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RESEARCH ARTICLE

The Sustainability Role of Women Entrepreneurs through the Digital Financial Literacy Movement

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Abstract

This study discusses how financial technology and financial literacy play a crucial role in supporting the sustainability of small and medium enterprises (SMEs) in East Java. The utilization of financial technology, which includes various digital services such as online payments and access to financing, along with financial literacy, which refers to the understanding and ability to manage finances wisely, has been proven to be essential in maintaining the competitiveness and growth of businesses, especially among female entrepreneurs.The research was conducted using a survey involving 390 female entrepreneurs in East Java, selected through purposive sampling. Using multiple linear regression analysis, the findings indicate that both financial technology and financial literacy significantly impact the sustainability of women's businesses in the region. However, this study is limited by its focus solely on female entrepreneurs in East Java, which may restrict the generalizability of the results to other cities. Therefore, a larger sample size across various regions would provide more comprehensive insights. This study suggests that the East Java government should pay closer attention to this sector, given its significant contribution to the regional and national economy.

Keywords

financial technology, financial literacy, women entrepreneurs, digitalization, sustainability

JEL codes: A10, G00, O10

Introduction

Indonesia is a developing country with stable economic growth and broad socio-cultural influence. As a member of the G20, Indonesia occupies a vital position in the global economy. The entrepreneurial sector contributes significantly to the stability of developing countries, proving to be the primary driver of economic expansion and increasing social welfare (Vîrjan et al. 2023). Entrepreneurial potential is often measured based on the number of working-age residents who are economically active and have the potential to engage in entrepreneurship (Amoros et al. 2023). This approach is more accurate than the total population because it excludes children and older people. Based on data from the Indonesian Central Statistics Agency (BPS) for February 2023, there are 208.54 million people of working age (15 years and over), with 143.02 million people included in the workforce.

According to BPS (2020), Indonesia's total male population was 136.66 million (50.58%), while the female population was 133.54 million (49.42%). This balance has crucial implications for the potential for gender-inclusive entrepreneurship and diversity of business types, utilizing the different perspectives and expertise of men and women. Equality in the working-age population between men and women opens up great opportunities to increase women's participation in entrepreneurship, which can bring greater innovation and economic growth.

Nonetheless, insufficient financial literacy among the Indonesian population remains a major concern. Based on a survey performed by the Financial Services Authority (OJK) in 2019, Indonesia's financial literacy index reached 38.03 percent, while financial inclusion reached 76.19 percent. This condition shows that although access to financial services is increasing, people's understanding of financial management is still low. The gender gap in financial literacy is also visible in Indonesia. Women often have lower levels of financial literacy than men, which has implications for their ability to manage personal and business finances. Surveys show that women tend to be less confident in making financial decisions, which may affect their participation in entrepreneurship.

Women entrepreneurs in Indonesia deal with various obstacles, including access to capital, low levels of financial literacy, limited access to technology, a double burden between business and household responsibilities, and a lack of networks and mentorship (Kumar 2023; Ramya et al. 2024). Many female entrepreneurs find it difficult to access financing to start and develop their businesses because they are considered riskier or less secure (Karimi 2023; Njagi 2023). Low levels of financial literacy prevent women entrepreneurs from effectively managing their firm finances, such as creating budgets, comprehending taxation, and managing cash flow (Maharana et al. 2023). Technology and digital platforms make it easier for women to start and operate businesses from home, reaching a broader market (Seet et al. 2023). However, many female entrepreneurs lack access to the expertise on how to use digital technology to increase their business's efficiency and marketability.

The condition of "financial illiteracy" or lack of understanding of basic financial concepts is also a severe problem in Indonesia, such as not understanding how credit, interest, and loans work, as well as difficulty in making and following a budget, which can lead to uncontrolled spending and difficulty in managing long-term finances (Asmara & Wiagustini 2021). A lack of understanding about the importance of saving, investing for the future, and other risk management strategies can also make individuals vulnerable to unexpected financial crises (Klapper & Lusardi 2020). Not understanding tax obligations and how to manage taxes can also lead to severe legal and economic problems (Gangl & Torgler 2020).

A 2020 Google survey with 990 female and 510 male respondents in Indonesia showed that 49 percent of women were already entrepreneurs, while 45 percent wanted to be entrepreneurs. Among men, 61 percent are entrepreneurs, and 34 percent want to be entrepreneurs. These findings reveal that over half of women are entrepreneurs, motivated by their need for financial independence and flexibility. These findings show that nearly half of women in Indonesia are already involved in entrepreneurship, driven by the motivation to achieve financial independence and work flexibility (Henry 2020).

