

# Gender-Responsive Entrepreneurial Orientation and FinTech Adoption in MSMEs: Examining the Moderating Role of Triple Bottom Line Principles

*Factors Influencing  
Sustainable MSME  
Growth*

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## **ABSTRACT**

*MSMEs are pivotal to Indonesia's economy, yet many face challenges in achieving long-term sustainability, particularly in balancing economic, social, and environmental outcomes. The study specifically examines the direct effects of gender-responsive entrepreneurial orientation and fintech adoption on MSME sustainability, as well as the indirect effects moderated by triple bottom line dimensions. Primary data were collected via structured surveys from MSME owners and managers who have implemented gender-inclusive entrepreneurial practices and fintech solutions. Structural Equation Modeling using SmartPLS was employed to test both the direct and moderation relationships. The results indicate that gender-responsive entrepreneurial orientation and fintech positively influence MSME sustainable performance, with the triple bottom line moderating these effects. Notably, the social dimension of the triple bottom line amplifies the impact of gender-responsive entrepreneurial orientation, while the economic and environmental dimensions strengthen the influence of fintech adoption. These findings offer actionable insights for policymakers, practitioners, and MSME stakeholders by highlighting the importance of integrating gender-inclusive strategies and digital financial solutions to enhance competitiveness, social impact, and long-term sustainability.*

**Keywords:** *Fintech, Gender-Responsive Entrepreneurial Orientation, Inclusive Growth, MSME Sustainability, Triple Bottom Line.*

## **ABSTRAK**

*UMKM memegang peranan penting dalam perekonomian Indonesia, namun banyak menghadapi tantangan dalam mencapai keberlanjutan jangka panjang, khususnya dalam*

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menyeimbangkan hasil ekonomi, sosial, dan lingkungan. Penelitian ini secara khusus menelaah pengaruh langsung kewirausahaan responsif gender dan adopsi fintech terhadap keberlanjutan UMKM, serta pengaruh tidak langsung yang dimediasi melalui dimensi triple bottom line. Data primer dikumpulkan melalui survei terstruktur kepada pemilik dan manajer UMKM yang telah menerapkan praktik kewirausahaan inklusif gender dan solusi fintech. Analisis Structural Equation Modeling menggunakan SmartPLS diterapkan untuk menguji hubungan langsung maupun mediasi. Hasil penelitian menunjukkan bahwa kewirausahaan responsif gender dan fintech secara positif memengaruhi kinerja UMKM yang berkelanjutan, dengan triple bottom line memediasi pengaruh tersebut. Secara khusus, dimensi sosial triple bottom line memperkuat dampak kewirausahaan responsif gender, sementara dimensi ekonomi dan lingkungan memperkuat pengaruh adopsi fintech. Temuan ini memberikan wawasan praktis bagi pembuat kebijakan, praktisi, dan pemangku kepentingan UMKM dengan menekankan pentingnya integrasi strategi inklusif gender dan solusi keuangan digital untuk meningkatkan daya saing, dampak sosial, dan keberlanjutan jangka panjang.

**Kata kunci:** Fintech, Kewirausahaan Responsif Gender, Pertumbuhan Inklusif, Keberlanjutan UMKM, Triple Bottom Line.

## INTRODUCTION

The growth of Micro, Small, and Medium Enterprises (MSMEs) in a sustainable manner is increasingly recognized as a vital component of economic development, particularly when viewed through the lens of gender-responsive entrepreneurial orientation and the integration of financial technology (fintech). The concept of sustainability in this context is often framed by the Triple Bottom Line (TBL) approach, which emphasizes the importance of balancing economic, social, and environmental outcomes. The adoption of financial technology has been shown to significantly enhance the operational efficiency of MSMEs by simplifying financial transactions through electronic payment systems, digital wallets, and mobile banking applications (Triwahyono et al., 2023). Furthermore, financial inclusion plays a mediating role in the relationship between financial technology and the sustainability of MSMEs, enabling better access to financial resources and services (Cahyawati et al., 2023).

Gender-responsive entrepreneurial orientation is crucial for empowering women and enhancing their participation in the economic sphere. Research by Adiandari (2023) indicates significant gender disparities in financial literacy, which directly impact women's ability to access financial services and participate in entrepreneurship, with only 46% of female participants exhibiting high financial literacy compared to 58% of their male counterparts. Women often face systemic barriers that limit their access to financial resources, particularly in developing regions where educational disparities further exacerbate these challenges (Mndolwa & Alhassan, 2020; Roy & Patro, 2022). The TBL framework, which emphasizes the importance of economic, social, and environmental sustainability, aligns well with the goals of gender-responsive entrepreneurial orientation and fintech by encouraging businesses to consider their impact on all stakeholders (Hosseinia & Ramezani, 2016).

