FinTech Adoption in Digital Business: Balancing Financial Opportunities, Risks, and Business Sustainability among MSMEs

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ABSTRACT

This study explores how MSMEs balance financial opportunities and risks arising from FinTech adoption and how this process contributes to business sustainability. A qualitative multiple-case study was conducted with 24 MSME owners and managers from five administrative cities of Jakarta, Bogor City, and Bogor Regency. Informants were selected purposively based on their experience using FinTech services in business operations. Data were collected through semi-structured interviews and analysed thematically using ATLAS.ti. The findings generated five major themes: FinTech adoption as an adaptive response to the digital business environment, financial opportunities, financial and digital risks, balancing strategies, and business sustainability. FinTech improved transaction efficiency, customer convenience, market access, financial record-keeping, cash-flow visibility, and access to digital financing. However, MSMEs also experienced transaction costs, fraud, data-security threats, technological dependence, and repayment pressure from digital debt. Business sustainability was strengthened when FinTech adoption was supported by digital financial literacy, transaction verification, financial separation, controlled borrowing, and payment diversification. The study concludes that FinTech does not automatically create sustainability; its contribution depends on MSMEs' capacity to manage opportunities and risks responsibly.

Keywords: Business Sustainability**,** Digital Business, FinTech Adoption, Financial Opportunities, Financial Risks.

INTRODUCTION

The development of digital technology has changed the way businesses conduct transactions, obtain financing, manage cash flow, record financial activities, and build customer relationships. One of the main drivers of this change is financial technology (FinTech), namely the integration of technology with financial services that include digital payments, e-wallets, mobile banking, payment gateways, digital-based financing, bookkeeping applications, and various platform-based financial services. In the context of digital business, FinTech no longer functions solely as a payment instrument, but has become part of the business infrastructure that connects transactions, customers, sales platforms, financial institutions, and business financial information. Research (Ganlin et al., 2021; Kajol et al., 2022; Sutjiatmo et al., 2022) explains that digital financial transactions encompass a wide range of financial activities initiated, confirmed, and completed through electronic devices or media, including online payments, digital wallets, and e-payments. Other research indicates that usability, convenience, compatibility, trust, security, and enabling conditions are important factors in the adoption of digital financial transactions, while cost of use, risk, complexity, resistance to change, and privacy concerns are the main barriers (Gupta et al., 2022; Martínez-Peláez et al., 2023; Nugraha et al., 2022; Santoso & Siska, 2025).

For MSMEs, FinTech offers a strategic opportunity to overcome limited access to formal financial services while accelerating integration into the digital business ecosystem. Digital payments can increase the speed and traceability of transactions, reduce reliance on cash, expand payment options for customers, and help businesses manage cash flow (Alfarizi et al., 2024; Chen et al., 2025; Kajol et al., 2022). Digital financing also provides alternative capital for businesses facing limited collateral, credit history, and administrative requirements at conventional financial institutions (Islam & Khan, 2024; Asif et al., 2023). The integration of FinTech with e-commerce, social media, digital cashier systems, and accounting applications enables MSMEs to expand their markets and obtain transaction information more quickly to support decision-making (Febriyani et al., 2026; Prathima et al., 2026). Bank Indonesia also positions QRIS as a gateway for MSMEs to the digital ecosystem and financial inclusion because a single payment code can facilitate various payment instruments quickly, easily, affordably, securely, and reliably.

This opportunity is becoming increasingly relevant as digital payment activity in Indonesia increases. Throughout 2024, digital payments reached 34.5 billion transactions, representing a 36.1% year-on-year increase, while QRIS transaction volume grew 175.2% due to the increase in users and merchants (Bank Indonesia, 2025). By June 2025, the number of QRIS merchants nationwide had reached 39.3 million, with approximately 57 million users, demonstrating that digital payments are increasingly embedded in the commercial activities of the public and MSMEs (Bank Indonesia, 2025). These developments strengthen FinTech's position as a crucial capability for MSMEs to adapt to changing consumer behavior, which demands more practical, fast, flexible transactions, and integration with digital sales channels. However, the increase in user numbers does not automatically indicate that all business actors are able to utilize transaction data, manage service costs, understand financing requirements, or adequately protect their accounts and business data.

On the other hand, FinTech adoption presents various new risks that can reduce the financial benefits obtained by MSMEs. These risks include transaction fees and platform commissions, network disruptions, payment confirmation errors or delays, digital fraud, data breaches, account misuse, dependence on platform providers, and the risk of debt resulting from the use of digital financing without adequate repayment planning. Research (Islam & Khan, 2024b; Kajol et al., 2022; Widagdo & Sa'diyah, 2023) identified usage costs, perceived risk, complexity, and privacy concerns as key barriers to the adoption of digital financial transactions. In line with this, research (Basar et al., 2024; Febriyani et al., 2026.; Ratnawati et al., 2024) indicates that low digital literacy, regulatory complexity, and cybersecurity concerns remain significant barriers to the use of FinTech by Indonesian MSMEs. Thus, FinTech is paradoxical: this technology can expand financial inclusion and improve efficiency, but it also creates financial and digital vulnerabilities when business actors lack adequate financial literacy, cash management discipline, and risk mitigation capabilities.

The relationship between FinTech adoption and business sustainability is therefore not straightforward. Several studies have found that FinTech adoption positively impacts MSME performance and sustainability by improving operational efficiency, market access, ease of financing, and financial management capabilities (Hassan et al., 2025; Kurniasari & Lestari, 2024; Yuan, 2025). Other research from (Gidion Sinuhaji et al., 2024; Nugraha et al., 2022; Setiawan et al., 2021; Yuan, 2025) found that the integration of technology and FinTech supports the efficiency, growth, and sustainability of MSMEs, while research (Anwarul Islam & Khan, 2024a; Ayu et al., 2025; Dewi Purnamasari et al., 2025) shows that the adoption of FinTech and digital payment systems contributes to business financial performance.