Empowerment programs from governments and non-governmental organizations support women by providing training, financing, and specialized business networks (Dotsey 2022). Social and cultural support that encourages gender equality and a solid community also plays an essential role in increasing women's participation in entrepreneurship (Benbya et al. 2020). As many as 59 percent of female entrepreneurs stated the need for access to supportive social groups, and 85 percent used cell phones to adopt digitalization in their business (Katadata 2020). East Java was chosen as a research location due to its high economic and cultural diversity, providing a unique backdrop for understanding financial literacy's impact on women entrepreneurs' sustainability. Economic sustainability in East Java presents unique challenges and opportunities, providing valuable insights into local and national policy development.

Micro-medium enterprises mainly drive Indonesian society's development, innovation, employment, social inclusion, and sustainability (Dairoby 2023). The flexibility and adaptability of this sector are vital to surviving the current economic crisis (Dumitriu et al. 2019). The development of information technology and the internet over the last few decades has influenced every aspect of social and organizational operations (Alecchi 2020). The government also encourages technology transfer and access to develop and compete with foreign companies (Pandey et al. 2022). Empowering regional entrepreneurs is crucial to overcome the current national economic crisis, showing how entrepreneurship significantly impacts the Indonesian economy (Anggadwita & Palalić 2020).

Capacity building for communication and information technology improves entrepreneurial governance (Sofyani et al. 2020). Digital literacy enables companies to utilize digital technology for social creation and interaction, information access, management, integration, analysis, and evaluation (Radovanović et al. 2020). Furthermore, digital-based companies operate more efficiently (Ji et al. 2023). Many small and medium-sized businesses are digitizing business activities to improve market and operational efficiency (Bagale et al. 2023). Indonesian business owners are more aware of how contemporary technology and the Internet increase productivity (Tambunan 2020). Digitalization of business processes is the application of internet-based information systems to entire organizations (Setyowati et al. 2021).

Research on the digitalization of small and medium-sized enterprises often focuses on one or more specific e-business practices (Roman & Rusu 2022). In the digital era, business owners must adapt to many demands, including climate change, population growth, increasing competition, new technologies, and the depletion of natural resources (Litvinenko 2020). All of these factors require more sustainable business practices. Sustainability and company strategy must be more integrated. Women entrepreneurs have incorporated sustainability into their communications, actions, and tactics because it is a critical challenge of our time (Silvius & Schipper 2022).

The transformation of financial technology in organizational business models is a real challenge, particularly for all organizations and entrepreneurs. Digital transformation can be an opportunity or a challenge depending on how businesses deal with it strategically (Brunetti et al. 2020; Rêgo et al. 2022). Small and medium businesses in the digital economy require digital innovation to meet significant challenges and enhance their technical expertise. Small and medium-sized businesses are key market players during structural changes in the digital economy, so it is important to analyze how they can be managed sustainably every year (Bagale et al. 2023). Digitalization helps women entrepreneurs utilize financial technology to increase access to financing, market expansion, and operational efficiency, increasing competitiveness and long-term business sustainability (Akpuokwe et al. 2024).

The importance of this subject in research lies in the key role of female entrepreneurs in driving Indonesia's economic growth. These entrepreneurs often face challenges accessing capital, markets, and technology despite their importance. This study explores how financial technology and financial literacy can increase the resilience of businesses led by women entrepreneurs. The timeliness and relevance of this research to the progress of the Indonesian economy stem from the anticipation that the research results will provide concrete policy recommendations to encourage the progress of the Micro, Small, and Medium Enterprises (SME) sector, which women entrepreneurs mostly manage.

In addition, the gender equality perspective is an integral part, where women participate in economic efforts and act as main contributors in building economic sustainability. Through understanding and applying financial literacy and financial technology, women can expand their access to business opportunities, increase competitiveness, and take a more significant role in economic development. Given the changing business paradigm in the digitalization, new skills have become a necessity. Financial literacy and financial technology is emerging as the key to understanding and accepting cutting-edge technologies and as a foundation for innovation and adaptation in an ever-evolving business landscape.

In the context of the importance of gender equality in the business world and the significance of financial literacy in the current digital era, this research aims to explore the influence of financial literacy and fintech on the sustainability of women's businesses in East Java, Indonesia. The insights generated from this study are expected to contribute to understanding how financial literacy and fintech can accelerate inclusive and sustainable economic growth.

Theoretical Review

OECD

The OECD identifies financial literacy as a major factor in enabling individuals, including women entrepreneurs, to make smart financial decisions and manage resources efficiently. Additionally, the organization highlights that women entrepreneurs often face unique challenges, such as limited access to capital and networks, as well as the need for supportive education in managing their businesses (Rudhumbu et al. 2020). Adopting financial technology (fintech) is also seen as a way to increase the accessibility of financial services and expand the reach of women's businesses (Esmaeilpour Moghadam & Karami 2023). The OECD encourages governments to develop policies supporting financial literacy and adopt fintech among women entrepreneurs as a strategy to increase their business interests. It is expected that by strengthening this support, women entrepreneurs will be able to manage their finances more effectively and expand their overall economic contribution.

