains suboptimal due to structural constraints and limited understanding of Islamic financial instruments. These limitations ultimately impact the low resilience of some micro-enterprises, particularly in the face of crises and the increasingly complex dynamics of the business environment.[17]

The difference between ideal conditions (das sollen) and empirical conditions (das sein) indicates a gap that warrants further study in research on business resilience. Microenterprises. Furthermore, previous studies have shown that research findings on the influence of human resource (HR) quality and access to financing on microenterprise resilience remain inconsistent, given that resilience is a multidimensional concept shaped by various contextual factors.[18,19] Furthermore, most existing research remains dominated by sectoral empirical approaches, thereby failing to provide a comprehensive overview of the development and structure of knowledge in this field.[20]

Therefore, using a bibliometric approach is important for mapping research trends, identifying gaps, and guiding the systematic development of studies.[21] Furthermore, research integrating human resource and financing factors, particularly Islamic financing, into a single analytical framework to explain micro-enterprise resilience remains relatively limited, as most studies

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[15] I. Made Suidarma and others, 'Financial Literacy Can Overcome Barriers To MSME Financing: Evidence From Indonesia', *JAS (Jurnal Akuntansi Syariah)*, 8.2 (2024), pp. 160–83, doi:10.46367/jas.v8i2.2050.

[16] Asli Demirgüç-Kunt and others, 'Financial Inclusion, Digital Payments, and Resilience in the Age Of', *The Global*, 2021.

[17] Rachel Doern, Nick Williams, and Tim Vorley, 'Special Issue on Entrepreneurship and Crises: Business as Usual? An Introduction and Review of the Literature', *Entrepreneurship & Regional Development*, 31.5–6 (2019), pp. 400–12, doi:10.1080/08985626.2018.1541590.

[18] Doern, Williams, and Vorley, 'Special Issue on Entrepreneurship and Crises'.

[19] Layla Jayne Branicki, Bridgette Sullivan-Taylor, and Sarah Rachael Livschitz, 'How Entrepreneurial Resilience Generates Resilient SMEs', *International Journal of Entrepreneurial Behavior & Research*, 24.7 (2018), pp. 1244–63, doi:10.1108/IJEBR-11-2016-0396.

[20] Rudrajeet Pal, Håkan Torstensson, and Heikki Mattila, 'Antecedents of Organizational Resilience in Economic Crises—an Empirical Study of Swedish Textile and Clothing SMEs', *International Journal of Production Economics*, 147 (2014), pp. 410–28, doi:10.1016/j.ijpe.2013.02.031.

[21] Naveen Donthu and others, 'How to Conduct a Bibliometric Analysis: An Overview and Guidelines', *Journal of Business Research*, 133 (2021), pp. 285–96, doi:10.1016/j.jbusres.2021.04.070.

examine the two factors separately.[22] Thus, a more comprehensive and integrative study is needed to bridge this gap and enrich the literature on micro-enterprise resilience.

Based on this, the research is crucial for addressing this gap by combining bibliometric analysis and empirical testing. This approach is expected to provide a more comprehensive understanding of the factors influencing micro-enterprise resilience, particularly in the areas of human resources and Islamic financing. Furthermore, the results of this study are expected to provide both theoretical and practical contributions, particularly in supporting business strengthening—micro by improving the quality of human resources and optimizing access to sharia-based financing.

RESEARCH METHOD

This study uses *a mixed-methods approach, combining bibliometric analysis and a quantitative (empirical) analysis to examine the determinants of Micro-Enterprise resilience, particularly the roles* of *human capital*, *Islamic financing*, and *innovation capability*. This approach was chosen because it provides a comprehensive understanding by integrating systematic literature analysis and empirical testing in the field.[23] Bibliometric analysis is used to map the development, trends, and intellectual structure of the research, while a quantitative approach is used to test the causal relationship between variables directly.

In the first stage, the study used bibliometric methods as a quantitative approach to analyze scientific publications using statistical techniques and network mapping (*science mapping*). Data were obtained from the internationally reputable scientific database, namely Scopus, as the primary source. Data inclusion criteria included journal articles indexed by Scopus, having an active DOI, published within the last five years (2021–2025), and relevant keywords such as "*Micro-Enterprise* resilience," "human capital," "innovation capability," "Islamic finance," "Islamic financing," and "*Micro-Enterprise*."

[22] Jaroslav Belas and others, 'Evaluation of Economic Potential of Business Environment Development by Comparing Sector Differences: Perspective of SMEs in the Czech Republic and Slovakia', *Oeconomia Copernicana*, 11.1 (2020), pp. 135–59, doi:10.24136/oc.2020.006.

[23] Creswell, J. W., *Research Design : Qualitative, Quantitative, and Mixed Methods Approaches*, 4th edn (SAGE Publications Ltd., 2014).

The search process is carried out using a combination of *Boolean operators* to ensure the relevance of the search results, as well as using the method Prism,[24] such as the image below this:

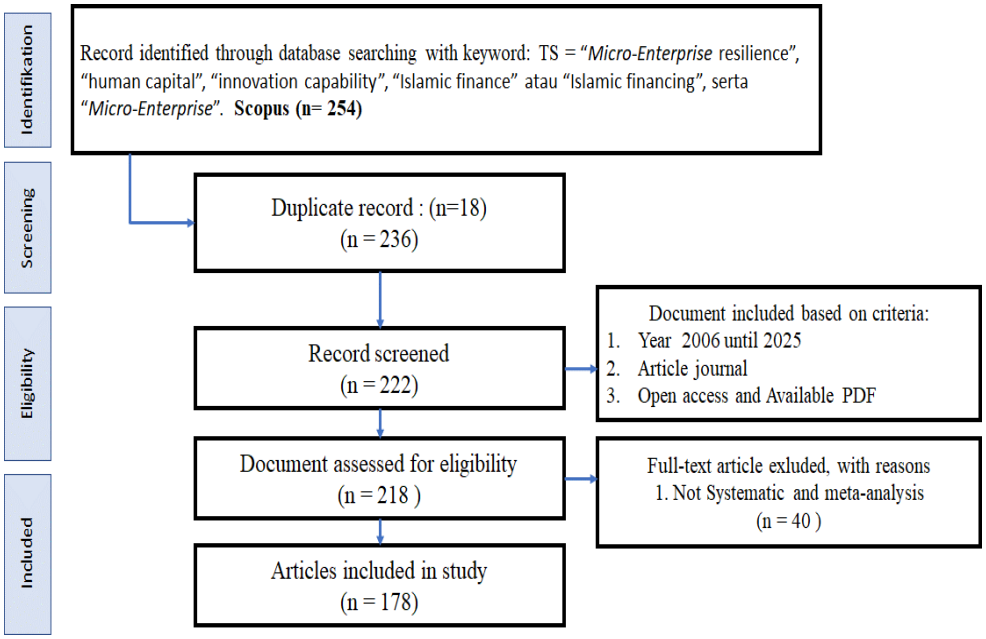


Figure 1. Prisma Method
Source: Matthew J. Page and others,

The article selection process in this study followed the PRISMA guidelines, with clearly defined inclusion and exclusion criteria to ensure data quality and relevance. Articles were selected from the Scopus database spanning 2006–2025, methodologically reflecting the developmental period of studies on micro-enterprise resilience, human capital, innovation, and Islamic finance, particularly from the post-2008 global financial crisis to the digital era and the post-COVID-19 pandemic, thereby enriching the research dynamics.[25] Restricting the selection to *peer-reviewed* journal articles ensured the scientific validity and credibility of the findings, while *full-text availability* enabled in-depth and transparent analysis. Furthermore, non-systematic or directly irrelevant studies were excluded to reduce bias and enhance methodological consistency,

[24] Matthew J. Page and others, 'The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews', *Journal of Clinical Epidemiology*, 134 (2021), pp. 178–89, doi:10.1016/j.jclinepi.2021.03.001.

[25] Naveen Donthu and others, 'How to Conduct a Bibliometric Analysis: An Overview and Guidelines', *Journal of Business Research*, 133 (2021), pp. 285–96, doi:10.1016/j.jbusres.2021.04.070.

in line with *systematic review standards.*[26] Thus, this combination of criteria ensures that only up-to-date, high-quality, and relevant literature is analyzed, thereby enhancing the reliability and robustness of the study results.

Bibliometric analysis was conducted using two main approaches: *performance analysis* and *science mapping*. This analysis was conducted using VOSviewer and *Biblioshiny* (*R-Bibliometrix*), both widely used in modern bibliometric studies.[27] The visualization results, in the form of *network, overlay, and density visualizations,* were used to identify trends, research clusters, and *research gaps* as a basis for developing an empirical model.

In the second stage, the research continued with a quantitative approach using *explanatory research*, namely, research that aims to test the causal relationship between variables.[28] The variables in this study consist of exogenous variables, namely *human capital* and *Islamic financing*, intervening variables, namely *innovation capability*, and endogenous variables, namely *Micro-Enterprise resilience*. Operationalization of variables was carried out using instruments from previous research that have been tested, namely, the human capital instrument.[29] *Islamic financing* from[30] *Innovation capability* from *the Oslo Manual*, and *Micro-Enterprise resilience* from.[31] All indicators were measured on a five-point Likert scale, commonly used in social research to assess respondents' perceptions.[32] Following the framework thinking used in the study:

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[26] Matthew J. Page and others, 'The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews', *Systematic Reviews*, 10.1 (2021), p. 89, doi:10.1186/s13643-021-01626-4.

[27] Gennaro Maione, Corrado Cuccurullo, and Aurelio Tommasetti, 'Biodiversity Accounting: A Bibliometric Analysis for Comprehensive Literature Mapping', *Sustainability Accounting, Management and Policy Journal*, 15.5 (2024), pp. 1178–209, doi:10.1108/SAMPJ-04-2022-0214.

[28] U. Sekaran and R. Bougie, *Research Methods for Business: A Skill-Building Approach*, 7th ed. (Wiley., 2016).

[29] OECD and Eurostat, *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition*, The Measurement of Scientific, Technological and Innovation Activities (OECD Publishing, 2018), doi:10.1787/9789264304604-en.

[30] Zamir Iqbal and Abbas Mirakhor, *Economic Development and Islamic Finance*, n.d.

[31] Kathryn M. Connor and Jonathan R. T. Davidson, 'Development of a New Resilience Scale: The Connor-Davidson Resilience Scale (CD-RISC)', *Depression and Anxiety*, 18.2 (2003), pp. 76–82, doi:10.1002/da.10113.

[32] Garba Abubakar and others, *Managing Entrepreneurship from an Islamic Perspective: Supporting Entrepreneurial Schemes through Islamic Work Ethics and Organizational Commitment*, 3.2 (2021).

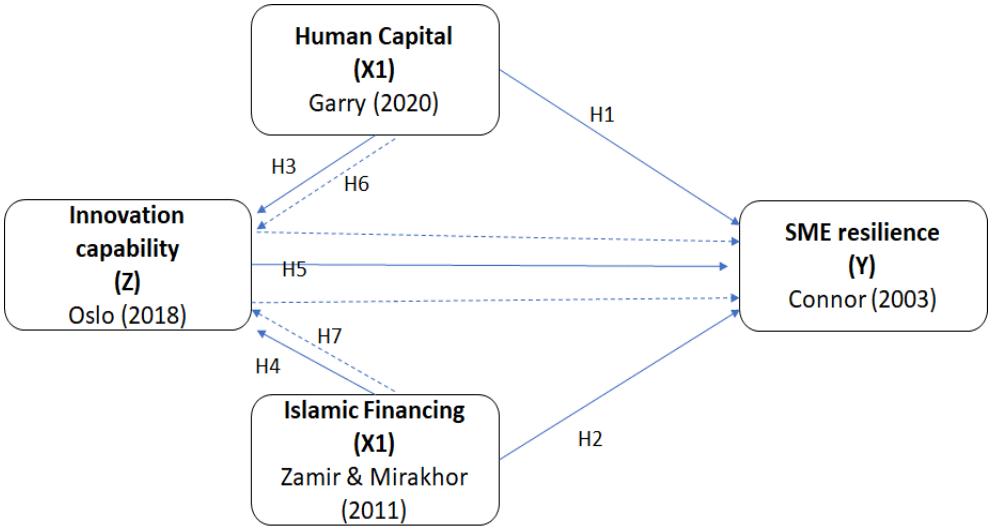


Figure 2. Framework Think

The population in this study comprises all business actors and micro-enterprises in Purwakarta Regency. The sampling technique used *was purposive sampling based on* business criteria. Microfinance institutions that have been operating for at least two years and have experience in accessing financing, particularly Sharia financing. The sample size was determined using the *Structural Equation Modeling (SEM) approach, which recommends a sample size of at least 5 to 10 times the number* of research indicators.[33] With 27 indicators, the minimum sample size used was approximately 270 respondents. Data were collected using questionnaires as the primary instrument, supplemented by observations and documentation to enhance data validity.

