TRANSFORMING SMALL BUSINESSES FOR A SUSTAINABLE FUTURE: THE ROLE OF INNOVATION POLICY, FINTECH, AND BANKING COMMITMENT IN EAST JAVA

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Abstract

This research will analyze the relationship between the sustainability of MSME product innovation policies, the banking industry's funding commitment for MSMEs, the use of fintech as environmentally friendly finance, and climate change strategies and financial system risks in the banking industry in the East Java region. This research aims to provide a better understanding of the factors that influence the success of MSMEs in accessing funding and adopting sustainable innovation policies.The research methodology uses a quantitative approach with interview data collection techniques and data analysis using path analysis. The research population is MSMEs in cities in East Java with a sample of 400 respondents selected using the Slovin technique. The research tools used were questionnaire forms and interview instruments using the zoom meeting platform. Data processing was carried out using SMART-PLS 3.0 analysis software. The variables studied include the sustainability of MSME product innovation policies, the banking industry's funding commitment for MSMEs, the use of fintech as environmentally friendly finance, and climate change strategies and financial system risks in the banking industry. This research is expected to contribute to increasing understanding of the factors that influence the success of MSMEs in adopting technology, obtaining adequate financial support, and strengthening commitment to environmental sustainability. In this research, it was found that the sustainability of MSME product innovation policies and the banking industry's funding commitment had a positive impact on the use of fintech as environmentally friendly finance. However, climate change strategies and financial system risks in the banking industry still need to be improved. Various strategies such as using waste for competitive innovation and climate monitoring can support the sustainability of MSMEs. Banks and fintech can also provide financial support and risk managerial training for MSMEs. With strong cooperation, industry can create a sustainable and environmentally friendly environment for all parties concerned.

***Keywords:*:** sustainability, MSMEs, innovation policy, fintech, bank industry funding, climate change strategy, East Java, path analysis.

Introduction

The 2023 MSME Census by BPS, Kemenkop UKM, and Bappenas is an activity to obtain accurate data on MSMEs in Indonesia so that they can formulate appropriate policies for the welfare and competition of MSMEs in the digital era (Alfian Pradana, Komari, and Dewi Indrasari 2020; BPS 2018; BPSStatistik-Indonesia 2019; Dewanti et al. 2022; IndibisPay 2023; Pradana et al. 2022; Rahardjo, Khairul, and Siharis 2019). Implemented in 2022-2024 with a focus on businesses with legal and non-legal entities(AlMaimani and Johari 2015; Bekraf 2020; Bourletidis and Triantafyllopoulos 2014; Cahyani 2022; Lidiawan, Ujianto, and Cempena 2023; Meslier et al. 2022).Participants can register via the OSS or BPS application and get benefits such as access to government programs and assistance as well as recognition from the government and society. Business actors can record transaction reports via IndibisPay(Badan Pusat Statistik Indonesia 2019; IndibisPay 2023).

The problems faced by MSMEs in East Java in accessing financing and adapting to increasingly competitive market developments are important things to research (Laely, Lidiawan, and Lidiawaty 2024; Laely, Lidiawan, and Putro 2023). Through this research, accurate and valid information will be collected about MSMEs in East Java, including their characteristics, distribution and business potential (Laely et al. 2024). Apart from that, this research will also focus on banking strategies in improving the welfare of MSMEs in East Java through implementing sustainable product innovation policies, as well as using financial technology as a solution to increase MSMEs' access to sustainable funding (Lidiawan et al. 2024). During the research, surveys and interviews will be conducted to collect data from the MSMEs and banks involved. It is hoped that this research can contribute to creating a more sustainable business environment for MSMEs in East Java and help them to remain competitive in an increasingly competitive market (Lidiawan 2024).

Banks have an important role in improving the welfare of MSMEs(Andarini, Laely, and Laily 2020; Lidiawan et al. 2021; Pontevedra et al. 2019).. Banks must provide adequate financial support to MSMEs with the adoption of sustainable financial technologies such as blockchain, AI and cloud computing(J. Lee 2023; Sriboonlue and Puangpronpitag 2019).Banks can also introduce environmentally friendly products and services, increase customer awareness about the importance of sustainability, and strengthen risk management(Chen et al. 2023; Le, Abakah, and Tiwari 2021; Shaik et al. 2023). The use of fintech can open up opportunities to promote green finance, such as cost savings and transaction processing efficiency, and introduce new innovations in more responsible investment and financing(Andarini et al. 2020; Djunaedi 2017; Jayadev, Singh, and Kumar 2017; Laely et al. 2022; Tian et al. 2023; Udeagha and Ngepah 2023). The bank's function in this case can help. The bank industry's funding commitment to MSMEs is also very important to support economic growth and business development in Indonesia(Alsayel, de Jong, and Fransen 2022; Kivimaa and Kern 2016; Radicic and Petković 2023a; Ramdani, Belaid, and Goutte 2023). Research on this subject can contribute to creating a more sustainable business environment and help MSMEs to remain competitive in the future.However, this requires a commitment to bank industry funding