Financial Technology

Financial Technology refers to companies that use technology-based systems to directly offer new, cheaper financial services or improve the productivity of existing financial businesses (Liu et al. 2021; Taherdoost 2023). The competition in the financial industry has continued to increase since the fourth industrial revolution. Due to its rapid expansion, this industry is one of the most dynamic industries that is constantly changing, making it difficult to gauge its size and potential (Merello et al. 2022).

Financial inclusion is one of the advantages of FinTech because it makes financial services affordable for customers. According to Cumming & Schwienbacher (2018), features that are common in countries with less regulation increase market dynamics in terms of transactions and invested capital. Experts state that this results in the production of goods and services not falling under the jurisdiction of financial regulators (such as crowdfunding platforms and alternative payment systems). A less restrictive regulatory framework would lower costs, thereby driving technological progress and increasing the accessibility of financial services (Pazarbasioglu et al. 2020). User trust and security are critical components that support the industry's long-term viability and are achieved primarily through regulation (Senyo & Osabutey 2020). States are becoming more involved in society every day, raising expectations about the rights that individuals can achieve and undermining market confidence. As a result, there is a paternalistic environment in state-individual relations, which raises society's demands for regulatory bodies to set up procedures to boost investor confidence in intervening institutions and boost security, but also raises expenses and decreases process efficiency. (Arner et al. 2020). Organizations whose access to financing was restricted due to the financial and economic crisis during the epidemic are the main users of FinTech services. As a result, entrepreneurship uses FinTech to solve specific problems, and FinTech increases organizational effectiveness, especially in developing countries (Arner et al. 2020).

In understanding the impact and role of fintech in the sustainability of women entrepreneurs, there are several key indicators that must be considered:

1. General Knowledge About Fintech, which includes the extent to which individuals understand the basic concepts of fintech.
2. Intensity of Use, which looks at how often and to what extent individuals utilize digital payment apps.
3. Ease of Transaction, which evaluates the ease of access, transaction speed, and financial management efficiency offered by Fintech.
4. Benefits of Use, which highlights the various advantages that users get from using Fintech, such as lower transaction fees, easy access to financial services, and ease of tracking and managing finances.
5. Weaknesses and Risks, which include data security risks, operational risks, and market risks that users may face when using Fintech services.

Financial Literacy

A fundamental understanding of money management is essential to empower individuals to manage their finances and improve overall well-being (Sabri et al. 2020). According to Hoang et al., (2021), government support shows that financial inclusion provides a gradual path towards eliminating poverty and achieving the Sustainable Development Goals (SDGs). Financially literate people make better decisions and are less likely to commit financial fraud when managing loans, savings accounts, investments, and banking. The increasing complexity of available financial tools, including e-wallets and internet banking, highlights the importance of having a solid understanding of finance. Governments in various countries are working to expand access to financial services such as credit products and bank accounts by actively promoting financial inclusion. The progress of economic products has provided a sense of empowerment to people who previously only depended on government assistance or the financial stability of work (Bharti 2021). Financial ignorance creates risks, such as spending more, paying higher interest, increasing credit levels, growing loans, and reducing savings (Lusardi & Tufano 2015).

According to Khalil (2021), to make wise financial decisions and achieve economic prosperity, a person must have various skills, mindsets, and behaviors that constitute financial literacy. Tuffour et al. (2022) describe five dimensions that make up financial literacy: financial knowledge, financial attitudes, financial management skills, financial understanding, and communication skills, as well as financial skills necessary for responsible decision-making, combined with self-confidence. Correspondingly, financial literacy is defined to include health, computer, and statistical literacy as part of the financial literacy domain (Lyons & Kass-Hanna 2021).