The data analysis technique in this study was the Partial Least Squares (PLS-SEM)-based Structural Equation Modeling (SEM) method, implemented using SmartPLS software. The PLS-SEM method was chosen because it has advantages in processing complex models, does not require normal data distribution, and is suitable for relatively small sample sizes (Hair et al., 2021). The analysis was carried out in two main stages: evaluation of the measurement model (*outer model*) and evaluation of the structural model (*inner model*). Evaluation of *the outer model* included a convergent validity test with a *factor loading above 0.70, discriminant validity with an Average Variance Extracted (AVE) above 0.50, and reliability tests with Cronbach's Alpha* and *Composite Reliability* above

[33] Adrian Leguina, 'A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)', *International Journal of Research & Method in Education*, 38.2 (2015), pp. 220–21, doi:10.1080/1743727X.2015.1005806.

0.70. Next, the inner model was evaluated by examining the R-Square (R^2) value, path coefficients, and hypothesis testing using t-statistics and p-values from bootstrapping. In addition, the mediating role of innovation capability was tested using an indirect effect analysis to assess its ability to mediate the relationship between human capital and Islamic financing and *micro-enterprise resilience* (Hair et al., 2021).

RESULT AND DISCUSSION

Stage First

Bibliometric analysis is conducted through two main approaches: *Performance analysis,* which is used to evaluate publication performance, such as the number of publications per year, the most productive authors, the journals with the most publications, and citation analysis. *Science mapping* uses keyword co-occurrence, co-authorship analysis, co-citation analysis, and bibliographic coupling to map research relationships and structures.

Network, overlay, and density visualizations are used to identify trends, research clusters, and *research gaps* as a basis for developing empirical models. Results analysis: bibliometric use VOS Viewer and Biblioshiny as follows:

Main Information



Figure 3. Main Information
Source: Processed data use Biblioshiny

Biblioshiny's findings indicate that research on the determinants of micro-enterprise resilience has grown rapidly between 2006 and 2025, with an annual growth rate of 22.32%. The 178 documents, drawn from 133 sources and written by 497 authors, demonstrate that this topic is broad and characterized by collaboration, as reflected in an average of 3.12 authors per article and a 20.22% international collaboration rate. Furthermore, there are 639 author keywords, indicating a diversity of research themes, particularly in human

capital, innovation capability, and Islamic financing. The average document age of 4.69 years indicates that this study is relatively recent, while the average citation rate per document of 22.75 indicates that this field has a fairly strong scientific influence. Overall, these findings confirm that the research topic is relevant, developing, and worthy of further research.

Co-Occurrence of Keywords

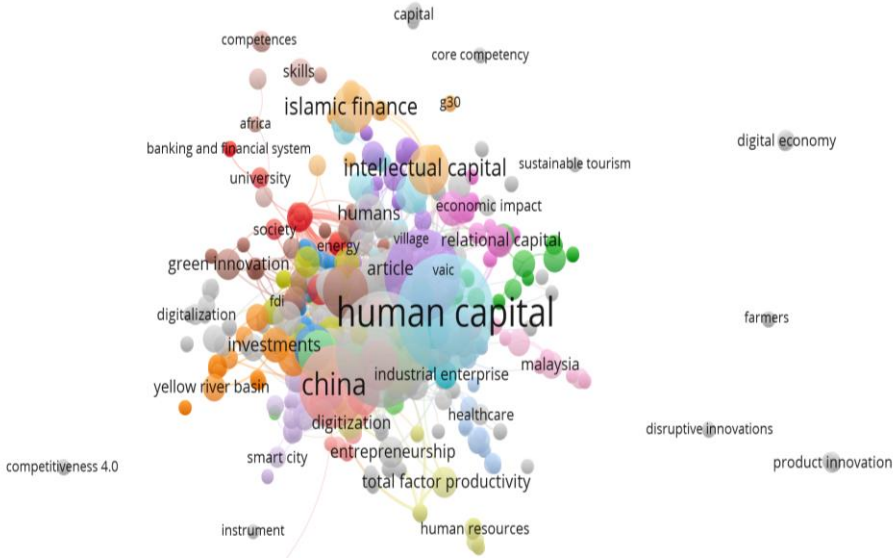


Figure 4. Keywords
Source: Processed data use Vos Viewer

Next, the VOSviewer results above. This map shows that human capital is the most dominant theme and the central link between keywords in this study. This keyword is linked to innovation, entrepreneurship, productivity, and industrial enterprise, indicating that human capital is seen as a crucial factor in strengthening business capacity and resilience. On the other hand, Islamic finance has also emerged as a relevant theme in intellectual capital and economic impact. The emergence of keywords such as digitization, digital economy, and green innovation indicates a shift towards innovation, digital transformation, and sustainability.