for MSMEs, which is very important to support economic growth and business development in Indonesia(Jaidi et al. 2022; Lidiawan 2024; Robra et al. 2023). Banks must ensure that they provide adequate financial support to MSMEs, which are the backbone of the national economy(Guesmi, Makrychoriti, and Spyrou 2023). The adoption of sustainable financial technology, such as blockchain, AI, and cloud computing, will help banks provide financial support and increase creditability to MSMEs(Awuni et al. 2023; Mullineux and Murinde 2014). Banks must collaborate with governments, MSME organizations and financial technology providers to achieve this goal(Achmad et al. 2023; Liu 2021; Sarango-Lalangui et al. 2023). By using the right strategy, banks can play an important role in helping MSMEs to survive and grow amidst existing economic challenges.(Chen et al. 2023; Lin et al. 2022; Onyimadu and Uche 2021).

The banking industry has an important role in climate change strategies, because it can influence financial system risks(Chenet, Ryan-Collins, and van Lerven 2021; Cronin and Doyle-Kent 2022; West et al. 2021). Banks can reduce the risk of climate change by implementing sustainable practices and investing in environmentally friendly projects(Naifar 2023; Onyimadu and Uche 2021; Wang and Altiparmak 2022). In the long term, this will help reduce climate risks in their investment portfolios and increase clients' awareness of the importance of sustainability(Alessi and Battiston 2022; Nouhou, Mouminy, and Nourou 2023; Ruzzenenti, Hubacek, and Gabbi 2023). However, there are climate risks that must be considered, such as the high risk of forest fires which could threaten banking assets(Khan et al. 2022; Narain 2023). Therefore, the banking industry must take strategies to mitigate climate change risks and maintain sustainability by strengthening risk management and carrying out sustainable investment diversification.(Torinelli and Silva Júnior 2021).

This research has research novelty because it will analyze the complex relationship between several factors that influence the success of MSMEs in adopting and implementing sustainable financial technology and sustainable innovation policies in the East Java region. In addition, this research will include an analysis of the influence of climate change strategies and banking industry financial system risks on the sustainability of MSME product innovation policies and the banking industry's funding commitment to MSMEs.

The aim of this research is to analyze the relationship between the sustainability of MSME product innovation policies, the banking industry's funding commitment for MSMEs, the use of fintech as environmentally friendly finance, and climate change strategies and financial system risks in the banking industry in the East Java region. This research aims to provide a better understanding of the factors that can influence the success of MSMEs in accessing funding and implementing sustainable innovation policies.

The practical benefit of this research is that it provides a more detailed view of how MSMEs can utilize sustainable financial technology, such as fintech, to support their business growth. This research can also help the banking industry understand how their funding commitments can contribute to the growth and development of MSMEs and help provide targeted funding. Apart from that, this research can also provide input for government and industry to develop better policies to support MSME development and environmental sustainability.

The theoretical benefits of this research contribute to theoretical understanding of the factors that influence the success of MSMEs in adopting sustainable financial technology and implementing sustainable innovation policies. This research can also provide new understanding of how interactions between MSMEs, fintech, and the banking industry can influence environmental sustainability and economic growth. This research can also contribute to research theory on risk management and climate change strategies in the financial industry.

Methods

Research design

The research design uses quantitative research which functions to collect numerical data and analyze the relationship between independent, dependent and mediating variables. Relationship analysis uses path analysis to test the relationship between these four variableswhat will be doneintervening is corrected by getting a significance level value of <0.05.

Population and Sampling

The location selection is the city area in East Java with the following filters (Table 1).

Table1. Research Population

City/Municipality	Population
Kediri	4,007
Blitar	3,714
Poor	13,111
Probolinggo	3,941
Pasuruan	5,591
Mojokerto	2,250
Madiun	3,848
Surabaya	15,650
Rock	3,494
Amount	55,606

Source: BPS Filter, 2023

The sampling technique uses the following slovin.

$$n = \frac{N}{1+N(e^2)} \quad \ldots 3.1$$

$$n = \frac{55606}{1+55606(0.05^2)} = 397{,}14\ dibulatkan\ 400\text{MSMEs}$$

Interview

This zoom meeting technique interview was conducted because the respondents were in different areas of East Java(Cunha et al. 2023; Umami and Darma 2021), the bank managers involved can identify areas that need improvement and improve the services provided according to customer needs. Interviews will help improve service quality, minimize bad regulations through trust towards superior customer value.

