Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

THE IMPROVEMENT OF MSME PERFORMANCE THROUGH BUSINESS INNOVATION, RISK MANAGEMENT, AND DIGITAL FINANCE

ASEP RISMAN
Professor, Faculty of Economics and Business, Universitas Mercu Buana, Jakarta, Indonesia.
Email: asep.risman@mercubuana.ac.id

ANEES JANEE ALI
Lecturer, School of Management, Universiti Sains Malaysia, Kuala Lumpur, Malaysia.

AMINA OMRANE*
Associate-Professor, University of Sfax & IHEC Carthage, ECSTRA Research Center, Tunisia.
*Corresponding Author Email: amina.omrane@yahoo.fr

WISAM ALMUHNAH
PhD Scholar, University of Sfax.

SAMAR BESBES
PhD Scholar, University of Sfax.

Abstract

The present research examines the empirical evidence of the influence of Digital Finance, Business Innovation and Risk Management on MSME performance. The sample used in this study includes 325 respondents from all over cities of Indonesia and Malaysia. Data is processed using Partial Least Square (PLS) software with Structural Equation Modeling (SEM). The results of the study demonstrate that Business Innovation, Digital Finance and Risk Management have positive effects on MSME performance. Digital Finance positively influences Business Innovation and Risk Management. Moreover, Business Innovation and Risk Management mediate the indirect influence of Digital Finance on MSME performance. However, the mediating role of Business Innovation and Risk Management minimizes or inhibits the impact of digital finance on MSME performance. Such findings might be insightful for MSMEs' managers and would help them anticipate future challenges and efforts to improve the MSME performance, which will ultimately increase the MSME's contributions to the whole economy.

Keywords: MSME Performance, Digital Finance, Innovation, Risk Management, Structural Equation Modeling (SEM).

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are crucial to a country's economic activities and significantly contribute to the economy. The significant influence of MSMEs on the economic development and/or prosperity has been demonstrated not just in developing countries, but also in advanced nations (Rodrigues et al., 2021; Endris & Kassegn, 2022; Purwanto et al., 2022; Lestari et al., 2022; Roman & Rusu, 2022; Risman et al., 2023). Therefore, every country strives to maintain and continually improve the performance of MSMEs to enhance their contribution to the economy.

However, like any other business entity, MSMEs also face several threats and challenges that will affect their future performance. In addition to the classic factors commonly faced

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

by the business world, such as capital and market access, the future performance and constraints of MSMEs are also influenced by various factors, such as business innovation and digitalization, as well as an increase in risk factors (Bashir et al., 2023; Holmström et al., 2019).

Currently, digitalization is required in all the sectors of economic activities, initially aimed at obtaining benefits such as improving efficiency and effectiveness involved in the operations of MSMEs. Therefore, digital transformation is implemented in all business management functions, such as marketing, production, and finance.

The implementation of digital finance in MSMEs itself is often closely tied to the payment methods that are synchronized with marketing activities. Moreover, “the use of digital payment systems as a key element of digital finance has been accelerated by the growth of online stores (e-commerce)” (Risman et al., 2021).

Digital transformation enables and has provided benefits by reducing transaction costs, enabling faster access to information, driving business and product innovation, and enhancing service quality and market expansion (Roman & Rusu, 2022; Bresciani et al., 2021; Chen and Wang, 2021; OECD, 2021; Xie et al., 2020). Therefore, digitalization not only improves efficiency and effectiveness; but also enhances competitive advantages and achieves a high profitability.

While the specific impact of digital transformation on MSME performance has not been extensively studied, several empirical findings on the effects of digital transformation on the performance of large companies indicate a positive impact (Xie & Wang, 2023; Masoud & Basahel, 2023; Do et al., 2022; Wang et al., 2020). Conversely, there are also studies that tend to show negative results (Amarneh et al., 2023; Niemand et al., 2021; Qi & Cai, 2020; Phan et al., 2020).

Those conflictual findings are primarily due to the fact that digital transformation (digitalization) requires significant investment, particularly in complex industries, and an advanced technology, such as banking. Studies on the impacts of digital transformation (digitalization) on the performance of Micro, Small, and Medium Enterprises (MSMEs) are still limited, but the existing findings tend to show positive results (Roman & Rusu, 2022; Octavia et al., 2020; Nuseir & Aljumah, 2020).

However, these studies have not specifically focused on the influence of digital finance, but rather on the impacts of digital marketing. Digital finance in MSMEs, particularly micro and small businesses (MSEs), is often intertwined with payment methods synchronized with digital marketing activities. In fact, “The use of digital payment systems is one of the key elements of digital finance, and the contribution of digital payments to digital finance has been accelerated by the rapid growth of e-commerce and advancements in financial technology” (Risman et al., 2021).

More specifically, previous research addressing the effects of digital finance on MSME performance is still limited, but indicates significant and positive results regarding such a kind of relationship (Daud et al., 2022; Luo et al., 2021).

