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Enhancing Financial Performance Through Fintech: The Mediating Role of Financial Literacy and Inclusion

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Abstract---This study investigates the mediating roles of financial literacy and financial inclusion in the relationship between fintech and MSME financial performance in Denpasar City. Employing a quantitative associative design, the research utilized an online questionnaire to collect data from 130 MSMEs using fintech services, selected through snowball sampling. Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 3. The results indicate that while fintech does not directly and significantly impact the financial performance of MSMEs, it has a significant and positive influence on both financial literacy and financial inclusion. Crucially, financial literacy was found to have a positive and significant effect on MSME financial performance, and it significantly mediated the relationship between fintech and MSME financial performance. Conversely, financial inclusion did not have a substantial effect on MSME financial performance, nor did it mediate substantially in this relationship. These findings underscore the crucial importance of enhancing financial literacy among MSMEs to optimize the benefits of fintech adoption and enhance their financial performance.

Keywords---Financial Inclusion, Financial Literacy, Fintech, MSME Financial Performance, PLS-SEM.

Introduction

Indonesian MSMEs are vital for economic growth, poverty reduction, and job creation (Marini et al., 2024; Wibowo & Widayat, 2023), with over 65 million units in 2024 (Kementerian Koperasi dan UKM, 2024). The government supports their digitalization via programs like "UMKM Level Up" to boost market access and sustainability. MSME financial performance is a global concern, directly impacting their survival and competitiveness (Wulandari & Wiagustini, 2024), though many face declines due to resource, funding, and tech limitations. Improving their financial health is crucial for sustained growth (Azizah et al., 2023).

Table 1
Total MSMEs in Denpasar Regency 2017-2023

No.	Classification	Year						
		2017	2018	2019	2020	2021	2022	2023
1	Micro Enterprises	30,145	30,363	30,678	30,737	30,812	30,923	31,071
2	Small Enterprises	422	826	1,050	1,188	1,208	1,246	1,247
3	Medium Enterprises	273	637	298	301	306	307	308
Total		30,840	31,826	32,026	32,226	32,326	32,476	32,626

Source: Dinas Koperasi and MSMEs Denpasar City (2024)

MSMEs are vital to Denpasar's economy, significantly contributing to tourism, which is boosted by Bali's local culture-based development (Priyatna, 2023). Table 1 shows Denpasar's MSMEs grew from 30,840 in 2017 to 32,626 in 2023, though growth rates fluctuated since 2019 after a 3% increase in 2018. This growth boosts employment and regional income, with diverse sectors like culinary (33%) and fashion (24%) leading the way (Putri, 2024). Despite increasing numbers, a key challenge is the mandatory Business Identification Number (NIB) registration via OSS.GO.ID. While crucial for official recognition and accessing funding, many MSMEs hesitate to register due to tax concerns and a lack of digital literacy. The Denpasar government aims for full NIB ownership by 2026, highlighting the urgent need for continued support and socialization to overcome these barriers.

From a financial perspective, financial technology (fintech) can significantly ease business operations for MSMEs (Putri et al., 2023). Fintech refers to businesses that leverage technology to gain a competitive edge and disrupt the financial industry (Wilter et al., 2023). It offers effective and efficient financial services to help MSMEs with their operations (Fandiyanto et al., 2024). According to the Financial Services Authority (OJK), fintech is an innovation in the financial services industry that utilizes technology, creating systems for specific financial transaction mechanisms. Essentially, fintech is an innovative technology for delivering financial services, aiming to improve the efficiency, accessibility, and transparency of financial transactions (Obeng et al., 2024).

The Technology Acceptance Model (TAM) suggests that fintech adoption is driven by its perceived usefulness and perceived ease of use. Perceived usefulness means users believe fintech will improve their work performance, leading to better decision-making for MSMEs. Perceived ease of use highlights how fintech can simplify tasks, even in challenging situations. Given current technological demands, MSMEs must adapt to enhance their financial performance. Understanding the factors influencing this performance is crucial for Denpasar entrepreneurs to optimize their financial outcomes and positively impact the local economy (Wardhana et al. 2023).

The rapid advancement of fintech and digital technology has significantly disrupted traditional banking services, revolutionizing aspects like payments, lending, customer acquisition, deposits, insurance, and financial advice. With fintech, users can conduct transactions remotely, obtain loans without visiting a bank branch, easily find suitable financial products, make investments, and receive financial consultations (Marini et al., 2024). For MSMEs, fintech represents a crucial digital financial transformation, simplifying digital transactions and improving financial access (Fandiyanto et al., 2024). Common fintech types utilized by MSMEs include Peer-to-Peer (P2P) Lending and Payment Gateways (Kisin & Setyahuni, 2024). P2P lending offers a legal platform for obtaining business capital directly, bypassing traditional banks to facilitate borrowing and lending for profit (Edward et al., 2023). Payment gateways, such as e-wallets like GoPay, ShopeePay, Dana, and OVO, enable easy cardless payment transactions (Lestari et al., 2020).

Research on fintech's influence on MSME financial performance shows varied results. Studies by Njonge (2023), Alkhalwaleh et al. (2023), Mirdiyantika et al. (2023), and Lontchi et al. (2023) generally indicate a positive relationship, with fintech either having a direct positive effect or a significant positive effect. However, other studies present conflicting findings. Sudaryanti et al. (2018) and Riadloh & Nasution (2023) suggest a negative impact of fintech on financial performance. Furthermore, Almulla & Aljughaiman (2021) found that fintech had a negative and insignificant effect on financial performance.

Research on fintech's influence on financial performance shows inconsistent results. This suggests that simply adopting fintech isn't enough; users need a strong understanding of financial systems to maximize its benefits. Financial literacy can significantly help MSME owners improve their financial understanding, enabling them to process financial information and make sound decisions. Entrepreneurs with high financial literacy are better equipped to assess fintech's perceived usefulness and perceived ease of use, aligning with the Technology Acceptance Model (TAM) theory. This leads to quicker and more confident adoption of financial technologies. Ultimately, this deeper understanding and confident adoption enable MSMEs to maximize fintech usage, positively impacting their financial performance through improved record-keeping, cash planning, and cost savings.