Corresponding Author's Countries

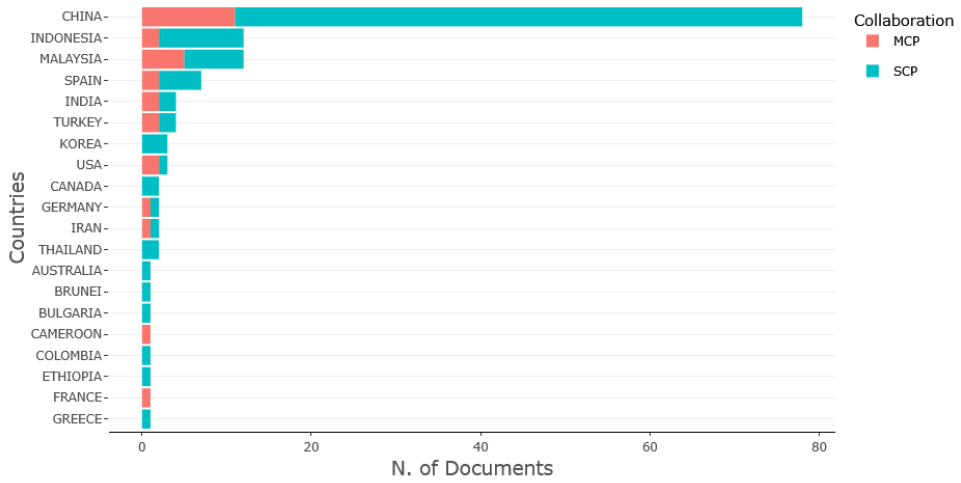


Figure 5. Corresponding Author's Countries
Source: Processed data use Biblioshiny

The country collaboration chart shows that research on micro-enterprise resilience is dominated by China, with the highest number of publications, primarily through significantly larger domestic collaborations (SCPs) compared to international collaborations (MCPs). Indonesia and Malaysia follow with significant contributions but remain dominated by domestic collaborations. Countries such as Spain, India, Turkey, and Korea make moderate contributions and exhibit more balanced collaboration patterns. Meanwhile, developed countries such as the United States, Germany, and Canada have relatively few publications on this topic. Overall, this pattern indicates that research still tends to be nationally focused, with limited international collaboration, thereby creating opportunities to strengthen global collaboration, particularly in examining the role of human capital, innovation capability, and Islamic financing in enhancing micro-enterprise resilience.

Citation Analysis

Below are the results of the analysis. This VOSviewer network map displays authors (co-authorship or co-citation) in the study of micro-enterprise resilience determinants. Several authors, such as Ouyang (2020), Martin-de Castro (2013), Wang (2021), and Branzei (2006), have larger nodes, indicating their influence and high citation frequency in this field. The interconnectedness among authors illustrates an intellectual network, particularly on human capital, innovation capability, and intellectual capital as the foundation of business resilience. The presence of other authors in various clusters demonstrates the diverse and evolving literature, including recent contributions addressing innovation, sustainability, and digital transformation. Overall, this map confirms

that research on the relationship among human capital, innovation capability, and Islamic financing in shaping micro-enterprise resilience is supported by a strong, well-structured body of literature.

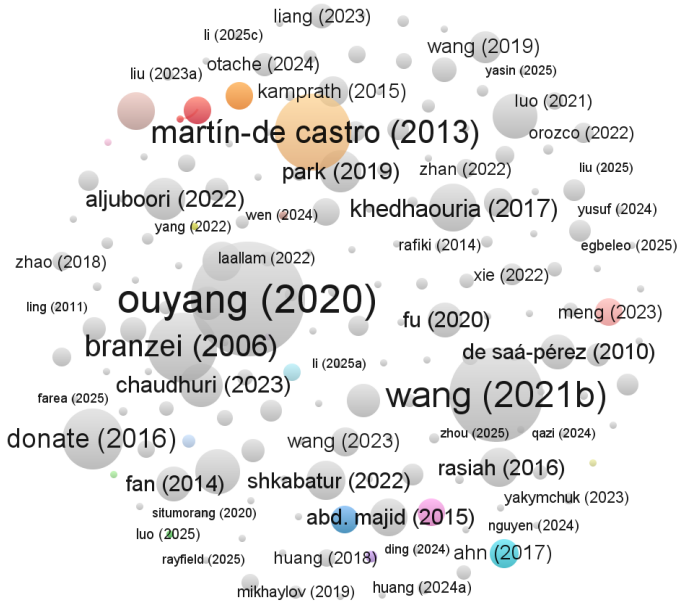


Figure 6. Citation Analysis
Source: Processed data. Use Biblioshiny

Bibliographic Coupling Sources

Next bibliographic coupling sources below. This map shows that publication sources on this topic are concentrated in key journals, including Sustainability (Switzerland), Technological Forecasting and Social Change, and the Journal of Business Research. The dense interconnectedness among journals indicates that research on micro-enterprise resilience is supported by a multidisciplinary literature, particularly in management, innovation, sustainability, entrepreneurship, and Islamic finance. Overall, this map confirms that your research topic has a strong, well-integrated reference base.

