

**THE EFFECT OF FRUGAL STRATEGY AND RISK MITIGATION ON  
THE SUSTAINABILITY OF MSMEs WITH THE USE OF TECHNOLOGY  
AS A MODERATING VARIABLE****Luluk Mukarromah<sup>1)</sup>, Moh. Ubaidillah<sup>2)</sup>, Nik Amah<sup>3)</sup>**<sup>1</sup>Faculty of Economics and Business, Universitas PGRI Madiun  
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email: [nikamah@unipma.ac.id](mailto:nikamah@unipma.ac.id)***Abstrak***

Penelitian ini memiliki tujuan untuk menganalisis pengaruh *frugal strategy* dan mitigasi risiko terhadap keberlanjutan UMKM, serta menguji peran pemanfaatan teknologi informasi sebagai variabel moderasi. Pendekatan penelitian ini yakni kuantitatif dengan metode survei melalui penyebaran kuesioner kepada pelaku UMKM di Kota Madiun, Kabupaten Madiun, dan Kabupaten Magetan yang telah menjalankan usahanya minimal selama lima tahun. Teknik analisis data menerapkan Partial Least Square (PLS) dengan bantuan aplikasi SmartPLS 3. Hasil penelitian mengindikasikan bahwa *frugal strategy* dan mitigasi risiko berpengaruh positif dan signifikan terhadap keberlanjutan UMKM. Selain itu, pemanfaatan teknologi informasi terbukti mampu memperkuat hubungan antara *frugal strategy* dan mitigasi risiko terhadap keberlanjutan UMKM. Temuan ini menegaskan pentingnya strategi hemat dan manajemen risiko yang didukung oleh pemanfaatan teknologi informasi untuk memastikan keberlanjutan UMKM di era digital. Penelitian ini memberikan implikasi bagi pelaku UMKM dan pemerintah dalam merumuskan kebijakan yang mendukung transformasi digital dan keberlanjutan usaha.

**Kata Kunci:** *Frugal Strategy*, Mitigasi Risiko, Keberlanjutan UMKM.

***Abstract***

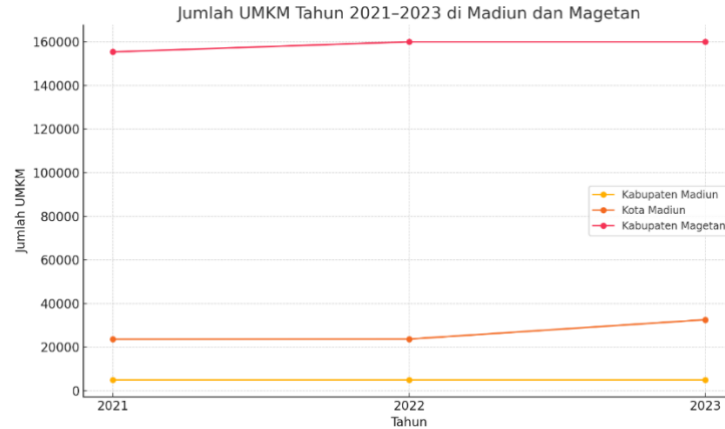
This study aims to analyze the influence of frugal strategies and risk mitigation on the sustainability of MSMEs and to examine the role of information technology utilization as a moderating variable. This research approach is quantitative, using a survey method through the distribution of questionnaires to MSMEs in Madiun City, Madiun Regency, and Magetan Regency who have been operating their businesses for at least five years. Data analysis used Partial Least

Squares (PLS) with the help of the SmartPLS 3 application. The results show that frugal strategy and risk mitigation have a positive and significant effect on the sustainability of MSMEs. Furthermore, the use of information technology has been shown to strengthen the relationship between frugal strategies and risk mitigation on the sustainability of MSMEs. This finding underscores the importance of frugal strategies and risk management supported by the use of information technology to ensure the sustainability of MSMEs in the digital era. This research has implications for MSMEs and the government in formulating policies that support digital transformation and business sustainability.

**Keywords:** Frugal Strategy, Risk Mitigation, MSME Sustainability.

## **A. INTRODUCTION**

The Indonesian Micro, Small, and Medium Enterprises (MSMEs) are the mainstay of the economy. Data from the Ministry of Cooperatives and SMEs (2023) indicates that MSMEs contribute over 60% to Gross Domestic Product (GDP) and employ over 90% of the workforce (Agustin et al., 2024). Despite this, the competitiveness of Indonesian MSMEs remains low, with only around 2% able to penetrate export markets. The main challenges faced include technological limitations, low digital literacy, and high business risks (Yanti et al., 2024). In the Madiun and Magetan regions, the number of MSMEs continues to increase. For example, Madiun City recorded 32,546 business units in 2023, while Magetan Regency had more than 160,000 MSMEs. This increase demonstrates significant potential, but is not matched by effective management strategies.



In times of market uncertainty and regulatory changes, MSMEs need to implement a cost-efficiency strategy, also known as a frugal strategy. This strategy emphasizes cost-effective innovation, optimal resource utilization, and the production of high-value products at low cost. Furthermore, risk mitigation is a crucial step to mitigate the impact of financial, operational, market, and legal risks.