The need to understand the balance between opportunities and risks becomes even more crucial in the context of the Jakarta and Bogor research areas. This study covers MSMEs spread across five administrative cities in Jakarta: Central Jakarta, North Jakarta, West Jakarta, South Jakarta, and East Jakarta, as well as Bogor City and Bogor Regency. Jakarta represents a metropolitan business environment with high community mobility, a large concentration of trade and services, strong digital payment penetration, and competition that encourages businesses to integrate digital-based payments, marketing, ordering, and delivery. However, each administrative city has distinct market characteristics, ranging from government and trade centers, industrial and port areas, residential centers, business districts, to areas with concentrations of culinary and service businesses. These differences can shape the variations in FinTech needs, usage intensity, and types of risks experienced by MSMEs.

Bogor City and Bogor Regency present different but complementary contexts. Bogor City has an urban business character closely linked to the trade, culinary, service, education, and tourism sectors, while Bogor Regency has a much larger area with more diverse economic characteristics and infrastructure access across sub-districts. Publications from the Statistics Indonesia (BPS) of Bogor City and Bogor Regency show that the two regions have different socio-economic structures and regional characteristics, thus requiring data and policies presented at the sub-district level. In the context of FinTech adoption, this diversity can lead to differences in connectivity quality, access to training, proximity to financial institutions, customer characteristics, use of cash transactions, and dependence on the community or MSME mentors. Therefore, comparing the experiences of business actors in Jakarta, Bogor City, and Bogor Regency can provide contextual understanding of how the characteristics of metropolitan areas, buffer cities, and regency areas influence the adoption and utilization of FinTech.

Although previous studies have provided significant evidence regarding the relationship between FinTech and financial performance, financial inclusion, and MSME sustainability, most of them used a quantitative approach that examined the interplay between variables through surveys and statistical analysis. Research (Basar et al., 2024; Gidion Sinuhaji et al., 2024; Safira et al., 2025; Santoso & Siska, 2025) has shown that FinTech's influence, literacy, trust, accounting practices, and risk management are positively related to performance and sustainability. This approach does not fully explain how business actors interpret FinTech's benefits, experience risks in their daily practices, make decisions about using services, and develop strategies to balance efficiency, access to financing, costs, security, and sustainability. The inconsistency of empirical findings on FinTech's influence also underscores the need for a qualitative approach to uncover the mechanisms, experiences, and conditions that make FinTech a source of opportunity or vulnerability for MSMEs.

To strengthen the explanatory basis of the study, three complementary theoretical lenses are integrated. Diffusion of Innovations (DOI) explains adoption through perceived relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003), while the technology–organization–environment (TOE) framework situates adoption within technological conditions, organizational readiness, and environmental pressures (Tornatzky & Fleischer, 1990). These perspectives explain why MSMEs adopt FinTech, but they are less explicit about how firms govern its post-adoption opportunities and risks. Dynamic capabilities theory addresses this issue by focusing on the capacity to sense changes, seize opportunities, and reconfigure routines in volatile environments (Teece, 2007). Consistent with the temporal emphasis of business sustainability (Bansal & DesJardine, 2014), sustainability in this study refers to the capacity to maintain economic continuity, operational resilience, and adaptive capability over time; it does not represent a full environmental, social, and economic triple-bottom-line assessment. The combined framework therefore connects adoption antecedents with post-adoption balancing capabilities and business continuity.

Based on these gaps, this study positions FinTech adoption as a dynamic business process, not simply a decision to use technology. Business sustainability is understood as the ability of MSMEs to maintain revenue continuity, manage cash flow, maintain operational efficiency, adapt to customer and market changes, and control financial and digital risks in the long term. This study aims to explore the factors driving FinTech adoption in digital businesses, identify financial opportunities and risks experienced by business actors, analyze MSME strategies in balancing the benefits and vulnerabilities of FinTech use, compare adoption experiences based on the context of the Jakarta and Bogor regions, and build a thematic understanding of FinTech's contribution to MSME business sustainability.

METHODOLOGY

This research uses a qualitative approach with a multiple case study design to explore the experiences of MSMEs in adopting financial technology in their digital business activities. The qualitative approach was chosen because the research aims not only to identify the benefits of using FinTech but also to gain a deeper understanding of the adoption process, decision-making considerations, financial opportunities, risks, and its contribution to business sustainability. The multiple case study design allows researchers to compare the experiences of MSMEs with different business characteristics, levels of technology use, and business environments in the Jakarta and Bogor regions.

The research locations include five administrative regions in Jakarta: Central Jakarta, North Jakarta, West Jakarta, South Jakarta, and East Jakarta, as well as the city and regency of Bogor. These two regions were selected based on their high levels of MSME activity, the development of digital-based businesses, and the increasing use of digital payments, e-wallets, mobile banking, bookkeeping applications, and FinTech-based financing. Jakarta represents a metropolitan business environment with high levels of technology penetration and business competition, while Bogor represents an urban buffer zone with more diverse business characteristics.

Research informants were MSME owners or managers directly involved in financial decision-making and the use of digital technology in business activities. Informants were selected using purposive sampling based on several criteria: the business had been operating for at least three years, had used at least one FinTech service for at least one year, conducted some business activities through digital media or platforms, and were willing to provide open information about the benefits and risks of using financial technology. FinTech services used may include QRIS, digital wallets, mobile banking, payment gateways, financial recording applications, peer-to-peer lending, or other digital financing services.

The number of informants used in this study was 24 MSMEs, consisting of 12 business actors from Jakarta and 12 business actors from Bogor. Informants came from the culinary, fashion, crafts, trade, services, and creative industries sectors. The selection of informants from several sectors aimed to capture variations in FinTech needs, usage patterns, and risks across different business characteristics. Data collection was conducted through semi-structured interviews, both face-to-face and online. Interviews lasted 45–60 minutes for each informant and were recorded after obtaining the informant's consent. The interview guide was open-ended to allow informants to explain their experiences in more depth. Interview questions covered reasons for using FinTech, types of services used, learning and adaptation processes, changes in financial transactions and management, ease of obtaining payments or financing, cost efficiency, impact on sales and cash flow, and FinTech's contribution to business sustainability. Interviews also explored risks such as transaction costs, system disruptions, digital fraud, data security, digital debt, payment difficulties, low financial literacy, and dependence on platform providers.