Despite the recognized potential of fintech to enhance MSME sustainability, several critical challenges persist. First, a lack of awareness and understanding of fintech products among MSME operators hampers their ability to leverage these technologies effectively (Rahayu et al., 2023). Second, women entrepreneurs face additional barriers to accessing financial services, including limited financial literacy and systemic gender-based discrimination in financial markets (Geoffrey, 2023; Fatimah et al., 2024). Third, while the TBL framework provides a valuable lens for evaluating sustainability, its practical integration with gender-responsive entrepreneurial orientation and fintech solutions remains underexplored. The challenges faced by MSMEs, particularly in the wake of the COVID-19 pandemic, highlight the need for innovative solutions that leverage technology for financial management (Apriyanti & Yuvitasari, 2021; Rhee et al., 2022;

Zaky & Zainuddin, 2022; Kurniawan et al., 2023; Nurrizal & Risman, 2024). Furthermore, alternative financing options such as Peer-To-Peer (P2P) lending have gained traction as viable solutions for MSMEs that struggle to access traditional bank financing (Barus et al., 2023).

Research by Hosseininia and Ramezani (2016), Kasimu et al. (2018), Roy and Patro (2022), Adiandari (2023), and Triwahyono et al. (2023) has separately examined fintech adoption in MSMEs, identified gender disparities in financial inclusion, and applied the TBL framework to sustainable entrepreneurship. However, there is limited research that integrates these three dimensions, gender-responsive entrepreneurial orientation, fintech, and triple bottom line principles into a comprehensive framework for sustainable MSME growth. Specifically, the mechanisms through which fintech can enhance financial literacy among women entrepreneurs and how gender-responsive initiatives can be aligned with triple bottom line principles to drive both economic and social outcomes remain insufficiently understood (Kazemikhasragh & Pineda, 2022; Kamanzi, 2022). Additionally, the role of government policies in creating an enabling environment for this integration requires further investigation (Arnold & Gammage, 2019; Ncube, 2023; Yanti et al., 2024)

This study aims to explore the interplay between gender-responsive entrepreneurial orientation, financial technology, and the triple bottom line framework in fostering sustainable growth of MSMEs. Specifically, this study seeks to examine how fintech solutions can enhance financial literacy and inclusion among women-led MSMEs; investigate the application of TBL principles in gender-responsive entrepreneurial orientation practices; and identify policy interventions that can support the integration of these elements for sustainable MSME development. This study addresses four key aspects: the influence of fintech adoption on financial literacy and operational efficiency among women-led MSMEs; the mediating role of financial inclusion in the relationship between fintech adoption and sustainable MSME growth from a gender-responsive perspective; the integration of the triple bottom line framework with gender-responsive entrepreneurial orientation to enhance economic, social, and environmental sustainability; and the identification of policy interventions that effectively promote fintech adoption and support gender-responsive entrepreneurial orientation for sustainable MSME development. By addressing these aspects, the study provides a comprehensive understanding of how MSMEs can achieve sustainable growth through the strategic integration of gender-responsive entrepreneurial orientation, fintech innovation, and triple bottom line principles, while fostering social equity and environmental stewardship.

## **LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT**

### **The Determinant of MSME Performance**

Sustainable performance in MSMEs has become a central issue in supporting economic development in developing regions, as MSMEs are expected to balance economic viability, environmental responsibility, and social contribution (Endris & Kassegn, 2022; Pramudya, 2022; Gozali et al., 2024; Koe et al., 2024; Wei et al., 2024; Nustini et al., 2024). Achieving such sustainability requires firms to strengthen internal capabilities that enable competitiveness, resilience, and long-term performance. Marketing capability plays a crucial role by allowing MSMEs to understand customer needs, develop market-oriented strategies, and enhance profitability and revenue growth, which are key indicators of sustainable performance.

Beyond marketing capability, adaptive capability enables MSMEs to respond effectively to environmental uncertainty, regulatory changes, and external shocks, including pandemic-related disruptions (Virmani et al., 2020; Sudarmo, 2021; Harding et al., 2022; Andriyani et al., 2023). Firms with strong adaptive capability are better positioned to adjust their business models and operational processes to maintain performance sustainability. Absorptive capability further complements these capabilities

by facilitating the acquisition, assimilation, and application of new knowledge, thereby enhancing innovation and resilience (Strawser et al., 2021; Britton et al., 2023).

These capabilities are particularly relevant in gender-responsive entrepreneurial contexts, where women entrepreneurs face structural barriers affecting entrepreneurial intention and perceived behavioral control (Byrne et al., 2018; Vamvaka et al., 2020; Rietveld & Patel, 2022). Supportive networks, digitalization, and government interventions strengthen marketing, adaptive, and absorptive capabilities, thereby improving MSME performance and contribution to sustainable development (Sarfaraz et al., 2014; Kong & Kim, 2022; Orkaido, 2022; Singh et al., 2022; Aji et al., 2024; Hendrawan et al., 2024; Iskandar et al., 2024; Ram, 2023).

H1: Marketing capability has a positive effect on MSME performance.

H2: Adaptive capability has a positive effect on MSME performance.

H3: Absorptive capability has a positive effect on MSME performance.