In understanding the impact and role of Fintech in the sustainability of women entrepreneurs, there are several key indicators that must be considered:

1. Financial Recording, refers to the extent to which all financial transactions are recorded in a timely manner, with precision and accuracy
2. Future Budget Planning, involves the process of setting short-term and long-term financial goals to be achieved
3. Business Budgeting, refers to the ability of a business to set and achieve specific financial targets

Sustainability of Women Entrepreneurs

The sustainability of entrepreneurship, particularly for women, refers to the ability of a business to maintain long-term operations, generate consistent income, and adapt to changing market conditions. In the current era of globalization, women entrepreneurs play an essential role in long-term economic growth and social progress (Raman et al. 2022). Women are also considered fresh, progressive engines (Cardel et al. 2020). Women entrepreneurs are seen as the future stars of economic revival in developing nations, with the potential to boost financial stability and prosperity (Muthukrishnan & Bhattacharyya 2024). Many academics worldwide are researching women's entrepreneurship (Cardella et al. 2020). Although research has proven that men dominate the environment, entrepreneurship is often associated with women (Bullough et al. 2022). The business initiative supports women's empowerment by offering independence, opportunity, self-confidence, and creativity (Dixit et al. 2023). Women's empowerment includes involvement in the workforce, taking leadership positions in social and political issues, and having access to finance (Al-Qahtani et al. 2020). Most international organizations have recently paid significant attention to women's empowerment as a policy issue (Aggestam & True 2020). Small businesses can spur economic growth by ending the cycle of poverty due to the need for affordable capital and the potential to create many jobs (Mama 2020). This sustainability of women entrepreneurs is measured through various indicators, including capital, workforce presence, increased production capacity, and marketing networks.

In understanding the impact and sustainability role of women entrepreneurs, there are several key indicators that must be considered:

1. Capital, including the availability of funds owned by entrepreneurs and access to external funding.
2. The existence of the workforce, ensures that businesses get employees who have the skills and experience that match the company's needs.
3. Increased production capacity, women entrepreneurs must be able to increase their production capacity.
4. Marketing network, seeing that collaboration with partners can expand market reach and improve operational efficiency.

The Influence of Financial Technology on the Sustainability of Women Entrepreneurs

Financial technology and business continuity are closely linked in the modern technological era. Business actors who were previously limited to traditional transactions, especially in distribution, can be considered the first to start incorporating non-cash payments into their interactions. Businesses may be wary of innovation because of the costs associated with implementing new technology (Paiola & Gebauer 2020; Van Looy 2021) or the uncertainty surrounding new technology (Lewallen 2021). Although these barriers imply that managers may not be on the cutting edge of technology, we argue that they will be more open to FinTech. Organizations must adopt new technologies in today's highly competitive global marketplace to survive because they have relatively few resources (Elali 2021). Therefore, businesses are expected to adopt FinTech as they consider it important for the long-term continuity of their operations. Suryanto et al. (2020) also claim that various fintech companies help SMEs develop. Fintech's influence goes beyond funding corporate capital and touches several areas, including digital payment services and financial regulators above:

H1: Financial technology influences the sustainability of women entrepreneurs.

The Influence of Financial Literacy on the Sustainability of Women Entrepreneurs

Knowledge-Based Valuation (KBV) defines financial literacy as part of the knowledge important for business survival. Therefore, developing organizational values requires financial literacy for sustainable performance (Haleem 2022). An organization's knowledge base is enhanced through financial literacy, making it easier to adapt to changes in the business environment and take advantage of new opportunities (Kulathunga et al., 2020). The business community must know financial literacy's significance and tactical role if it hopes to broaden its understanding. The business community must also examine how knowledge sources, including business experience and financial literacy, influence organizational performance. So, it can be concluded that these resources contribute to maintaining success. This study provides a comprehensive exploration of financial literacy and explores how financial literacy can improve a company's capacity to run sustainable operations.

Several studies have examined the impact of specific sources of information, such as financial literacy, on business continuity. Many studies show that financial literacy and business performance have a high correlation. Strong financial literacy enables companies to better understand the financial consequences of strategic difficulties, resulting in superior performance compared to similar companies (Tuffour et al. 2022), emphasizes the need for financial literacy for organizational survival, regardless of a country's economic conditions (Yakob et al. 2021). Financial mistakes are often the result of ineffective financial management strategies(Hubbard 2020). So, there is a need for financial literacy to navigate rapid economic changes. This shows that financial literacy is needed to deal with rapid economic changes. Likewise, (Widdowson & Hailwood 2017) emphasized that financial literacy is critical for an organization to survive regardless of a country's economic conditions (Yakob et al. 2021). Because ineffective money management strategies often lead to financial mistakes (Ahmad et al. 2022).

Moreover, it is often acknowledged that earning wealth and managing a business need financial literacy. As a result, financial literacy is becoming increasingly important in long-term strategic financial planning and corporate decision-making. Therefore, financial literacy is crucial to an organization's survival, regardless of a country's economic situation. Ineffective financial management strategies usually lead to significant financial mistakes.

H2: Financial literacy influences the sustainability of women entrepreneurs.