Data analysis followed the six-phase thematic-analysis process of familiarisation, initial coding, candidate-theme development, theme review, theme definition, and reporting (Braun & Clarke, 2006; Nowell et al., 2017). ATLAS.ti was used to organise transcripts, retrieve coded extracts, compare cases, maintain analytic memos, and visualise code relationships; analytical interpretation remained researcher-led. All interviews were transcribed verbatim and checked against the recordings. The researchers then read each transcript repeatedly and prepared a short case summary recording the business context, FinTech services used, perceived benefits, reported risks, and sustainability-related consequences.

Initial coding was predominantly inductive. The research questions served as sensitising domains rather than fixed categories, allowing unanticipated experiences to be retained. Meaningful segments were coded at the semantic level and, where interpretation was required, at the latent level. The evolving codebook recorded each code label, operational definition, inclusion and exclusion rule, representative quotation, related cases, and an analytic memo. A new code was created only when an extract was not adequately captured by an existing definition. Overlapping codes were merged, codes covering distinct meanings were split, and ambiguous labels were renamed. Each change and its rationale was documented in the audit trail.

Codes were then clustered into higher-order categories and candidate themes. Candidate themes were reviewed against both the coded extracts and the full dataset to assess internal coherence, distinction from other themes, and relevance to the research questions. Constant comparison was conducted across Jakarta and Bogor, business sectors, and types of FinTech service. Contradictory and deviant cases were retained and used to refine theme boundaries rather than being removed. Code co-occurrence outputs were treated as navigational aids, not as numerical evidence of importance. The final thematic map linked adoption drivers, financial opportunities, financial and digital risks, balancing strategies, and sustainability outcomes. Themes were selected on analytical relevance and explanatory coherence rather than frequency alone.

Trustworthiness was addressed through credibility, dependability, confirmability, and transferability procedures. Source triangulation compared accounts across locations, sectors, and FinTech-service profiles. Member

checking invited a subset of informants to review interview summaries and the researchers' preliminary interpretations. During peer-debriefing meetings, the research team reviewed the evolving codebook, selected coded extracts, category boundaries, deviant cases, and the thematic map. Differences were resolved by returning to the relevant transcript and reaching a documented consensus; consistency was therefore established through an auditable interpretive process rather than an unreported inter-coder coefficient. The audit trail retained transcript-checking notes, codebook versions, merge and split decisions, analytic memos, theme revisions, and cross-case comparisons. Thick description of the participants, locations, sectors, and FinTech uses supports readers in judging transferability. Appendix A summarises the coding workflow and coding framework.

RESULTS AND DISCUSSION

The thematic analysis of interviews with 24 MSME owners in Jakarta and Bogor generated five major themes: (1) FinTech adoption as an adaptive response to the digital business environment, (2) financial opportunities arising from FinTech adoption, (3) financial and digital risks, (4) strategies for balancing financial opportunities and risks, and (5) the contribution of FinTech adoption to business sustainability. The themes were developed through an iterative analytical process involving transcript familiarisation, open coding, code categorisation, code co-occurrence analysis, and thematic interpretation using ATLAS.ti. The findings demonstrate that FinTech adoption among MSMEs is not merely a technological transition, but a strategic and adaptive process shaped by customer expectations, market competition, operational demands, financial capability, and perceived digital risks.

Theme 1: FinTech Adoption as an Adaptive Response to the Digital Business Environment

The first theme revealed that FinTech adoption was primarily driven by changes in customer behaviour, particularly the growing preference for cashless transactions. Many informants stated that customers increasingly expected businesses to provide QR-based payments, electronic wallets, bank transfers, and mobile banking options. The absence of digital payment facilities was perceived as a potential barrier to purchasing decisions.

A culinary business owner in Jakarta explained:

> *"Customers, especially younger customers, often ask whether payment can be made using QRIS. Sometimes they do not carry cash at all, so we have to provide digital payment facilities." (JKT-04, culinary business owner)*

A similar experience was shared by a beverage business owner:

> *"Initially, I only accepted cash, but customers frequently asked for digital payment. After using QRIS, transactions became easier and customers did not need to look for an ATM or prepare cash." (JKT-07, beverage business owner)*

In Bogor, the preference for digital payments was also evident, although its intensity varied depending on the location and customer segment. An informant operating near a tourist destination stated:

> *"Visitors from Jakarta usually prefer to pay digitally. If we only accept cash, it can make the purchasing process difficult, especially when they do not have enough cash."*
>
> *(BGR-05, food and souvenir business owner)*

These statements indicate that customer demand functioned as a strong external pressure encouraging MSMEs to adopt FinTech. The ATLAS.ti code co-occurrence analysis showed frequent connections among the codes customer demand**,** cashless preference**,** service convenience**,** and FinTech adoption**.** FinTech adoption was also influenced by competitive pressure. Several participants observed that competitors had begun accepting digital payments and integrating financial technology with online marketplaces and delivery platforms. Consequently, FinTech adoption was perceived as necessary to maintain business competitiveness and relevance.

A fashion entrepreneur from Jakarta explained:

> *"Most competitors already accept digital payments and sell through marketplaces. If we do not follow these developments, customers may choose another seller because the transaction is easier." (JKT-09, fashion business owner)*

Another participant added:

> *"Digital payment is no longer an additional service. It has become a standard requirement, particularly for businesses operating through social media and online platforms." (JKT-12, craft business owner)*

In Bogor, competitive pressure was more strongly felt among businesses located in urban areas and tourist centres. A culinary business owner stated:

> *"After several neighbouring businesses started using QRIS, customers began asking why we did not provide it. We finally adopted it because we did not want to be left behind."*
>
> *(BGR-02, culinary business owner)*

The adoption process was often initiated through informal learning. Informants learned to use digital financial services through fellow entrepreneurs, customers, family members, bank officers, marketplace representatives, government training programmes, and MSME communities. One participant explained:

> *"I first learned about digital payments from another business owner. She helped me register and showed me how to check transactions." (BGR-08, food processing business owner)*