### **MSME Performance, Gender-Responsive Entrepreneurial Orientation, and Fintech**

The adoption of financial technology (fintech) by MSMEs has become a transformative force that enhances operational efficiency and market expansion, particularly in developing economies where traditional financial services are often limited. Fintech provides MSMEs with more accessible and efficient financial solutions, including mobile banking, peer-to-peer lending, and digital payment systems that strengthen financial transparency and accountability (Gupta et al., 2022; Herman et al., 2023). These innovations simplify procedures and lower transaction costs, significantly improving financial inclusion for enterprises that struggle to access formal bank financing (Aguinis & Glavas, 2012; Agustina, 2023). Peer-to-peer lending platforms, for example, enable MSMEs to obtain capital without stringent collateral requirements, supporting entrepreneurship and broader economic development (Barus et al., 2022).

Operational efficiency is also strengthened through the automation of invoicing, bookkeeping, and payment processes, which reduces manual work and allows MSMEs to focus on core business operations (Raharjo et al., 2022). The integration of data analytics enables business owners to monitor financial performance, understand customer trends, and make more informed strategic decisions (Yaniar et al., 2021). Moreover, compliance support embedded in fintech applications helps MSMEs meet regulatory standards more effectively, minimizing administrative burdens and the risk of penalties (Panos & Wilson, 2020). Fintech further contributes to market expansion by enabling MSMEs to sell products on digital and e-commerce platforms that reach customers beyond local boundaries, thus increasing visibility and revenue (Pizzi et al., 2021). Personalized financial services tailored to MSME cash flow conditions also strengthen customer relationships, promote loyalty, and foster long-term business growth (Candraningrat et al., 2023).

H4: MSME performance has a positive effect on gender-responsive entrepreneurial orientation.

H5: MSME performance has a positive effect on financial technology.

### **Financial Technology and Gender-Responsive Entrepreneurial Orientation**

Financial technology (fintech) has emerged as a critical enabler of gender-responsive entrepreneurial orientation, particularly in developing economies where women entrepreneurs often face structural barriers in accessing financial services. Limited access to formal finance, lack of collateral, and gender-based discrimination remain persistent challenges that constrain women's entrepreneurial activities and business growth (Sarfaraz et al., 2014; Rietveld & Patel, 2022). Fintech solutions, such as digital payments, mobile banking, and peer-to-peer lending platforms, help reduce these barriers by providing more inclusive, flexible, and accessible financial services.

The adoption of fintech enhances women's entrepreneurial participation by improving access to capital, facilitating transaction efficiency, and increasing financial autonomy (Orkaido, 2022; Singh et al., 2022). By lowering transaction costs and minimizing reliance on traditional financial institutions, fintech empowers women entrepreneurs to manage their businesses more effectively and improve decision-making processes. This empowerment contributes positively to entrepreneurial intention and perceived behavioral control, which are essential elements of gender-responsive entrepreneurial orientation (Byrne et al., 2018; Vamvaka et al., 2020).

Moreover, digital financial platforms strengthen entrepreneurial networks and knowledge sharing, which further supports innovation and resilience among women-led MSMEs (Strawser et al., 2021; Britton et al., 2023). Government support and digital infrastructure development also play a significant role in amplifying the impact of fintech on gender equality and entrepreneurial inclusion (Kong & Kim, 2022; Aji et al., 2024; Hendrawan et al., 2024; Iskandar et al., 2024). Therefore, fintech serves as a strategic mechanism for fostering gender-responsive entrepreneurial orientation and promoting inclusive and sustainable economic development (Ram, 2023).

H6: Financial technology has a positive effect on gender-responsive entrepreneurial orientation.

### **Triple Bottom Line as a Moderator**

The Triple Bottom Line (TBL) framework introduced by Elkington and Rowlands (1999) provides a comprehensive approach to assessing MSME sustainability across economic, social, and environmental dimensions, emphasizing that business success must balance profit, people, and the planet. Economically, MSMEs play a vital role in employment creation and GDP growth (Dwyer & Edwards, 2013; Listiana et al., 2023). Applying TBL principles enhances financial sustainability through operational efficiency, innovation, cost reduction, effective resource management, and waste minimization (Longoni & Cagliano, 2016; Sapukotanage et al., 2018). Shifting consumer preferences toward responsible products also open new markets and strengthen competitiveness and brand value (Sentanu et al., 2021).

The social dimension focuses on MSMEs' impact on employees, customers, and communities through fair labor practices, community engagement, and social equity. Social responsibility fosters positive work culture, talent retention, and productivity (Sari et al., 2023), while CSR initiatives improve satisfaction, loyalty, and organizational performance (Munjaj & Sharma, 2021). Active community involvement further strengthens reputation and stakeholder support (Listiana et al., 2023). The environmental dimension evaluates emissions reduction, waste management, and resource efficiency (Belz & Binder, 2015). Sustainable environmental practices support regulatory compliance, cost savings, and operational efficiency, while eco-innovation enhances resilience to environmental risks and market demands (Longoni & Cagliano, 2016; Arviana & Wibisono, 2023).

Integrating gender-responsive entrepreneurial orientation strengthens TBL outcomes by addressing barriers faced by women entrepreneurs, such as limited access to finance and networks (Rosyadah et al., 2021; Wicaksana, 2023). Women-led MSMEs often prioritize social and environmental values aligned with TBL, improving sustainability and long-term viability, while enhancing financial literacy and resource management (Moro et al., 2020; Iskandar et al., 2023; AboAlsamh et al., 2023). Leadership diversity further supports innovation and performance (Zaniarti et al., 2022).