Observation

Observations were carried out indirectly. This observation uses analysis of the results of interviews conducted via zoom meetings(Alom et al. 2023; Cuaca Dharma, Asmarani, and Dewi 2017; Dassel and Klein 2023). This observation involves selected respondents

to explain according to their understanding of instruments that are closely related to the research construct

Research Tools

The research tool for interviews uses zoom meetings to meet the urgency of research on respondents and as a more efficient observation strategy(Sadikin and Hamidah 2020). Distribution of research forms using WhatsApp chat by designing a questionnaire via Google Forms(Rasdiana, Muhamad, and Kurniaji 2016). Tabulation of the results of filling out the questionnaire using a spreadsheet is then computerized using the SMART-PLS 3.0 analysis tool to determine the intervening model(Gumelar et al. 2020; Rimadias, Ferli, and Hertingkir 2017) (Table 2).

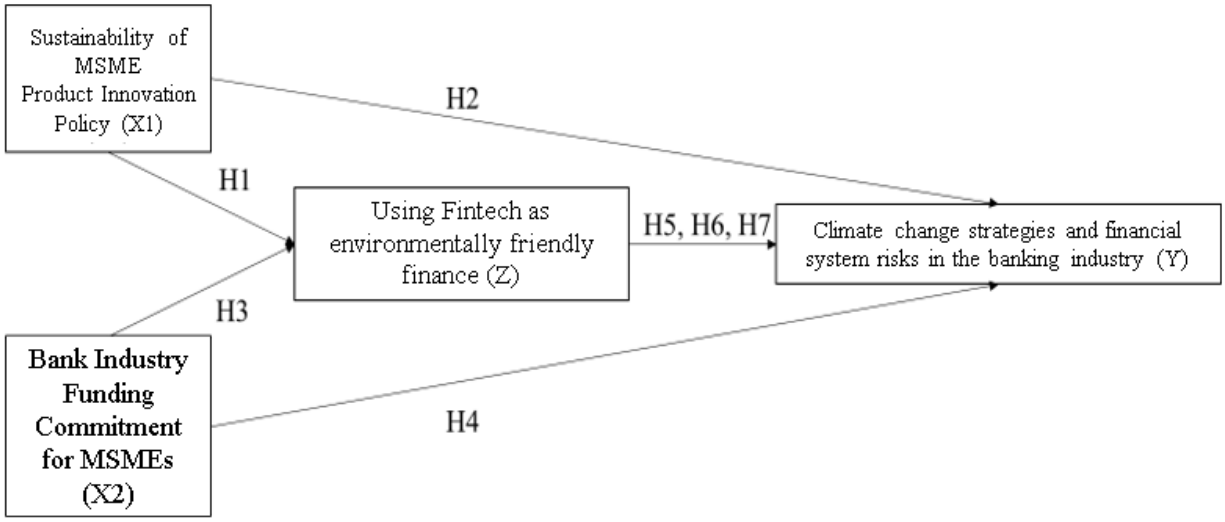
Table 2. Operational Definition of Variables

Construct	Construct Indicator	Reference
Sustainability of MSME Product Innovation Policy	Utilizing waste for competitive innovation Competitive organizational system innovation for outstanding business Increasing business technology innovation capabilities, superior technology and determining the market status of products Environmental protection for sustainable green product innovation Innovation in open access digital value chains and big data databases to improve product reviews before purchasing decisions	(Pontevedra et al. 2019) (Sriboonlue and Puangpronpitag 2019) (J. Lee 2023) (Tian et al. 2023) (Le and Hoang 2020; Radicic and Petković 2023a)
Bank Industry Funding Commitment for MSMEs	The bank's policy is to strictly assess the lending and distribution of funds The role of social networks and ambidexterity towards innovation commitment in appropriate funding recognition Risk mitigation to get targeted MSMEs that need funds appropriately by managing risks from the sustainability of sales of innovative products Codify strict to increase big livestock Monitoring firm size and firm capital of MSMEs for bank commitment to provide large capacity funds	(Chen et al. 2023) (Jaidi et al. 2022) (Awuni et al. 2023) (Narain 2023) (Sriboonlue and Puangpronpitag 2019)