A Jakarta-based entrepreneur similarly stated:

> *"The local MSME community provided information about QRIS and digital bookkeeping. Without assistance, I might have been hesitant because I was concerned about making mistakes." (JKT-03, retail business owner)*

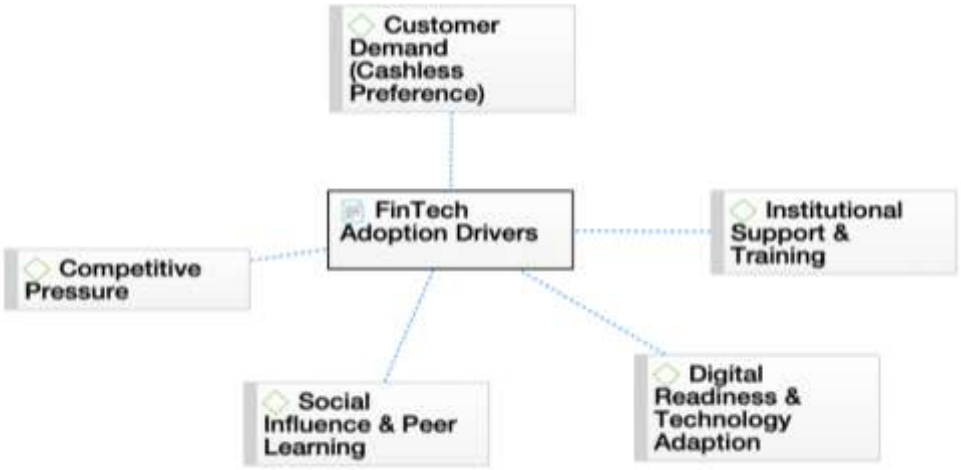

Figure 1. Driving Factors for FinTech Adoption as an Adaptive Response to the Digital Business Environment

The thematic analysis in Figure 1 shows that FinTech adoption by MSMEs is an adaptive response to changes in the digital business environment, shaped by five main factors: customer demand for cashless transactions, competitive pressures, social influence and learning among business actors, institutional support and training, and digital readiness and adaptability to technology. Customer demand is one of the strongest drivers, as consumers increasingly expect fast, practical, and flexible payment methods, such as QRIS, digital wallets, and

bank transfers. At the same time, business actors are encouraged to adopt FinTech to keep up with competitors who have already integrated digital payments with social media, marketplaces, and delivery services. This finding aligns with (Kajol et al., 2022; Nugraha et al., 2022; Setiawan et al., 2021) which states that usability, ease of use, compatibility, trust, enabling conditions, and performance expectations are important factors in the adoption of digital financial transactions. Research (Alhajjaj & Ahmad, 2022; Asif et al., 2023; Sharma & Rai, 2023) shows that performance expectations, convenience, and social influence play a role in shaping intentions and actual use of FinTech services.

In addition to market pressures, the FinTech adoption process among MSMEs is also influenced by social and institutional support. Businesses generally gain knowledge through MSME communities, business partners, family members, banks, FinTech service providers, and training provided by the government or supporting institutions. These interactions help reduce doubts, increase confidence, and accelerate the learning process for using digital financial applications. However, successful adoption still depends on the digital readiness of business actors, including the ability to operate devices, understand application features, adapt transaction processes, and manage digital risks. Research (Islam & Khan, 2024a; Ratnawati et al., 2024) emphasizes that digital literacy, training, technological infrastructure, market demand, regulatory support, and ecosystem collaboration are critical success factors in FinTech integration in MSMEs. Research (Basar et al., 2024; Hadi et al., 2026; Mohapatra et al., 2025) shows that financial literacy and digital financial literacy increase the likelihood of MSMEs adopting FinTech more effectively. Thus, FinTech adoption is not solely driven by technology availability but is shaped by the interaction of customer demand, competitive pressures, internal capabilities, social learning processes, and business ecosystem support.

Theme 2: Financial Opportunities through FinTech Adoption

The second theme concerned the financial opportunities generated through FinTech adoption. Four interrelated subthemes emerged: transaction efficiency, market expansion, improved financial recording, and access to digital financing.

Transaction Efficiency and Customer Convenience

Most participants reported that digital payment systems accelerated transactions and improved customer convenience. This benefit was particularly relevant for culinary, retail, and beverage businesses that served many customers within a limited period.

A Jakarta culinary business owner stated:

> *"During lunch hours, transactions must be completed quickly. QRIS reduces the time needed to count cash or prepare change." (JKT-02, culinary business owner)*

Another informant explained:

> *"Digital payments make transactions more practical. Customers simply scan the code, and we can immediately serve the next customer." (JKT-06, beverage business owner)*

The same benefit was recognised by business owners in Bogor:

> *"When the store is crowded, digital payment helps us serve customers faster. It also reduces mistakes when returning change." (BGR-03, retail business owner)*

A food producer added:

> *"Bank transfers and digital payments make it easier to receive orders from resellers. They do not need to come to the production site just to make a payment." (BGR-10, food processing business owner)*

Digital payments also reduced cash-handling risks. Several participants stated that they no longer needed to keep large amounts of cash at their business premises.

> *"I feel safer because not all sales revenue is kept in cash. The money goes directly into the account and can be checked through the application." (JKT-08, fashion business owner)*

The ATLAS.ti analysis demonstrated frequent co-occurrence among transaction speed, customer convenience, reduced cash handling, transaction security, and operational efficiency.

Market Expansion and Sales Opportunities

FinTech also enabled MSMEs to participate more actively in digital business ecosystems. Integration between digital payments, social media, online marketplaces, and delivery platforms allowed businesses to reach customers beyond their immediate geographical areas.

A Jakarta entrepreneur explained:

> *"Before using digital payment and online delivery services, most customers came directly to the store. Now, orders come from different parts of Jakarta." (JKT-05, culinary business owner)*

Another participant stated:

> *"Customers from Instagram usually prefer bank transfers or electronic wallets. Digital payments allow us to sell without meeting customers directly." (JKT-10, fashion business owner)*

In Bogor, digital payments supported transactions with tourists and customers from outside the local area.