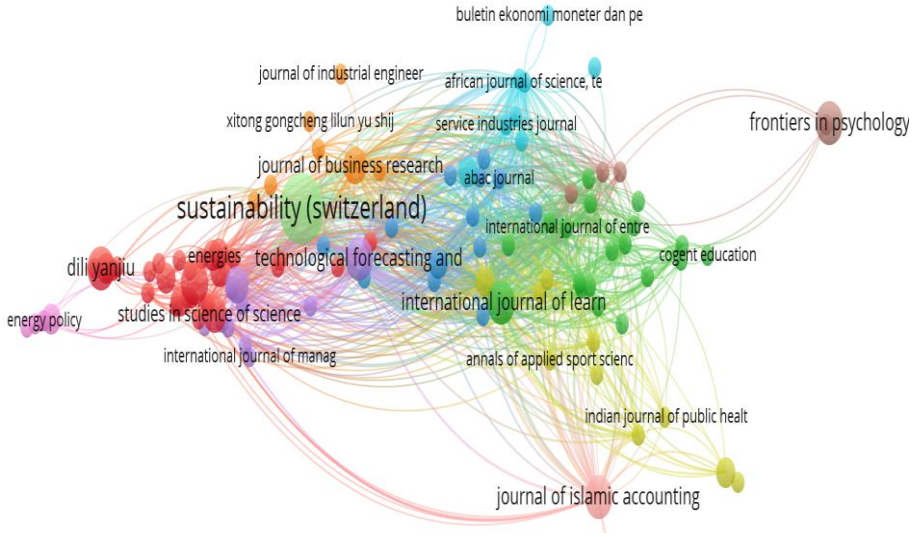


Figure 7. Bibliographic Coupling Sources
Source: Processed data use Biblioshiny

Stage Second

Outer Model

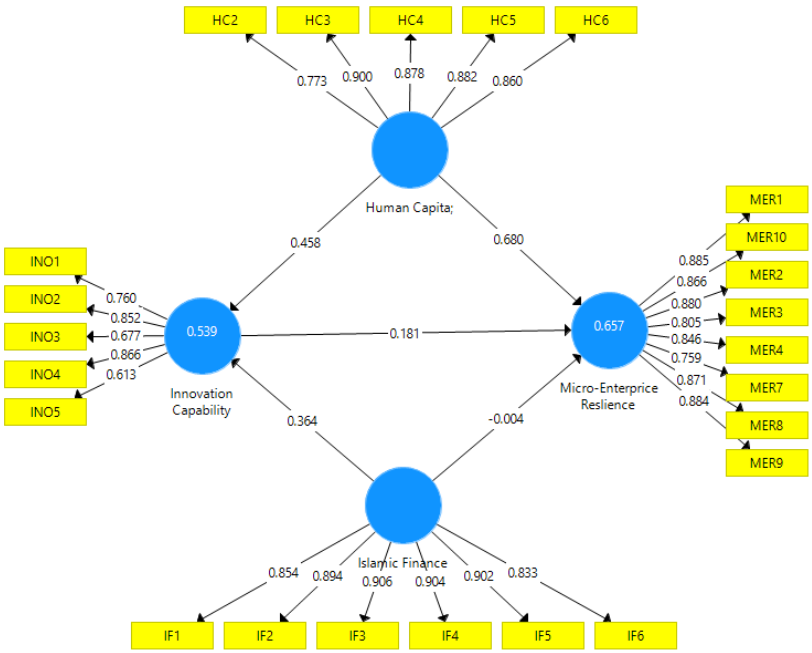


Figure 8. Results Outer Model Testing

1. Construct Reliability

Table 1. *Outer Loading & Construct Reliability*

Dimensions	Indicator		OL	CR	AVE	CA
Business results	HC2	I can convey the production process both orally and in writing.	0.773	0.934	0.739	0.911
Behavior & attitude	HC3	I always feel excited	0.899			
	HC4	I am very diligent	0.877			
	HC5	I obey the rules	0.883			
	HC6	I feel the current working conditions	0.861			
Source of Capital	IF1	The role of Sharia financing in developing halal economic sectors to meet the need for business capital.	0.856	0.883	0.656	0.826
Ease of access & procedures	IF2	Sharia financing is easily accessible, and the procedures are straightforward.	0.893			
	IF3	Sharia financing can reach lower-income communities	0.905			
Payment System Innovation	IF4	Sharia financing helps advance and increase the business income of microentrepreneurs	0.904			
	IF5	Sharia financing provides guidance and empowerment down to the grassroots level.	0.901			
	IF6	Easy to get information about the loan products offered	0.833			
Process Innovation	INO1	The production process is being changed using new, improved methods.	0.785	0.955	0.779	0.943
	INO2	I have used equipment with new technology	0.861			
Market Innovation	INO3	I package and design the product well	0.706			
	INO4	I am trying to add branches to my business in other places.	0.875			
Strengthening the effects of stress	MER1	When I fail, I try another way.	0.885	0.954	0.723	0.945
	MER2	I keep trying even though the chances of success are small.	0.88			

Dimensions		Indicator	OL	CR	AVE	CA
Positive acceptance of change and secure relationships	MER3	I can adapt to a changing environment.	0.804			
	MER4	I like new things at work	0.845			
	MER7	I will pray when I have difficulties	0.759			
	MER8	I always pray whenever I want.	0.871			
	MER9	I believe that whatever happens is best according to God.	0.884			
	MER10	I believe everything happens because of God's will.	0.866			

Information:

OL: Outer Loading CR: Composite Reliability

AVE: Average Variance Extracted CA: Cronbach's Alpha

Of the outer model is results the third test, where 3 indicators thrown away from indicators said, so that All constructs, namely human capital, Islamic finance, innovation capability, and micro-enterprise resilience, have met the criteria for convergent validity and reliability, because all indicators have outer loadings above 0.70, while the composite reliability, average variance extracted, and Cronbach's alpha values for each construct are also above the required minimum limit, namely 0.70 for reliability and 0.50 for AVE. Thus, all indicators are declared capable of measuring their constructs well, consistently, and accurately, so that the measurement model is worthy of being continued to the inner model analysis.

2. Discriminant Validity

Table 2. Fornell-Larcker Criterion

	Human Capital	Innovation Capability	Islamic Finance	Micro-Enterprise Resilience
Human Capital	0.860			
Innovation Capability	0.653	0.810		
Islamic Finance	0.592	0.621	0.882	
Micro-Enterprise Resilience	0.799	0.622	0.514	0.850

The results of the Fornell-Larcker Criterion test indicate that all constructs have met discriminant validity, because the square root of the AVE

value (diagonal value) for each variable is greater than the correlation between other constructs. The values of Human Capital (0.860), Innovation Capability (0.810), Islamic Finance (0.882), and Micro-Enterprise Resilience (0.850) are each higher than the relationship with other variables in the same row or column. This indicates that each construct has a good ability to differentiate itself from other constructs, so that the measurement model is declared discriminant valid and suitable for further analysis on the inner model.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

	Human Capital	Innovation Capability	Islamic Finance
Innovation Capability	0.730		
Islamic Finance	0.631	0.688	
Micro-Enterprise Res instead of	0.857	0.666	0.532

The HTMT test results show that all ratio values between constructs are below the 0.90 threshold, ranging from 0.532 to 0.857. Therefore, it can be concluded that the model has met discriminant validity. The highest value, 0.857, is observed in the relationship between Human Capital and Micro-Enterprise Resilience and remains within acceptable limits. Meanwhile, the relationships between other variables, such as Human Capital and Innovation Capability (0.730), Islamic Finance and Innovation Capability (0.688), and Islamic Finance and Micro-Enterprise Resilience (0.532), also show relatively moderate values. Thus, each construct in the model clearly differs from the others, and there is no problem with construct discrimination; therefore, the measurement model is deemed valid and suitable for proceeding to the inner model analysis.