Financial literacy is vital for a financially intelligent society and MSME owners, helping them leverage fintech and avoid financial issues (Al-Amudi et al., 2024). It's an internal strength aiding financing and growth, encompassing numeracy, inflation understanding, and risk diversification (Lusardi, 2019). This knowledge shapes financial decision-making (Timuneno et al., 2023), optimizing MSME financial performance through better operations and management (Kartika & Musmini, 2022; Marini et al., 2024). Numerous studies consistently confirm financial literacy's positive and significant impact on MSME financial performance (e.g., Hertadiani & Lestari, 2021; Rusnawati et al., 2022). Furthermore, research highlights its positive and significant mediating role between fintech and financial performance (Lontchi et al., 2023; Triana & Syera, 2023).

Financial inclusion is crucial for MSMEs to access and effectively utilize financial services (Alamsyah et al., 2023). While fintech provides the platforms, genuine financial inclusion—meaning having digital accounts, awareness of financial products, and the ability to use applications—is what allows MSMEs to truly benefit from

fintech services. This boosts their experience and trust in financial technology, making fintech seem both easy and useful. Financial inclusion is a fundamental right, ensuring everyone has full access to financial institutions and receives timely, convenient, informative, and affordable services while maintaining dignity and value (Ruminta & Oktaviani, 2024). The goal of financial inclusion is to foster inclusive financial growth, aiming to reduce poverty, promote development, and eliminate price and non-price barriers to accessing financial services, including the use of fintech (Ranti & Sartika, 2024).

While financial inclusion in Indonesia is rising, many individuals and MSMEs still lack access and knowledge, hindering its full adoption (Azizah et al., 2023). The primary goal of financial inclusion is to dismantle barriers to accessing and utilizing financial services, especially in rural areas, by leveraging existing infrastructure and expanding offerings like savings accounts (Yanti, 2019). Essentially, it aims to ease the constraints MSMEs face when seeking financial services (Yanti, 2019). Numerous studies affirm the positive impact of financial inclusion on MSME performance. Research by Azizah et al. (2023), Habibi et al. (2022), Wibowo & Widayat (2023), and Yanti (2019) consistently show that financial inclusion has a positive and significant effect on MSME financial performance.

The pivotal role of MSMEs in bolstering regional economies necessitates an enhancement of their financial performance. In light of this, and given the inconsistent findings in prior research regarding factors influencing MSME financial performance, this study aims to re-examine these relationships. This research focuses specifically on MSMEs in Denpasar City, investigating the interplay between fintech, financial literacy, and financial inclusion. Consequently, the study's objective is to explore "The Mediating Role of Financial Literacy and Financial Inclusion in Enhancing Financial Performance through Fintech

Technology Acceptance Model Theory

The Technology Acceptance Model (TAM) is a frequently used framework for analyzing how new technologies are adopted (Toraman, 2022). It helps identify factors influencing the acceptance and use of financial technology (fintech) services, such as perceived usefulness, perceived ease of use, and behavioral intentions, all of which can boost fintech utilization (Heliani & Novitasari, 2024). While TAM was initially developed to explain user acceptance of information systems and software, its application has since broadened to encompass various technological contexts, including mobile technology, social media, and the Internet of Things (IoT). According to research by Fayad & Paper (2015) and Toraman (2022), TAM comprises three core elements: Perceived Ease of Use, which refers to the belief that a technology will increase productivity with less effort; Perceived Usefulness, which describes the belief in the benefits and performance improvements gained from using the technology; and Intention to Use, which is an individual's conscious plan to perform a specific future behavior related to the technology.

The TAM is highly relevant to this study as it helps explain the importance of fintech adoption by MSME actors to enhance their financial performance. This research will utilize TAM's three core elements—perceived ease of use, perceived usefulness, and intention to use—as indicators for measuring fintech's impact. As users develop more positive perceptions regarding the benefits of fintech in improving performance, and as they recognize the advantages stemming from financial technology's presence, the adoption and continued use of fintech in their businesses are likely to increase. The rapid pace of technological development compels business owners to leverage technology, providing easier access to broader markets. This, in turn, can lead to increased sales and, consequently, improved business financial performance.

Financial Performance

Performance measures work achievement by comparing results against set standards, influenced by individual ability, motivation, and expectations (Syauqi et al., 2023). Financial performance specifically measures a company's success in generating profit (Putri et al., 2021). It's an analytical tool derived from financial statements and ratios to assess a company's financial health, considering indicators like profitability and productivity (Laurensia et al., 2024; Lontchi et al., 2023). MSME performance evaluation has evolved, offering better measurement capabilities for stakeholders to assess business outcomes and prospects. Overall business performance results from various factors influencing individuals or groups toward organizational goals (Syauqi et al., 2023). Notably, financial inclusion has become a key policy focus in MSME development, seen as vital for economic growth and stability (Azizah et al., 2023).

A business's success can be gauged from various aspects, including its financial performance and company image. Over time, successful ventures typically show improvements in capital, operational scale, profitability, and

business type. The success of an enterprise is clearly and accountably demonstrated through an analysis of its financial performance. This study, referencing [Monica & Ruzikna \(2024\)](#), uses the following indicators to measure MSME financial performance: Assets, defined by PSAK as controlled resources expected to yield future economic benefits, which are crucial for MSME income generation and operations; Sales Turnover, representing total gross revenue from goods or services before deductions; and Operating Profit, which, according to PSAK, is the profit from core business activities prior to non-operating income and expenses.

Financial Technology

Financial Technology (Fintech) has fundamentally reshaped the financial industry, introducing innovative business models and solutions that disrupt traditional services like banking and insurance ([Alkhawaldeh et al., 2023](#)). This technology, exclusively for the financial sector ([Zarifis & Cheng, 2022](#)), enables efficient cashless transactions ([Tambun & Nurwanti, 2023](#)) and enhances financial service functionality ([Vonny et al., 2024](#)). It optimizes transactional payments, with a growing shift from physical cash to e-money via various applications. This not only boosts financial service accessibility but also alters market structures ([Aleemi et al., 2023](#)). Fintech offers new ways for institutions and users to deliver and receive services, providing novel financial experiences and transforming traditional financial features with technology's aid ([Marini et al., 2024](#)).