Methods

This research uses a quantitative survey method to collect primary data from respondents consisting of female managers, female business owners, and female staff members who are entrusted with running companies in East Java, Indonesia. The survey was carried out by distributing questionnaires to samples selected using purposive sampling, who met specific criteria such as having been operating for at least two years, and having adequate transaction records. The questionnaire prepared includes questions related to the dependent and independent variables studied, namely the sustainability of women entrepreneurs, financial technology, and financial literacy.

The research population consisted of 17,157 female entrepreneurs in East Java. According to Sugiyono (2021), formulas were used to determine the sample size as follows:

$$n = \frac{\mathrm{N}}{\mathrm{N}^{(e)^2} + 1}, \tag{1}$$

$$n = \frac{17.157}{17.157^{(0,05)^2} + 1} = 390 \text{ Women Entrepreneurs.}$$

Thus, 390 female entrepreneurs in East Java are the sample for this research. Secondary data that supports this research was also collected through company records regarding trade or economic transactions and relationships with other parties. Respondents were asked to fill out the questionnaire provided to collect data. The sustainability of women entrepreneurs is this research's dependent variable (Y), while financial technology and financial literacy are independent factors (X). Stata 16 measurement tools and multiple linear regression analysis were used to evaluate the hypotheses. The Common Effect model was chosen for this investigation using normality, heteroscedasticity, multicollinearity test methods, model accuracy tests, and classical assumptions.

Table 1. Operational Definition of Variable

Variable	Indicator	Sub-Indicators	Scale
Financial Technology (Diana & Leon 2020)	1. General Knowledge About Fintech	a. Level of knowledge possessed	Likert Point 1-5
		b. How fintech works	
		c. Types of Fintech Services	
		d. Fintech products available	
	2. Intensity of Use	a. Intensity of use of digital payment applications	
		b. Online loan platform	
		c. Digital financial services	
	3. Ease of Transaction	a. Ease of access	
		b. Speed of making transactions	
		c. Financial management efficiency	
	4. Benefits of Use	a. Low transaction fees	
		b. Easy access to financial services	
		c. Easy tracking and managing finances	
	5. Weaknesses and Risks	a. Data security risks	
		b. Risks of surgery;	
		c. Market risk	
Financial Literacy (Iramani et al. 2020)	1. Financial Recording	a. Recording Completeness	Likert Point 1-5
		b. Timeliness	
		c. Recording Accuracy	
		d. Recording Consistency	
	2. Future Budget Planning	a. Financial Goal Setting	
		b. Estimated Income and Expenditures	
		c. Preparation of Budget Plans	
	3. Business Budgeting	a. Implementation of Business Targets	
		b. Estimated Business Income	
		c. Resource Allocation	
Sustainability of Women Entrepreneurs (Darzi et al. 2016)	1. Capital	a. Availability of Funds	Likert Point 1-5
		b. External Funding Access	
	2. The existence of the workforce	a. The right recruitment	
		b. Employee Productivity	
		c. Employee Welfare	
	3. Increased production capacity	a. Improved product quality	
		b. Product Innovation	
	4. Marketing network	a. Collaboration with Partners	
		b. Use of Digital Media	
		c. Market Analysis	

Source: authors' processed data

Results

This study captures demographic information on female entrepreneurs in East Java about having been in business for at least two years and already having a minimum local market share in East Java, as shown in Table 2.

Table 2. Summary of Respondents' Socio-Economic Information

Variable	Categories	N of observations	%
Education Level	Primary School	40	10%
	Junior School	83	21%
	Senior High School	175	45%
	Diploma/Bachelor's Degree	92	24%
Company Age	2 years	158	41%
	3-5 Years	232	59%
Financial Records	Have Financial Records	144	37%
	Don't Have A Financial Record	246	63%
Marketplace	Online	234	60%
	Offline	70	18%
	Hybrid (Online & Offline)	86	22%

Source: authors' calculations

Online questionnaires were distributed through Google Forms, and offline surveys were conducted through the distribution of physical questionnaires, and 390 data were collected from respondents, then analyzed and processed. Findings revealed that a high school education and lack of money management skills dominate the traits of female entrepreneurs. These characteristics describe actual conditions in East Java. Many business actors do not come from a higher education background but have much experience running their business operations, seeing companies operating for over two years. The majority of female entrepreneurs in East Java (63%) still do not have financial records. Regarding the sales system, the data revealed that the majority of female entrepreneurs in East Java prefer online sales, with 234 respondents (60%) conducting their business primarily online. This preference for online sales underscores the importance of digital platforms in reaching broader markets and managing sales efficiently. However, 70 respondents (18%) still rely on offline sales, often utilizing traditional markets, bazaars, and direct customer interactions, which remain valuable for certain segments. Meanwhile, 86 respondents (22%) adopt a hybrid approach, combining online and offline sales methods to maximize their market reach and leverage the advantages of both systems.