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

One other factor that might increase the development of competitive advantages and is believed to contribute to achieving high profitability is innovation.

The influence of innovation on a firm's performance has been widely recognized for a long time as an interesting research topic. Additionally, the positive impact of innovation on firm's performance has been validated by many studies in the last two decades (Kijkasiwat & Phuensane, 2020; Rajapathirana and Hui, 2018), involving the latest researches conducted by Agustia (2022) and Islam (2023).

Even though numerous empirical studies demonstrated that the influence of innovation on a firm's performance of MSMEs differ from its effects on MSEs due to a narrow and diverse business scale, the effects of innovation on MSME performance still need to be carried out. Likewise, risk management remains also an issue and an interesting research topic that requires to be more explored.

Although the current research has the tendency to show up the important role of digital finance as an emerging source of risk, due to the sensitivity of data and systems, the present investigation undertaken from a different perspective, depicts that digital finance could be quite the opposite and becomes a tool in risk management. As with innovation, this current study seeks to examine whether digital finance might foster business innovation. Otherwise, the interplay between digital finance, business innovation and risk management on MSME performance is also underlined. Besides, the mediating effects of innovation and risk management on the association between digital finance and MSMEs' performance will be also tested.

LITERATURE REVIEW

Micro, Small, Medium Enterprises' (MSMEs') performance

"Micro, small and medium enterprises (MSMEs) are business entities like other business organizations in general. However, MSMEs have several criteria that differ in each country.

Therefore, in general, MSMEs can be defined as an activity that is undertaken by individuals and/or individual business entities that produce or add a certain value to goods or products. It is expected that those goods/products meet certain criteria or measures such as asset value, number of workers, turnover, and so on" (Risman et al., 2023).

Meanwhile, MSMEs' performance is generally similar to business performance in its conceptualization, although until now there is still no uniform consensus on the definition of business performance, especially in determining the parameters (Kiyabo & Isaga, 2020; Serawitu, 2020; Purwanto et al., 2022). The use of various performance parameters mostly aligns with their respective disciplines, so that the definition of business performance varies.

We can therefore assimilate business performance to the achievement of the results related to business activities both individually and in groups, via certain parameters such as profit, target achievement, productivity, business scale, number of assets that show

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

progress, growth, or improvement and change for the general betterment of the organization (as compared to the previous periods).

According to Kiyabo & Isaga (2020), business performance can be evaluated via financial and non-financial indicators.

In the current study, and particularly for MSMEs, the measurement of business performance employs a qualitative approach. On the other hand, a quantitative method is deemed more suitable for evaluating the performance of large and public companies, while financial statements are reliable due to independent audits. MSME's performance might rely on business performance indicators.

As underlined by Ibor et al. (2017); Serawitu (2020); and Purwanto et al. (2022), the following indicators might serve qualitatively as a response to the given questionnaire, including the following indicators:

a. Increase in profits

b. Growth of business scale

c. Increase in asset value

Business Innovation

The Organization for Economic Co-operation and Development (OECD) broadly defines innovation as "the introduction of a new or significantly improved product (good or service), process, marketing method, or organizational method in business practices, workplace organization, or external relations" (OECD, 2005).

Wang et al. (2022), Akbari et al. (2021), as well as Zaoui et al (2021) defined business innovation as innovation that involves companies integrating new practices, services, or products that drive positive business changes.

There are three indicators of product innovation as follows (Kotler & Armstrong, 2012):

1. Product Quality

   The ability of a commodity to perform its functions., incorporating the resulting durability, reliability, and precision,

2. Product Variants

   As a competitive means of differentiating goods from each other or between products owned by competitors.

3. Item Style and Design

   Style shows the appearance of a particular product, while design means more than just style.

Based on the antecedent literature, business innovation could be pursued as a new idea or concept that involves change, development and something new that relate to habits, processes, products, systems, etc. which are expected to provide new, effective and

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

efficient benefits. Therefore, innovation can encourage increased revenues, cost savings, and others indicators that might in turn improve the performance of business entities, including MSMEs.

Based on the above statements, the second hypothesis can be formulated as follows:

H1: Business Innovation positively affects the performance of MSMEs.

Risk Management

*"Risk management is a critical process that concerns every aspect of organizational asset protection as well as the activities of the professional protection officer" (*Peterson, 2020*).*

According to the Indonesian Financial Services Authority (2016), "risk management is a series of procedures and methodologies used to identify, measure, monitor and control risks arising from the Bank's business activities".

Therefore, risk management can be assimilated to a comprehensive process that encompasses risk identification, risk analysis and measurement, risk monitoring, risk control, and evaluation activities.

The risk management process might therefore involve dimensions and indicators of the application of risk management in a business entity, including MSMEs.