As the digital era advances, the use of information technology can strengthen MSME business strategies. Information technology can reduce operational costs, accelerate marketing, and enhance risk management capabilities. However, low digital literacy prevents optimal use of technology. Against this backdrop, study examines the influence of frugal strategies and risk mitigation on MSME sustainability, with use of technology information as a moderating variable.

It is important to examine the extent to which frugal strategies and risk mitigation can influence the MSMEs of sustainability, and how use of information technology can strengthen this relationship. External pressures, such as the rapid development of digitalization, can make innovation and efficiency urgent. In this context, a deeper understanding of frugal strategies and risk mitigation becomes increasingly important. Furthermore, the role of information technology as a moderating variable can help MSMEs make more strategic decisions.

## B. METHOD

This research uses a quantitative approach to examine the influence of frugal strategies and risk mitigation on the sustainability of MSMEs, as well as the role of information technology utilization as a moderating variable. This quantitative approach was chosen because it allows for objective measurement of inter-variable relationships based on numerical data and statistical analysis. This study focuses on hypothesis testing and measuring the extent to which independent variables influence the dependent variable using data collected through questionnaires.

This explanatory research uses a survey design to test the formulated hypotheses. The instrument used was a questionnaire with a Likert scale of 1 to 5, distributed to several MSMEs in the Madiun residency area. The collected data will be analyzed using multivariate analysis techniques with the Partial Least Squares (PLS) model to determine the extent to which information technology moderates the relationship between frugal strategy and risk mitigation on MSME sustainability.

A population is the entire area encompassing objects and subjects with a specific number and characteristics determined by the researcher as study material to draw conclusions. In this study, the population in question is MSMEs in Madiun Regency. The sample for this study used MSMEs from Madiun Regency, Madiun City, and Magetan Regency. The data collection technique in this research used random sampling, technique was chosen because it provides equal opportunities for each unit in the population to be used as a sample to avoid bias in respondent selection. This method is a random selection of respondents from the population of MSME actors spread across Madiun Regency with a total of 15,000 units, Madiun City with 32,546 units, and Magetan Regency with 160,000 units, the total population is 207,546 units. The determination of the sample for this study uses the Solvin formula as follows.

$$n = \frac{N}{1 + N \cdot (e)^2}$$

Description:

n: Number of samples required

N: Population size

e: Margin of error (0.05)

$$n = \frac{207.546}{1 + 207.546 \cdot (0,05)^2}$$

$$n = \frac{207.546}{1 + (207.546 \cdot 0,0025)}$$

$$n = \frac{207.546}{1 + 518,865}$$

$$n = \frac{207.546}{519,865}$$

$$n = 399$$

So, the number of samples needed is 399 samples.

## C. RESULTS AND DISCUSSIONS

**Tabel 1.1** “Path Coefficients (Mean, STDEV, T-Values)”

	Sampel Asli (O)	Rata-rata Sampel (M)	Standar Deviasi (STDEV)	T Statistik ( O/STDEV )	P Values	Keterangan
TI*FS -> KU	0,232	0,240	0,134	1,729	0,042	Diterima

TI*MT -> KU	-0,104	-0,101	0,099	1,043	0,149	Ditolak
FS	0,151	0,149	0,065	2,320	0,010	Diterima
MT	0,536	0,532	0,081	6,609	0,000	Diterima
TI	0,319	0,324	0,096	3,318	0,000	Diterima

Source: Output SmartPLS 3 (2025)

## DISCUSSIONS

### The Influence of Frugal Strategy on the Sustainability of MSMEs

The results of this study indicate that a frugal strategy has a positive and significant impact on the sustainability of MSMEs. The greater the adoption of frugal strategies in business management, the greater the opportunity for MSMEs to survive and grow sustainably. A frugal strategy emphasizes efficient resource use, and low-cost innovation allows MSMEs to remain competitive even with limited capital and access.

This approach can encourage entrepreneurs to create simple yet effective solutions, enabling stable and adaptive business operations. The results of this research are supported by research Hossain, (2021) states that a frugal strategy influences business sustainability, demonstrating how individuals with limited funds and resources are able to deliver products while maintaining quality. The research De Marchi et al., (2022) states that frugal strategy has an impact on sustainability.

### The Impact of Risk Mitigation on the Sustainability of MSMEs

The research results show that risk mitigation has a positive and significant impact on the sustainability of MSMEs. This indicates that the better MSMEs identify, manage, and mitigate potential risks, the greater their chances of survival and sustainable development. In the context of MSMEs, risk mitigation encompasses various aspects, from managing financial risks (unstable

cash flow), legal risks (trademark licensing), to operational risks (damage to production equipment and supply chain disruptions).

Risk mitigation as a determining factor for MSME sustainability is increasingly relevant amidst global economic challenges, market fluctuations, and rapidly changing technological dynamics (Agustin et al., 2024). MSMEs with a sound risk management system can minimize negative impacts and accelerate the recovery process. The importance of risk mitigation for MSME sustainability is increasingly relevant amidst global economic uncertainty and the dynamics of ever-evolving technology. Therefore, implementing risk mitigation is seen not only as protection against losses but also as a way to create sustainable businesses Fajrul et al., (2025). The results of this research are supported by research (Irham et al., 2024). which states that risk mitigation has a significant influence on the sustainability of MSMEs. The research Hardian, (2025) stated that legal and financial risks have a significant impact on business sustainability. The research(Affan & Widyastuti, 2022) stated that risk mitigation has an impact on the behavior of MSMEs.