Inner Model

1. *R-Square (R^2)*

Table 4. *R-Square (R^2)*

	R Square	R Square Adjusted
Innovation Capability	0.511	0.507
Micro-Enterprise Resilience	0.657	0.653

The R-square test results show that the Innovation Capability variable has an R^2 of 0.511 (Adjusted R^2 = 0.507), indicating that 51.1% of the variation in Innovation Capability is explained by the model's independent variables, namely Human Capital and Islamic Finance. In comparison, other factors

outside the model influence the remaining 48.9%. Furthermore, the Micro-Enterprise Resilience variable has an R^2 of 0.657 (Adjusted R^2 = 0.653), indicating that Human Capital, Islamic Finance, and Innovation Capability explain 65.7% of the variation in micro-enterprise resilience. In comparison, the remaining 34.3% is influenced by other variables not examined. In general, the R^2 value is considered moderate to strong, indicating the model has good explanatory power.

2. F-Square (f^2)

Table 5. F-Square (f^2)

	Innovation Capability	Micro-Enterprise Resilience
Human Capital	0.256	0.709
Innovation Capability		0.043
Islamic Finance	0.173	0,000

The f-square results indicate that Human Capital has a moderate influence on Innovation Capability and a significant influence on Micro-Enterprise Resilience. Islamic Finance has a moderate influence on Innovation Capability, but no influence on Micro-Enterprise Resilience. Meanwhile, Innovation Capability has only a small influence on Micro-Enterprise Resilience. Therefore, Human Capital is the most dominant variable in the model.

3. Q-Square (Q^2)

Table 6. Q-Square (Q^2)

	SSO	SSE	Q^2 (=1-SSE/SSO)
Human Capital	1350,000	538,441	0.601
Innovation Capability	1080,000	615,991	0.430
Islamic Finance	1620,000	511,552	0.684
Micro-Enterprise Resilience	2160,000	786,365	0.636

The Q^2 results show that all Q^2 values are positive: Human Capital at 0.601, Innovation Capability at 0.430, Islamic Finance at 0.684, and Micro-Enterprise Resilience at 0.636. This indicates that the model has good predictive relevance. The relatively high Q^2 values, especially for Islamic Finance and Micro-Enterprise Resilience, indicate that the model can predict the endogenous variables with high accuracy. Therefore, this research model demonstrates good predictive relevance and is suitable for further analysis.

4. *Path Coefficient*

Table 7. Path Coefficient

Path of Influence	STDEV	T Statistics	P Values	Decision
Human Capital → Innovation Capability	0.058	7,555	0	Significant
Human Capital → Micro-Enterprise Resilience	0.066	10.45	0	Significant
Innovation Capability → Micro-Enterprise Resilience	0.059	2,968	0.003	Significant
Islamic Finance → Innovation Capability	0.065	5,575	0	Significant
Islamic Finance → Micro-Enterprise Resilience	0.051	0.002	0.998	Not significant

Based on the results of the path coefficient test, Human Capital has a positive and significant effect on Innovation Capability, with a coefficient of 0.439, a t-statistic of 7.555, and a p-value of 0.000. Human Capital also has a positive and significant effect on Micro-Enterprise Resilience, with a coefficient of 0.686, a t-statistic of 10.450, and a p-value of 0.000. Furthermore, Innovation Capability has a positive and significant effect on Micro-Enterprise Resilience, with a coefficient of 0.174, a t-statistic of 2.968, and a p-value of 0.003. Islamic Finance has been shown to have a positive and significant effect on Innovation Capability, with a coefficient of 0.361, a t-statistic of 5.575, and a p-value of 0.000. However, Islamic Finance does not have a significant effect on Micro-Enterprise Resilience, as indicated by a coefficient of 0.000, a t-statistic of 0.002, and a p-value of 0.998.

5. Hypothesis

a. Hypothesis Influence Directly

Table 8. Statements Hypothesis Influence Direct

Code	Hypothesis
H1	Human Capital has a positive and significant effect on Innovation Capability.

Code	Hypothesis
H2	Human Capital has a positive and significant effect on Micro-Enterprise Resilience.
H3	Innovation Capability has a positive and significant effect on Micro-Enterprise Resilience.
H4	Islamic Finance has a positive and significant effect on Innovation Capability.
H5	Islamic Finance has a positive and significant impact on Micro-Enterprise Resilience.
H6	Innovation Capability Mediates the Influence of Human Capital on Micro-Enterprise Resilience
H7	Innovation Capability Mediates the Influence of Islamic Finance on Micro-Enterprise Resilience

Based on the results of direct hypothesis testing, Human Capital is proven to have a positive and significant effect on Innovation Capability, so H1 is accepted, and H0 is rejected. Human Capital has also been shown to have a positive and significant effect on Micro-Enterprise Resilience, so H2 is accepted and H0 is rejected. Furthermore, Innovation Capability has a positive and significant effect on Micro-Enterprise Resilience, so H3 is accepted and H0 is rejected. Islamic Finance has also been shown to have a positive and significant effect on Innovation Capability; therefore, H4 is accepted, and H0 is rejected. However, Islamic Finance does not have a significant effect on Micro-Enterprise Resilience; therefore, H5 is rejected, and H0 is accepted. Thus, these results indicate that, in direct hypothesis testing, Human Capital plays the dominant role in influencing Innovation Capability and Micro-Enterprise Resilience. At the same time, Islamic Finance has a significant effect only on Innovation Capability and no direct effect on Micro-Enterprise Resilience.

b. Hypothesis Influence No Direct

Table 9. Statement Hypothesis Influence No Direct

Code	Hypothesis
H6	Innovation Capability Mediates the Influence of Human Capital on Micro-Enterprise Resilience
H7	Innovation Capability Mediates the Influence of Islamic Finance on Micro-Enterprise Resilience

Table 10. Results Hypothesis Influence No Direct

	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Human Capita; -> Innovation Capability -> Micro-Enterprise Resilience	0.029	2,620	0.009
Islamic Finance -> Innovation Capability -> Micro-Enterprise Resilience	0.024	2,630	0.009

The results of the specific indirect effects test indicate that Innovation Capability plays a significant mediating role in the relationship between Human Capital and Islamic Finance on Micro-Enterprise Resilience. This is indicated by t-statistic values of 2.620 and 2.630, both greater than 1.96, and a p-value of 0.009, which is smaller than 0.05. Thus, both indirect relationships are significant. Thus, H6 and H7 are accepted, and H0 is rejected. Furthermore, the mediation in the Human Capital relationship is partial because its direct effect is also significant. In contrast, the Islamic Finance relationship is full because its direct effect is insignificant. This finding confirms that increasing innovation capability is a key mechanism in transforming the influence of human capital and Islamic finance into micro-enterprise resilience.