Using Fintech as environmentally friendly finance	With fintech, the fund distribution process reduces carbon emissions The role of gamification and intermediation for appropriate funding through fintech The role of refund time and frequency of domain connectedness and spill over Fintech development refers to digital twin to facilitate distribution across all lines of MSMEs Hedonic motivation and operational minimization in fund distribution through fintech With fintech, new findings will emerge for the development of easy transaction tools and improving the quality of mindset of MSME owners to increase the adoption of financial technology With fintech, ecological footprint and green finance can be controlled	(Udeagha and Ngepah 2023) (Lai and Langley 2023) (Le et al. 2021) (Bhat, AlQahtani, and Nekovee 2023) (Bhat et al. 2023) (Najib et al. 2021) (Nenavath and Mishra 2023) (Khan et al. 2022)
Climate change strategies and financial system risks in the banking industry	Climate monitoring can prevent radical uncertainty in financial policies for MSMEs With a climate strategy, there will be an opportunity to produce MSME products that can reduce disasters for society because of healthy financial circulation for the production of products that help society. The rapid development of MSMEs will increase bank financial turnover quickly and accurate monitoring is needed to reduce the risk of bad credit Social environmental landscape design, governance for the readiness of MSEs with compliance in maintaining the climate towards going green with financial assistance from banks By studying the climate and minimizing financial risks for MSMEs, it is necessary to strengthen the resilience of MSME products from post-sale longitudinal conditions.	(Chenet et al. 2021) (Guesmi et al. 2023) (Guesmi et al. 2023) (West et al. 2021) (Cronin and Doyle-Kent 2022) (Gebre et al. 2023)

Procedure

The procedure we carry out is with a two-way model, because there is an influence (significance) between two variables, but we also want to know whether the influence is positive or negative(Asmuni and Pradana 2018). In stepsMeasurement (Outer) Modelwithassessing the validity of using a loading factor > 0.5 because it is the initial stage of development of outer loading(Hagedoorn et al. 2021; Liang et al. 2023).Reliability measurement uses construct reliability with composite reliability > 0.5 because the research is in the newest research category, so it must use the composite reliability value. Structural (Inner) Model to assess R-Square of endogenous constructs and mediating constructs(Elfiondri, Zaitul, and Rina 2021). Boostrapping test by assessing path coefficients and specific indirect effects as a mediating role using the Tstatistics parameter > 1.96 with the condition that the p-value is significant ≤ 0.05(Chica, Hernández, and Perc 2022; Moliner-Velázquez, Fuentes-Blasco, and Gil-Saura 2023). Measurement of Mediator Modelswithmeasuring the mediator for full mediation, namely the exogenous construct does not play a significant role (p-values ≤ 0.05) on the endogenous construct without the mediator construct(Bui et al. 2023; Raihan, Ibrahim, and Ahmed 2023). Meanwhile, the mediator part mediation measurement model, namely the exogenous construct, plays a significant role (p-value ≤ 0.05) on the endogenous construct without the mediator construct (Figure 1).



