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BUILDING A TRUSTED AND RISK-RESILIENT DIGITAL FINANCIAL ECOSYSTEM: A GOVERNANCE FRAMEWORK FOR MSME SCALING IN INDONESIA

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Abstract

Digital transformation has created new opportunities for micro, small, and medium enterprises (MSMEs) to expand access to finance, reach wider markets, and improve business efficiency through digital financial services. At the same time, the rapid adoption of digital technologies has introduced new challenges, including digital fraud, cyber threats, data misuse, platform dependency, and emerging risks associated with artificial intelligence. These developments suggest that the success of MSME digitalization depends not only on technological advancement and financial access but also on the level of trust and resilience within the digital financial ecosystem. This study develops a governance framework to support the creation of a trusted and risk-resilient digital financial ecosystem that enables sustainable MSME scaling in Indonesia. The study adopts a qualitative conceptual approach based on a comprehensive literature review, thematic analysis, and the synthesis of academic studies, policy documents, and institutional reports. The findings indicate that trust and risk resilience play a pivotal role in linking the digital financial ecosystem to MSME growth and long-term sustainability. Building on these findings, the study proposes the ***Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework)****, which comprises five interrelated pillars: digital trust governance; cyber and operational resilience governance; data governance and responsible AI; consumer protection and capability governance; and collaborative ecosystem governance. The framework offers a conceptual foundation and practical policy guidance for regulators, financial institutions, and other stakeholders seeking to build a secure, inclusive, and sustainable digital financial ecosystem that supports MSME development.*

Keywords: *digital financial ecosystem; governance; trust; risk resilience; MSMEs; financial system stability.*

1. INTRODUCTION

Digital transformation has changed the way people, firms, and financial institutions interact. The internet, cloud computing, artificial intelligence, big data, digital platforms, and financial technology have created new ways of producing, transacting, and generating economic value. In an increasingly connected and data-driven environment, the ability to adapt to technology has become an important factor shaping business competitiveness. For micro, small, and medium enterprises (MSMEs), this shift creates opportunities to overcome long-standing barriers to growth, such as limited market access, high transaction costs, and information gaps. E-commerce platforms allow businesses to reach wider markets. Social media provides a relatively low-cost marketing channel. Meanwhile, various digital applications help MSMEs manage inventory, customers, and finances more efficiently.

In Indonesia, digital transformation has strategic importance because MSMEs form the backbone of the national economy. Even so, many MSMEs still face limited access to formal

financing, weak managerial capacity, and low levels of technology adoption. Digitalization is therefore increasingly seen as an instrument to improve productivity, expand markets, and strengthen business capacity. In line with this agenda, the government has placed MSME digitalization as an important part of economic development through the strengthening of digital infrastructure, the development of digital talent, and broader access to digital financial services (UKM Center FEB UI, 2023). However, MSME transformation should not be understood merely as a process of technology adoption by individual business actors. MSMEs now operate within networks that involve digital platforms, financial institutions, technology providers, regulators, and various supporting institutions. As a result, the success of MSMEs is increasingly shaped by the quality of the digital ecosystem in which they operate.

One of the most important developments in the digital economy is the emergence of the digital financial ecosystem. This ecosystem connects financial institutions, fintech firms, payment system providers, digital platforms, technology companies, regulators, and other supporting institutions in the provision of technology-based financial services. According to IFC (2025), digitalization has changed the way MSMEs access financial services. In the past, relationships with financial institutions mainly took place through bank branches. Today, many services can be accessed through digital applications, e-commerce platforms, and financial services embedded directly into everyday business activities. This development has made the boundary between the financial and non-financial sectors increasingly blurred.

These developments have also changed the way financial institutions understand and serve MSMEs. Digital payments and electronic transactions generate data trails that can be used to understand business profiles, assess credit risk, and develop financial services that are more closely aligned with user needs. IFC (2025) shows that the use of alternative data enables financial institutions to reduce traditional barriers, such as limited collateral, the absence of formal financial statements, and weak credit histories. In addition, innovations such as digital lending, digital banking, open finance, supply chain finance, embedded finance, and alternative credit scoring have expanded financing options for MSMEs. The IFC-GPFI (2023) report shows that these innovations not only broaden access to finance but also improve the efficiency of financial service delivery. At the same time, various platforms and financial institutions also provide non-financial services, including training, business mentoring, financial management, and digital marketing support, which help strengthen business capacity. In this sense, the digital financial ecosystem serves not only as a financing channel but also as an infrastructure that supports MSME growth and scaling.

However, the growing reliance on digital technologies and services has also introduced a range of new risks. As business activities become increasingly dependent on digital connectivity, MSMEs are more vulnerable to digital fraud, identity theft, data breaches, cyberattacks, platform misuse, and operational disruptions caused by failures in digital infrastructure. The consequences extend beyond financial losses. Such incidents can damage business reputations and undermine customer confidence. Among the fastest-growing threats is digital fraud, which exploits phishing, social engineering, account takeover, impersonation, and other forms of digital manipulation. These vulnerabilities are particularly pronounced among MSMEs, many of which lack the resources and cybersecurity capabilities needed to protect themselves effectively.

Beyond cybercrime, the digital economy also gives rise to broader risks, including misinformation, disinformation, reputational manipulation, and other forms of digital harm. Haugh (2023) argues that the expanding use of digital platforms in economic activities has created new forms of information-related vulnerabilities and reputational risks. Heavy reliance

on a limited number of digital platforms may also create platform dependency risk, making MSMEs more exposed to changes in platform policies, operational disruptions, and unequal bargaining power (Wardoyo, 2025). At the same time, advances in artificial intelligence (AI) have further expanded this spectrum of risk. On the one hand, AI improves operational efficiency and enables more personalized services. On the other hand, it introduces new challenges related to cybersecurity, data privacy, algorithmic transparency, and accountability in automated decision-making (Maturbongs, 2025). The success of MSME digital transformation therefore depends not only on the adoption of new technologies but also on the ecosystem's capacity to manage the risks that accompany them.

Against this backdrop, trust has become a fundamental condition for the sustainable use of digital financial services. Unlike conventional transactions, which often rely on face-to-face interactions, digital transactions depend on users' confidence that the underlying technologies, institutions, and governance mechanisms operate in a secure, reliable, and fair manner (McKnight et al., 2002; Kim et al., 2008). For MSMEs, trust shapes decisions to adopt digital payments, digital banking, fintech services, and other platform-based financial solutions. IFC (2025) shows that confidence in service providers, perceptions of transaction risk, and beliefs about system security are among the key factors influencing digital maturity and the adoption of digital financial services by MSMEs. In this context, trust extends beyond transaction security. It also encompasses confidence in the institutions that govern the system, the organizations that provide financial services, and the protection mechanisms available to users (McKnight et al., 2002; Kim et al., 2008). Conversely, fraud, data breaches, system failures, and weak consumer protection can erode trust and reduce the benefits expected from digitalization (Acquisti et al., 2016; Arner et al., 2024).

Trust does not emerge automatically. The increasing integration of digital financial services highlights that the success of MSME digitalization depends not only on access to technology or finance but also on the quality of governance that shapes relationships among actors within the ecosystem. In an environment involving regulators, banks, fintech firms, digital platforms, technology providers, and millions of MSMEs, governance plays a central role in ensuring security, transparency, accountability, and the long-term sustainability of innovation (Jacobides et al., 2018; Tiwana et al., 2010). Previous studies have shown that weak data protection, limited algorithmic transparency, fragmented oversight, and unclear accountability can increase risk while weakening user trust (Acquisti et al., 2016; Martin, 2018; Arner et al., 2024). By contrast, effective governance strengthens trust and enhances the ecosystem's capacity to anticipate, withstand, and recover from a wide range of disruptions. Trust and risk resilience are therefore inseparable from the quality of governance underpinning the digital financial ecosystem.