> *"Many customers find our products through social media. They can place an order and transfer the payment even though they live outside Bogor." (BGR-07, craft business owner)*

A processed-food entrepreneur described a similar experience:

> *"After accepting digital payments, we began receiving more orders from Jakarta and Depok. Payment confirmation became easier and products could be shipped immediately." (BGR-08, food processing business owner)*

However, the interviews showed that FinTech adoption alone did not automatically increase sales. Its contribution was stronger when combined with digital promotion, online platforms, attractive product content, and responsive customer service.

A Jakarta participant explained:

> *"QRIS does not directly bring customers. It only makes payment easier. Sales increase when digital payment is combined with promotion through social media and online delivery platforms." (JKT-11, creative business owner)*

This finding suggests that FinTech functions as an enabling infrastructure within a broader digital business strategy.

Improved Financial Recording and Cash-Flow Monitoring

Another important opportunity was the improvement in financial recording. Informants who previously relied on handwritten notes began using transaction histories from mobile banking, digital payment dashboards, or bookkeeping applications. These records helped them estimate sales revenue, identify payment patterns, and monitor daily cash inflows. The code network developed in ATLAS.ti demonstrated that digital transaction records were connected to financial control**,** cash-flow visibility, and business decision-making. Participants who

reviewed their transaction records regularly were better able to separate personal and business finances, plan inventory purchases, and identify periods of declining sales.

FinTech-generated transaction records improved financial visibility for several businesses. Before adopting digital financial services, some participants relied on handwritten notes or personal memory, making it difficult to calculate revenue and expenses accurately.

A Jakarta fashion entrepreneur stated:

> *"Previously, I often forgot which customers had paid because transactions were recorded manually. Now, I can check payment records through mobile banking." (JKT-09, fashion business owner)*

Another participant explained:

> *"The transaction history helps me calculate daily sales and compare them with the previous week. It is easier to see whether sales are increasing or declining." (JKT-01, retail business owner)*

Bogor-based informants reported similar benefits:

> *"Digital payment records help us identify how much revenue comes from direct sales and how much comes from online orders." (BGR-04, culinary business owner)*

Access to Digital Financing

Digital lending and credit facilities provided an alternative source of capital for some participants, particularly those who had difficulty accessing conventional bank financing. Digital loans were used for purchasing equipment, increasing inventory, expanding production, and addressing temporary cash-flow shortages.

A Bogor-based food producer explained:

> *"I used digital financing to purchase a larger production machine. The application was easier than applying for a conventional bank loan." (BGR-10, food processing business owner)*

A Jakarta participant similarly stated:

> *"The digital loan helped me increase stock before the festive season. Approval was relatively fast because the transaction history was already available on the platform." (JKT-08, fashion business owner)*

Another entrepreneur emphasised the benefit of quick access:

> *"When an urgent order came, I needed additional capital immediately. Digital financing allowed me to purchase raw materials without waiting for a long approval process." (JKT-12, craft business owner)*

However, informants differentiated between productive and consumptive borrowing. Digital financing was regarded as beneficial when used for activities that could generate additional income.

> *"Borrowing can be useful when the money is used to buy equipment or stock that can be sold quickly. It becomes dangerous when the loan is used only to cover daily expenses." (BGR-09, retail business owner)*

Figure 2. Financial Opportunities Generated through FinTech Adoption in MSMEs

The thematic analysis results in Figure 2 show that FinTech adoption creates four key financial opportunities for MSMEs: increased transaction efficiency and customer convenience, market expansion and sales opportunities, improved financial record-keeping and cash flow monitoring, and increased access to digital financing. The central theme of market expansion and sales opportunities demonstrates that FinTech functions not only as a payment method but also as a bridge between digital transactions, online marketing, marketplaces, social media, and delivery services. Ease of payment through QRIS, digital wallets, and bank transfers can reduce transaction barriers and increase customer convenience, thus giving MSMEs a greater opportunity to reach consumers beyond their physical business locations. The results of this study are in line with (Islam & Khan, 2024b; Asif et al., 2023; Hadi et al., 2026) that the adoption of FinTech and digital payment systems supports financial performance through increased efficiency, expanded customer access, and improved cash flow management. In addition to opening up sales opportunities, FinTech strengthens financial management through more traceable transaction recording and faster cash flow monitoring. Transaction histories in payment apps, mobile banking, or digital bookkeeping systems provide information that can be used to evaluate sales, separate personal and business finances, plan inventory purchases, and support business decision-making.

Transaction data can increase the opportunities for MSMEs to obtain digital financing because financial service providers have better information about business transaction activities and capabilities. Research (Prathima et al., 2026) that FinTech can improve operational efficiency, financial transparency, and access to financing solutions that better suit the needs and cash flow cycles of MSMEs. However, these benefits don't emerge automatically, as business actors still need financial literacy and the ability to use transaction information strategically. Research (Basar et al., 2024) that financial literacy and digital financial literacy strengthen FinTech adoption and its contribution to sustainable entrepreneurship. Thus, financial opportunities from FinTech arise when ease of transactions, market access, financial record-keeping, and digital financing are effectively integrated into MSME business management.

Theme 3: Financial and Digital Risks of FinTech Use

Despite the opportunities generated through FinTech, the interviews revealed several financial and digital risks. These were grouped into four subthemes: transaction costs, fraud and data security, technological dependence, and digital debt.

Transaction Costs and Reduced Profit Margins

Many participants expressed concern about merchant discount rates, platform commissions, administrative charges, withdrawal fees, and promotional deductions. Although individual fees were often perceived as small, their accumulated value could reduce business profit.

A Jakarta culinary entrepreneur explained:

> *"Each transaction has a deduction. For businesses selling low-priced products, even a small deduction affects the profit margin." (JKT-02, culinary business owner)*

Another informant stated:

> *"Online platforms help increase sales, but the commission is relatively high. Sometimes we receive many orders, but the net profit is not as large as expected." (JKT-05, culinary business owner)*

A Bogor entrepreneur also raised a similar issue:

> *"Customers prefer digital payment, but we must calculate the transaction charges carefully. If the selling price is too low, the business gains very little profit." (BGR-03, beverage business owner)*

A craft producer added:

> *"The problem is not only payment fees but also platform commissions and shipping promotions. All of these reduce the amount received by the seller." (BGR-07, craft business owner)*

The ATLAS.ti code co-occurrence analysis showed strong connections among transaction costs, platform commissions, reduced margin, pricing adjustment, and profitability pressure.