A t-test is carried out to test the hypothesis proposed in this research. The results of the t-test show that if the calculation obtained is more significant than table (th>tt) or the considerable probability value obtained is ≤ 0.05 (α), then the proposed hypothesis is accepted.

Descriptively, this research will explain the average value or sample average used in the analysis shown in Table 3.

Table 3. Descriptive Statistical Results

Variables	Obs	Mean	Std Dev.	Min	Max
X_1	390	3.838462	0.5573142	3	5
X_2	390	4.605128	0.6478035	2	5
Y	390	3.894872	0.4665956	1	5

Source: authors' calculations

With a standard deviation of 0.5573142, the financial technology study sample ranged from a minimum of 3 (agree) to a maximum of 5 (strongly agree). The sample mean value is 3.838462. With a standard deviation of 0.6478035, the minimum respondent score is 2 (disagree), the maximum score is 5 (strongly agree), and the average financial literacy score is 4.60518%. The sustainability variable of the 390 female entrepreneur respondents had a standard deviation of 0.4665956, with one answering "disagree" and a maximum of 5 answering "strongly agree."

Validity and Reliability test results are shown in Table 4 as follows:

Table 4. Validity and Reliability Test

Item	Obs	Sign	Item-test correlation	Item-rest correlation	Average Interitem Covariance	alpha
X_{11}	390	+	0.5626	0.4352	0.0648721	0.7112
X_{12}	390	+	0.5545	0.3822	0.0631449	0.7197
X_{13}	390	+	0.6511	0.5479	0.0621478	0.6979
X_{14}	390	+	0.3666	0.2097	0.0724392	0.7396
X_{15}	390	+	0.6403	0.5485	0.0640174	0.7012
X_{21}	390	+	0.3372	0.2318	0.0743447	0.7338
X_{22}	390	+	0.4693	0.3714	0.0706077	0.7217
X_{23}	390	+	0.7454	0.5766	0.049581	0.6886
Y_{11}	390	+	0.3588	0.2844	0.0749787	0.7311
Y_{12}	390	+	0.5077	0.3564	0.0663678	0.7216
Y_{13}	390	+	0.5308	0.4286	0.068037	0.7149
Y_{14}	390	+	0.3488	0.1953	0.0731676	0.7407
Test Scale					0.669755	0.7368

Source: authors' calculations

The validity test results table shows that all questionnaires are valid and can measure what the researcher wants to measure by comparing the calculated r > r table. Meanwhile, the questionnaire also meets reliability by looking at the results of calculating an alpha value greater than 0.60 using the Stata data analysis tool.

Normality Test

The normality test used is the Shapiro-Wilk test, as shown in Table 5 below.

Table 5. Normality Test Output

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	adj chi2 (2)	Prob>chi2
res	390	0.5121	0.0167	4.36	0.1568

Source: authors' calculations

As the table above shows, the residual normality test is fulfilled by looking at the results at a probability of 0.1568, where the value is more significant than 0.05. This shows that the residuals of the regression model are distributed regularly.

Heteroscedasticity Test

The results of the heteroscedasticity test using Breusch-Pagan can be seen in Table 6.

Table 6. Heteroskedasticity Test Output

abs_res	Coef	Std. Err	t	P>|t|	Beta
X_1	0.0126443	0.0172198	0.73	0.463	0.0401147
X_2	0.0425663	0.0300064	1.42	0.157	0.0745841
_cons	1.373665	0.1618362	8.49	0.000	0.1583653

Source: authors' calculations

It can be seen from the data above that the probability value of financial literacy (0.157) and the financial technology variable (0.463) is more significant than 0.05. This is compelling evidence that the assumption of either homoscedasticity or heteroscedasticity is not met.

Multicollinearity Test

The multicollinearity test was carried out by calculating the VIF value with the STATA data analysis tool, which was then produced in Table 7.

Table 7. Multicollinearity Test

Variable	VIF	1/VIF
X_1	1.66	0.603093
X_2	1.55	0.643118
Mean VIF	1.44	

Source: authors' calculations

Based on the data above, where the VIF value is less than 10, it can be said that there is no substantial evidence of multicollinearity. As a result, the independent variables are not correlated with each other.

The results of the equation model analysis can be explained in Table 8 below.