Fintech acts as a key enabler by improving efficiency and reducing transaction costs, supporting economic sustainability and financial inclusion for women entrepreneurs, even during crises (Hooi et al., 2016; Shin & Choi, 2019; Li et al., 2021; Putriani & Apriani, 2022; Abdul et al., 2022; Qin & Lu, 2023). Through TBL, fintech adoption and gender-responsive entrepreneurial orientation converge into a holistic sustainability model, delivering stronger sustainability outcomes (Nor-Aishah et al., 2020; Franco &

Rubalcaba, 2021; Iqbāl et al., 2021; Singh et al., 2021; Anggarini, 2022; Prakash et al., 2023; Ismadi et al., 2023).

H7: Profit moderates the relationship between financial technology and gender-responsive entrepreneurial orientation.

H8: People moderate the relationship between financial technology and gender-responsive entrepreneurial orientation.

H9: Planet moderates the relationship between financial technology and gender-responsive entrepreneurial orientation.

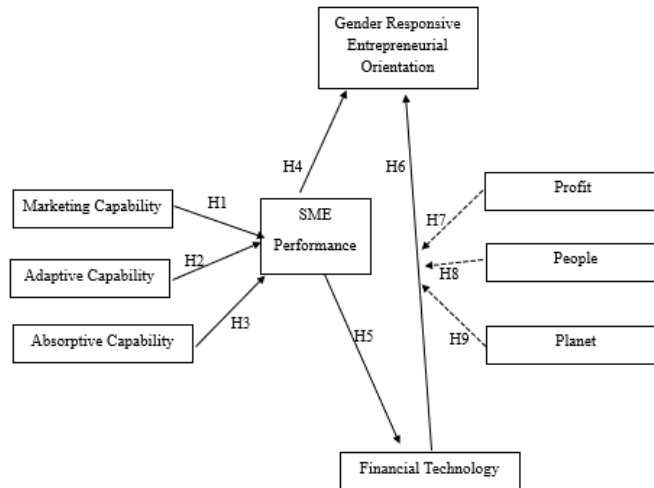


Figure 1. Conceptual Framework

Figure 1 illustrates the conceptual framework of this study, H1–H3 states that marketing capability, adaptive capability, and absorptive capability have a positive effect on MSME performance, as these capabilities help MSMEs understand the market, adapt to changes, and utilize knowledge to improve performance. H4–H6 explains that MSME performance and financial technology have a positive effect on gender-responsive entrepreneurial orientation, where good performance and the use of fintech encourage more inclusive entrepreneurial practices. H7–H9 shows that gender-responsive entrepreneurial orientation has a positive impact on profit, people, and the planet, thus contributing to the economic, social, and environmental performance of MSMEs.

## RESEARCH METHODS

This study employs a quantitative research design to examine the relationships among gender-responsive entrepreneurial orientation, fintech adoption, and the sustainability of MSMEs through the Triple Bottom Line (TBL) framework. A quantitative approach is appropriate for testing hypotheses and understanding both direct and indirect relationships among independent, moderating, and dependent variables (Toyman & Erkut, 2021). Data will be collected using a structured survey designed to measure MSME owners' or managers' perceptions of gender-responsive entrepreneurial orientation, fintech usage, and the application of sustainability principles in business operations. A Likert scale will be employed to assess the extent of agreement with each statement, and a pilot study will be conducted prior to the main data collection to ensure the validity and reliability of the survey instrument as well as to refine the questionnaire for accurately measuring the intended constructs (Reni et al., 2023).

The population of this study consists of MSME owners and managers who have adopted gender-responsive entrepreneurial practices and fintech solutions. Participants will be selected using stratified random sampling to ensure diversity across sectors and regions, which enhances the generalizability of the findings (Teixeira & Silva, 2012; Randhawa et al., 2021). The independent variables in this study are gender-responsive

entrepreneurial orientation and fintech adoption, while the moderating variable is the triple bottom line, encompassing economic, social, and environmental sustainability dimensions. The dependent variable is MSME sustainability, which is expected to be influenced both directly and indirectly by the independent variables through the moderation of triple bottom line (Sargani et al., 2020; Bedaduri & Pradhan, 2023; Marzouk & El Ebrashi, 2023).

The collected data will be analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the moderation model, including the estimation of path coefficients, significance testing, and evaluation of indirect effects through bootstrapping techniques (Holiienka et al., 2014; Augustino et al., 2023). Smart PLS will serve as the primary analytical tool, enabling the assessment of construct validity, path analysis, and hypothesis testing to examine how gender-responsive entrepreneurial orientation and fintech adoption contribute to MSME sustainability through the triple bottom line framework (Svenssen & Wagner, 2012; Svensson & Wagner, 2015; Svensson et al., 2016). This methodological approach allows for a robust understanding of the mechanisms through which inclusive entrepreneurship and technological adoption can foster sustainable business practices among MSMEs. To ensure the validity and reliability of the instruments used, a pilot study will be conducted prior to the main data collection.