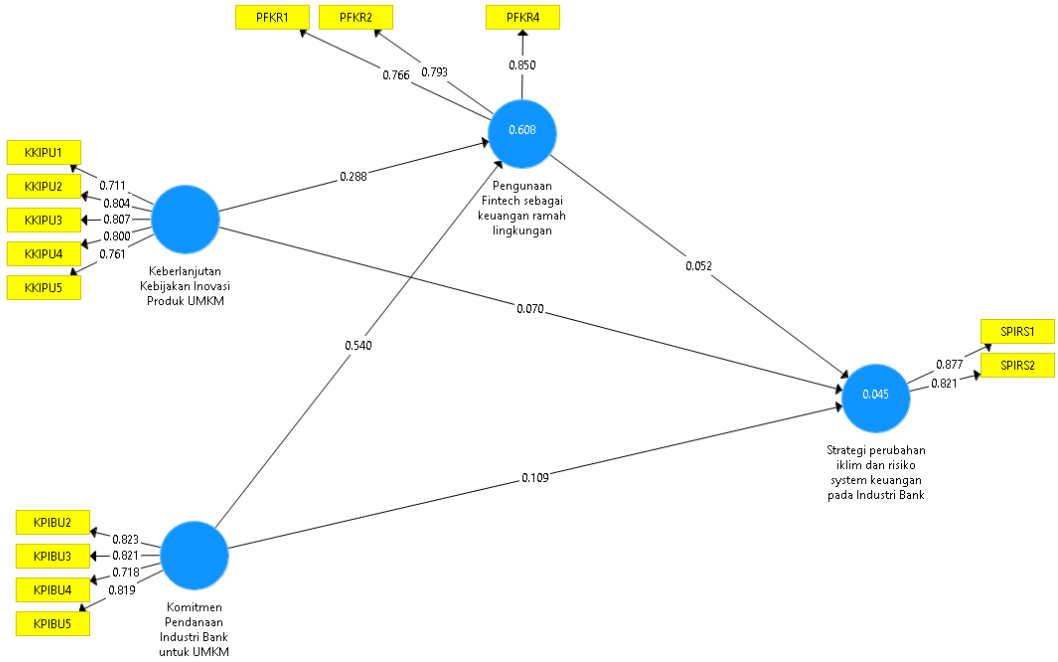
Figures1.Theoretical framework

Reference :(Audretsch et al. 2023; Bhatti et al. 2023; Dullayaphut and Untachai 2013; J. won Lee 2023; Nakwa, Zawdie, and Intarakumnerd 2012; Pontevedra et al. 2019; Radicic and Petković 2023b; Tian et al. 2023)

Results and Discussion

Corrected Model

Outer Model



Figures2. Corrected Outer Model

Outer Loading

Table 3. Outer Loading

	Sustainability of MSME Product Innovation Policy	Bank Industry Funding Commitment for MSMEs	Using Fintech as environmentally friendly finance	Climate change strategies and financial system risks in the banking industry
KKIPU1	0.711			
KKIPU2	0.804			
KKIPU3	0.807			
KKIPU4	0.8			
KKIPU5	0.761			
KPIBU2		0.823		
KPIBU3		0.821		
KPIBU4		0.718		
KPIBU5		0.819		
PFKR1			0.766	

PFKR2			0.793	
PFKR4			0.85	
SPIRS1				0.877
SPIRS2				0.821

Based on the table above, it can be identified that the Bank Industry has a fairly high commitment to supporting MSMEs through sustainable product innovation policies. Apart from that, the banking industry also has a high commitment to providing funding to MSMEs. The use of fintech as environmentally friendly finance is also being considered by the Banking Industry. However, the KPIBU4 value shows that the Bank Industry still does not have optimal performance in climate change and financial system risk strategies. In terms of the use of renewable energy, no indicators are visible in the table. However, it can be seen that the Climate Change and Financial System Risk Strategy (SPIRS) has quite high scores, indicating that the Bank Industry is considering climate change in its business decisions. Overall, the banking industry still needs to make improvements in certain aspects, such as the use of renewable energy and climate change which is more integrated into its business decisions, even though it already has a strong commitment to supporting MSMEs (Figure 2 and Table 3).

Table4. Average Variance Extracted

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Sustainability of MSME Product Innovation Policy	0.836	0.839	0.884	0.604
Bank Industry Funding Commitment for MSMEs	0.808	0.817	0.874	0.635
Using Fintech as environmentally friendly finance	0.725	0.731	0.845	0.646
Climate change strategies and financial system risks in the banking industry	0.616	0.628	0.838	0.721

Based on the table above, several things can be seen regarding the reliability and validity of the variables studied. First, Cronbach's Alpha of the four variables above shows that all variables have quite high reliability values, with a range of 0.616 to 0.836. This shows that all variables are reliable in measurement and data analysis. Furthermore, the Composite Reliability of all variables is also quite high, with a range of 0.838 to 0.884. Composite Reliability measures the overall reliability of a construct, and a high value indicates that the variable is reliable and consistent in measuring the same construct. Finally, Average Variance Extracted (AVE) also measures construct validity by paying

attention to how much construct variance is explained by the variables. All variables have quite high AVE values, with a range of 0.604 to 0.721. A high value indicates that the variable is valid for measuring the same construct. Overall, it can be concluded that all variables in this study have quite high reliability and validity, so they can be trusted to be used as a basis for data analysis (Table 4).

Table5. Discriminant Vaidity

	Sustainability of MSME Product Innovation Policy	Bank Industry Funding Commitment for MSMEs	Using Fintech as environmentally friendly finance	Climate change strategies and financial system risks in the banking industry
Sustainability of MSME Product Innovation Policy	0.777			
Bank Industry Funding Commitment for MSMEs	0.754	0.797		
Using Fintech as environmentally friendly finance	0.695	0.757	0.804	
Climate change strategies and financial system risks in the banking industry	0.188	0.201	0.183	0.849

The table above shows the results of discriminant analysis between the four variables studied. It can be seen that the correlation coefficient value between all variables is above 0.1, so it can be said that these variables are correlated with each other. However, in analyzing the relationship between these variables, it is necessary to pay attention to the fairly low correlation coefficient values for the climate change strategy and financial system risk variables in the banking industry with other variables. This shows that this variable has a weaker relationship with other variables. Overall, discriminant analysis can provide information about the relationships and correlations between variables, so that it can help researchers to understand more deeply the concept being studied. However, it should be noted that discriminant analysis only explains the relationship between variables that are correlative, but does not explain the cause-and-effect relationship between these variables (Table 5).