Fintech offers young entrepreneurs a vital alternative in the financial sector, expanding access to adequate financial services and fundamentally transforming how businesses manage their finances ([Putri et al., 2021](#)). Its innovations boost transaction efficiency, reduce costs, and broaden financial accessibility for all ([Prabhakaran & Mynavathi, 2023](#)). This technology, tailored for the financial industry ([Lontchi et al., 2023](#)), enhances financial product quality and ensures relevant information reaches stakeholders. For MSMEs, fintech significantly contributes through advancements like POS systems and mobile banking, aiding success ([Njonge, 2023](#)). Fintech continually evolves, driven by technology, to improve customer experience by increasing transparency, cutting costs, and making financial information easily accessible ([Irimia-Diéguez et al., 2023](#)). However, navigating its challenges requires sound knowledge, especially concerning regulatory complexities and inter-agency coordination to optimize its potential ([OJK, 2016](#); [Syauqi et al., 2023](#)).

Research exploring the impact of fintech on financial performance presents conflicting results. Some studies, like those by [Alkhawaldeh et al. \(2023\)](#) and [Wulandari & Wiagustini \(2024\)](#), indicate a positive influence. Conversely, other research suggests a negative relationship; for instance, [Sudaryanti et al. \(2018\)](#) and [Riadloh & Nasution \(2023\)](#) found that fintech negatively affected Return on Assets (ROA), a common measure of financial performance. Additionally, [Almulla & Aljughaiman \(2021\)](#) reported a negative and insignificant effect of fintech on financial performance.

Given the inconsistent findings on fintech's impact on financial performance, this research proposes financial literacy as a crucial mediating variable. Drawing on the Technology Acceptance Model (TAM), fintech helps MSMEs boost financial literacy through accessible information, user-friendly interfaces, and educational features. The perceived ease of use of fintech encourages positive financial behaviors like saving and budgeting. Fintech also expands access to financial information via apps and digital content, improving MSME owners' financial literacy. This perspective is supported by various studies consistently showing a positive and significant effect of fintech on financial literacy ([Muhtarom, 2022](#); [Mulasiwi & Julialevi, 2020](#); [Kofi et al., 2023](#); [Rohman et al., 2023](#); [Marpaung, 2021](#)).

Fintech has fundamentally transformed financial inclusion, breaking down traditional barriers to financial service access and simplifying saving, borrowing, and investing to improve livelihoods ([Rolando, 2024](#)). Expanding financial inclusion, especially for MSMEs, is crucial, leveraging tools like QRIS and e-wallets, alongside digital banking services ([Pitri, 2023](#)). Successful fintech-driven inclusion strategies require an inclusive tech ecosystem, supportive regulations, consumer protection, and collaboration among stakeholders ([Rolando, 2024](#)). Numerous studies confirm fintech's positive and significant influence on financial inclusion (e.g., [Marpaung, 2021](#); [Mulasiwi & Julialevi, 2020](#); [Candraningsih et al., 2023](#)). Based on the preceding discussion, the hypothesis formulated for this study is:

H1: Fintech has a positive and significant effect on financial performance of MSMEs

H2: Fintech has a positive and significant effect on financial literacy of MSMEs

H3: Fintech has a positive and significant effect on financial inclusion of MSMEs

Financial Literacy

Financial literacy is a blend of awareness, knowledge, skills, attitudes, and behaviors essential for making sound financial decisions that promote financial well-being (Yang et al., 2023). The OECD (2016) defines it as the abilities and knowledge needed to make informed financial choices, leading to financial prosperity. It's critical for a thriving economy, as informed transactions keep the economic wheel turning (Khalikussabir et al., 2024). At its core, financial literacy is the capacity to manage finances effectively when making decisions (Hasanudin & Panigfat, 2023; Laurensia et al., 2024). This includes understanding financial concepts and risks, coupled with the confidence and skills to make effective choices in diverse financial situations. A financially literate company can quickly identify and respond to changes in the business and economic climate, enabling innovative solutions that boost performance and ensure long-term sustainability (Yakob et al., 2021).

Financial literacy encompasses various concepts, including knowledge of financial products and institutions, financial understanding and skills, and the ability to plan and manage finances. Individuals with strong financial literacy can manage their money more effectively, make sound investment decisions, adopt better saving behaviors, and leverage new financial products and services (Lontchi et al., 2023). It serves as a crucial supportive function that significantly impacts an entity's longevity, beyond its core offerings (Yakob et al., 2021). While a lack of financial literacy may not show immediate major effects, it can profoundly hinder an MSME's long-term growth and sustainability.

Numerous studies confirm the positive influence of financial literacy on MSME performance. Research by Hertadiani & Lestari (2021) indicates a direct impact. Furthermore, studies by Rusnawati et al. (2022), Hartina et al. (2023), Kartika & Musmini (2022), Natsir et al. (2023), and Hasanudin & Panigfat (2023) all consistently demonstrate a positive and significant relationship between financial literacy and MSME financial performance. Based on the preceding discussion, the hypothesis formulated for this study is:

H4: Financial Literacy has a positive and significant effect on financial performance of MSMEs

Financial Inclusion

Financial inclusion refers to the access and use of formal financial services within an organization, representing a key policy priority in many nations (Ozili et al., 2024). It's a strategic national financial approach ensuring universal access to financial institutions and services that are accessible, informative, timely, cost-effective, and respectful of dignity. This aims to boost formal financial service access by promoting understanding of financial systems and products, guaranteeing affordable and secure services (Hasanudin & Panigfat, 2023). Fundamentally, financial inclusion is a process that facilitates access, availability, and benefits from the formal financial system for all economic participants.

Indonesia's Financial Services Authority (OJK, 2017) defines financial inclusion as all efforts to reduce both price and non-price barriers preventing public access to financial services. The World Bank's financial inclusion framework empowers policymakers to achieve robust digital inclusion for underserved populations. Moreover, significant government and donor funding, from entities like UNICEF, USAID, and the UN, is now digitally disbursed to beneficiaries via fintech instruments (Mustafa et al., 2023). Digital payment services broaden financial access and enhance government efficiency and transparency in disbursing benefits such as pensions and social welfare schemes. MSMEs leveraging financial inclusion can improve both their financial and non-financial performance. Greater access to financial services, especially credit, can boost MSME market share, employment, sales, and profits, ultimately supporting overall MSME performance.