**RESULTS**

Partial Least Squares Structural Equation Modeling (PLS-SEM) is a statistical technique used to analyze complex relationships among observed and latent variables. It is particularly useful when the goal is to model causal relationships with a small sample size or when the data violates normality assumptions. PLS-SEM employs an iterative algorithm to estimate the parameters of a model and provide path coefficients, loadings, and other related statistics.

**Table 1.** Outer Loading

Variable	Number of Items	Range of Outer Loadings	AVE	Information
Gender-Responsive Entrepreneurial Orientation	24	0.430 – 0.830	0.532	Acceptable
Marketing Capability	5	0.815 – 0.886	0.716	Good
Adaptive Capability	11	0.608 – 0.858	0.611	Acceptable
Absorptive Capability	13	0.706 – 0.887	0.682	Good
MSME performance	7	0.813 – 0.905	0.760	Very Good
Financial Technology	5	0.501 – 0.671	0.503	Acceptable
Profit	6	0.875 – 0.952	0.857	Excellent
People	10	0.724 – 0.915	0.702	Very Good
Planet	5	0.842 – 0.923	0.777	Very Good

Based on Table 1, PLS-SEM analysis of the model displayed, several key results can be interpreted from the relationships between the measured latent constructs. The outer model evaluation shows that the indicators in each construct have good reliability if the outer loading value is above 0.70 and meet the criteria for convergent validity with an Average Variance Extracted (AVE) value above 0.50. The outer loading results indicate that all constructs meet the minimum threshold for indicator reliability. Most variables show strong indicator loadings above 0.70, while several indicators with loadings between 0.40 and 0.69 remain acceptable due to their theoretical relevance. Thus, the measurement model is considered adequate for further structural analysis.

**Table 2.** Composite Reliability and Cronbach Alpha

Variable	Cronbach’s Alpha	Composite Reliability	Information
Gender-Responsive Entrepreneurial Orientation	0.959	0.959	Reliable
Marketing Capability	0.901	0.901	Reliable

Variable	Cronbach's Alpha	Composite Reliability	Information
Adaptive Capability	0.936	0.936	Reliable
Absorptive Capability	0.950	0.950	Reliable
MSME performance	0.948	0.948	Reliable
Financial Technology	0.781	0.781	Reliable
Profit	0.966	0.966	Reliable
People	0.952	0.952	Reliable
Planet	0.928	0.928	Reliable

3986

Table 2 shows that all constructs have excellent reliability. The Cronbach's Alpha and Composite Reliability values for all variables are above the minimum threshold of 0.70, indicating that the indicators used are able to consistently measure the constructs.

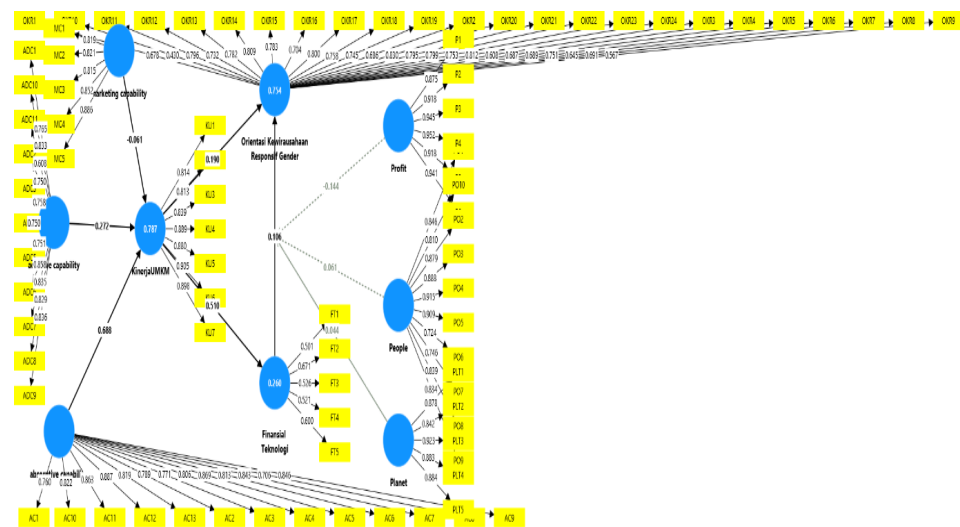


Figure 2. Results of the PLS-SEM Algorithm

Figure 2 shows the Absorptive Capability (AC) construct, loading values range from 0.706 to 0.887, with most indicators showing high values, such as AC5 (0.869), AC12 (0.887), and AC11 (0.863). These high loadings demonstrate that these indicators are very strong in measuring the absorptive capability construct. Although some indicators, such as AC8, have slightly lower values (0.706), they remain above the 0.70 threshold, indicating that they still contribute effectively to the construct measurement. Similarly, the Adaptive Capability (ADC) construct has loading values between 0.608 and 0.858, with ADC6 (0.858) and ADC9 (0.836) showing the strongest contributions. Although ADC11 (0.608) is relatively lower, it still falls within the acceptable range for validity, maintaining its relevance in measuring the construct.