Inner Model

Table6R Square Model

	R Square	**R Square Adjusted**
Using Fintech as environmentally friendly finance	**0.608**	**0.606**
Climate change strategies and financial system risks in the banking industry	**0.045**	**0.037**

The inner model table above shows the R Square and Adjusted R Square of the two variables studied. R Square measures how much variability in the dependent variable can be explained by the independent variables, while Adjusted R Square takes into account the complexity of the model in explaining the relationship between variables. Based on the table above, it can be seen that the R Square of the variable Using Fintech as environmentally friendly finance is quite high, namely 0.608. This shows that 60.8% of the variability in the use of fintech as environmentally friendly finance can be explained by the independent variables studied. Meanwhile, for the climate change strategy and financial system risk variables in the banking industry, the R Square is only 0.045. This shows that the variability in the dependent variable can only be explained by 4.5% of the independent variables studied. However, it should be noted that the Adjusted R Square for these two variables is quite low, namely 0.606 and 0.037 respectively. This may be due to the complexity of the model in explaining the relationship between the variables studied. In this case, it is necessary to adjust the model to increase the Adjusted R Square so that it can better explain the relationship between variables. Overall, R Square and R Square Adjusted can give an idea of how well the model can explain the relationship between variables. However, it is necessary to consider other factors, such as model complexity and research context, in evaluating the significance of analysis results (Table 6).

Path Coefficients

Table7. Path Analysis

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Hypothesis
Sustainability of MSME Product Innovation Policy -> Use of Fintech as environmentally friendly finance	0.288	0.29	0.06	4,801	0.0000	Hypothesis accepted

Sustainability of MSME Product Innovation Policy -> Strategy for climate change and financial system risks in the Bank Industry	0.07	0.074	0.073	0.958	0.339 0	Hypothesis rejected
Bank Industry Funding Commitment for MSMEs -> Using Fintech as environmentally friendly finance	0.54	0.541	0.058	9,380	0.000 0	Hypothesis accepted
Bank Industry Funding Commitment for MSMEs -> Strategy for climate change and financial system risks in the Bank Industry	0.109	0.119	0.096	1,135	0.257 0	Hypothesis rejected
Using Fintech as environmentally friendly finance -> Climate change strategies and financial system risks in the banking industry	0.052	0.044	0.088	0.586	0.558 0	Hypothesis rejected
Sustainability of MSME Product Innovation Policy -> Use of Fintech as environmentally friendly finance -> Strategy for climate change and financial system risks in the Banking Industry	0.015	0.013	0.026	0.565	0.572 0	Hypothesis rejected
Bank Industry Funding Commitment for MSMEs -> Using Fintech as environmentally friendly finance -> Climate change strategies and financial	0.028	0.024	0.048	0.581	0.562 0	Hypothesis rejected

system risks in the Bank Industry						

The path coefficients table above shows the results of hypothesis testing regarding the relationship between the variables studied (Table 7). The null hypothesis (H0) states that there is no significant relationship between the dependent and independent variables, while the alternative hypothesis (H1) states that there is a significant relationship between the two. Based on the table above, it can be seen that the hypothesis H0 on the two relationship paths between the Sustainability of MSME Product Innovation Policy and Bank Industry Funding Commitment with the Use of Fintech as environmentally friendly finance is rejected, because the p-value for both paths is very small (0.0000). However, for the relationship between the Sustainability of MSME Product Innovation Policy and climate change strategies and financial system risks in the banking industry, the H0 hypothesis is accepted, because the p-value is quite large (0.3390). Likewise, for the relationship between Bank Industry Funding Commitments for MSMEs and climate change strategies and financial system risks in the Bank Industry, the H0 hypothesis is also accepted because the p-value is greater than alpha (0.05). For the relationship between the use of Fintech as environmentally friendly finance and climate change strategies and financial system risks in the banking industry, the H0 hypothesis is also accepted because the p-value is quite large (0.5580). Likewise for the two relationship lines: Use of Fintech as environmentally friendly finance -> Climate change strategy and financial system risks in the Bank Industry and Bank Industry Funding Commitment for MSMEs -> Use of Fintech as environmentally friendly finance -> Climate change strategy and financial system risks in Industry Bank, the H0 hypothesis is also accepted because the p-value is greater than alpha (0.05).