Research consistently demonstrates a positive and significant influence of financial inclusion on financial performance (Hasanudin & Panigfat, 2023; Martono & Febriyanti, 2023; Mirdiyantika et al., 2023). This aligns with the broader objective of financial inclusion, which aims to ensure financial services are accessible to all segments of society, with particular emphasis on vulnerable groups such as the poor, productive poor, and those in remote areas (Bank Indonesia, 2014). Given the preceding discussion, the following hypothesis is proposed for this study:

H5: Financial Inclusion has a positive and significant effect on financial performance of MSMEs

The Mediating Role

Fintech adoption can significantly boost MSME owners' financial literacy by exposing them to diverse financial products (Tan & Syahwildan, 2022). This is vital as financial literacy empowers individuals to make sound financial decisions, enhancing well-being and minimizing losses. A strong financial literacy foundation improves company

performance, especially with flexible resources and accessible information. When MSME owners possess robust financial literacy, they can optimize how fintech improves their financial performance (Astari & Candraningrat, 2022).

Fintech offers various digital financial services to streamline MSME activities, but its effectiveness depends on users' comprehension and sound financial decision-making, supported by financial literacy. This aligns with the Technology Acceptance Model (TAM): strong financial literacy allows business owners to better understand fintech's perceived usefulness and ease of use, leading to optimal adoption and a positive impact on profitability, efficiency, and sustainability. Prior research consistently supports this mediating role. Studies highlight that both financial literacy and fintech are crucial for micro-business performance (Kusumardiyani et al., 2023). Specifically, financial literacy positively and significantly mediates the relationship between fintech and financial performance (Lontchi et al., 2023; Candraningsih et al., 2023; Tan & Syahwildan, 2022). Based on this, the following hypothesis is formulated:

H6: Financial literacy mediates the influence of fintech on financial performance

Financial inclusion describes a state where every individual has access to diverse, high-quality, timely, seamless, and secure formal financial services at an affordable cost, aligning with their needs and capacity to enhance societal well-being (Kusumardiyani et al., 2023). Fintech contributes significantly to MSME development by facilitating business capital, digital payment systems, and financial management (Ranti & Sartika, 2024). Fintech advancements particularly expedite financial inclusion for micro and small entrepreneurs in both rural and urban areas (Tan & Syahwildan, 2022).

Financial inclusion signifies an individual's or MSME's ability to access and utilize formal financial services. From the Technology Acceptance Model (TAM) perspective, an individual's intent to use technology is shaped by their perceived usefulness and perceived ease of use. Financial inclusion is crucial here: as MSME actors gain experience and access to financial services, they become more familiar with digital features. This familiarity allows them to better assess fintech's tangible benefits and perceive it as easier to use. Consequently, financial inclusion drives the acceptance and actual use of fintech, which then boosts MSME financial performance. Prior research supports this mediating role. Studies show financial inclusion mediates the relationship between fintech and MSME financial performance (Ranti & Sartika, 2024; Tan & Syahwildan, 2022). Fintech has also been found to positively and significantly influence financial performance when mediated by financial inclusion (Kusumardiyani et al., 2023). Based on this, the following hypothesis is formulated for this study:

H7: Financial inclusion mediates the influence of fintech on financial performance

Research Methods

This study employs a quantitative associative research design, which assumes that phenomena can be classified and their relationships are causal (Sugiyono, 2019). Associative research specifically investigates hypothesized relationships between variables within a population (Sugiyono, 2019). The research aims to explain the influence of fintech on MSME financial performance in Denpasar City, with financial literacy and financial inclusion acting as mediating variables. Data will be collected using questionnaires with a Likert scale for variable indicator measurement. The data analysis will be conducted using the Partial Least Squares (PLS) method, facilitated by SmartPLS version 3 software.

Sample and Sampling Method

A sample is a subset of a population that possesses its characteristics (Sugiyono, 2019; Sekaran & Bougie, 2016). For this study, the sample will consist of MSMEs in Denpasar City that utilize financial technology services. Following Hair et al. (2019), the minimum sample size should be five times the number of research indicators, while the maximum is ten times. With 13 indicators in this study, the target sample size is 130 MSMEs. Snowball sampling will be employed to collect participants. This technique involves identifying initial respondents who then refer other potential respondents, and so on, until the desired sample size of 130 is reached (Sekaran & Bougie, 2016).

Data Collection and Analysis Procedure

This study will collect data using an online questionnaire distributed via Google Forms. A questionnaire is a data collection technique where respondents answer a set of written questions or statements (Sugiyono, 2019). The questionnaire will contain written statements related to financial literacy, financial inclusion, fintech usage, and

MSME financial performance. Respondents will indicate their opinions using a 5-point Likert scale. This scale allows for graduated responses, from strongly disagree (1) to strongly agree (5), giving respondents freedom to express their views. The source of questionnaire indicators is explained as follows:

Table 1
Source of Questionnaire Indicators

Construct	Number of Items	Source
Financial Performance (Y)	3	Destiana & Jubaedah (2016); Monica & Ruzikna (2020)
Financial Technology (X)	3	Novianti <i>et al.</i> (2022)
Financial Literacy (M1)	3	OECD (2021); Kurniadi <i>et al.</i> (2022); Timoneno <i>et al.</i> (2023)
Financial Inclusion (M2)	4	Timoneno <i>et al.</i> (2023)

This study employs the Structural Equation Modeling (SEM) method, utilizing a Partial Least Squares (PLS) approach. SEM-PLS was chosen due to its suitability for analyzing structural models that incorporate latent variables. Before the main data analysis, the research instruments underwent validity and reliability testing to ensure data authenticity and dependability. An instrument is deemed reliable if its Cronbach's Alpha value exceeds 0.70. The instrument's feasibility test was conducted on an initial sample of 30 respondents using IBM SPSS Statistics 26 software. The results indicated that all indicators achieved a Cronbach's Alpha value exceeding 0.70, confirming that all variables and indicators in this study are reliable and valid, making them suitable for subsequent analysis and continuing to test the hypothesis.