Risk management includes also a set of processes and techniques designed to identify, assess, track, and mitigate risks stemming from the business entity. With this understanding of risk management, its implementation within a business organization can help minimize losses and variations from anticipated returns, as well as lower unforeseen non-operational expenses.

Therefore, risk management might have a positive impact on the performance of a business entity, such as MSMEs.

Based on the above observations, the third hypothesis can be suggested as follows:

H2: Risk Management positively influences the performance of MSMEs.

Digital Finance

The definition of digital finance varies, both from the perspective of academics and practitioners. Several governments and monetary authorities also have different definitions of digital finance, including the classification of payment data, which is partially integrated with electronic transactions.

Digital finance is thus associated to "financial services delivered via mobile phones, personal computers, internet, mobile banking, e-wallets, mobile wallets, and credit and debit cards. Digital finance begins with digital payments, as well as the current developments in digital finance which tend to be triggered by the rapid development of digital payments" (Risman et al., 2021).

According to the European Commission, digital finance refers to the integration of digital technologies into the financial services' sector, so that it could enhance its access,

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

efficiency, and convenience for consumers and businesses. It encompasses a wide array of technology-enabled financial activities, incorporating online banking, mobile payments, point-of-sale (POS) systems, and cryptocurrencies. The primary objectives of digital finance is accordingly to improve the reach, speed, and cost-effectiveness of financial services, making them more accessible to the general public, particularly in regions with a limited traditional banking infrastructure.

Digital payment is rather a payment method made for the usage of digital technologies. Thus, all the forms of transactions occur online or through internet-enabled cellular computing so that they do not require the exchange of physical money, but become an electronic money. In other words, electronic money has certainly a good impact on the national economy. Thus, the main indicators that a business entity could implement in its operations for digital finance include the following elements “(Risman, 2024):

1) Transactions that can be conducted via mobile phone
2) Transactions that can be made via the usage of a personal computer
3) Transactions that can be performed online (over the internet)
4) Transactions that can be done using mobile banking
5) The usage of e-wallet services
6) The deployment of mobile wallet services
7) Payments that can be ensured with a credit card
8) Payments that can be made with a debit card

Current developments in digital finance tend to be triggered by the rapid evolution of digital payments. Hence, the adoption of digital finance in a business organization might positively contribute to boosting sales’ revenues, as well as improving the efficiency and effectiveness of cash management, financial recording, and business operations, leading to the improvement of the overall business performance. Based on those above observations, the third hypothesis can be put forwarded as follows:

H3: Digital finance positively influences the performance of MSMEs.

Digital finance might help overcome the challenges faced by MSMEs in obtaining financing for business innovation, and thereby positively affecting its innovation performance (Kan & Sun, 2022).

Furthermore, the implementation of digital finance within business entities fosters the emergence of new ideas or concepts and supports the development of new products—whether goods or services—as well as changes in habits, processes, systems, and other aspects related to digital payment services. Based on the above opinions and reasoning of the relationship, the following hypothesis could be proposed:

H4: Digital finance positively influences the business innovation of MSMEs.

Digital finance has a significant impact on MSME performance, especially when it acts

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

with business innovation.

Through innovation, MSMEs can optimize the benefits of digital finance to create new solutions, enhance operational efficiency, and expand their markets. For instance, the adoption of digital payment technologies might accelerate transactions and support the development of new products or services.

With innovation acting as a catalyst, digital finance not only strengthens the financial stability of MSMEs but also accelerates their business transformation, improving their competitiveness and ultimately upgrading the overall performance of firms.

Based on these statements, the fifth hypothesis can be formulated as follows:

H5: Digital finance has a positive influence on MSMEs' Performance through business innovation.

Digital finance enables its users to leverage technology to access financial data in real-time, allowing for more accurate monitoring of cash flow, expenses, and incomes. Additionally, digital finance simplifies the diversification of funding sources, helping to minimize liquidity risks. Overall, financial digitalization enhances transparency, efficiency, and control in managing business risks.

Considering the above reasons, the sixth hypothesis can be proposed as follows.:

H6: Digital finance has a positive effect on Risk Management within MSMEs.

Through the implementation of digital financial services, such as online insurance, financial data analytics, and secure payment systems, MSMEs might better manage operational, financial, and market risks.

Digital technology enables MSMEs to monitor cash flow in real-time, identify potential risks early, and implement appropriate preventive measures. Integrating digital finance into MSME risk management strategies not only safeguards business continuity, but also enhances operational efficiency, builds customer trust, and strengthens overall financial stability, ultimately boosting MSME performance.

Based on the reasoning about this relationship, the following hypothesis could be proposed:

H7: Digital finance has a positive influence on MSMEs performance through risk management.

RESEARCH METHODOLOGY

In the present study, the target population consists of Micro, Small, and Medium Enterprises (MSMEs) business units. According to the Ministry of Cooperatives and SMEs of the Republic of Indonesia, the total number of MSME units is 65, 471, 134.