Discussion

This study integrates bibliometric and quantitative approaches to provide a comprehensive understanding of the determinants of *micro-enterprise resilience*. Bibliometric analysis not only serves as a descriptive mapping but also provides an overview of the research theme's development trajectory. The results of *keyword co-occurrence* indicate that *human capital*, *innovation capability*, and *Islamic financing* are key themes interconnected within the global literature. Furthermore, the emergence of keywords such as *digitization*, *digital economy*, and *green innovation* indicates a shift in research themes towards integrating innovation, digital transformation, and sustainability. These findings indicate that the study of micro-enterprise resilience is no longer limited to conventional, stability-based approaches but is evolving toward an adaptive approach that emphasizes the ability to transform and innovate in response to the dynamics of the business environment. Thus, the bibliometric results not only map dominant themes but also reflect the development of increasingly complex and multidimensional research focuses, which are then strengthened through empirical testing.

The results of the study indicate that *human capital* has a positive and significant effect on *innovation capability* and *micro-enterprise resilience*. This finding indicates that the quality of human resources functions not only as a production factor but also as a key driver in increasing business adaptive capacity. In this context, human capital serves as a foundation that enables micro-enterprises to respond to environmental changes more flexibly and strategically. The competence, knowledge, and adaptive abilities of business actors have proven key to increasing business resilience, as human capital significantly strengthens adaptability, crisis response, and organizational performance in dynamic environments.[34];[35] Thus, the results of this study strengthen *the Resource-Based View (RBV) perspective* by positioning *human capital* as a dynamic strategic resource rather than a static asset.

From the perspective of *the Resource-Based View (RBV)* and *Human Capital Theory*, the quality of human resources is a strategic asset that determines competitive advantage and business resilience. Human capital encompasses managerial competencies, digital skills, and adaptability, enabling businesses to thrive. Micro survives in conditions of uncertainty.

Investing in human capital, particularly by strengthening human resource management skills, has proven crucial to increasing the resilience of micro-enterprises, especially in the face of economic crises and uncertainty. These skills enable entrepreneurs to manage their workforce more effectively, improve team motivation and performance, and build self-efficacy in running their businesses, ultimately driving business sustainability.[36]

Innovation capability is a company's ability to create and implement new ideas in response to environmental changes. The quality of its human capital heavily influences this capability. Research shows that human capital plays a crucial role in enhancing innovation capability by enhancing knowledge, creativity, and problem-solving skills.[37] Competent human resources are better

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[34] Qin Zhou and others, 'Building Organisational Resilience Capability in Small and Medium-sized Enterprises: The Role of High-performance Work Systems', *Human Resource Management Journal*, 33.4 (2023), pp. 806–27, doi:10.1111/1748-8583.12479.

[35] Kun Chao, Shixue Wang, and Meijia Wang, 'Human Capital Investment, Technological Innovation, and Resilience of Chinese High-End Manufacturing Enterprises', *Sustainability*, 17.1 (2025), p. 247, doi:10.3390/su17010247.

[36] Ali Saleh Alshebami, 'Empowering Micro and Small Enterprises in Times of Crisis: How Human Resources Management Skills and Owned Funds Drive Self-Efficacy and Continuity Intention', *Sustainable Futures*, 10 (2025), p. 100791, doi:10.1016/j.sftr.2025.100791.

[37] Yosua Giovani Walukow, Willem J. F. A. Tumbuan, and Emilia M. Gunawan, 'The Influence Of Innovation Capability And Human Capital To The Business Performance Of Leilem Furniture Sme's Units', *Jurnal EMBA : Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, 11.4 (2023), pp. 1276–86, doi:10.35794/emba.v11i4.52359.

able to identify opportunities and develop relevant innovations. Thus, human capital is the main driver of business innovation capabilities.

Furthermore, *innovation capability* has been shown to have a positive and significant effect on *micro-enterprise resilience*. These results indicate that innovation not only increases efficiency but also serves as a key mechanism for dealing with disruption and uncertainty. In the context of the growing literature identified through bibliometric analysis, innovation is increasingly positioned as a key factor in business transformation, including through the adoption of digital technology, product development, and business model adjustments. This suggests that micro-enterprise resilience is related not only to the ability to survive but also to the ability to adapt and grow. This finding is consistent with research confirming that business resilience reflects the capacity to adapt to change and capitalize on opportunities to achieve sustainable growth.[38] and,[39] who emphasize that *innovation capability* is a critical determinant of small business sustainability.

Innovation capability is a crucial factor in improving business adaptability and resilience. Innovative micro- enterprises are better able to respond to market changes and survive crises. Research shows that innovation capabilities directly contribute to increased business resilience and performance by strengthening adaptive capabilities and driving improved organizational performance.[40,41] Innovation enables companies to create new value and maintain business continuity.

Human capital not only directly impacts resilience but also, through innovation capability, does so indirectly. Quality human resources will drive innovation, ultimately enhancing business resilience. Research shows that innovation capability mediates the relationship between human capital and

[38] Paul Saah, Charles Mbohwa, and Nelson Sizwe Madonsela, 'The Role of Adaptive Management in the Resilience and Growth of Small and Medium Size Enterprises', *International Review of Management and Marketing*, 14.1 (2024), pp. 1–10, doi:10.32479/irmm.15139.

[39] Walukow, Tumbuan, and Gunawan, 'The Influence of Innovation Capability and Human Capital on the Business Performance of Leilem Furniture Sme's Units'.

[40] Wassim J. Aloulou, 'Be Innovative and Resilient: Empirical Evidence from Saudi Firms on How to Translate Entrepreneurial Orientation into Firm Performance', *Administrative Sciences*, 13.7 (2023), p. 168, doi:10.3390/admsci13070168.