Research Framework

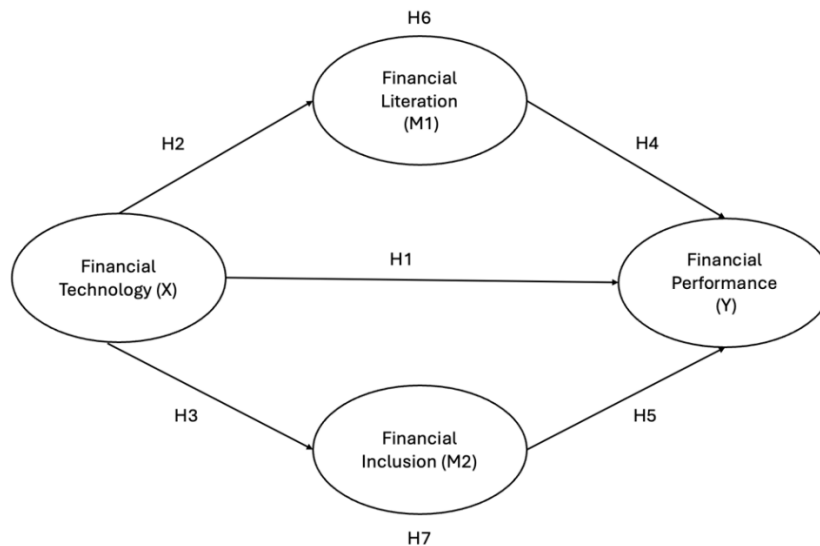


Figure 1. Research Framework

Research Result

This study collected data via an online questionnaire distributed through Google Forms to MSME owners in Denpasar City. Eligible respondents possessed a Business Identification Number (NIB) and utilized fintech services. The respondent profile showed that a majority were male, over 40 years old, owned micro-enterprises, and had been operating for less than five years. The predominant business sector among respondents was culinary.

Descriptive Analysis

This analysis aims to provide a general overview of respondent perceptions for each research variable. By categorizing responses according to the established five-point measurement scale, the aim is to understand data

patterns before proceeding with more advanced inferential analysis. The categories of variable class interval is shown in Table 2 below

Table 2
Variable Class Interval Category

Class Interval	Financial Performance, Financial Technology, Financial Literacy, Financial Inclusion
1,00 – 1,80	Very Low
1,80 – 2,60	Low
2,61 – 3,40	Medium
3,41 – 4,20	High
4,21 – 5,00	Very High

The average value of each variable is presented in Table 3 below:

Table 3
Description of Research Variable Values

Variable	Average Value
Financial Performance (Y)	3.934
Financial Technology (X)	4.201
Financial Literacy (M1)	4.077
Financial Inclusion (M2)	3.770

Table 3 presents the descriptive analysis for the MSME financial performance variable. The results indicate that respondents generally demonstrate strong capabilities in managing their MSMEs' financial performance. The overall average for all indicators stands at 3.934, which falls within the high criterion.

The fintech variable assesses the extent to which Denpasar City's MSME actors are capable of utilizing fintech to enhance their financial performance. Table 3 presents the descriptive analysis for this variable, revealing that respondents exhibit a high level of fintech usage. The overall average across all indicators is 4.201, which falls within the very high criterion.

The financial literacy variable in this study assesses the extent to which MSME actors in Denpasar City possess the capability to enhance their MSMEs' financial performance. Financial literacy was measured using six statements with a five-point semantic differential scale. Table 3 presents the descriptive analysis results for the financial literacy variable, indicating that respondents demonstrate a high level of financial literacy. This is evidenced by an overall average across all indicators of 4.077, which falls within the "high" criterion.

The financial inclusion variable in this study, symbolized as M2, serves as a mediating variable. It was measured using eight statements responded to on a five-point semantic differential scale. Table 3 presents the descriptive analysis results for the financial inclusion variable, indicating that respondents demonstrate a high level of financial inclusion. This is supported by an overall average across all indicators of 3.770, which falls within the "high" criterion.

SEM-PLS Analysis

SEM-PLS (Structural Equation Modeling - Partial Least Squares) analysis is employed to test both direct and indirect (mediation) relationships between the variables hypothesized in this research. The evaluation of an SEM-PLS model proceeds in two primary stages. First, the measurement model (outer model) is evaluated to assess the validity and reliability of the constructs. Following this, the structural model (inner model) is evaluated to examine the hypothesized relationships between the latent variables and to conduct hypothesis testing.

The measurement model analysis assesses how effectively indicators represent their respective constructs. For reflective measurement models, three key analyses are conducted: convergent validity, discriminant validity, and construct reliability (composite reliability). The results of these evaluations are crucial for confirming the suitability of the indicators before proceeding to the structural model (inner model) evaluation to test the relationships among latent variables. The summary of convergent validity and composite reliability is shown in Table 4 below.

Table 4
Convergent Validity and Composite Reliability Test

	Variable	Outer Loading	Criteria	Explanation
Convergent Validity	Financial Performance (Y)	0.776 - 0.939	> 0.5	Valid
	Fintech (X)	0.864 - 0.932	> 0.5	Valid
	Financial Literacy (M1)	0.828 - 0.941	> 0.5	Valid
	Financial Inclusion (M2)	0.802 - 0.856	> 0.5	Valid
	Variable	AVE	Criteria	Explanation
	Financial Performance (Y)	0.791	> 0.5	Valid
	Fintech (X)	0.808	> 0.5	Valid
	Financial Literacy (M1)	0.826	> 0.5	Valid
Composite Reliability	Financial Inclusion (M2)	0.750	> 0.5	Valid
	Variable	Cronbach Alpha	Criteria	Explanation
	Financial Performance (Y)	0.947	> 0.6	Reliable
	Fintech (X)	0.952	> 0.6	Reliable
	Financial Literacy (M1)	0.958	> 0.6	Reliable
	Financial Inclusion (M2)	0.931	> 0.6	Reliable
	Variable	Composite Reliability	Criteria	Explanation
	Financial Performance (Y)	0.958	> 0.6	Reliable
	Fintech (X)	0.962	> 0.6	Reliable
	Financial Literacy (M1)	0.966	> 0.6	Reliable
Financial Inclusion (M2)	0.947	> 0.6	Reliable	

Table 4 indicates that all outer loading values for the variable exceed 0.5, it confirms that all data in this study are valid. Convergent validity assesses how consistently indicators explain their latent variable. This is achieved by calculating the Average Variance Extracted (AVE), which is expected to have a minimum value of 0.50. The result of the convergent validity test, utilizing ACE, is also presented in Table 4.

The expected composite reliability and Cronbach's Alpha value should be at least 0.60. As Table 4 details, all construct parameter values from these reliability tests are above 0.6. This confirms that the reliability analysis, using both Cronbach's Alpha and Composite Reliability, validates the good internal consistency of all constructs, making them suitable for the proposed model's evaluation. Discriminant validity aims to ensure that each construct in the model is unique and does not overlap with other constructs.