The sampling method employed is random sampling, as the questionnaires were distributed to respondents (MSMEs) via an online platform and measured via the recourse to a Likert scale ranging from 1 to 5.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

The sample size is calculated via the usage of the Slovin formula:

$$n = N/(1+(N \times e^2))$$

N = Total population 65,471,134

e = error, 10%

$n = (65,465,497) / (1 + (65,465,497 \times (0.1)^2))$

n = 99,999.8, rounded to 100

According to the calculations above, the minimum required sample size for this study is 100 responses. However, more than 100 samples were collected, with a total of 325 respondents from various regions of Indonesia. The framework of this research might thus be presented by a conceptual model via the usage of a Structural Equation Modeling (SEM) as depicted in Figure 1 below:

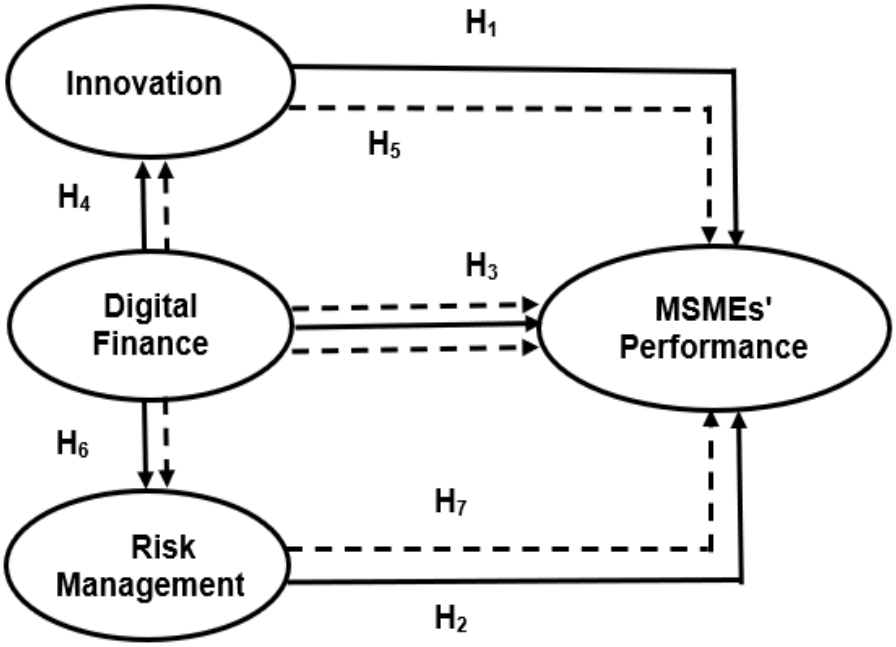

Fig 1: Conceptual research Model

RESULTS AND DISCUSSION

Validity Test

Two tests were conducted for checking the convergent validity. In the first test, two indicators were found to be invalid and had to be removed. However, in the second test, all the indicators were valid, as each one of them had a loading factor value that is greater than 0.50.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