Fraud, Security, and Data Privacy

Digital fraud emerged as a significant concern. Participants reported false payment receipts, phishing links, fraudulent messages, requests for one-time passwords, and suspicious account-verification calls. A Bogor retail entrepreneur described an incident:

> *"A customer once showed a transfer screenshot, but the money had not entered the account. Since then, I always check the official application before handing over the product." (BGR-06, retail business owner)*

A Jakarta informant had a similar experience:

> *"Someone sent a fake payment notification through a messaging application. The format looked convincing, but after checking the account, there was no incoming payment." (JKT-03, retail business owner)*

Other informants expressed concerns about phishing:

> *"I often receive messages containing links that claim my merchant account must be updated. I do not understand which links are official, so I prefer to ask the bank officer." (BGR-01, micro-culinary business owner)*

Older entrepreneurs and those with limited digital literacy reported greater uncertainty regarding data privacy and application security. These findings demonstrate that the perceived convenience of FinTech is accompanied by heightened exposure to digital fraud.

System Disruptions and Technological Dependence

FinTech adoption increased dependence on smartphones, internet connectivity, electricity, banking systems, and digital platforms. Several informants reported that unstable connections or application maintenance occasionally disrupted transactions. A Bogor business owner stated:

"Sometimes the internet connection is unstable, so the payment notification appears late. Customers have paid, but we cannot immediately confirm the transaction." (BGR-05, food and souvenir business owner)

Another participant explained:

"When the application cannot be opened, we have difficulty confirming whether the payment has been received. Therefore, we still accept cash." (BGR-02, culinary business owner)

Jakarta-based entrepreneurs also experienced technological disruptions:

"Even in Jakarta, banking or payment applications sometimes experience maintenance. If we rely on only one payment system, transactions can stop temporarily." (JKT-06, beverage business owner)

The comparative analysis showed that network instability was more frequently reported by Bogor informants, while application maintenance, platform policy changes, and system dependence were commonly mentioned in both locations.

Digital Debt and Repayment Pressure

Digital lending created one of the most serious risks identified in the interviews. The speed and simplicity of borrowing could encourage business owners to take loans without sufficient financial planning. A Bogor entrepreneur stated:

"The loan was approved quickly, but the repayment period was short. When sales declined, the instalments became a burden." (BGR-11, craft business owner)

Another participant explained:

"At first, digital loans seemed helpful because the process was easy. However, after adding interest and service fees, the total repayment was higher than expected." (BGR-09, retail business owner)

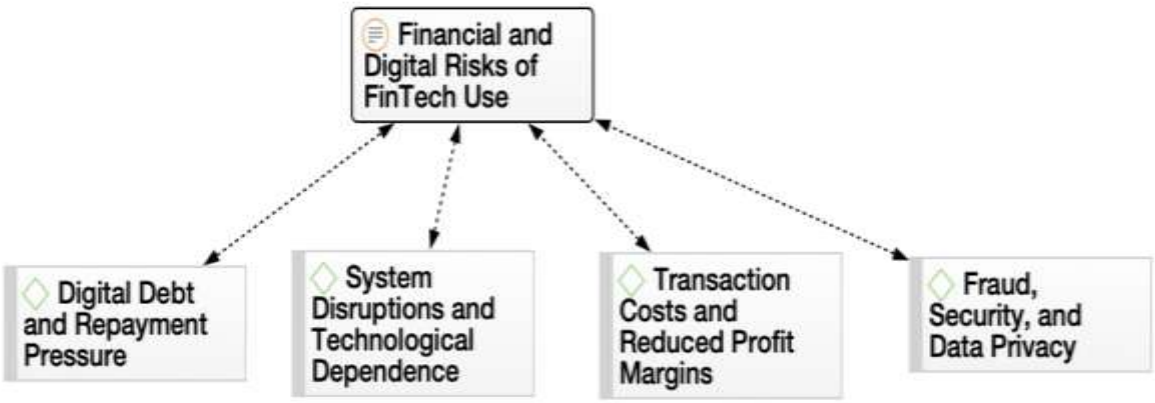

Figure 3. Financial and Digital Risks in the Use of FinTech in MSMEs

The thematic analysis results in Figure 3 show that FinTech use by MSMEs presents four main risks: digital debt and repayment pressure, system disruptions and technology dependency, transaction costs that can reduce profit margins, and the risks of fraud, security, and data privacy. Ease of obtaining digital financing can help with business capital, but it also has the potential to burden cash flow if loans are taken without considering repayment capacity, especially when the tenor is short, service fees are high, or sales decline. On the other hand, dependence on internet connections, devices, applications, and payment platforms can disrupt transactions when system disruptions occur, while merchant fees and platform commissions can reduce MSMEs' net profits. Security risks also arise through fake transfer receipts, phishing, account misuse, and data leaks. These findings align with

those of Asif et al., 2023; Kajol et al., 2022; Zaid et al., 2025) who identified usage costs, perceived risk, complexity, and privacy concerns as key barriers to digital financial transactions who emphasized that low digital literacy, cybersecurity issues, and dependence on technological infrastructure remain significant challenges to FinTech adoption by MSMEs (Purnamasari et al., 2025; Yang & Zhang, 2020; Zaid et al., 2025). Reaserch (Safira et al., 2025; Sharma & Rai, 2023; Widagdo & Sa'diyah, 2023) shows that the benefits of FinTech for business sustainability are highly dependent on the ability of business actors to implement structured risk management so that credit, operational, market and security risks do not develop into long-term business vulnerabilities (Murti et al., 2023; Sutjiatmo et al., 2022).