Table 5
Discriminant Validity Test with Cross-Loading

	<i>Financial Technology</i>	<i>Financial Inclusion</i>	<i>Financial Performance</i>	<i>Financial Literation</i>
M1.1.1	0.622	0.559	0.789	0.937
M1.1.2	0.604	0.605	0.727	0.941
M1.2.1	0.565	0.524	0.751	0.890
M1.2.2	0.612	0.631	0.731	0.941
M1.3.1	0.615	0.641	0.718	0.913
M1.3.2	0.574	0.596	0.638	0.828
M2.1.1	0.576	0.697	0.464	0.557
M2.1.2	0.507	0.867	0.330	0.478
M2.2.1	0.572	0.931	0.422	0.589
M2.2.2	0.550	0.928	0.434	0.613
M2.3.1	0.549	0.914	0.463	0.590
M2.3.2	0.572	0.835	0.440	0.524
X1.1.1	0.864	0.502	0.542	0.591
X1.1.2	0.912	0.674	0.485	0.555
X1.2.1	0.903	0.596	0.457	0.602

	<i>Financial Technology</i>	<i>Financial Inclusion</i>	<i>Financial Performance</i>	<i>Financial Literation</i>
X1.2.2	0.882	0.560	0.416	0.534
X1.3.1	0.908	0.528	0.476	0.578
X1.3.2	0.923	0.612	0.559	0.681
Y1.1.2	0.548	0.478	0.901	0.811
Y1.2.1	0.517	0.428	0.917	0.711
Y1.2.2	0.437	0.378	0.896	0.687
Y1.3.1	0.528	0.468	0.939	0.718
Y1.3.2	0.428	0.442	0.776	0.602
Y1.1.1	0.445	0.460	0.900	0.715

Discriminant validity was assessed by examining the cross-loadings. As shown in Table 5, each latent variable's cross-loading correlation is greater than its correlation with any other latent variable. This confirms that all constructs have successfully passed the discriminant validity test. Therefore, the research model is deemed suitable for proceeding to the structural model (inner model) evaluation stage.

Table 6
Evaluation Result of Goodness of Fit Model

Structure Model	Endogen Variable	R ²
1	Financial Inclusion	0.417
2	Financial Performance	0.642
3	Financial Literation	0.434
Qualification:	$Q^2 = 1 - (1 - R_1^2)(1 - R_2^2)(1 - R_3^2)$	
	$Q^2 = 1 - (1 - 0.417)(1 - 0.642)(1 - 0.434)$	
	$Q^2 = 1 - (0.583)(0.358)(0.566)$	
	$Q^2 = 0.882$	

Table 6 demonstrates the model's explanatory power: financial inclusion, fintech, and financial literacy collectively account for a substantial portion of the variance in MSME financial performance, with other factors influencing the rest. Specifically, fintech explains 41.7% of financial inclusion's variance and 43.4% of financial literacy. The predictive relevance (Q^2) test further confirms the model's robustness. A Q^2 value above zero, as seen in Table 6, signifies good predictive relevance, meaning the model effectively explains a large portion of the endogenous variables' variance and is suitable for predictions.

Path Coefficient Evaluation and Hypothesis Test

The evaluation of path coefficients helps to understand the strength and direction of relationships between latent variables within the model. Each path coefficient indicates the magnitude of influence an exogenous variable exerts on an endogenous variable. A positive coefficient denotes a positive relationship, while a negative coefficient suggests a negative one. For a relationship to be statistically significant, the t-statistic must exceed 1.96 and the p-value must be less than 0.05. These results are presented in Figure 2.

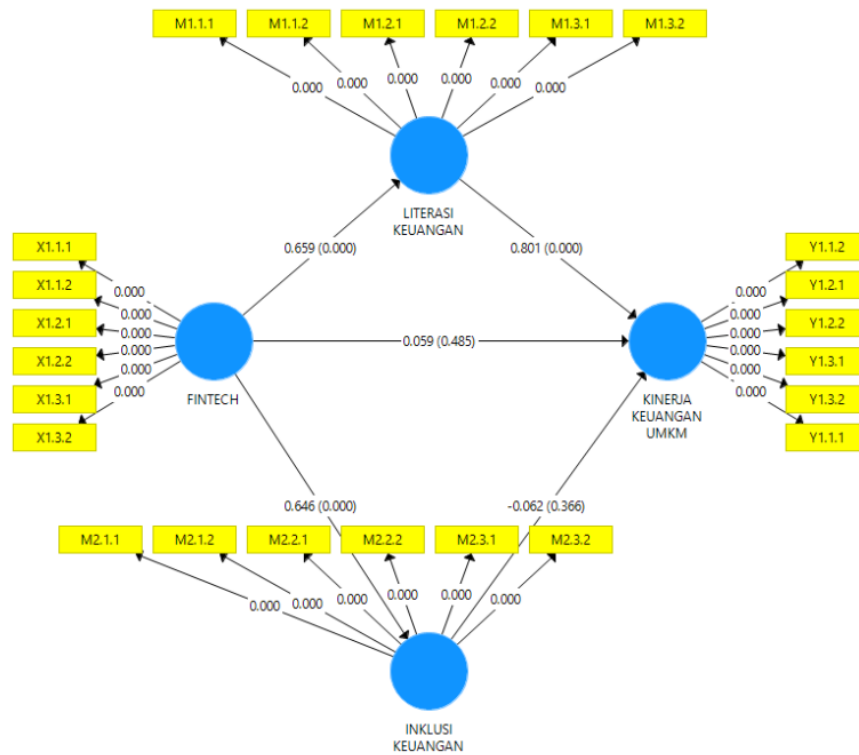


Figure 2. Bootstrapping Result

The path coefficients, as illustrated in Figure 2, are summarized in Table 8 below

Table 8
Summary of Path Coefficient

Hypotheses	Path	Path Coefficient	t-statistics	p values	Conclusion
Direct Effect					
H1	X -> Y	0,059	0.698	0.485	Not Significant
H2	X -> M1	0,659	9.336	0,000	Positive Significant
H3	X -> M2	0,646	8.271	0,000	Positive Significant
H4	M1 -> Y	0,801	10.635	0,000	Positive Significant
H5	M2 -> Y	-0.062	0.904	0,366	Not Significant
Indirect Effect					
H6	X -> M1 -> Y	0,528	6.749	0,000	Positive Significant
H7	X -> M2 -> Y	-0.040	0.855	0,393	Not Significant

Discussion

H1: Fintech has a positive and significant effect on the financial performance of MSMEs

Fintech does not significantly influence the financial performance of MSMEs in Denpasar City. Specifically, t-statistic < 1.96, and a p-value > 0.05, hypothesis 1 is rejected. This finding aligns with other research suggesting that many traditional MSMEs don't perceive fintech as a crucial necessity (Farahiyah & Haryadi, 2024), partly due to low digital literacy hindering optimal use (Akbar et al., 2024). Hesitation and a lack of familiarity with technology also limit adoption (Maulana et al., 2022). Furthermore, simply using fintech for transactions (like e-wallets) without integrating it with digital financial management tools, such as automated record-keeping, fails to translate into direct performance improvements (Satyawati et al., 2023).