Although the literature on MSME digitalization, fintech, financial inclusion, and digital literacy has grown rapidly, an important research gap remains. Most existing studies examine access to finance, technology adoption, or digital literacy as separate issues (Arner et al., 2016; Gomber et al., 2017; Ozili, 2017). Other studies have emphasized the role of digital financial literacy and digital readiness in supporting MSME transformation (OECD, 2023; Andriansyah, 2025; Widari, 2025). However, relatively few studies have integrated governance, trust, risk resilience, and MSME scaling within a single conceptual framework. Yet trust and resilience do not develop in isolation. They emerge through interactions among institutions, regulations, technologies, digital platforms, data, and oversight mechanisms that collectively shape the digital financial ecosystem (Jacobides et al., 2018; Duchek, 2020; Arner et al., 2024). This gap

has become increasingly important as the rapid growth of digital fraud, cyber threats, data misuse, and platform dependency may discourage MSME participation in the digital economy and weaken the effectiveness of financial inclusion initiatives (Haugh, 2023; Houtti et al., 2024; Maturbongs, 2025).

Against this background, this study examines how governance can foster trust and strengthen risk resilience within the digital financial ecosystem to support sustainable MSME scaling in Indonesia. As its primary conceptual contribution, the study develops the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework), which positions governance as the institutional foundation for building trust and risk resilience across the digital financial ecosystem. Unlike most previous studies, which primarily focus on access to finance or technology adoption, this study argues that successful MSME scaling is shaped by the interaction between governance quality, the level of trust, and the ecosystem's capacity to manage digital risks. The proposed framework seeks to enrich the literature on digital financial ecosystems while offering policy insights for regulators, financial institutions, fintech companies, and other stakeholders committed to building a secure, inclusive, and sustainable digital ecosystem.

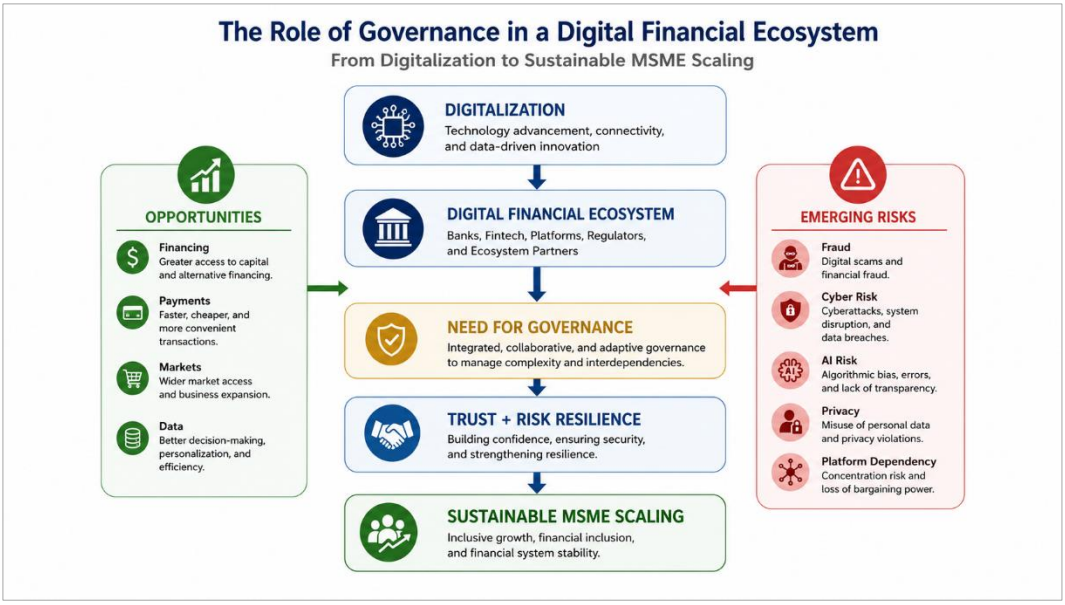

Figure 1. The role of governance in a digital financial ecosystem
Source: Developed by the authors based on Jacobides et al. (2018), Arner et al. (2025), Duchek (2020), Goldfarb and Tucker (2019), Ozili (2018), and related literature..

Figure 1 presents the conceptual foundation of this study. The framework illustrates that the digital financial ecosystem provides the institutional environment in which MSMEs interact with financial institutions, fintech companies, digital platforms, regulators, and other supporting actors. Within this ecosystem, governance functions as the primary institutional mechanism that shapes the quality of digital trust and strengthens the ecosystem's capacity to manage a wide range of digital risks. Rather than treating governance solely as a regulatory function, the framework conceptualizes it as an integrated system that promotes secure digital transactions, protects data, strengthens cybersecurity, supports responsible AI, enhances consumer capability,

and encourages collaboration among ecosystem participants. Through these governance mechanisms, trust and risk resilience emerge as strategic capabilities that enable the digital financial ecosystem to operate in a secure, reliable, and sustainable manner.

The framework further proposes that higher levels of trust and stronger risk resilience create conditions that enable MSMEs to make greater use of digital financial services, improve business performance, and achieve sustainable scaling. In this perspective, governance does not influence MSME development directly. Instead, its effects are transmitted through the creation of a trusted and resilient digital financial ecosystem that reduces uncertainty, mitigates digital risks, and encourages broader participation in digital finance. Accordingly, the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework) positions trust and risk resilience as the central mechanisms linking governance quality to sustainable MSME growth within Indonesia's evolving digital economy.

2. LITERATURE REVIEW

2.1 Digital Financial Ecosystem

Digital transformation has changed the way financial services are produced, distributed, and used by both individuals and business actors. Digitalization is no longer understood merely as the use of technology to improve the efficiency of conventional financial services. It is increasingly seen as a process that creates networks connecting various actors through data, platforms, and digital infrastructure (Arner et al., 2016; Goldfarb & Tucker, 2019). In this environment, economic interactions take place with lower transaction costs, lower search costs, and lower coordination costs. This, in turn, enables the development of new business models and new forms of financial services.

Recent literature views the digital financial ecosystem as a system composed of interdependent actors that jointly create value. This perspective is consistent with the ecosystem theory developed by Jacobides et al. (2018), which explains that ecosystems emerge through complementary relationships among organizations that coordinate without being placed under a single hierarchical structure. In the context of digital finance, these actors include banks, fintech firms, payment system providers, digital platforms, telecommunications operators, regulators, digital identity providers, cybersecurity companies, investors, and end users.

Tiwana et al. (2010) emphasize that the success of a digital ecosystem is strongly shaped by the relationship between platforms, governance, and the external environment. Platforms provide the foundation for interaction and innovation, while governance determines how rights, obligations, and coordination mechanisms are arranged. The value generated within an ecosystem therefore does not come only from the capability of a single organization. It also depends on the effectiveness of collaboration among all actors involved.

In the financial sector, the development of digital payment systems has become a key catalyst in the formation of such ecosystems. According to Arner et al. (2024), the digital payment ecosystem functions as an infrastructure that connects financial services and economic activities through continuous data flows. A digital financial ecosystem can therefore be understood as a socio-economic infrastructure that integrates technology, data, institutions, and financial services within an interconnected network. The higher the level of connectivity, the greater the need for governance mechanisms that can safeguard the ecosystem’s security, trust, and long-term sustainability.