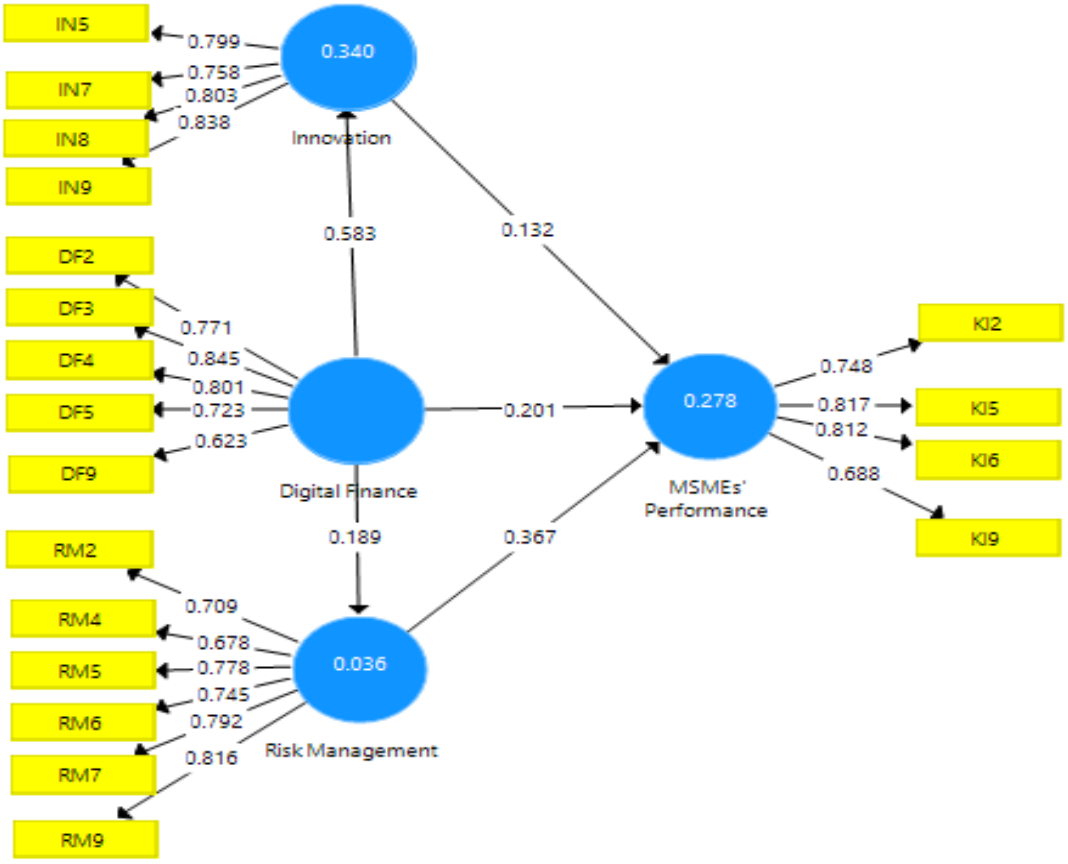

Fig 2: Second validity test

Reliability Test

Composite reliability testing is conducted to assess the consistency of the instrument used in the research model. A construct is considered to have a good reliability, whenever the questionnaire is consistent as a research tool, and if the composite reliability and the Cronbach's alpha values for all the variables are above 0.70.

Table 1: Composite Reliability

Variables	*Composite Reliability*	*Cronbach's Alpha's*	Conclusion
Business Innovation	0.877	0.814in	Reliable
Digital Finance	0.869	0.809	Reliable
Risk Management	0.888	0.849	Reliable
MSMEs' Performance	0.851	0.766	Reliable

According to Table 2, all the latent variables are considered reliable, as both the composite reliability and Cronbach's alpha values are greater than or equal to 0.70.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

The Goodness of Fit Test

The goodness of fit test is conducted for the structural model in the inner model on the basis of the predictive relevance (Q^2) value. The R-square value of the endogenous variables (MSMEs' performance) and each intervening variable is also calculated, i.e. for the two intermediate variables, namely Business Innovation and Risk Management. The predictive relevance (Q^2) value using business innovation mediation can be computed as follows:

$$Q^2 = 1 – (1\text{-}R^1)\ (1\text{-}R^2) = 1 – (1\text{-}\ 0{,}274)\ (1\text{-}\ 0{,}339) = 0{,}520114$$

The value of predictive relevance (Q^2) using risk management mediation:

$$Q^2 = 1 – (1\text{-}R^1)\ (1\text{-}R^2) = 1 – (1\text{-}\ 0{,}274)\ (1\text{-}\ 0{,}034) = 0{,}298684$$

Based on those calculations above, the predictive relevance value (Q^2) of the two mediating variables is obtained while greater than zero, and indicating that the model is considered as a good fit.

Hypotheses' Testing

Table 2: Hypotheses testing results for direct & indirect relationships

	Original Sample	***Standard Deviation***	**T-statistics**	**P values**	**Conlusion**
Business Innovation → MSMEs' Performance	0.132	0.047	2.838	0.005	Positive - Significant
Digital Finance → MSMEs' Performance	0.201	0.047	4.291	0.000	Positive - Significant
Risk Management → MSMEs' Performance	0.367	0.042	8.731	0.000	Positive - Significant
Digital Finance → Business Innovation	0.583	0.028	21.030	0.000	Positive - Significant
Digital Finance → Risk Management	0.189	0.045	4.181	0.000	Positive - Significant
Digital Finance → Business Innovation → MSMEs' Performance	0.077	0.028	2.780	0.006	Positive - Significant
Digital Finance → Risk Management → MSMEs' Performance	0.070	0.017	3.977	0.000	Positive - Significant

Based on the hypotheses' testing step as shown in Table 2, it appears that Business Innovation positively affects the performance of MSMEs. The results of this study indicate that Business Innovation can increase income through new ideas or concepts that involve change, development, and something new related to habits, processes, products, and others. Business innovation can also save costs, such as the use of technology & systems so that MSME business activities become effective and efficient. The empirical evidence that risk management positively affects the performance of MSMEs, indicate that risk management can increase operating revenues, reduce losses and deviations from estimated revenues, and reduce unexpected non-operating costs.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

The direct effect of digital finance is examined by the hypothesis testing that is performed and presented in Table 2. It seems that digital finance positively affects the performance of MSMEs. The results of this study indicate that business innovation can increase business revenues by augmenting revenues from sales through the usage of digital finance, especially digital payments.

Digital finance might also save costs such as transaction costs, be efficient and effective in managing cash and financial records and other business operations. There is also empirical evidence that digital finance positively influences the Business Innovation of MSMEs. The results of this study indicate that the application of digital finance, especially digital payments for business entities, might encourage the emergence of new ideas or concepts and the development of new products, both goods and services (services), and changes in habits, processes, systems, and others.