Overall, the results of hypothesis testing show that there is a significant relationship between the two relationship paths between the Sustainability of MSME Product Innovation Policy and Bank Industry Funding Commitments and the Use of Fintech as environmentally friendly finance. However, there is no significant relationship between other relationships, namely climate change strategies and financial system risks in the banking industry, with other variables.

Model estimation

Table8. Estimated Model

	Saturated Model	Estimated Model
SRMR	0.076	0.076
d_ULS	0.603	0.603
d_G	0.302	0.302
Chi-Square	699,214	699,214
NFI	0.73	0.73

The model estimation table above shows the comparison results between the Saturated Model and the Estimated Model. Saturated Model is a model that contains all the relationships between variables in the proposed model, while Estimated Model is a model that has been simplified by eliminating relationships that are not significant. The table 8 shows that SRMR (Standardized Root Mean Square Residual), d_ULS (Degree of Unweighted Least Squares), and d_G (Degrees of Geodesic Freedom) in the Saturated Model and Estimated Model have the same values, namely 0.076, 0.603, and 0.302, respectively. consecutive. This shows that the Estimated Model has been estimated successfully and is no less good than the Saturated Model. Apart from that, both models also have the same Chi-Square value, namely 699,214. This shows that the two models have quite good similarities in describing the correlation between variables in the model. However, the NFI (Normed Fit Index) in the Saturated Model and Estimated Model also has the same value, namely 0.73. This valueshows that the Estimated Model obtains a fairly good NFI value in estimating the relationship between the variables in the model. Overall, the model estimation results show that the Estimated Model succeeded in obtaining the same SRMR, d_ULS, d_G, and Chi-Square values as the Saturated Model. This shows that the simplified model is quite good at explaining the relationship between variables in the model and can be used as an alternative model that is simpler and easier to understand.

Findings

Sustainability of MSME Product Innovation Policy on the Use of Fintech as Environmentally Friendly Finance

The implementation of the sustainability strategy for MSME product innovation policies throughout East Java has made MSMEs more competitive and able to compete in the global market. In this case, collaboration with the financial industry has proven to be very helpful by providing financial access for financing and developing MSME businesses. The strategy of utilizing waste into competitive innovation, open access digital value chain database innovation, and environmental protection for green products are some of the most important strategies developed to support the growth and development of MSMEs. Superior technology and increasing business innovation capabilities in product introduction also help the growth and development of MSMEs. In this case, lending and fund distribution policies, recognition of appropriate funding, and strict provisions for big livestock can help assist MSMEs and provide guarantees for business continuity.(Narain 2023; Ruan et al. 2019). A combination of effective strategies and policies can increase entrepreneurship, make a positive impact on society, and help regional economic growth and encourage increased social equality.

Sustainability of MSME Product Innovation Policy Against Climate Change Strategy and Financial System Risk in the Banking Industry

To increase the sustainability of MSME product innovation policies in East Java, a strategy is needed that includes utilizing waste for competitive innovation, organizational system innovation, increasing technological innovation capabilities, environmental protection, and innovation in open access digital value chains and big data databases.(Csordás et al. 2022; Radicic and Petković 2023a). These activities must be managed well and linked to climate monitoring and climate strategies to produce healthy and environmentally friendly MSME products. To support the implementation of this

strategy, MSMEs throughout East Java need to be more active in implementing accurate accounting. This can help MSMEs to manage finances and make the right decisions in developing their products and business. Apart from that, MSMEs can also take advantage of financial services from the banking industry in East Java to support sustainable product innovation, such as environmentally friendly and responsible funding commitments. By implementing this strategy, it is hoped that MSMEs throughout East Java can increase their competitiveness and sustainability in facing increasingly complex business challenges. Apart from that, this strategy can also contribute to equitable economic and environmental development in East Java.

Bank Industry Funding Commitment for MSMEs towards the Use of Fintech as Environmentally Friendly Finance

Apart from that, MSMEs can also take advantage of fintech technology as an environmentally friendly financial alternative that is efficient and affordable. In this case, climate monitoring can help detect individuals or groups of MSMEs who potentially need funding support, so that banks can provide financial assistance appropriately and on target. Financial support from banks and strategies for using fintech must also pay special attention to risk prevention efforts and sustainability of sales of innovative MSME products.(Adhi, Setyawati, and Suwandari 2021; Khiewngamdee and Yan 2019; Menne et al. 2022). Apart from that, monitoring the size and capital of MSME companies can also help banks to provide regular support and maintain regularity in the distribution of funds. By using the right strategy and support from banks and fintech, MSMEs can continue to develop and contribute to creating a more environmentally friendly environment and sustainable economy in East Java.