2.2 Digital Finance and MSME Scaling

MSMEs play an important role in job creation, economic growth, and the distribution of welfare. However, many studies show that limited access to finance remains one of the main barriers to the growth of small and medium-sized enterprises. In this context, digital finance offers a new approach to expanding access to financial services while reducing the barriers embedded in traditional financial systems (Arner et al., 2016; Gomber et al., 2017).

The literature shows that digital finance enables financial services to be delivered in a faster, more flexible, and lower-cost manner. The use of mobile banking, fintech lending, digital payments, embedded finance, and other innovations expands opportunities for MSMEs to access financing without relying entirely on conventional credit mechanisms. Yofy Syarkani (2025) shows that the use of alternative data and digital technology enables financial institutions to reach business groups that previously faced difficulties in accessing formal credit.

Beyond expanding access to finance, digital finance also creates new sources of information that can reduce information asymmetry between providers and users of financial services. Arner et al. (2024) explain that digital transaction activities generate data trails that can be used to understand business profiles, assess credit risk, and improve the quality of financial decision-making. In this sense, digitalization contributes to the development of a more inclusive and data-driven financing system.

Several empirical studies show that the use of digital financial services is positively associated with improved business performance. Zaragoza & Pramesti (2025) found that digital financial inclusion strengthens the relationship between financial literacy and MSME performance. Similar findings were reported by Zaragoza and Pramesti (2025), who show that the benefits of financial literacy become greater when business actors are able to use digital services effectively. Nevertheless, various studies also indicate that the success of digital finance is not determined solely by the availability of technology. Digital literacy, organizational readiness, governance quality, consumer protection, and user trust also shape the extent to which the benefits of digitalization can be translated into sustainable business growth (IFC-GPFI, 2023; Arner et al., 2024).

2.3 Trust in Digital Financial Ecosystems

Trust has long been recognized as one of the fundamental conditions for economic exchange, particularly in environments characterized by uncertainty and information asymmetry. In digital financial services, trust becomes even more important because transactions take place without direct physical interaction between service providers and users. Instead, users must rely on digital technologies, automated systems, and institutions that operate behind the platform (McKnight et al., 2002; Kim et al., 2008).

McKnight et al. (2002) conceptualize trust as a multidimensional construct comprising trusting beliefs and trusting intentions. Trusting beliefs refer to users' perceptions of a service provider's competence, integrity, and benevolence, whereas trusting intentions reflect users' willingness to rely on that provider despite the inherent uncertainty of digital transactions. Building on this perspective, Kim et al. (2008) propose that trust is shaped by a combination of perceived benefits, perceived risks, institutional assurances, and users' previous experiences. Together, these dimensions explain why individuals decide to adopt or reject digital financial services.

Within the digital financial ecosystem, trust extends beyond confidence in individual service providers. It also encompasses trust in the broader institutional environment, including

regulatory frameworks, payment infrastructures, data governance arrangements, cybersecurity measures, and consumer protection mechanisms. As financial services become increasingly interconnected through digital platforms, trust evolves into a systemic attribute that depends on the performance and reliability of the ecosystem as a whole rather than on any single institution (Arner et al., 2024).

For MSMEs, trust strongly influences decisions to adopt digital payments, digital banking, fintech lending, and other technology-enabled financial services. IFC-GPFI (2023) reports that confidence in digital service providers, perceptions of transaction security, and trust in institutional safeguards are among the key factors shaping the adoption of digital financial services by MSMEs. Conversely, repeated incidents of fraud, data breaches, cyberattacks, or service failures can undermine confidence, discourage digital participation, and reduce the potential benefits of digital transformation. Trust should therefore be viewed not only as an outcome of effective governance but also as a strategic asset that supports the long-term sustainability of the digital financial ecosystem.

2.4 Digital Risks and MSME Vulnerability

While digitalization creates new opportunities for MSMEs, it also exposes them to a growing range of digital risks. The increasing integration of financial services with digital platforms has expanded the number of potential entry points for fraud, cyberattacks, operational failures, and data misuse. As a result, digital risks have become an integral part of the digital financial ecosystem and can no longer be treated as isolated technological issues.

Cybersecurity has become one of the most pressing concerns in this environment. Wang et al. (2022) argue that the rapid expansion of digital connectivity has significantly increased the complexity of cyber threats affecting both public and private organizations. Cyber risks now extend beyond technical attacks on information systems to include ransomware, phishing, identity theft, account takeover, malware, and social engineering. Because many MSMEs have limited cybersecurity capabilities, they are often more vulnerable than larger firms to these forms of attack.

In addition to cybersecurity threats, the digital financial ecosystem also faces risks related to data governance and privacy protection. Acquisti et al. (2016) argue that the growing use of personal and transactional data creates a trade-off between economic efficiency and individual privacy. As digital financial services increasingly rely on large volumes of user data, concerns regarding data ownership, informed consent, transparency, and responsible data use have become central governance issues. Weak data governance can reduce user confidence and discourage participation in digital financial services.

The rapid adoption of artificial intelligence has further broadened the spectrum of digital risks. AI enables financial institutions to automate decision-making, improve fraud detection, personalize financial services, and enhance operational efficiency. At the same time, AI introduces new governance challenges related to algorithmic bias, explainability, accountability, and ethical decision-making (Koroye, 2025). When AI systems operate without sufficient transparency or oversight, they may produce unfair outcomes, reinforce existing inequalities, or reduce public trust in digital financial services.

Another important challenge is the growing dependence on digital platforms. As more MSMEs conduct their business activities through e-commerce platforms, digital payment providers, and integrated financial applications, they become increasingly exposed to platform dependency risk. Wardoyo (2025) explains that excessive reliance on dominant platforms may

reduce business autonomy, increase switching costs, and create asymmetric bargaining relationships between platform operators and MSMEs. These conditions may ultimately weaken the resilience of MSMEs and increase systemic vulnerabilities within the broader digital financial ecosystem.

Taken together, these risks demonstrate that the sustainability of digital finance depends not only on technological innovation but also on the ecosystem's capacity to anticipate, manage, and recover from a wide range of disruptions. Risk resilience therefore becomes a strategic capability that enables the digital financial ecosystem to maintain public trust, protect economic actors, and sustain long-term digital transformation.

2.5 Governance, Trust, and Risk Resilience in Digital Financial Ecosystems

As digital financial ecosystems become increasingly complex, governance has emerged as a key determinant of their sustainability. Governance extends beyond regulatory compliance. It encompasses the institutional arrangements, coordination mechanisms, and accountability structures that shape interactions among regulators, financial institutions, fintech firms, technology providers, digital platforms, and users. Effective governance establishes the conditions under which innovation can develop while ensuring that digital risks remain manageable and public trust is maintained.

The ecosystem perspective provides a useful foundation for understanding this role. Jacobides et al. (2018) argue that ecosystems require governance mechanisms capable of coordinating complementary actors whose objectives, capabilities, and incentives may differ. Unlike conventional hierarchical organizations, digital ecosystems rely on distributed coordination, shared standards, and mutually reinforcing institutional arrangements. Consequently, governance must not only regulate individual organizations but also strengthen relationships across the ecosystem as a whole.

The platform governance perspective proposed by Tiwana et al. (2010) further highlights that governance determines how digital platforms balance innovation with stability. Appropriate governance mechanisms define participation rules, allocate decision rights, manage data, and establish responsibilities among ecosystem participants. In digital financial ecosystems, these functions become increasingly important because financial services depend on continuous interactions among payment systems, financial institutions, technology providers, and digital platforms. Weak governance may therefore amplify systemic risks, whereas effective governance enhances coordination and improves the ecosystem's ability to respond to disruption.