Besides, findings stress that digital finance positively influences the Risk Management of MSMEs, indicating that, in a business entity, it will help and make it easier to identify, measure, monitor and control risks arising from business activities.

The indirect impacts of digital finance on MSME performance occurs through business innovation. Based on the hypothesis test illustrated in Table 2, business innovation mediates the effects of digital finance on MSME performance. This empirical evidence indicates that the application of digital finance in MSMEs enhances their performance through the introduction of new ideas or concepts, innovative business models, the development of new products (goods and services), and changes in habits, processes, and systems. However, the indirect effect of digital finance on MSME performance through business innovation is small (0.077) compared to its direct impact on MSME performance, which is 0.201. This finding highlights that business innovation moderates the effects of digital finance on MSME performance, as innovation often requires significant costs and a long implementation time.

The indirect effect of digital finance on MSME performance through risk management is analyzed on the basis of the hypothesis test presented in Table 2. Findings demonstrate that risk management might mediate the indirect influence of digital finance on MSME performance. Such an empirical evidence indicates that the application of digital finance in MSMEs helps facilitate risk identification, measurement, monitoring, and control of risks arising from business activities. Effective risk management efforts can then increase operational income, minimize losses, reduce deviations from estimated income, and lower unexpected non-operational costs.

However, the indirect influence of digital finance on MSME performance through risk management is smaller (0.070) compared to its direct impact on MSME performance, which is 0.201. This finding suggests that risk management may limit the extent of the influence of digital finance on MSME performance, as it can restrict the scope of management in making financial and strategic decisions that require speed and precision.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

CONCLUSION

Business innovation upgrades income through new ideas or concepts that involve change, development, and new elements that are related to habits, processes, products, and others. Innovation can also save costs such as the use of technology & systems so that MSME business activities become effective and efficient. Risk management might increase operating revenues, reduce losses and deviations from estimated revenues, and eliminate unexpected non-operating costs. On the other hand, digital finance improves business revenues by increasing revenues from sales, especially through digital payments.

Digital finance can also save costs such as transaction costs, and be efficient and effective in managing cash and financial records and other business operations. Thus, the application of digital finance for business entities, will encourage the emergence of new ideas or concepts and the development of new products, both goods and services, as well as changes in habits, processes, systems.

Digital finance positively influences the Risk Management of MSME. It will help a business entity and make it easier for it to identify, measure, monitor and control risks arising from business activities. Business Innovation can therefore mediate the effects of digital finance on MSME performance. Thus, the application of digital finance to MSMEs will improve the performance of MSMEs through the existence of new ideas or concepts, and the development of new products (goods and services), as well as changes in habits, processes, systems, and so on. However, business innovation might inhibit the influence of digital finance on MSME performance, because it requires costs and takes a long time.

Risk management can also mediate the influence of digital finance on MSME performance. Thus, the application of digital finance to MSMEs will also contribute to identify, evaluate, and control risks arising from business activities, so that these risk management efforts upgrade the operating income, reduce losses and deviations from the estimated incomes, and diminish the unforeseen non-operating costs. However, risk management can inhibit the influence of digital finance on MSME performance, as it might limit the management's breadth in making financial and other strategic decisions.

Acknowledgements: Not applicable.

Author contributions: Approved the final manuscript.

Funding: No funding supports.

Availability of data and materials: Yes.

Declarations

Competing interests: The authors declare that there is no competing interest.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

References

1) Akbari.M., Omrane.A., Hoseinzadeh.A., and Nikookar.H (2021),«Effects of innovation on corporate performance of manufacturing companies : which roles associated to social responsibility ?», Transnational Corporations Review, Vol. 14, N°4, pp. 438-453.
DOI: 10.1080/19186444.2021.1940055

2) Amarneh, A. A., Yaseen, H., Atta, A. B., & Khalaf, L. (2023). Nexus Between Information Technology Investment and Bank Performance: The Case of Jordan. Banks and Bank Systems, 18(1), 68–76. https://doi.org/10.21511/bbs.18(1).2023.06

3) Agustia, D., Haryanto, S.D., Permatasari, Y. and Midiantari, P.N. (2022). Product innovation, firm performance and moderating role of technology capabilities. *Asian Journal of Accounting Research*, Vol. 7 No. 3, pp. 252-265. https://doi.org/10.1108/AJAR-12-2021-0266

4) Bashir, M., Alfalih, A., & Pradhan, S. (2023). Managerial ties, business model innovation & SME performance: Moderating role of environmental turbulence. *Journal of Innovation & Knowledge*, 8(1), 100329. https://doi.org/10.1016/J.JIK.2023.100329.