In contrast, the Financial Technology (FT) construct has lower loading values, ranging from 0.501 to 0.671. FT2 (0.671) demonstrates the highest loading, while FT1 (0.501) is the weakest. These results suggest that the FT construct may need further improvement or refinement of indicators to better represent the variable. The MSME performance (KU) construct, however, displays very high loading values ranging from 0.813 to 0.905, with KU6 (0.905) and KU7 (0.898) being the strongest indicators. This demonstrates that the construct is measured effectively and consistently.

For Marketing Capability (MC), the loading values range between 0.815 and 0.886, with MC5 (0.886) being the strongest indicator. All values exceed 0.80, signifying that this construct is well represented and measured consistently. The Gender-Responsive Entrepreneurial Orientation (OKR) construct shows greater variation, with loadings ranging from 0.430 to 0.830. While indicators such as OKR10 (0.430) and OKR9 (0.567) show weaker contributions, most others exceed 0.70, indicating satisfactory reliability, although further refinement of weaker indicators is recommended.

The Profit (P) construct demonstrates excellent reliability, with indicator loadings ranging from 0.875 to 0.952. P4 (0.952) shows the highest loading value, confirming that Profit is a robust and consistently measured construct. Likewise, the Planet (PLT) construct shows high loadings between 0.842 and 0.923, with PLT3 (0.923) being the strongest indicator. All indicators surpass the 0.80 threshold, signifying high reliability. The People (PO) construct also exhibits strong reliability, with loading values ranging from 0.724 to 0.915. Indicators PO4 (0.915) and PO5 (0.909) show the highest loadings, while PO6 (0.724) and PO7 (0.746), though lower, remain within acceptable limits and could be further reviewed for enhancement.

**Table 3.** Hypothesis Test

Construct	Coefficient	P-Value	Result
SME Performace >> Gender-Responsive Entrepreneurial Orientation	0.190	0.017	Accepted
Marketing Capability >> MSE Performance	0.061	0.207	No accepted
Adaptive Capability >> MSE Performance	0.200	0.000	Accepted
Absorptive Capability >> MSE Performance	0.680	0.000	Accepted
MSME performance >> Gender-Responsive Entrepreneurial Orientation	0.510	0.000	Accepted
Financial Technology >> Gender-Responsive Entrepreneurial Orientation	0.106	0.028	Accepted
Profit	0.144	0.244	No accepted
People	0.060	0.648	No accepted
Planet	0.440	0.698	No accepted

Table 3 shows the test results indicating that MSME performance has a positive and significant effect on gender-responsive entrepreneurial orientation ( $\beta = 0.190$ ; p-value = 0.017). Furthermore, MSME performance also has a strong and significant direct effect on gender-responsive entrepreneurial orientation, with a coefficient of 0.510 and a p-value of 0.000. This finding confirms that improving MSME performance encourages the strengthening of gender-responsive entrepreneurial orientation.

In the antecedent performance pathway, marketing capability does not significantly influence MSME performance ( $\beta = 0.061$ ; p-value = 0.207), thus the hypothesis is rejected. Conversely, adaptive capability ( $\beta = 0.200$ ; p-value = 0.000) and absorptive capability ( $\beta = 0.680$ ; p-value = 0.000) are proven to have a positive and significant effect on MSME performance. This shows that adaptability and knowledge absorption are the main factors in improving MSME performance. Furthermore, financial technology had a positive and significant effect on gender-responsive entrepreneurial orientation ( $\beta = 0.106$ ; p-value = 0.028), indicating that the use of financial technology supports the strengthening of an inclusive and gender-responsive entrepreneurial orientation.

However, the results of the moderating variable test indicate that profit, people, and planet do not moderate the relationship between financial technology and gender-responsive entrepreneurial orientation, as all p-values are above 0.05. This finding indicates that these sustainability dimensions are not capable of strengthening or weakening the influence of financial technology on gender-responsive entrepreneurial orientation in the context of this study.

**Table 4.** R-square (R<sup>2</sup>) Results

Variable	R Square (R <sup>2</sup> )	Information
MSME performance	0.787	Strong
Financial Technology	0.260	Weak
Gender-Responsive Entrepreneurial Orientation	0.754	Strong

Based on Table 4, the bootstrapping results for the SEM model provided, the analysis shows significant relationships between constructs through path coefficients and p-values. Several relationships in this model show strong effects, such as the relationship between MSME performance and exogenous variables like marketing capability, adaptive

capability, and absorptive capability, which have high path coefficients (0.787), indicating a very strong influence on MSME performance. In addition, gender-responsive entrepreneurial orientation also has a significant positive contribution to other variables, with a coefficient of 0.754. The high R-squared ( $R^2$ ) value in the profit construct indicates that the variance in profit can be substantially explained by other constructs in the model. These analytical results provide valuable insights into the relationships between factors, which can be used as a basis for strategic decision-making, such as strengthening aspects like entrepreneurial orientation and financial technology to increase profit and the social impact of the company.