Recent studies also emphasize the close relationship between governance, trust, and resilience. Duchek (2020) conceptualizes organizational resilience as a dynamic capability that enables organizations to anticipate, cope with, and adapt to unexpected disruptions. Applied to digital financial ecosystems, this perspective suggests that resilience should be understood not merely as technical robustness but as an institutional capability supported by governance, collaboration, learning, and adaptive capacity. At the ecosystem level, resilience depends on the collective ability of interconnected actors to respond to technological, operational, and institutional shocks while maintaining essential financial functions.

Trust and resilience are therefore mutually reinforcing. Trust encourages greater participation in digital financial services, while effective governance strengthens the ecosystem's capacity to manage risks and preserve that trust over time. Conversely, weak governance may increase cyber vulnerabilities, reduce institutional credibility, and undermine confidence in digital financial services. Building a trusted and risk-resilient digital financial ecosystem

therefore requires governance arrangements that integrate cybersecurity, data governance, responsible AI, consumer protection, institutional coordination, and continuous oversight into a coherent policy framework.

2.6 Research Framework

Drawing on the preceding literature, this study argues that the sustainable scaling of MSMEs depends not only on technological innovation or improved access to finance. It also depends on the quality of governance that shapes trust and strengthens risk resilience throughout the digital financial ecosystem. Existing studies have generally examined digital finance, financial inclusion, digital literacy, trust, or governance as separate research streams. Relatively limited attention has been given to explaining how these elements interact within a single conceptual framework that supports sustainable MSME development.

To address this gap, this study develops the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework). The framework positions governance as the institutional foundation for creating an ecosystem that is both trusted and resilient. Rather than viewing trust solely as an individual perception or resilience solely as a technical capability, the framework conceptualizes both as systemic outcomes generated through effective governance across the digital financial ecosystem.

The framework comprises five interrelated governance pillars. The first is digital trust governance, which strengthens institutional credibility, transparency, accountability, and confidence in digital financial services. The second is cyber and operational resilience governance, which enhances the ecosystem's capacity to anticipate, withstand, and recover from cyber incidents and operational disruptions. The third is data governance and responsible AI, which promotes secure data management, ethical AI deployment, transparency, and accountability in automated decision-making. The fourth is consumer protection and capability governance, which improves digital financial literacy, consumer empowerment, and user protection. The fifth is collaborative ecosystem governance, which reinforces coordination, shared responsibility, and policy alignment among regulators, financial institutions, fintech companies, technology providers, and other ecosystem participants.

Collectively, these five pillars create institutional conditions that foster trust while strengthening the ecosystem's ability to manage digital risks. The framework therefore proposes that governance influences MSME scaling indirectly through the development of a trusted and risk-resilient digital financial ecosystem. Figure 2 illustrates the conceptual relationships underlying the proposed framework and provides the theoretical foundation for the analysis presented in this study.

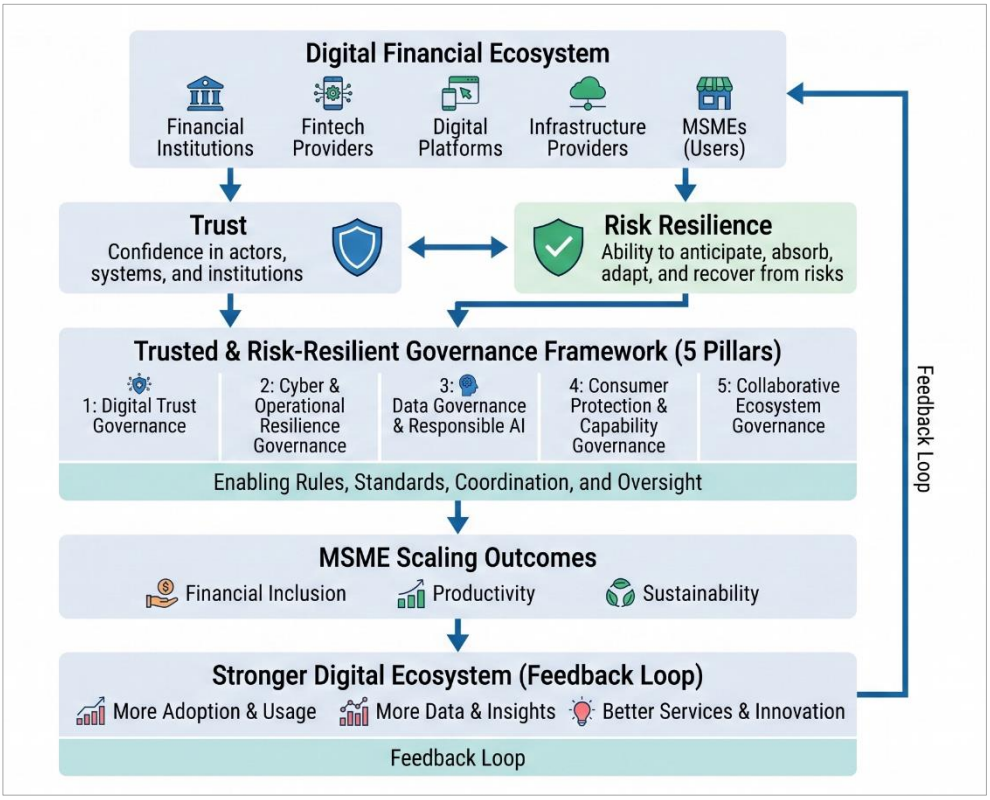

Figure 2. Conceptual Framework: Trusted and Risk-Resilient Digital Financial Ecosystem for MSME Scaling

Source: Developed based on the synthesis of Arner et al. (2025), Jacobides et al. (2018), Duchek (2020), Ozili (2018), Gomber et al. (2017), McKnight et al. (2002), Kim et al. (2008), Acquisti et al. (2016), and related literature.

Figure 2 presents the conceptual foundation of the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework) developed in this study. The framework integrates insights from the literature on digital financial ecosystems, ecosystem governance, trust, organizational resilience, and digital finance. It illustrates that the digital financial ecosystem serves as the institutional environment in which MSMEs interact with financial institutions, fintech firms, digital platforms, technology providers, regulators, and other supporting actors. Within this environment, governance functions as the institutional mechanism that shapes trust while strengthening the ecosystem's capacity to anticipate, manage, and recover from digital risks. Accordingly, governance is positioned not merely as a regulatory instrument but as the foundation for creating a secure, reliable, and sustainable digital financial ecosystem.

The framework further proposes that effective governance is reflected in five mutually reinforcing pillars: digital trust governance, cyber and operational resilience governance, data governance and responsible AI, consumer protection and capability governance, and collaborative ecosystem governance. Together, these pillars create institutional conditions that foster trust, enhance resilience, and support the responsible development of digital financial services. As trust grows and the ecosystem becomes more resilient, MSMEs are more likely to adopt digital financial services, expand their business activities, improve productivity, and achieve sustainable scaling. The framework therefore suggests that governance contributes to

MSME development indirectly by strengthening trust and risk resilience across the digital financial ecosystem. In this way, the TRR-DFEG Framework provides an integrated conceptual perspective for understanding how governance can support secure, inclusive, and sustainable digital transformation for MSMEs in Indonesia.

3. METHODOLOGY

3.1 Research Design

This study adopts a qualitative research design with a conceptual and policy-oriented approach to examine the role of governance in building a trusted and risk-resilient digital financial ecosystem that supports the sustainable scaling of MSMEs in Indonesia. This approach was selected because the phenomenon under investigation involves multiple interrelated dimensions, including digital finance, governance, trust, risk resilience, and financial system stability.