Table 8. Regression by making equations

Source	ss	df	MS	Number of obs =	390
Model Residual	8.70328339	8	1.08791042	F(8,381) =	16.34
				Prob > F =	0.0000
	25.3710756	381	0.06659075	R-squared =	0.2554
Total	34.074.359	389	0.87594753	Adj R-squared =	0.2398
				Root MSE =	0.25805

Y	Coef.	Std. Err.	t	P>|t|	Beta
X_1	0.0631325	0.0272278	2.32	0.021	0.1257758
X_2	0.0208123	0.0163955	1.27	0.016	0.0699751
-cons	2.77653	0.2081079	13.34	0.000	0.029272

Source: authors' calculations

Number of obs = 390 respondents

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon, \tag{2}$$

$$Y = 2.77653 + 0.0631325X_1 + 0.0208123X_2. \tag{3}$$

The first hypothesis was proven correct, showing that financial technology significantly influences the long-term sustainability of female entrepreneurs in business. The probability value of 0.021, less than the limit of 0.05, shows financial technology's actual influence on women entrepreneurs' sustainability. The second hypothesis, which shows that financial literacy impacts the sustainability of women entrepreneurs, is also supported by a probability value of 0.016, below the significance level of 0.05. Thus, it can be confirmed that financial literacy influences the long-term survival of women entrepreneurs. Validation of both theories highlights the importance of financial technology and financial literacy in influencing the long-term survival of companies managed by women entrepreneurs.

Discussion

The Influence of Financial Technology on the Sustainability of Women Entrepreneurs

This research shows that financial technology significantly influences the sustainability of women entrepreneurs. Many women entrepreneurs in East Java use various types of fintech in their business operations, particularly for transactions. The most commonly used fintech by respondents includes e-payment, e-wallets like GoPay and OVO (46%), and mobile banking services provided by local banks (54%). These findings indicate that most respondents utilize mobile banking services for sales and purchases, while e-wallets are more frequently used for daily transactions. The use of fintech demonstrates that financial technology plays a crucial role in the development of their businesses. The study's results show that 60% of women entrepreneurs prefer trading online rather than offline due to the ease of access and broader market reach offered by digital platforms. Additionally, 22.1% of respondents adopt a hybrid approach, combining online and offline sales. On the other hand, only 17.9% continue to choose offline sales methods at events like bazaars and markets, primarily because direct interaction with customers is still considered important by certain segments.

This research measures sustainability from the aspects of capital, workforce presence, production capacity enhancement, and marketing networks. This enables women entrepreneurs to optimize available resources, maintain stable business performance, and expand their market reach, thereby increasing competitiveness and business resilience in the long term. .

In addition, this research identifies several vital indicators of fintech use that contribute significantly to the sustainability of women entrepreneurs, reflected in general knowledge about fintech, enabling women entrepreneurs to utilize various fintech services optimally in their business operations. The intensity of fintech use shows that the more often female entrepreneurs use fintech services, the greater their benefits, reflecting trust and dependence on financial technology. Also, the ease of transactions offered by fintech increases customer satisfaction and expands market reach because it allows fast, safe, and comfortable transactions. Thus, the benefits of using fintech, such as cost savings, increased operational efficiency, and fast access to financial information, help women entrepreneurs manage their businesses better and make more informed decisions. Understanding the drawbacks and risks of using fintech, such as data security and privacy, as well as dependence on technology, allows women entrepreneurs to manage these risks better, maintaining the sustainability of their businesses.

The results of testing financial technology on the sustainability of women entrepreneurs show that financial technology influences the sustainability of women entrepreneurs. This indicates that financial technology influences the sustainability of women entrepreneurs in East Java because many women entrepreneurs use financial technology for their operations, especially in transactions. Women entrepreneurs like modern commerce and respondents prefer doing business online to offline at events like bazaars and fairs because they are not time-bound and can flexibly organize their selling time. This is where the role of financial technology becomes a solution for the business development of women entrepreneurs in the future.

This research is supported by Kulathunga's findings (2020), which show that financial literacy improves organizational sustainability by reducing errors and improving financial management procedures, as well as by the findings of Tuffour et al. (2022) which shows that financial literacy has a direct and positive impact on SME performance. Lind et al. (2020) also confirm that financial knowledge improves organizational sustainability. Overall, this research highlights the importance of financial technology and financial literacy for women entrepreneurs in improving the sustainability and growth of their businesses, and underscores the need for stronger financial education and training programs for women entrepreneurs. Thus, the adoption of financial technology and good financial literacy can make a major contribution to the sustainability of women entrepreneurs, enabling them to survive and thrive in an increasingly competitive business environment (Andriamahery & Qamruzzaman 2022; Baporikar & Akino 2020). This will ultimately increase the profit margin of the business.

Meanwhile, business owners/managers with healthy financial literacy can create financial plans, manage working capital, and make more informed investment decisions (Babajide et al. 2023). This will contribute positively to increasing returns on capital investment and long-term business profitability. Adoption of financial technology can facilitate cash flow in and out of a business (Kumar & Ayedee 2021). Receiving sales proceeds and working capital funding becomes faster. Apart from that, payments to suppliers/creditors also become more efficient. This will have a positive impact on business liquidity.