5) Bengrich, Mustapha, Azzahid, A., and Omrane, A. (2020). Contribution of Social Capital to Innovation: The Mediating Role of Knowledge Embedded in Social Networks. Chapter book in "*Accelerating Knowledge Sharing, Creativity, and Innovation Through Business Tourism",* edited by Muhammad Waseem Bari, et al., IGI Global Publishers, pp. 149-171. https://doi.org/10.4018/978-1-7998-3142-6.ch009.

6) Bresciani, S., Huarng, K. H., Malhotra, A., & Ferraris, A. (2021). Digital transformation as a springboard for product, process and business model innovation. *Journal of Business Research,* 128, 204–210. https://doi.org/10.1016/J.JBUSRES.2021.02.003.

7) Chen, W. R., & Wang, J. X. (2021). Platform-dependent upgrade: Digital transformation strategy of complementors in platform-based ecosystem. Manage. World, 10, 195-213.

8) Daud, I., Nurjannah, D., Mohyi, A., Ambarwati, T., Cahyono, Y., Haryoko, A. D. E., Handoko, A. L., Putra, R. S.,Wijoyo, H., Ari-Yanto, A., & Jihadi, M. (2022). The effect of digital marketing, digital finance and digitalpayment on finance performance of indonesian smes. International Journal of Data and Network Science, 6(1), 37–44. https://doi.org/10.5267/J.IJDNS.2021.10.006.

9) Do, T. D., Pham, H. A. T., Thalas-Sinos, E. I., & Le, H. A. (2022). The Impact of Digital Transformation on Performance: Evidence from Vietnamese Commercial Banks. *Journal of Risk and Financial Management*, 15(1). https://doi.org/10.3390/jrfm15010021.

10) Endris, E., Kassegn, A. (2022), The role of micro, small and medium enterprises (MSMEs) to the sustainable development of sub-Saharan Africa and its challenges: a systematic review of evidence from Ethiopia. *Journal of Innovation and Entrepreneurship*. 11 (20), https://doi.org/10.1186/s13731-022-00221-8.

11) European Commission. (2024). Overview of digital finance. Retrieved December 22, 2024, from https://finance.ec.europa.eu/digital-finance/overview-digital-finance_en?utm_source=chatgpt.com

12) Holmström, J., Holweg, M., Lawson, B., Pil, F. K., & Wagner, S. M. (2019). The digitalization of operations and supply chain management: Theoretical and methodological implications. Journal of Operations Management, 65(8), 728-734.

13) Ibor, I. B., Offiong, A. I., & Mendie, E. S. (2017). Financial Inclusion and Performance of Micro, Small and Medium Scale Enterprises in Nigeria. *International Journal of Research -Granthaalayah,* 5(3), 104–122. https://doi.org/10.29121/granthaalayah.v5.i3.2017.175.

14) Islam, M.M. (2023). Innovations and service firms' performance: a firm-level mediating and moderating effects analysis for India", *International Journal of Innovation Science*, Vol. 15 No. 3, pp. 385-405.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

15) Kan, L., & Sun, R. (2022). Research on the impact of digital finance on innovation and R&D of technology-based SEMs —Moderating role based on financial flexibility*. American Journal of Industrial and Business Management.* 12. 1650-1666. 10.4236/ajibm.2022.1211090.

16) Kijkasiwat, P. & Phuensane, P. (2020). Innovation and Firm Performance: The Moderating and Mediating Roles of Firm Size and Small and Medium Enterprise Finance*. Journal of Risk Financial Management.* 13(5), 97. https://doi.org/10.3390/jrfm13050097.

17) Kiyabo, K., Isaga, N. (2020). Entrepreneurial orientation, competitive advantage, and SMEs' performance: application of firm growth and personal wealth measures. *Journal of Innovation and Entrepreneurship,* 9 (12). https://doi.org/10.1186/s13731-020-00123-7

18) Kotler, Philip Dan Armstrong, Gary. (2012). Principles of Marketing. New Jersey: Prentice Hall.

19) Lestari, N., Levyta, F., Rosman, D., Zainal, V., & Affini, D. (2022). Technology is a solution for MSMEs Sustainability. *Indikator: Jurnal Ilmiah Manajemen dan Bisnis*, 6(2), 71 - 80. Doi: http://dx.doi.org/10.22441/indikator.v6i2.14771

20) Luo, Y., Peng, Y., & Zeng, L. (2021). Digital financial capability and entrepreneurial performance. *International Review of Economics & Finance,* 76, 55–74. https://doi.org/10.1016/J.IREF.2021.05.010

21) Niemand, T., Rigtering, J. P. C., Kallmünzer, A., Kraus, S., & Maalaoui, A. (2021). Digitalization in the financial industry: A contingency approach of entrepreneurial orientation and strategic vision on digitalization. *European Management Journal,* 39(3), 317–326. https://doi.org/10.1016/j.emj.2020.04.008.