Unlike empirical studies that focus on testing causal relationships using primary data, this research seeks to develop a conceptual synthesis that explains how governance influences the quality of the digital financial ecosystem. The study also emphasizes policy implications related to regulatory coordination, consumer protection, and ecosystem resilience in supporting MSME development.

3.2 Data Sources

The study draws on secondary data from academic literature, policy reports, regulatory documents, and publications issued by international organizations relevant to digital finance, MSME development, governance, trust, risk management, and financial system stability.

Academic sources include peer-reviewed journal articles on digital financial ecosystems, fintech, trust, ecosystem governance, organizational resilience, cybersecurity, and MSME development, including the works of Jacobides et al. (2018), Tiwana et al. (2010), McKnight et al. (2002), Ozili (2018), Duchek (2020), Goldfarb and Tucker (2019), and Arner et al. (2016, 2024). To strengthen the policy perspective, the study also draws on publications from the Financial Services Authority (OJK), Bank Indonesia, the OECD, IFC, CGAP, ADBI, IBC, and other international organizations. Combining these sources enables the triangulation of academic insights with policy perspectives.

3.3 Secondary Evidence Analysis

The analysis is supported by descriptive contextual evidence drawn from secondary data. The data include indicators reflecting developments in the digital financial ecosystem, MSME digitalization, the adoption of digital payment systems, financial inclusion, cybersecurity risks, digital fraud, and financial system stability. These indicators were obtained from credible national and international institutions, including Bank Indonesia, the Financial Services Authority (OJK), Statistics Indonesia (BPS), the World Bank, the OECD, the Asian Development Bank (ADB), the International Finance Corporation (IFC), CGAP, as well as relevant industry reports and policy publications.

The purpose of incorporating secondary evidence is to provide empirical illustration and contextual support for the conceptual framework developed in this study. The selected indicators are used to identify emerging trends, opportunities, and challenges associated with MSME digitalization. They also illustrate how the expansion of digital financial access has been

accompanied by increasing exposure to new forms of risk, including digital fraud, cyber threats, data misuse, and platform dependency. In this way, the secondary evidence serves as a bridge between the conceptual literature and policy realities, ensuring that the proposed framework is grounded not only in theory but also in the evolving empirical context and governance needs of Indonesia's digital financial ecosystem.

3.4 Analytical Approach

The analysis was conducted in three stages. First, a narrative literature review was used to identify and synthesize studies on digital financial ecosystems, MSME scaling, trust, digital risks, governance, and financial system stability. This approach was chosen because the study aims to build an integrated conceptual understanding rather than to statistically aggregate empirical findings.

Second, thematic analysis was applied to identify the main themes emerging from the literature and policy documents. This process generated several key themes, namely the digital financial ecosystem, trust formation, digital risks, data governance, consumer protection, ecosystem resilience, and governance coordination.

Third, the results of the literature synthesis and thematic analysis were integrated into a conceptual framework referred to as the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework). The framework was developed through an abductive logic that connects theoretical insights from the literature with policy realities in Indonesia’s evolving digital financial ecosystem.

3.5 Research Framework

This study proposes that the relationship between the digital financial ecosystem and MSME scaling is mediated by trust and risk resilience, both of which are shaped by effective governance. Governance serves as the institutional foundation that encompasses regulation, supervision, consumer protection, data governance, cybersecurity, and coordination among stakeholders.

Effective governance is expected to strengthen user trust while also improving the ecosystem’s capacity to anticipate, withstand, and recover from digital risks. Under these conditions, MSMEs are more likely to operate in an environment that enables them to use digital financial services, improve productivity, and achieve sustainable scaling. At a broader level, this process contributes to greater financial inclusion and financial system stability.

4. RESULTS AND DISCUSSION

4.1 Digital Financial Ecosystems as Enablers of MSME Scaling

Digital transformation has created new opportunities for MSMEs to access financing, expand their markets, and improve business efficiency. In practice, MSME growth is no longer shaped only by the availability of capital or access to physical markets. It is also influenced by the ability of firms to connect with increasingly integrated financial services and digital platforms. For this reason, the digital financial ecosystem has become an important factor in supporting business scaling.

In Indonesia, the growth of the internet, smartphones, QRIS, mobile banking, e-wallets, and various fintech services has expanded MSME access to financial services that were

previously difficult to reach. Beyond facilitating transactions, the use of digital services also generates data that can strengthen business management and broaden access to financing.

Several studies show that digital finance contributes positively to MSME growth. Zaragoza and Pramesti (2025) found that the benefits of financial literacy and financial access become greater when business actors are able to use digital technology in their business activities. This finding suggests that digitalization is not merely a transaction tool. It also strengthens the capacity of firms to grow.

This development has also changed the way financial institutions assess business feasibility. In the past, access to credit depended heavily on collateral and formal credit histories. Today, digital transaction data are increasingly used as a basis for risk assessment. According to IFC (2025), digital payments, e-commerce activities, and the use of business applications generate information that can help expand financing access for MSMEs that were previously underserved by the formal financial system.

Beyond financing, the digital ecosystem also improves operational efficiency through electronic payments, better transaction records, and integration with logistics and digital commerce services. Innovations such as embedded finance, supply chain finance, and digital merchant services further expand financing options while helping MSMEs manage their cash flow more effectively (IFC, 2025).

Thus, the digital financial ecosystem supports MSME scaling through four main pathways: expanding access to finance, improving business efficiency, widening market access, and using data as a source of economic value creation. However, these benefits do not arise automatically. Infrastructure quality, digital literacy, and trust in the system remain important factors that determine the extent to which digitalization can be translated into sustainable business growth (UNDP, 2025).

4.2 Trust Deficits in Indonesia's Digital Financial Ecosystem

Although digital financial services continue to expand rapidly in Indonesia, the development of a trusted digital financial ecosystem remains a major challenge. The growing adoption of digital payments, fintech services, and platform-based financial solutions has not always been accompanied by a corresponding increase in public confidence. For many MSMEs, decisions to use digital financial services depend not only on convenience and accessibility but also on their confidence that these services are secure, reliable, and adequately protected against potential risks.

Trust within a digital financial ecosystem is shaped by multiple factors. At the individual level, users evaluate transaction security, the reliability of service providers, and the perceived protection of their personal data. At the institutional level, trust depends on the effectiveness of regulations, supervisory mechanisms, consumer protection arrangements, and the accountability of ecosystem participants. Weaknesses in any of these dimensions can reduce confidence in digital financial services and discourage broader adoption by MSMEs.

Recent developments indicate that digital fraud, cyber incidents, data breaches, and the misuse of digital platforms continue to undermine public trust. The increasing sophistication of phishing attacks, account takeovers, identity theft, social engineering, and other forms of digital manipulation demonstrates that technological innovation alone is insufficient to ensure a trusted digital environment. Even when financial losses are relatively limited, repeated security incidents can weaken users' confidence and slow the adoption of digital financial services.

Similar patterns have been observed internationally, where scam victimization has been shown to reduce consumer trust and discourage participation in digital finance.

For MSMEs, declining trust has implications that extend beyond individual transactions. Lower confidence in digital financial services may discourage investment in digital business models, reduce the use of digital payment systems, and limit access to technology-enabled financing. As a result, the potential contribution of digital finance to MSME scaling may not be fully realized.