Theme 4: Strategies for Balancing Financial Opportunities and Risks

The fourth theme captured the strategies used by MSME owners to maximise FinTech benefits while controlling financial and digital risks. Five major strategies emerged: payment diversification, separation of business and personal finances, transaction verification, controlled borrowing, and continuous learning.

Diversifying Payment Channels

Most participants avoided relying on a single payment channel. They combined cash, QRIS, bank transfers, and electronic wallets to ensure business continuity. A Jakarta participant explained:

> *"We provide several payment options because each customer has a different preference. If one application has a problem, customers can use another method." (JKT-04, culinary business owner)*

A Bogor entrepreneur expressed a similar strategy:

> *"Cash is still accepted because the internet connection is not always stable. Digital and cash payments must support each other." (BGR-02, culinary business owner)*

Another participant added:

> *"We use two bank accounts and QRIS. This reduces dependence on one system and makes transactions more flexible." (JKT-01, retail business owner)*

Separating Business and Personal Finances

Several entrepreneurs created separate accounts for business and household transactions. This strategy improved financial control and reduced the risk of using business funds for personal consumption. A fashion business owner stated:

> *"After opening a separate business account, I could calculate revenue more accurately and avoid using business funds for household expenses." (JKT-09, fashion business owner)*

A Bogor food producer explained:

> *"Digital payments are directed to a special business account. I withdraw money for personal needs only after calculating operating expenses." (BGR-10, food processing business owner)*

Another participant noted:

> *"Separating accounts helps me determine whether the business is actually profitable. Previously, all money was mixed together." (BGR-07, craft business owner)*

Strengthening Transaction Verification and Digital Security

Participants developed security practices based on their experiences with fraud. These included checking account balances directly, avoiding suspicious links, using strong passwords, activating two-factor authentication, and limiting employee access. A Bogor entrepreneur stated:

> *"We never accept a screenshot as the only proof of payment. The transaction must appear in the official merchant application." (BGR-06, retail business owner)*

A Jakarta participant explained:

> *"Only the owner and one trusted employee can access the financial application. Other employees can only see the payment notification." (JKT-05, culinary business owner)*

Another informant added:

> *"Passwords are changed regularly, and I never provide OTP codes to anyone, including people claiming to be bank officers." (JKT-03, retail business owner)*

These practices show that digital risk management often developed through practical experience rather than formal cybersecurity training.

Controlling Digital Borrowing

Financially cautious entrepreneurs established internal rules regarding digital borrowing. Loans were only taken when there was a clear business purpose and a realistic repayment calculation. A Jakarta entrepreneur explained:

> *"Before borrowing, I calculate whether the additional sales can cover the instalments. If the calculation is unclear, I do not take the loan." (JKT-11, creative business owner)*

A Bogor participant stated:

> *"I only use digital financing for productive purposes, such as buying equipment or increasing stock. I avoid borrowing for household expenses." (BGR-10, food processing business owner)*

Another business owner emphasised limiting the number of lenders:

> *"I do not use several loan applications at the same time because it becomes difficult to control repayment dates and interest." (BGR-09, retail business owner)*

Improving Digital Financial Literacy

Participants recognised that sustainable FinTech use required continuous learning. They obtained information through government programmes, banks, business communities, social media, and peer networks. A Jakarta business owner stated:

> *"Training helped me understand transaction fees and how to identify fraudulent messages. Previously, I only knew how to receive payments." (JKT-07, beverage business owner)*

A Bogor entrepreneur similarly explained:

> "The MSME community teaches us how to use digital bookkeeping and calculate loan instalments. Learning from other business owners is easier because they use practical examples." *(BGR-08, food processing business owner)*

Figure 4. MSME Strategies in Balancing Financial Opportunities and Risks of Using FinTech

The thematic analysis results in Figure 4 show that MSMEs' ability to balance the benefits and risks of FinTech is shaped by five key strategies: improving digital financial literacy and continuous learning, verifying transactions and strengthening digital security, separating business and personal finances, controlling loans and financial discipline, and diversifying payment channels. These strategies demonstrate that sustainable FinTech adoption requires more than just technological convenience; it requires active financial and risk management capabilities. Business owners who understand transaction fees, payment schedules, account security, and financial record-keeping are more likely to utilize FinTech productively. Transaction verification practices, the use of strong passwords, and direct checking through official applications help reduce the risk of fraud, while separating business and personal accounts improves cash flow control. Loan control prevents excessive use of digital financing, while diversifying payment methods reduces reliance on a single platform during system disruptions. These findings align with (Basar et al., 2024) who emphasized that financial literacy and digital financial literacy support more effective and sustainable FinTech adoption. Research (Nugraheni et al., 2024; Prathima et al., 2026; Santoso & Siska, 2025)that financial literacy and accounting practices strengthen the performance and sustainability of MSMEs.

Theme 5: FinTech Adoption and Business Sustainability

The final theme explained how FinTech adoption contributed to business sustainability. Three dimensions emerged: economic continuity, operational resilience, and adaptive capability.

Economic Continuity

FinTech supported economic continuity by enabling businesses to maintain transactions, reach customers, and manage cash flows. Participants considered digital payments increasingly essential because they responded to customer preferences and supported sales through digital channels. For some businesses, FinTech-generated transaction records also strengthened their ability to assess revenue and prepare for financing applications.

However, FinTech did not guarantee financial sustainability. Its positive contribution depended on whether the business could manage costs, protect accounts, control debt, and use financial data effectively. Thus, sustainability resulted from responsible FinTech utilisation rather than adoption alone.

Operational Resilience

The use of multiple payment systems and digital banking services helped businesses remain operational during changes in customer behaviour or physical market disruptions. Businesses that had integrated FinTech with online ordering and delivery systems were more capable of continuing sales beyond physical stores. Participants also reported that transaction histories allowed them to respond more quickly to sales fluctuations. They could reduce inventory, adjust promotion, or delay non-essential expenditure when revenue declined.

Adaptive Capability

FinTech adoption enhanced the adaptive capability of MSMEs by encouraging owners to learn new technologies, redesign transaction processes, and integrate digital tools into business operations. This capability was particularly evident among entrepreneurs who gradually expanded from basic payment adoption to digital bookkeeping, online sales, and data-based financial planning.