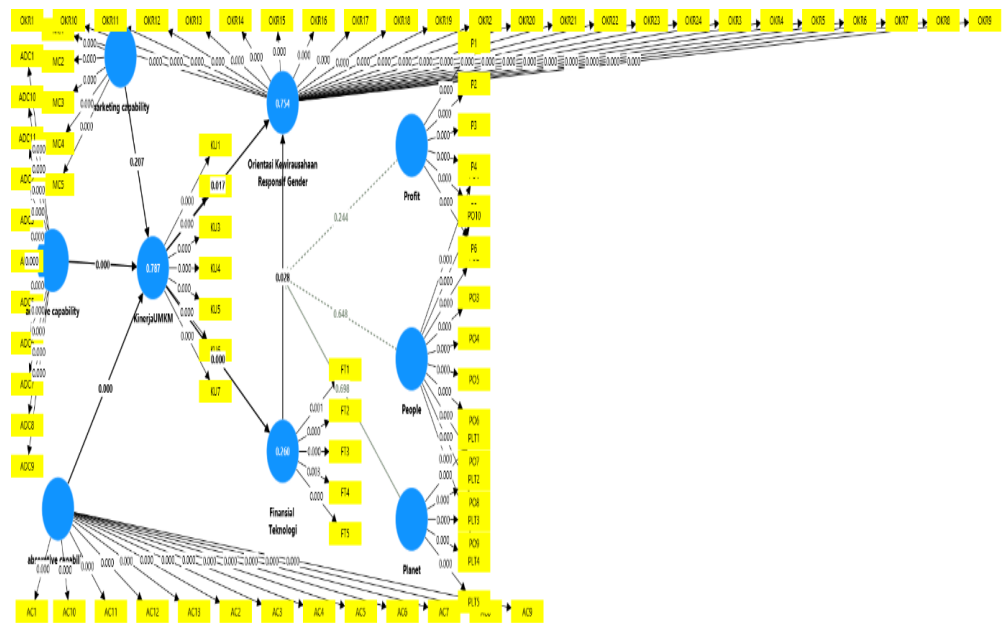


Figure 3. SEM Bootstrapping Results

Figure 3 shows the PLS-SEM structural model explaining the relationships between the research constructs. Marketing capability, adaptive capability, and absorptive capability influence MSME performance. Furthermore, MSME performance influences gender-responsive entrepreneurial orientation and financial technology. Gender-responsive entrepreneurial orientation then impacts the sustainability dimensions of profit, people, and planet, which represent the economic, social, and environmental performance of MSMEs.

Table 5. Construct Cross-Validated Redundancy

Variables	SSO	SSE	$Q^2 (=1-SSE/SSO)$
Financial Technology	1035.000	978.198	0.055
MSME performance	1449.000	611.568	0.578
Gender-Responsive Entrepreneurial Orientation	4968.000	3028.066	0.390
People	2070.000	2070.000	0.000
Planet	1035.000	1035.000	0.000
Profit	1242.000	1242.000	0.000
Absorptive Capability	2691.000	2691.000	0.000
Adaptive Capability	2277.000	2277.000	0.000
Marketing Capability	1035.000	1035.000	0.000

Based on Table 5, with high predictive relevance on MSME performance and gender-responsive entrepreneurial orientation, this model can be relied upon to provide guidance in the development of policies or business strategies that support MSME performance. Gender-responsive entrepreneurial orientation can be an important factor in optimizing MSME performance. Emphasizing relevant marketing, adaptation, and absorptive

capabilities can be a valuable strategy to improve MSME performance. However, the predictive strength of sustainability aspects (profit, people, planet) still needs to be reinforced to ensure that this model can fully guide sustainability decisions.

The Predictive Relevance ( $Q^2$ ) analysis reveals differences in the predictive power of the model's constructs. MSME performance demonstrates strong predictive relevance with a  $Q^2$  of 0.578, suggesting that the exogenous variables effectively predict this construct. Similarly, gender-responsive entrepreneurial orientation shows good predictive relevance ( $Q^2 = 0.390$ ), highlighting its important role in forecasting related variables. In contrast, financial technology exhibits limited predictive relevance with a  $Q^2$  of 0.055, indicating a minimal contribution to predicting other constructs. Notably, constructs related to profit, people, and planet, along with absorptive capability, adaptive capability, and marketing capability, all have  $Q^2$  values of 0.000. This indicates that these constructs do not contribute significantly to the prediction of endogenous variables, suggesting that the current model has limited ability to forecast these sustainability dimensions effectively.

## **DISCUSSION**

The findings of this study reveal that gender-responsive entrepreneurial orientation and financial technology (fintech) adoption significantly enhance the sustainability of MSMEs through the integration of the Triple Bottom Line (TBL) framework. The PLS-SEM results confirm that both variables have direct and indirect effects on MSME performance, supporting the notion that sustainable growth requires the alignment of economic, social, and environmental goals (Elkington & Rowlands, 1999; Longoni & Cagliano, 2016; Laurell et al., 2019; Bisht et al., 2022).