According to the Technology Acceptance Model (TAM), technology adoption is driven by perceived usefulness and perceived ease of use. For Denpasar's MSMEs, these perceptions are not yet strong. Many owners don't see fintech as genuinely boosting profits or efficiency, often finding it complex or incompatible with their traditional methods. This limited, non-strategic use of available fintech is why it hasn't significantly impacted their financial performance.

H2: Fintech has a positive and significant effect on the financial literacy of MSMEs

The results from Table 8 indicate that fintech significantly and positively influences financial literacy. With a path coefficient of 0.659, a t-statistic of 9.336, and a p-value of 0.000, which is less than 0.05, hypothesis 2 is accepted. This means higher fintech usage correlates with higher financial literacy. This finding aligns with previous research. [Lontchi et al. \(2023\)](#) highlight that individuals with stronger financial literacy are better at managing money, making investment decisions, improving saving habits, and effectively utilizing new financial products like fintech. Similarly, [Morgan & Trinh \(2020\)](#) found that higher financial literacy positively correlates with an individual's awareness of fintech products.

Fintech plays a crucial role in bridging financial literacy gaps, as engaging with fintech services increases familiarity with financial concepts ([Belgacem et al., 2024](#)). The evolution of fintech acts as a catalyst for improving public financial literacy. Using fintech encourages deeper exploration and understanding of financial literacy, leading to overall improvements ([Kakinuma, 2023](#)). Moreover, frequent fintech use directly contributes to higher financial literacy levels for MSME owners ([Chikmah & Karsono, 2024](#)). From the Technology Acceptance Model (TAM) perspective, Denpasar MSMEs perceive fintech as useful due to its ability to simplify financial management, such as transaction recording and cash flow monitoring. The user-friendly design of many fintech services also enhances perceived ease of use. This combination strengthens the intention to use, deepens financial understanding, and ultimately increases financial literacy as MSMEs more frequently utilize fintech.

H3: Fintech has a positive and significant effect on the financial inclusion of MSMEs

The results from Table 8 indicate that fintech significantly and positively influences financial inclusion. With a path coefficient of 0.646, a t-statistic of 8.271, and a p-value of 0.000 ($p < 0.05$), Hypothesis 3 is accepted. This means that as fintech adoption increases, so does financial inclusion. Specifically, a one-unit increase in fintech leads to a 0.646 increase in financial inclusion. This finding aligns with previous research, highlighting how financial technology can drive financial inclusion by providing easier access to banking and other financial services ([Putri et al., 2023](#)). Fintech's presence is crucial for boosting financial inclusion, especially for MSMEs, by offering alternative and more accessible financial services.

Fintech has consistently shown a positive and significant impact on financial inclusion globally, including in Indonesia. Digital financial services like e-wallets, peer-to-peer (P2P) lending, and online savings platforms have opened up financial access for previously underserved populations. [Chikmah & Karsono \(2024\)](#) specifically emphasize fintech's role in providing access to savings and credit for financially unserved communities worldwide.

MSMEs in Denpasar perceive fintech applications (like digital wallets, online loans, and QR payment platforms) as highly beneficial. These tools simplify transactions, accelerate capital access, and expand payment networks, reducing reliance on conventional banking. This aligns with the Technology Acceptance Model (TAM): MSMEs' high perceived usefulness and perceived ease of use of fintech, driven by intuitive design and mobile accessibility, strengthens their intention to adopt and continuously use these services. Essentially, fintech breaks down traditional barriers such as cost, bureaucracy, and limited literacy, fostering broader, more equitable, and efficient access to formal financial services for MSMEs.

H4: Financial Literacy has a positive and significant effect on the financial performance of MSMEs

Statistical tests confirm that financial literacy positively and significantly influences MSME financial performance ($p\text{-value} < 0.05$, $t\text{-statistic} > 1.96$), hypothesis 4 is accepted. This makes financial literacy a key factor for the sustainability and improvement of Micro, Small, and Medium Enterprises (MSMEs). It encompasses understanding and utilizing fundamental financial concepts like cash flow management, record-keeping, budgeting, and formal financial products ([Lusardi & Mitchell, 2014](#)). This finding aligns with research by [Kartika & Musmini \(2022\)](#), which states that MSMEs with higher financial literacy can optimize their financial performance through careful operations and easier business management. Financial literacy also enhances MSMEs' capacity in financial

management and access, aiding business growth through better financial planning, improved work efficiency, and increased value of goods or services (Marini et al., 2024).

Retnaningdiah & Samsudin (2024) found that financial literacy directly affects MSME performance and sustainability. MSME owners who understand basic financial principles are better equipped to strategize, manage debt, and create simple financial reports, fostering business stability. Boosting financial literacy is crucial for MSMEs to achieve efficient financial management and sustainable profitability. Financial knowledge encourages entrepreneurs to focus beyond short-term gains, developing long-term strategies for business continuity. These findings collectively highlight financial literacy as a fundamental pillar, not just a technical tool, for building MSME resilience and productivity amid evolving economic dynamics.

In today's digital economy, financial literacy is vital for successful business management, especially for MSMEs in Denpasar City. It involves not only understanding financial concepts but also the behavior and attitude towards managing money, making informed financial decisions, and wisely using financial products and services. Denpasar MSMEs with high financial literacy are better at assessing financial product risks and benefits, creating short- and long-term financial plans, and managing cash flow and debt more effectively. Financially literate MSME owners tend to make sounder business decisions, such as when to incur debt, how to manage profits, and how to anticipate financial risks.