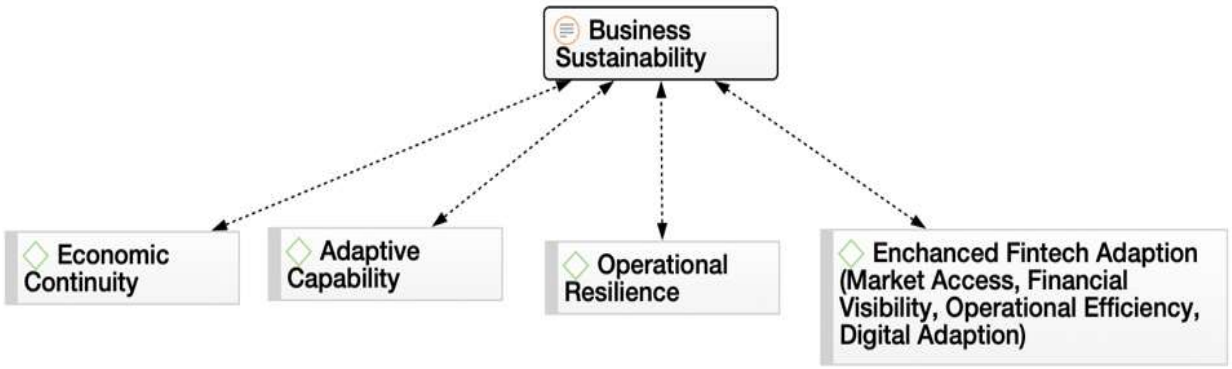

Figure 5. Contribution of FinTech Adoption to the Sustainability of MSME Businesses

The thematic analysis results in Figure 5 show that FinTech adoption contributes to business sustainability through four main channels: economic sustainability, adaptive capacity, operational resilience, and strengthening FinTech adoption, reflected in expanded market access, improved financial visibility, operational efficiency, and digital adaptation. FinTech helps MSMEs maintain revenue continuity by providing a wider range of payment options, supporting sales through digital channels, and expanding consumer reach beyond physical business locations. Furthermore, digital transaction recording improves business owners' ability to monitor cash flow and make faster decisions, while the integration of digital payments, marketplaces, and delivery services strengthens operational resilience when in-person transactions experience disruptions. These findings (Yuliawati et al., 2025; Zaid et al., 2025) that the adoption of FinTech and digital payment systems can improve financial performance and support business sustainability, and (Sinuhaji et al., 2024; Nugraheni et al., 2024; Prathima et al., 2026) that FinTech utilization strengthens MSME efficiency, growth, and resilience. Febriyani et al. (2024) also explained that FinTech plays a role in the digital transformation of MSMEs by increasing financial inclusion, operational efficiency, access to financing, and market expansion.

Comparison between Jakarta and Bogor MSMEs

The thematic comparison indicated several contextual differences between MSMEs in Jakarta and Bogor. Jakarta-based MSMEs generally demonstrated higher levels of digital payment intensity and stronger integration with online marketplaces and delivery platforms. Their main concerns involved platform commissions, competitive pressure, and declining profit margins. Bogor-based MSMEs showed more variation in their level of digital adoption. Businesses located near urban centres actively used QRIS, mobile banking, and online marketplaces, while those in less connected areas experienced infrastructure limitations and unstable internet access. Bogor participants also reported stronger dependence on informal learning networks, including family members, communities, and local government training. Despite these differences, MSMEs in both regions shared similar concerns regarding fraud, data security, financial literacy, and digital debt. Both groups viewed FinTech as necessary for business development but emphasised that its use required stronger financial discipline and risk awareness.

Thematic Model of FinTech Adoption and MSME Sustainability

Based on the analysis, the findings produced a thematic model consisting of four interconnected processes. First, external and internal pressures encouraged FinTech adoption. External pressures included customer demand, competition, and digital market development, while internal pressures included the need for transaction

efficiency, capital, and financial control. Second, FinTech adoption generated financial opportunities through faster transactions, broader market access, financial records, and digital financing. Third, adoption simultaneously created financial and digital risks, including transaction costs, fraud, technological dependence, and repayment pressure. Fourth, the effect of FinTech on business sustainability was determined by balancing capabilities, particularly digital financial literacy, financial discipline, security practices, and risk-management strategies.

The model indicates that FinTech adoption is not a linear pathway to business sustainability. Instead, it represents a dynamic balancing process in which MSME owners continuously evaluate financial benefits, costs, technological risks, and business needs. Business sustainability is more likely to be achieved when FinTech adoption is supported by financial capability, digital literacy, diversified payment systems, and responsible borrowing practices.

CONCLUSION

This study concludes that FinTech adoption among MSMEs in Jakarta and Bogor is not merely a technological choice, but an adaptive response to changing customer preferences, competitive pressures, and the growing integration of digital platforms into business activities. The findings identified five interconnected themes: FinTech adoption drivers, financial opportunities, financial and digital risks, balancing strategies, and business sustainability. FinTech supports MSMEs through faster transactions, improved customer convenience, broader market access, better financial records, cash-flow visibility, and alternative financing. However, these benefits are accompanied by transaction costs, platform dependence, system disruptions, fraud, data-security concerns, and digital debt pressures. The experience of MSMEs also differs contextually, with Jakarta businesses showing stronger platform integration and Bogor businesses facing greater variation in infrastructure and digital readiness.

The study further confirms that FinTech adoption does not automatically lead to business sustainability. Its contribution depends on MSMEs' ability to balance opportunities and risks through digital financial literacy, transaction verification, separation of business and personal finances, controlled borrowing, payment-channel diversification, and continuous learning. When FinTech is supported by financial discipline and risk-management capabilities, it strengthens economic continuity, operational resilience, adaptive capability, and long-term business survival. Therefore, MSME owners, financial institutions, FinTech providers, and government agencies should collaborate in providing practical digital-financial education, secure infrastructure, responsible financing mechanisms, and contextual assistance suited to metropolitan, urban, and regency business environments.

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