These findings suggest that trust should not be regarded solely as an individual perception or behavioural outcome. Rather, it represents a systemic characteristic of the digital financial ecosystem that reflects the quality of governance, institutional coordination, and risk management. Building and maintaining trust therefore requires an integrated governance approach that combines effective regulation, strong consumer protection, robust cybersecurity, responsible data governance, and clear institutional accountability. Only under these conditions can the digital financial ecosystem provide a stable foundation for sustainable MSME growth.

4.3 Emerging Risks Facing MSMEs in the Digital Ecosystem

Digitalization has created new opportunities for MSMEs, but it has also introduced a range of risks that were previously uncommon for small businesses. An increasing share of business activities now depends on digital platforms, electronic payments, data-driven services, and internet connectivity. While this dependence improves efficiency, it also expands the number of vulnerabilities that may disrupt business continuity.

One of the most visible threats is the growing prevalence of digital fraud. Phishing, social engineering, impersonation, and account takeover increasingly exploit human behaviour rather than technological weaknesses alone. Houtti et al. (2024) describe digital scams as a global phenomenon that has become more sophisticated, coordinated, and difficult to detect. For MSMEs, the consequences extend beyond financial losses. Fraud can also erode customer confidence and interrupt day-to-day business operations.

Cybersecurity has likewise become an increasingly critical concern. Many MSMEs adopt digital technologies without possessing adequate cybersecurity capabilities. Wang et al. (2022) argue that small businesses are generally more vulnerable to cyberattacks because of limited financial resources, technical expertise, and risk management capacity. In a highly interconnected environment, a single security incident may simultaneously disrupt business operations, damage customer relationships, and undermine corporate reputation.

Another important source of vulnerability arises from the growing use of data in digital financial services. Transaction records, behavioural data, and other forms of alternative data are increasingly used to support financial decision-making. Although these practices can broaden access to finance, they also raise concerns regarding data privacy, information security, and transparency in data use. Acquisti et al. (2016) caution that the economic benefits of extensive data utilization are often accompanied by greater risks of information misuse and a reduced ability for users to control their own personal data.

The rapid advancement of artificial intelligence has added another dimension to these risks. AI enables faster and more efficient financial services, but it also facilitates the creation of manipulated content, synthetic identities, and increasingly sophisticated forms of fraud. Koroye and Alaekwe (2025) argue that while AI offers substantial opportunities for innovation in financial services, it simultaneously introduces new governance challenges that require more adaptive regulatory and oversight mechanisms.

In addition to technology-related risks, MSMEs also face vulnerabilities arising from the structure of the digital ecosystem itself. Many businesses have become increasingly dependent on specific digital platforms for marketing, payment processing, distribution, and customer access. Although this dependence can improve efficiency, it may also expose businesses to changes in platform policies, service disruptions, or market concentration that limits their strategic flexibility (Jacobides et al., 2018; Tiwana et al., 2010).

These findings suggest that risks within the digital financial ecosystem are highly interconnected rather than isolated. Technological risks, data-related risks, behavioural vulnerabilities, and institutional weaknesses interact with one another and may reinforce their combined impact. Consequently, the central challenge is not simply to mitigate individual risks, but to strengthen the ecosystem's capacity to manage multiple and evolving risks in an integrated and sustainable manner.

4.4 Governance Challenges in Building a Trusted and Risk-Resilient Ecosystem

The increasing complexity of digital risks demonstrates that the development of a sustainable digital financial ecosystem cannot rely solely on technological innovation. The ability to manage these risks depends fundamentally on the quality of governance that shapes interactions among the diverse actors within the ecosystem. One of the key challenges is that technological innovation often advances more rapidly than the capacity of institutions to adapt regulatory frameworks, supervisory mechanisms, and consumer protection measures.

A further challenge stems from the multi-actor nature of the digital ecosystem. A single digital financial transaction may involve banks, fintech companies, payment service providers, telecommunications operators, digital platforms, and other technology providers. When data breaches, digital fraud, or operational failures occur, assigning responsibility is often far from straightforward. This illustrates that governance extends beyond regulating individual institutions; it also requires effective coordination among all participants across the digital financial ecosystem (Jacobides et al., 2018).

Data governance presents another major challenge. Data have become one of the most valuable assets in the digital economy and increasingly underpin financial decision-making. At the same time, the growing use of data raises important questions concerning ownership, access rights, security, privacy, and accountability. Martin (2018) argues that as algorithms play a greater role in decision-making, ensuring transparency and accountability becomes increasingly critical. Without appropriate governance mechanisms, data that should create economic value may instead erode user trust and weaken confidence in digital financial services.

Consumer protection has also become a central governance issue. Many of the risks faced by users arise not from technological failures but from information asymmetry between service providers and users. In practice, many MSMEs still have limited digital and financial literacy, making it difficult for them to fully understand the risks associated with digital financial services. Consequently, consumer protection should extend beyond user education. It should also encompass transparent service design, accessible complaint and redress mechanisms, and clearly defined responsibilities among ecosystem participants.

Moreover, digital risk governance cannot be addressed effectively by individual institutions acting in isolation. Digital fraud, cyberattacks, and data misuse frequently transcend organizational and sectoral boundaries. Their effective management therefore depends increasingly on information sharing, coordinated supervision, and collaboration among regulators, financial institutions, technology providers, and other stakeholders. Arner et al.

(2024) emphasize that the success of digital payment ecosystems is closely linked to the ability of institutions to operate within an integrated governance framework.

These governance challenges are particularly relevant in Indonesia, where digital transformation is progressing rapidly while the preparedness of users and institutions has not always advanced at the same pace. This imbalance underscores the need for a governance approach that not only encourages innovation but also strengthens trust, enhances resilience, and safeguards the long-term sustainability of the digital financial ecosystem.

Ultimately, the central governance challenge is not to choose between innovation and protection, but to establish an institutional balance that allows both to reinforce one another. This perspective provides the foundation for the governance framework proposed in this study, which seeks to integrate trust, risk resilience, and collaborative governance into a coherent institutional architecture for sustainable MSME development.

4.5 Proposed Governance Framework

The analysis presented in the preceding sections indicates that the success of MSME digitalization depends not only on the availability of technology or access to digital financial services. Rather, the benefits of digital transformation are fundamentally shaped by the quality of the institutional environment governing interactions among regulators, financial institutions, fintech firms, digital platforms, technology providers, and users. Against this backdrop, this study proposes the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework) as a conceptual framework for fostering a digital financial ecosystem capable of supporting the sustainable scaling of MSMEs.

The framework is founded on the premise that trust and risk resilience are mutually reinforcing conditions. Trust encourages the adoption and continued use of digital financial services, while risk resilience ensures that the benefits of digitalization can be sustained when the ecosystem faces disruptions such as fraud, cyberattacks, operational failures, or rapid technological change. Neither trust nor resilience develops spontaneously. Both are shaped by the quality of governance that underpins the digital financial ecosystem (McKnight et al., 2002; Duchek, 2020).

The first pillar, digital trust governance, comprises institutional mechanisms designed to strengthen confidence in digital financial services, supporting institutions, and the underlying digital infrastructure. It emphasizes transparency, accountability, user protection, and clearly defined rights and responsibilities for all participants within the ecosystem (Kim et al., 2008; McKnight et al., 2002).

The second pillar, cyber and operational resilience governance, focuses on enhancing the ecosystem's ability to prevent, withstand, respond to, and recover from cyber incidents and operational disruptions. As dependence on digital technologies continues to increase, resilience extends beyond technical safeguards to include organizational preparedness, effective incident management, and coordinated responses among ecosystem participants (Duchek, 2020; Wang et al., 2022).