H5: Financial Inclusion has a positive and significant effect on financial performance of MSMEs

Financial Inclusion does not significantly influence the financial performance of MSMEs in Denpasar City. Specifically, t -statistic < 1.96 , and a p -value > 0.05 , the hypothesis 5 is rejected. Statistical analysis reveals that financial inclusion does not significantly impact the financial performance of MSMEs. This finding is consistent with research by Harbert & Arifin (2025), Suryanto et al. (2024), and Hilmawati & Kusumaningtias (2021), all of which indicate that expanded access to financial services doesn't necessarily translate into a statistically significant improvement in MSMEs' operational and financial performance. This often stems from a low integration level between formal financial services and the daily managerial practices of MSMEs, making formal financial access still challenging for many.

One key challenge MSME owners face in securing financial support from banks is their limited ability to produce quality financial reports (Kofi et al., 2023; Yulianasari & Mahrina, 2021). This limitation directly impacts their access to bank funding, subsequently affecting their financial performance. Consequently, this study's findings indicate that financial inclusion does not significantly affect MSME financial performance in Denpasar City. Despite having access to products (product holding), awareness of their existence (product awareness), and service options (product choice), many MSMEs don't fully understand how to optimize these services for business management. This is primarily due to a low perception of benefits and ineffective utilization of formal financial products; thus, access alone isn't enough to tangibly improve financial performance.

H6: Financial literacy mediates the influence of fintech on financial performance

Hypothesis 6 is accepted, which confirms that financial literacy significantly mediates the influence of fintech on MSME financial performance. This finding aligns with Tan & Syahwildan's (2022) research, which found that MSME owners' decisions to boost their financial literacy help them recognize and learn about various fintech products, ultimately enhancing their financial performance. The higher an MSME owner's financial literacy, the more optimally they can leverage fintech to improve financial outcomes. Financial literacy empowers MSMEs to understand technology-driven financial products and services, leading to better financial decisions and maximizing fintech's contribution to their financial performance.

Further studies support this mediating role. Yulianto & Rita (2023) found that the combination of fintech and financial literacy improves financial management behavior, significantly impacting MSME performance. Hikmah & Khoiri (2023) also stated that financial literacy, via financial management behavior, positively mediates the effect of fintech usage on business performance, implying that fintech's benefits are maximized with higher user literacy. Additionally, Ranti & Sartika (2024) identified the crucial role of financial literacy in enhancing financial inclusion as an indirect mediator from fintech to MSME performance.

According to the Technology Acceptance Model (TAM), technology adoption, including fintech, is influenced by perceived usefulness and perceived ease of use. However, fintech's benefits can't be fully realized without a solid understanding of financial concepts. Financial literacy boosts financial knowledge, promotes sound financial

behavior, and fosters wise financial decision-making. This enables MSMEs to more effectively use fintech for tasks like transaction recording, cash flow management, and accessing and managing business loans.

H7: Financial inclusion mediates the influence of fintech on financial performance

Statistical analysis reveals that financial inclusion does not significantly mediate the influence of fintech on MSME financial performance, leading to the rejection of Hypothesis 7. This finding aligns with [Pitri \(2023\)](#), who suggests that while financial inclusion offers advantages like QRIS and e-wallets, its development among MSMEs is still ongoing. Mere access to financial products through fintech doesn't automatically translate into optimal utilization. Many MSMEs, despite using fintech, still underutilize or misuse financial products, preventing financial inclusion from becoming an effective mediator between fintech and MSME performance.

Even though financial inclusion expands access, many MSMEs still grapple with barriers such as limited managerial capacity and suboptimal market access, rendering financial inclusion an insufficient mediator ([Nguyen & Luu, 2020](#)). Furthermore, many MSMEs lack the financial management knowledge and skills needed to effectively leverage the financial services they access. Thus, despite fintech simplifying access, without proper literacy and management, financial inclusion cannot be a significant mediator.

In this study, even though fintech has broadened access to financial services (like digital savings, online loans, and e-wallets), this access doesn't automatically boost business financial performance. According to Technology Acceptance Model (TAM) theory, technology adoption is only effective when users have strong perceptions of perceived usefulness and perceived ease of use. Here, financial inclusion indicators such as product awareness, product holding, and product choice haven't been enough to guide MSME actors toward productively using financial services. Many MSMEs have access but aren't optimizing it for planning, record-keeping, or business management. Consequently, access without proper understanding and effective utilization doesn't yield tangible impacts on business efficiency or profitability, preventing financial inclusion from significantly mediating fintech's positive influence on financial performance.

Conclusion

The analysis revealed that while fintech does not directly and significantly impact MSME financial performance, it does exert a positive and significant influence on both financial literacy and financial inclusion. Critically, financial literacy was found to have a positive and significant effect on MSME financial performance, and it significantly mediated the relationship between fintech and MSME financial performance, suggesting that fintech's contribution to better performance largely occurs through improved financial understanding. Conversely, financial inclusion did not have a significant effect on MSME financial performance, nor did it significantly mediate this relationship, indicating that merely having access to financial services isn't sufficient to translate into performance gains without accompanying understanding and strategic utilization.

These findings offer significant theoretical contributions, particularly to the Technology Acceptance Model (TAM). The study reinforces that while perceived usefulness and ease of use are central to technology adoption, the ultimate impact of fintech on business outcomes hinges on the user's underlying capabilities. Specifically, financial literacy emerges as a critical mediating factor, demonstrating that the benefits of fintech are maximized when users possess the financial acumen to fully comprehend and strategically apply these digital tools. This suggests that for technology to truly drive performance, it must foster an environment where users develop the necessary knowledge and skills to leverage its potential beyond basic functionality.

The practical implications of this research are substantial for various stakeholders. For MSMEs, the key takeaway is the paramount importance of financial literacy: simply adopting fintech isn't enough; actively enhancing their financial understanding is essential to realize tangible performance improvements. For policymakers and the government, the results underscore the need to shift focus from merely broadening fintech access to investing heavily in financial literacy programs. These initiatives should equip MSMEs with the skills to strategically manage finances using digital tools. Collaborative efforts among government, financial institutions, and tech innovators are vital to create an ecosystem where readily accessible fintech is paired with strong financial literacy, ensuring that MSMEs can genuinely thrive in the digital economy.

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