### **The Utilization of Information Technology Moderates the Influence of Frugal Strategy on the Sustainability of MSMEs**

The results of the research indicate that information technology significantly moderates the influence of frugal strategy on MSME sustainability. This means that the use of technology strengthens the influence of frugal strategy on business sustainability. The higher the utilization of information technology by MSMEs, the greater the contribution of frugal strategy in driving business sustainability. Efficiency strategies implemented by MSMEs become more effective when supported by digital tools such as social media or e-commerce platforms. Frugal strategies implemented by MSMEs, such as cost efficiency, simple innovation, and resource reuse, will have a greater impact when supported by digital technology that can accelerate work processes. In this case, frugal strategy can be said to be more productive when combined with the use of technology.

These findings suggest that a frugal strategy cannot stand alone without the support of digital transformation in today's business context. Given the resource constraints faced by MSMEs, the utilization of information technology is a tool that can accelerate efficiency, expand market reach, and quality of decision -making improve.

### **The Utilization of Information Technology Moderates the Influence of Risk Mitigation on the Sustainability of MSMEs**

The results of the research indicate that the use of information technology does not significantly moderate the relationship between risk mitigation and MSME sustainability. This means that although information technology can directly improve business sustainability, its role in strengthening the effectiveness of risk mitigation on sustainability has not been statistically proven. This fact suggests that most MSMEs may still use conventional methods of identifying and managing risks, such as manual bookkeeping or reactive responses to business problems. Information technology plays a major role in increasing the accuracy and speed of risk analysis, helping MSMEs monitor finances in real time (Rachmatsyah, 2025).

While information technology holds significant potential for the sustainability of MSMEs, particularly in strengthening risk mitigation, MSME support institutions need to promote training and provide simple, accessible systems so that technology is not only available but also effectively utilized in risk management processes. This strengthening is expected to strengthen the sustainability of MSMEs. The role of information technology has not been proven to moderate the relationship between risk mitigation and MSME sustainability. This is due to low digital literacy among MSMEs or their limited use for basic functions such as communication and promotion. Information technology has a significant direct impact on MSME sustainability. This research was supported by Angraini et al., (2024) which states that digital transformation have a significant influence in increasing the sustainability of MSMEs. The research Pratama et al., (2024) also stated that information technology makes a significant contribution to the practices of the MSME industry.

Based on the classification of moderating variables, the results of this research indicate that information technology falls into the pseudo-moderation category. A pseudo-moderator is a variable that has a direct influence on the dependent variable but does not exhibit a significant interaction effect on the relationship between the independent and dependent variables. Although information technology plays a crucial role in business sustainability, its function does not interactively strengthen frugal strategies or mitigate risk.

## **D. CONCLUSIONS**

The following conclusions were reached after analysis and discussion:

1. Frugal strategy has been shown to have a positive and significant impact on the sustainability of MSMEs, where efficient resource use and cost-effective innovations can improve business sustainability.
2. Risk mitigation also has a positive impact on the sustainability of MSMEs. The ability to manage financial, operational, market, and legal risks has proven crucial in maintaining business stability and sustainability.
3. Information technology directly and positively impacts the sustainability of MSMEs, particularly in terms of operational efficiency, market access, and digital-based business management.
4. As a moderating variable, information technology moderates the influence of frugal strategy on MSME sustainability.
5. Information technology does not show a significant moderating effect on the influence of risk mitigation on MSME sustainability. This indicates that the use of technology in risk management is still limited.
6. Respondent characteristics indicate that the majority of MSMEs are of productive age, have secondary education, and have been running their businesses for more than five years. They possess considerable business experience, but with digitalization that still needs to be improved.

7. The low moderating effect of information technology may reflect that digitalization is still viewed as a complement, rather than an integral part of managerial strategy in MSMEs.
8. This study emphasizes the importance of a strategic management approach that combines cost efficiency, risk management, and technology utilization to build MSME sustainability.

## **E. SUGGESTIONS**

Based on the research results and conclusions, several recommendations can be made:

1. MSMEs are advised to continue strengthening strategic cost-effective practices in their business activities through resource efficiency, simple innovations, and priority-based cost management.
2. Risk mitigation efforts must continue to be implemented more systematically, such as through financial record-keeping, legal protection, and regular monitoring of the business environment.
3. The use of information technology needs to be developed strategically to support decision-making and business data analysis.
4. MSME support institutions are advised to provide digital literacy training and mentoring to enable MSMEs to understand and apply technology in their business processes.
5. Further research is recommended using a longitudinal approach to determine the impact of cost-effectiveness and digitalization strategies over a longer period.
6. Researchers and academics are expected to continue developing innovative models that integrate information technology into MSME operational strategies to enhance their adaptability.

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