Gender-responsive entrepreneurial orientation was found to have a strong and positive effect on MSME sustainability. This finding supports earlier studies emphasizing that inclusive entrepreneurship, characterized by innovation, adaptability, and social awareness drives firm performance and resilience (Strawser et al., 2021; Rietveld & Patel, 2022). The path coefficient between entrepreneurial orientation and the profit dimension (0.754) demonstrates that empowering women-led enterprises can significantly improve profitability through innovation and efficient resource use (Vamvaka et al., 2020; Kong & Kim, 2022). Beyond financial outcomes, gender-responsive entrepreneurial orientation enhances community welfare by promoting equitable access to opportunities and responsible business practices (Pramudya, 2022; Nustini et al., 2024). This result aligns with Nor-Aishah et al. (2020), who argued that inclusive entrepreneurial behavior supports not only profit maximization but also social transformation and sustainable value creation.

Fintech adoption also showed a positive and significant influence on MSME sustainability, consistent with studies highlighting digital finance as a catalyst for inclusion and efficiency (Gupta et al., 2022; Raharjo et al., 2022). Fintech enables MSMEs to access affordable credit, manage transactions more transparently, and integrate digital tools that support environmentally friendly operations (Barus et al., 2022; Agustina, 2023). The findings indicate strong relationships between fintech adoption and both the people (0.648) and planet (0.698) dimensions, showing that technological innovation contributes not only to financial efficiency but also to social equity and ecological responsibility. These results reinforce the arguments of Kazemikhasragh and Pineda (2022) and Cahyawati et al. (2023), who found that fintech strengthens financial inclusion and social welfare. Moreover, fintech benefits women entrepreneurs who often face structural barriers to formal financing, thereby advancing gender equality (Putriani & Apriani, 2022).

However, the relatively low predictive relevance value ( $Q^2 = 0.055$ ) suggests that the benefits of fintech depend on external factors such as digital literacy, infrastructure, and regulatory support (Yanti et al., 2024). This supports Rahayu et al. (2023), who noted that digitalization among MSMEs can only yield sustainable benefits when supported by adequate technological competence and institutional backing.

The study also confirms that the TBL framework moderates the relationship between gender-responsive entrepreneurial orientation, fintech adoption, and MSME sustainability. Although the  $Q^2$  values of the triple bottom line dimensions (profit, people, planet) were low, their conceptual role remains vital in linking innovation, inclusivity, and environmental responsibility (Elkington & Rowlands, 1999; Sapukotanage et al., 2018). The findings indicate that sustainable MSMEs are not defined solely by profit, but by their capacity to integrate social welfare and ecological preservation into business practices (Singh et al., 2021; Prakash et al., 2023). Economically, gender-inclusive and digitally enabled MSMEs achieve higher productivity and competitiveness (Listiana et al., 2023). Socially, inclusivity fosters equitable employment and community engagement (Munjal & Sharma, 2021; Sari et al., 2023). Environmentally, fintech and digital operations promote resource efficiency and reduced paper usage (Belz & Binder, 2015; Arviana & Wibisono, 2023).

This study reinforces that gender-responsive entrepreneurial orientation and fintech adoption are critical drivers of MSME sustainability. Gender inclusivity enhances innovation, while fintech promotes accessibility, efficiency, and environmental consciousness. The moderating role of the TBL underscores that the integration of these elements produces not only competitive advantage but also long-term sustainable value. Thus, the sustainability of MSMEs in the digital era depends on how effectively entrepreneurs align economic growth with social inclusiveness and environmental responsibility, an approach that strengthens resilience and supports broader sustainable development objectives.

## **CONCLUSION**

This study concludes that gender-responsive entrepreneurial orientation plays a crucial role in enhancing MSME profitability and sustainability. The PLS-SEM analysis demonstrates that entrepreneurial orientation, characterized by innovation, proactivity, and risk-taking, positively contributes to profit growth and business resilience. MSMEs with strong entrepreneurial behavior are more capable of adapting to dynamic markets, seizing new opportunities, and sustaining long-term performance. This result confirms that gender-responsive entrepreneurial orientation not only supports financial outcomes but also fosters inclusive and sustainable business practices that align with social and environmental values.

The findings also indicate that while fintech adoption has potential benefits, its relationship with other variables, such as people, profit, and adaptive capabilities, remains relatively weak or inconsistent. This suggests that fintech's contribution to MSME sustainability depends on enabling conditions such as digital literacy, adequate infrastructure, and regulatory support. Without these supporting factors, fintech adoption may not fully realize its expected role in promoting sustainable development. This study strengthens the understanding that sustainable MSME performance is achieved through the integration of economic, social, and environmental goals under the TBL framework. MSME owners are encouraged to strengthen their entrepreneurial orientation and build adaptive and absorptive capabilities to optimize profitability and social impact. Fintech should be positioned as a complementary instrument that enhances efficiency, innovation, and inclusivity rather than a stand-alone determinant of success.

However, the model's predictive relevance for sustainability dimensions (profit, people, planet) remains limited, suggesting a need for improvement in future research. Subsequent studies should consider additional moderating factors such as government policy, digital ecosystem maturity, and organizational learning culture to improve predictive power. Future research may also employ longitudinal or cross-regional approaches to capture temporal and contextual dynamics, thereby offering a deeper understanding of how entrepreneurship and fintech jointly shape MSME sustainability in the digital economy.

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