22) Nuseir, M. T., & Aljumah, A. (2020). The role of digital marketing in business performance with the moderating effect of environment factors among SMEs of UAE. *International Journal of Innovation, Creativity and Change*, 11(3), 310-324.

23) Masoud, R., & Basahel, S. (2023). The Effects of Digital Transformation on Firm Performance: The Role of Customer Experience and IT Innovation. *Digital*, 3(2), 109-126.

24) OECD (2005) The Measurement of Scientific and Technological Activities Oslo Manual. Guidelines for Collecting and Interpreting Innovation Data. 3rd Edition, OECD EUROSTAT, Paris. https://doi.org/10.1787/9789264013100-en.

25) Octavia, A., Indrawijaya, S., Sriayudha, Y., & Hasbullah, H. (2020). Impact on E-commerce adoption on entrepreneurial orientation and market orientation in business performance of SMEs. *Asian Economic and Financial Review*, 10(5), 516-525. https://doi.org/10.18488/journal.aefr.2020.105.516.525.

26) Omrane.A. (2019). Small and medium-sized enterprises' networks and their contribution to the territorial development». Book chapter (N°17) in *«Advances in Management Research: Innovation and Technology»* (20 pages), Taylor & Francis Book Series (December), 304 pages), ISBN: 978-0-367-22688-6.

27) Peterson, K. E. (2020). What is risk management? In The Professional Protection Officer (pp. 367-372). Butterworth-Heinemann.

28) Phan, D. H. B., Narayan, P. K., Rahman, R. E., & Hutabarat, A. R. (2020). Do financial technology firms influence bank performance? *Pacific Basin Finance Journal,* 62. https://doi.org/10.1016/j.pacfin.2019.101210.

29) Purwanto AHD, Nashar M, and Jumaryadi Y et al. (2022). Improving medium small micro enterprise' (MSME) performance. *International Journal of Advanced and Applied Sciences*, 9(5): 37-46.

Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 57 Issue: 12:2024
DOI: 10.5281/zenodo.14874029

30) Qi, Y. D., & Cai, C. W. (2020). The Multiple Effects and Mechanism Study of Digitalization on the Performance of Manufacturing Enterprises. *Frontiers of Business Research in China*, 16(2), 187-206. DOI: https://doi.org/10.3868/s070-007-022-0009-1.

31) Rajapathirana, R. P. J., & Hui, Y. (2018). Relationship between innovation capability,innovation type, and firm performance. *Journal of Innovation & Knowledge*, 3(1), 44–55. https://doi.org/10.1016/j.jik.2017.06.002

32) Risman, A., Mulyana, B., Silvatika, B., & Sulaeman, A. (2021). The Effect of Digital Finance on Financial Stability. *Management Science Letters*, 1979-1984.

33) Risman, A., Ali, A. J., Soelton, M., & Siswanti, I. (2016). The Behavioral finance of MSMEs in the advancement of financial inclusion and financial technology (Fintech). *The Indonesian Accounting Review,* 13(1), 91-101. doi: http://dx.doi.org/10.14414/tiar.v13i1.3213.

34) Risman, A. (2024). The Behavioral Finance of MSME: Digital Finance, Managerial Biases, Financial Literacy. *Dinasti International Journal of Economics, Finance & Accounting*. 5(2), 641-649.

35) Rodrigues, M.; Franco, M.; Silva, R.; Oliveira, C. (2021). Success Factors of SMEs: Empirical Study Guided by Dynamic Capabilities and Resources-Based View. *Sustainability*. Vol 13, 12301. https://doi.org/10.3390/su132112301

36) Roman, A. & Rusu, V. (2022). Digital Technologies and the Performance of Small and Medium Enterprises. *Studies in Business and Economics*,17(3), 190-203. https://doi.org/10.2478/sbe-2022-0055

37) Serawitu, A. (2020). Factors affecting the performance of micro and small enterprises in Diredawa city administration. *Research Journal of Finance and Accounting*, 11(11), 23-30.

38) Wang, H.; Feng, J.; Zang, H.; Li, X. (2020). The effect of digital transformation strategy on performance: The moderating role of cognitive conflict. *International Journal of Conflict Management.* 31, 1044–4068

39) Xie, K., Xia, Z. H., & Xiao, J. H. (2020). The enterprise realization mechanism of big data becoming a real production factor: From the product innovation perspective. *China Industrial Economics,* 5, 42-60.

40) Xie, X., & Wang, S. (2023). Digital transformation of commercial banks in China: Measurement, progress and impact. *China Economic Quarterly International*, 3(1), 35–45. https://doi.org/10.1016/J.CEQI.2023.03.002.

41) Zaoui.S., Safae Ait Hamou-ou-Brahim.S., Zhou.H., Omrane.A., and Huang.D. (2021), «Consumer Purchasing Behaviour Towards Strategic Innovation Management Practices in Morocco During COVID-19 Health Crisis », FIIB Business Review, Vol.10, N°2, pp. 158-171.