Bank Industry Funding Commitment for MSMEs on Climate Change Strategies and Financial System Risks in the Bank Industry

Strategies to increase the sustainability of MSME product innovation policies in East Java must be carried out by utilizing technology and using resources efficiently. In this case, climate monitoring and climate strategies can help to prevent uncertainty in MSME financial policies and promote products that can reduce disasters for society. In addition, the role of social networks and ambidexterity must be applied to increase innovation, appropriate funding commitments and the introduction of new products that are more environmentally friendly(Ali et al. 2020; Keshavarz and Gölgeci 2023; Kinkel et al. 2023). Managerial risks in the sustainability of sales of MSME innovation products are also important to be aware of in order to avoid the risk of failure in financial management. MSMEs can also take advantage of fintech as a financial alternative that is environmentally friendly but still effective. Banks and fintechs can also provide continuous support and large capacity by monitoring the size and capital of MSME companies and implementing targeted funding. With the right strategy and support provided, MSMEs can continue to develop and contribute to economic development and a better environment in East Java.

Using Fintech as Environmentally Friendly Finance for Climate Change Strategies and Financial System Risks in the Banking Industry

This strategy can be carried out with concrete steps such as conducting research and innovation to improve the quality of environmentally friendly products, collaborating with fintech for the fund distribution process by minimizing carbon emissions, and

implementing gamification and intermediation for targeted and effective funding. Apart from that, the development of fintech with digital twins can also help facilitate distribution for all lines of MSMEs and promote products that are more efficient and environmentally friendly. Banks and fintech can also provide training and guidance to MSMEs to improve risk managerial capabilities and improve sustainability in financial management(Adhi et al. 2021; Nußholz et al. 2023). With commitment and synergy from all related parties, it is hoped that MSMEs in East Java can develop well and contribute to more sustainable and environmentally friendly economic development.

Sustainability of MSME Product Innovation Policy Through the Use of Fintech as Environmentally Friendly Finance Against Climate Change Strategies and Financial System Risks in the Banking Industry

To increase the sustainability of MSME product innovation policies in East Java through the use of fintech as environmentally friendly finance, it is necessary to implement climate change strategies and financial system risks in the banking industry. First, banks and fintechs need to develop effective monitoring systems to detect potential financial risks from MSMEs(Paparrizos et al. 2023; Ruzzenenti et al. 2023). This can be done through providing training and guidance to MSMEs in risk management, as well as developing appropriate algorithms and data security technology. Second, banks and fintech must also strengthen cooperation with MSMEs to develop environmentally friendly products, such as recycled products and bio-products. Third, banks and fintechs must also pay attention to an efficient and carbon-free fund distribution process by utilizing digital twin technology. In climate change strategies, banks and fintech must increase public awareness and education about the importance of sustainability and savings. With the right strategy and support provided, MSME product innovation policies through the use of fintech as environmentally friendly finance can have a positive impact on the environment, society and economy in East Java.

Bank Industry Funding Commitment for MSMEs Through the Use of Fintech as Environmentally Friendly Finance Against Climate Change Strategies and Financial System Risks in the Bank Industry

Developing risk monitoring and management systems, developing environmentally friendly products, and maximizing carbon-free fund distribution processes(Udeagha and Ngepah 2023). Technological development and efficient use of resources must also be considered, because this will help in promoting environmentally friendly products and reduce disasters for society. Banks and fintechs must also raise public awareness of the importance of sustainability and savings to help change consumer behavior and increase participation in a more sustainable economy. In this strategy, strong cooperation between banks, fintech and MSMEs must continue to be improved to achieve greater common goals. In this way, the entire industry will be able to create sustainable prosperity for all parties concerned.

Conclusions and Recommendations

Based on this research, it can be concluded that the sustainability of MSME product innovation policies and the banking industry's funding commitment have a positive impact on the use of fintech as environmentally friendly finance in the East Java region. However,

climate change strategies and financial system risks in the banking industry still need to be improved to ensure a sustainable environment for MSMEs. Therefore, innovation strategies are needed such as using waste for competitive innovation and climate monitoring to support the sustainability of MSMEs and banks and fintechs must provide financial support and risk managerial training for MSMEs. With strong collaboration, industry can create a sustainable and environmentally friendly environment that will benefit all parties involved.

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