[41] Qining Deng and K. Noorliza, 'Integration, Resilience, and Innovation Capability Enhance LSPs' Operational Performance', *Sustainability*, 15.2 (2023), p. 1019, doi:10.3390/su15021019.

organizational performance and resilience.[42] Thus, innovation capability is an important mechanism explaining how human capital increases resilience.

The research results also show that *Islamic financing* has a positive and significant effect on *innovation capability*, but does not directly impact *micro-enterprise resilience*. Taken together with bibliometric findings, these indicate that the role of Islamic financing in literature and practice is not solely as a source of capital but also as a supporting factor that strengthens a business's capacity for innovation. In other words, Islamic financing is effective at increasing resilience when used to encourage innovation. The difference in results from previous research[43] can be explained by contextual factors, such as financial literacy levels, access to financing, and business readiness in resource management. This suggests that the impact of financing is indirect and highly dependent on the business's internal capabilities.

Access to financing is a crucial factor in maintaining business continuity. Microfinance. Sharia financing offers a financial system based on the principles of profit sharing, fairness, and stability that is relatively more resilient to crises than conventional systems. Empirical studies show that Islamic financing can enhance financial stability and business resilience among micro-enterprises by providing more inclusive and sustainable access to capital.[44] Furthermore, adequate financial support helps micro-enterprises survive and adapt to changes in the business environment, as access to financing has been shown to increase business resilience and sustainability, especially during times of crisis.[45]

In addition to human capital, external factors such as access to financing also influence innovation capacity. Islamic financing provides financial resources that enable micro-enterprises to invest in technology, product development, and digitalization. Research shows that access to financing, including Islamic financing, contributes to increased innovation and digital transformation among micro-enterprises, especially through financial technology (fintech), which

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[42] Walukow, Tumbuan, and Gunawan, 'The Influence Of Innovation Capability And Human Capital To The Business Performance Of Leilem Furniture Sme's Units'.

[43] M. Kabir Hassan, Mustafa Raza Rabbani, and Mahmood Asad, 'Challenges for the Islamic Finance and Banking in Post COVID Era and the Role of Fintech', *Journal of Economic Cooperation and Development*, 41.3 (2020), pp. 93–116.

[44] Hassan, Rabbani, and Asad, 'Challenges for the Islamic Finance and Banking in Post COVID Era and the Role of Fintech'.

[45] Angelo Castaldo and others, 'Access to Bank Financing and Start-up Resilience: A Survival Analysis across Business Sectors in a Time of Crisis', *The Manchester School*, 91.3 (2023), pp. 141–70, doi:10.1111/manc.12433.

expands access to funding and encourages the adoption of business innovations.[46]

Furthermore, *innovation capability* was shown to mediate the relationship between *human capital* and *Islamic financing* on *micro-enterprise resilience*. In the *human capital relationship*, mediation was partial, indicating that human resource quality has both a direct and indirect influence through innovation. This confirms that *human capital* has a dual role, namely as a primary resource and as a driver of innovation. Meanwhile, in the *Islamic financing relationship*, mediation was full, indicating that financing affects resilience only when converted into innovation activities. This finding strengthens the argument that, in the context of modern micro-enterprises, the strategic value of a resource is determined not only by its availability but also by the ability to transform it into relevant innovations.

Human capital not only directly impacts resilience but also, through innovation capability, does so indirectly. Quality human resources will drive innovation, ultimately enhancing business resilience. Research shows that innovation capability mediates the relationship between human capital and organizational performance and resilience.[47] Thus, innovation capability is an important mechanism explaining how human capital increases resilience.

In addition, Islamic financing can also increase resilience through innovation capability. Access to financing enables micro-enterprises to carry out innovations that support adaptation to environmental changes. Research shows that financial support increases innovation, which ultimately strengthens business resilience, especially through the use of financial technology and the digitalization of financing, thereby encouraging innovation and business adaptability.[48] Thus, innovation capability also mediates the relationship between Islamic financing and business resilience in micro-enterprises.

Overall, the results of this study indicate that *human capital*, *innovation capability*, and *Islamic financing* are integrated in shaping *micro-enterprise resilience*. Bibliometric analysis indicates the development of research themes towards a more adaptive, innovative, and contextual approach. At the same time, empirical results confirm that innovation is the primary mechanism in connecting these various determinants. Thus, this study not only provides an empirical

[46] Sujawal Hussain and others, 'Enhancing Competitive Advantage in SMEs through FinTech: The Mediating Roles of Technological Innovation and Financial Agility in Emerging Economy', *Journal of Innovative Research in Management Sciences*, 6.2 (2025), pp. 45–64, doi:10.62270/jirms.v6i2.99.

[47] Walukow, Tumbuan, and Gunawan, 'The Influence Of Innovation Capability And Human Capital To The Business Performance Of Leilem Furniture Sme's Units'.

[48] Sekaran and Bougie, *Research Methods for Business: A Skill-Building Approach*.

contribution but also enriches the literature by demonstrating that micro-enterprise resilience results from a dynamic interaction between internal and external factors amid increasingly complex changes in the business environment.

Literature Limitations

The literature on *micro-enterprise resilience* still has several limitations. First, many studies are contextual and country-based, thus limiting generalizability. Second, although digitalization and innovation are emerging, the integration of variables such as *human capital*, innovation, and Islamic financing remains incomplete. Third, *Islamic financing studies* still focus more on access to financing than on the mechanisms that impact resilience. Fourth, most studies use a cross-sectional approach, thus failing to capture long-term dynamics. Therefore, more integrative, longitudinal, and multidisciplinary research is needed to broaden our understanding of micro-enterprise resilience.

CONCLUSION

This study shows that human capital is a key determinant of innovation capability and micro-enterprise resilience. At the same time, Islamic financing strengthens innovation capability but does not directly affect micro-enterprise resilience. Furthermore, innovation capability is shown to play a significant role as a mediating variable, with partial mediation in the relationship between human capital and resilience, and full mediation in the relationship between Islamic financing and resilience. Overall, these results confirm that strengthening human resource quality and innovation capabilities are key to enhancing micro-enterprise resilience amidst the complex dynamics of the business environment.■

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