The Influence of Financial Literacy on the Sustainability of Women Entrepreneurs

This research shows that financial literacy significantly influences the sustainability of women entrepreneurs. Women entrepreneurs with good financial literacy are better able to face economic crises and make more informed financial decisions, which positively impacts the sustainability of their business. Capabilities in risk management and long-term financial planning enable them to anticipate and mitigate the impact of unexpected economic shocks. Additionally, proficiency in financial analysis enables female entrepreneurs to make informed decisions. This financial literacy equips them to maintain financial stability, optimize profit margins, and ensure the sustainability of their businesses. Therefore, female entrepreneurs with strong financial literacy are better positioned to face economic challenges, seize growth opportunities, and sustain their businesses in the long term. Apart from that, indicators of financial recording, future budget planning, and business budgeting also have a significant influence on the sustainability of women entrepreneurs. Accurate and regular financial recording helps women entrepreneurs to better track their income and expenses, identify areas that require special attention, and ensure that there are no errors in financial reports that could cause problems in the future. This research found that women entrepreneurs who consistently record their finances have better control over their finances, which allows them to make more precise and strategic decisions.

Future budget planning is also an important indicator. Women entrepreneurs who are able to plan their budgets well can anticipate future financial needs, allocate resources more efficiently, and reduce financial risks. With careful budget planning, they can manage cash flow better and ensure that their business remains solvent and able to survive in the long term. Business budgeting, which includes creating operational and capital budgets, is crucial in sustainability. Women entrepreneurs with business budgeting skills can set realistic financial goals, allocate funds to strategic projects, and monitor the financial performance of their businesses against a predetermined budget. This study shows that women entrepreneurs who regularly carry out business budgeting have a better ability to manage costs and maximize profitability, ultimately increasing their business's sustainability.

This is in line with the findings of Kulathunga et al. (2020), which states that financial literacy improves organizational sustainability by reducing errors and improving financial management procedures. This research is also supported by the findings of Eniola & Ektebang (2014), which show that financial literacy has a direct and positive impact on SMEs' performance. (Buchdadi et al. 2020), as well as research by Bilan et al. (2020), which confirms that financial knowledge improves organizational sustainability.

This finding is different from the results of Siswoyo & Asandimitra's research (2021), which found no relationship between financial literacy and organizational success, perhaps due to differences in methods of measuring financial literacy.

Overall, this research highlights the importance of financial literacy for women entrepreneurs in enhancing the sustainability and growth of their businesses and emphasizes the need for more solid financial education and training programs for women entrepreneurs. Women entrepreneurs who increase their financial literacy can boost their businesses' resilience to economic crises and make better use of current possibilities.

Conclusion

This research highlights the importance of financial technology (fintech) and financial literacy as key factors influencing the continuity of women's businesses in East Java. Interestingly, the research results show that financial technology has a more significant direct influence on the survival of women-owned companies than financial literacy. Adopting financial technology is a critical component that offers women entrepreneurs prospects for market expansion and creates a structural link between financial technology, financial literacy, and women entrepreneurs' business desires.

This research confirms that fintech has a more dominant role than financial literacy in determining the sustainability of women's businesses in East Java. The use of financial technology enables women entrepreneurs to expand their markets and improve operational efficiency, which in turn strengthens business continuity. However, it is important to recognize that financial literacy remains an important element that supports entrepreneurs' ability to manage financial technology effectively.

This study has various limitations that must be highlighted. First, the research results are limited to the East Java region and the samples used, so they may not be generalizable to other areas. Second, the data collection techniques used in this research may limit the understanding of women entrepreneurs' unique experiences and difficulties. Third, this research primarily uses a quantitative approach, so it may not capture the perspectives and subjective experiences of women entrepreneurs in depth. The findings of this research have significance for women business owners, policymakers, and the business community. For women business owners, using fintech as a primary strategy can significantly increase the viability of their business. Policymakers need to improve financial literacy education and aggressively encourage the adoption of financial technology among women entrepreneurs. For the business community, the results of this research can be used to design more effective training and support programs for women entrepreneurs. For future research, it is recommended to conduct more qualitative research to gain a deeper understanding of the experiences and perspectives of women entrepreneurs regarding fintech and financial literacy. Additionally, longitudinal monitoring methods are recommended to understand changes and radiate the long-term effects of fintech and financial literacy on the survival of women-owned firms over time. Future research may also cover other regions to see whether these findings apply more broadly and to understand different regional contexts.

By understanding and addressing these limitations, future research can provide more comprehensive insights and broader practical applications in supporting women's business continuity through fintech and financial literacy.

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