The third pillar, data governance and responsible AI, recognizes the growing role of data and artificial intelligence in credit assessment, service personalization, fraud detection, and financial decision-making. Effective governance is therefore essential to ensure that data are managed securely, transparently, and responsibly while minimizing the risks of data misuse, algorithmic bias, and opaque automated decision-making (Acquisti et al., 2016; Martin, 2018).

The fourth pillar, consumer protection and capability governance, highlights that protecting users within an increasingly complex digital environment requires more than regulatory compliance alone. Digital and financial literacy should be strengthened alongside effective consumer protection mechanisms so that MSMEs are better equipped to understand, assess, and manage the risks associated with digital financial services (OECD, 2023; IFC, 2025).

The fifth pillar, collaborative ecosystem governance, reflects the reality that contemporary digital risks frequently transcend organizational and sectoral boundaries. Consequently, effective risk management depends on collaboration among regulators, financial institutions, fintech firms, technology providers, digital platforms, and other stakeholders. Information sharing, coordinated oversight, and the development of common standards are therefore essential to preserving the security, integrity, and resilience of the digital financial ecosystem (Jacobides et al., 2018; Arner et al., 2024).

Taken together, the proposed framework positions governance as the institutional foundation that simultaneously strengthens trust and enhances risk resilience. These two mutually reinforcing outcomes create a secure and enabling environment in which MSMEs can confidently adopt digital financial services, expand their business activities, and pursue sustainable growth.

The conceptual relationships among the five governance pillars, trust, risk resilience, MSME scaling, financial inclusion, and financial system stability are synthesized in the proposed TRR-DFEG Framework, presented in Figure 3.

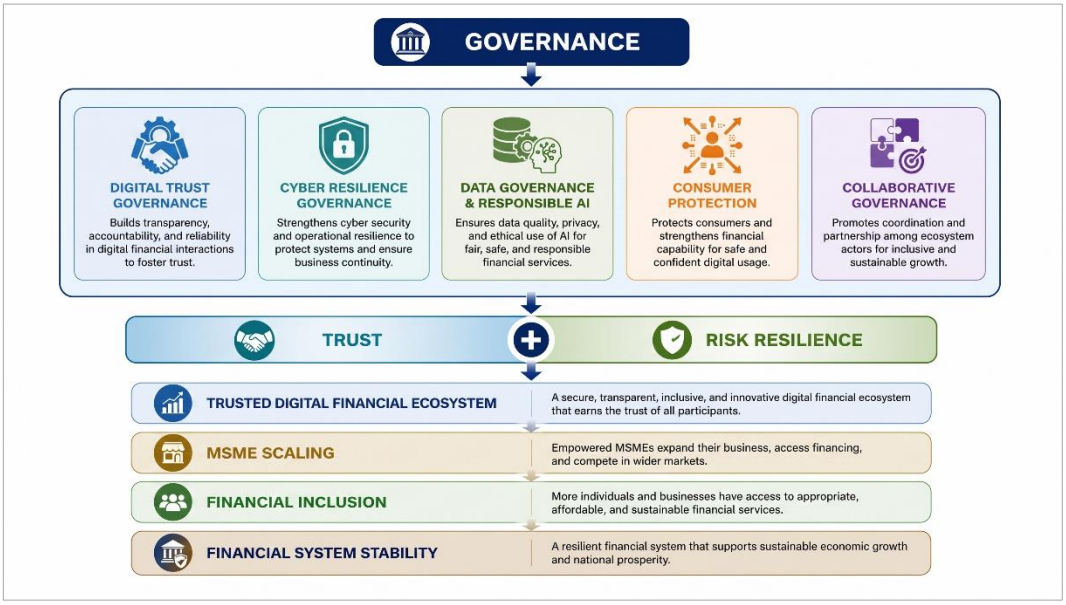

Figure 3. Trusted and Risk-Resilient Digital Financial Ecosystem Governance
Source: *Developed by the authors based on McKnight et al. (2002), Tiwana et al. (2010), Acquisti et al. (2016), Jacobides et al. (2018), Duchek (2020), Arner (2024), and the literature synthesized in this study.*

Figure 3 presents the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework) proposed in this study. The framework positions governance as the institutional foundation that shapes the quality of the digital

financial ecosystem. Rather than treating governance merely as a regulatory mechanism, the framework conceptualizes governance as a multidimensional capability consisting of five complementary pillars: digital trust governance, cyber resilience governance, data governance and responsible AI, consumer protection, and collaborative governance. These pillars collectively establish the institutional conditions necessary to foster trust among ecosystem participants while simultaneously strengthening the ecosystem's ability to anticipate, withstand, and recover from digital risks.

The framework further illustrates that trust and risk resilience function as two mutually reinforcing strategic outcomes of effective governance. Together, they create a trusted digital financial ecosystem that enables MSMEs to access digital financial services with greater confidence, expand their business activities, and achieve sustainable scaling. As MSME participation in the digital economy increases, broader financial inclusion can be achieved, ultimately contributing to a more resilient and stable financial system. Accordingly, the framework extends previous studies by integrating governance, trust, digital risk management, MSME development, and financial system stability into a single conceptual model that explains how institutional governance can translate digital transformation into sustainable economic development.

4.6 Implications for MSME Scaling and Financial System Stability

The framework developed in this study demonstrates that MSME scaling depends not only on access to technology and financial services but also on the quality of the ecosystem in which businesses operate. The higher the level of trust in digital financial services and the stronger the ecosystem's capacity to manage emerging risks, the greater the opportunity for MSMEs to utilize digital financial services productively and sustainably.

For MSMEs, a trusted and risk-resilient digital financial ecosystem can expand access to finance, improve operational efficiency, strengthen customer relationships, and create broader market opportunities. Conversely, increasing levels of digital fraud, cybersecurity incidents, and governance deficiencies may reduce user participation and limit the expected benefits of digital transformation. These findings suggest that trust is not merely a behavioral factor but also an economic asset that influences business decisions and the long-term sustainability of digital financial service adoption (McKnight et al., 2002; Kim et al., 2008).

At the ecosystem level, strengthening trust and risk resilience contributes to creating a more stable environment for the continued development of digital financial services. When users have confidence in the security, integrity, and reliability of the system, participation is more likely to increase, enabling innovation to flourish in a sustainable manner. Conversely, the accumulation of unmanaged digital risks may erode public confidence, ultimately slowing financial inclusion and hindering the broader digital transformation of the economy.

These implications extend beyond MSME development to the broader objective of financial system stability. Arner et al. (2024) argue that modern digital payment ecosystems increasingly rely on highly interconnected networks. Within such an environment, disruptions affecting one component of the ecosystem can rapidly propagate across interconnected participants, amplifying systemic vulnerabilities. Consequently, ecosystem resilience becomes an increasingly critical element in safeguarding financial system stability in the digital era.

The findings of this study further demonstrate that trust, risk resilience, and governance are mutually reinforcing and inseparable components of a sustainable digital financial ecosystem. Together, they provide the institutional foundation that enables digital financial ecosystems to

evolve in a secure, inclusive, and sustainable manner. Accordingly, strategies for MSME development should move beyond their traditional emphasis on expanding access to finance and promoting technology adoption toward building ecosystem governance that simultaneously strengthens trust and enhances the effective management of digital risks.

This perspective is particularly relevant for Indonesia as the country continues to accelerate its digital economic transformation. In the long term, the success of MSME digitalization will depend not only on technological innovation and financial inclusion but also on the ability to establish a trusted and risk-resilient digital financial ecosystem capable of supporting sustainable MSME growth while reinforcing financial system stability.

5. POLICY AND REGULATORY IMPLICATIONS

5.1 Implications for OJK

The development of a digital financial ecosystem for MSMEs is no longer only about expanding access to financial services. The increasing use of digital platforms, electronic payments, and data-driven services has also broadened the risks faced by users. These risks include digital fraud, data misuse, cyber threats, and various forms of manipulation that exploit users' behavioural vulnerabilities. In this context, the role of the Financial Services Authority (OJK) has become increasingly important in maintaining a balance between innovation, consumer protection, and the stability of the financial services sector.

The first implication is the need to broaden the supervisory approach from institutional compliance toward ecosystem-wide resilience. In a digital environment, risks often arise from interconnected relationships among actors, rather than from weaknesses within a single institution. For this reason, effective supervision should consider the ecosystem's ability to prevent, detect, and respond to disruptions that may weaken public trust in digital financial services. This approach is consistent with the growing importance of market conduct supervision and consumer protection in the financial services sector.

The second implication is the importance of positioning trust as a strategic indicator in the development of the digital financial sector. So far, the success of digitalization has often been measured by the number of users, accounts, or transaction volumes. Yet the continued use of digital services is strongly influenced by users' perceptions of security, transparency, and system reliability. OJK may therefore consider developing digital trust indicators to complement the financial inclusion indicators that have traditionally been used.

The third implication concerns the need for more preventive digital consumer protection. Various forms of phishing, social engineering, impersonation, and AI-enabled scams show that modern digital risks exploit not only technological weaknesses but also user behaviour. Consumer protection should therefore be embedded in service design, data governance, and product development processes. It should not be limited to complaint handling after losses have occurred. This approach is aligned with the direction of the 2023–2027 Roadmap for Market Conduct Supervision, Education, and Consumer Protection.

The fourth implication is the need to strengthen digital financial literacy. Wider access to digital services is not always accompanied by users' ability to understand the risks involved. Educational programs should therefore cover cybersecurity, personal data protection, digital fraud detection, and risk management in digital environments. For MSMEs, this aspect is especially important because they are often targeted by digital fraud while having relatively limited risk mitigation capacity.

Another implication is the need to strengthen data governance and the use of artificial intelligence in the financial services sector. Data and AI are increasingly used in credit assessment, fraud detection, and service personalization. These benefits, however, must be balanced with principles of transparency, accountability, and user protection. In this regard, OJK has a strategic role in encouraging the adoption of responsible data governance and responsible AI, so that innovation can develop without neglecting users' rights.

In addition, an ecosystem-based anti-fraud approach should continue to be strengthened. The establishment of the Indonesia Anti-Scam Centre (IASC) shows that digital fraud is a cross-sectoral problem that requires collaboration among regulators, financial institutions, technology providers, telecommunications operators, and law enforcement agencies. The success of such initiatives can help reduce financial losses while preserving trust in the digital financial ecosystem.

Ultimately, OJK needs to play a stronger role as an ecosystem orchestrator that promotes coordination among stakeholders in developing digital finance for MSMEs. In the digital economy, stability and inclusion cannot be achieved through fragmented sectoral approaches. OJK's role is no longer limited to regulation and supervision. It also includes shaping governance arrangements that strengthen trust, improve risk resilience, and ensure that digital transformation produces safe and sustainable benefits for MSMEs.

5.3 Implications for Government and Regulators

This study shows that the development of a digital financial ecosystem should not be viewed solely as a financial sector agenda. The risks faced by MSMEs in the digital environment have become increasingly diverse and frequently extend beyond the jurisdiction of individual institutions. These risks include digital fraud, misuse of personal data, cybersecurity threats, and growing dependence on digital platforms. As a result, the effective governance of the digital financial ecosystem depends heavily on the ability of government agencies and regulatory authorities to work in a coordinated manner.

One of the study's principal implications is the need to strengthen a whole-of-government approach to digital economy governance. Technological advances have increasingly blurred the boundaries between the financial sector, digital commerce, telecommunications, data protection, and public services. In such an environment, fragmented policy responses may create regulatory gaps and weaken the capacity to respond to emerging risks. Closer coordination among the Financial Services Authority (OJK), Bank Indonesia, the Ministry of Communication and Digital Affairs, the National Cyber and Crypto Agency (BSSN), the Ministry of Cooperatives and SMEs, local governments, and other relevant institutions is therefore becoming increasingly important.

The findings also highlight the strategic importance of data governance as a cornerstone of the digital economy. The growing use of data creates significant opportunities to expand access to finance, improve service efficiency, and stimulate innovation. These benefits, however, must be accompanied by robust safeguards for privacy, information security, and users' rights. Over the long term, public trust in the digital economy will depend largely on the government's ability to ensure that data are collected, managed, and used in a secure, transparent, and accountable manner.

Another important implication concerns digital and financial literacy. The increasing prevalence of digital fraud and online manipulation demonstrates that many risks arise from information asymmetries between service providers and users. Literacy initiatives should

therefore be viewed not merely as educational programmes but as an integral component of the national strategy to strengthen the economic resilience of individuals and MSMEs. This perspective is consistent with Indonesia's National Financial Literacy Strategy, which emphasizes the responsible and secure use of digital technologies.

The study further indicates that consumer protection should become an integral component of the digital transformation agenda. To date, the success of digitalization has often been assessed by increases in user numbers or transaction volumes. In the long run, however, the sustainability of the digital ecosystem depends more fundamentally on its ability to provide users with a strong sense of security and confidence. Individuals and MSMEs who feel adequately protected are more likely to adopt digital financial services, share data when appropriate, and expand their businesses through digital platforms.

The findings also underscore the need for regulators to adopt more adaptive and risk-based regulatory approaches. Rapid advances in artificial intelligence, embedded finance, alternative data, and other digital innovations require regulatory frameworks that can anticipate emerging risks without constraining productive innovation. Such an approach is essential to ensure that regulatory policies remain effective and relevant in an environment of continuous technological change.

Overall, this study suggests that building a digital financial ecosystem capable of supporting sustainable MSME scaling requires a careful balance between innovation, inclusion, security, and effective governance. The objective is not simply to accelerate digitalization, but to create a trusted digital environment that protects users, strengthens resilience, and provides a solid foundation for long-term economic growth.

5.4 Implications for Financial Institutions and Fintechs

For financial institutions and fintech companies, this study demonstrates that trust has become one of the most valuable strategic assets in the digital economy. Technological capability, service convenience, and product innovation remain important sources of competitive advantage. However, long-term business sustainability ultimately depends on an institution's ability to earn and maintain users' trust. A single incident involving a data breach, digital fraud, or service disruption can quickly undermine confidence that has taken years to build.

In this context, digital risk management should no longer be regarded merely as a supporting function. Cybersecurity, data protection, and operational resilience need to be embedded within core business strategy rather than treated solely as compliance requirements. Investments in security infrastructure, continuous risk monitoring, and effective incident response mechanisms are essential not only for meeting regulatory expectations but also for preserving long-term customer relationships and institutional credibility.

The findings further indicate that many digital risks arise from the interaction between technology and human behaviour. Cases involving phishing, impersonation, and social engineering demonstrate that protecting users cannot rely exclusively on technological safeguards. Financial institutions and fintech firms should therefore adopt a more human-centred approach to service design, taking into account how users make decisions, perceive risks, and respond to digital information.

This perspective reinforces the importance of transparent and user-friendly service design. Information regarding fees, risks, users' rights, and available protection mechanisms should be communicated in a clear and accessible manner. Trust is built not simply because sophisticated

technologies are deployed, but because users understand the services they use and are confident that their interests are adequately protected.

For institutions serving MSMEs, the study highlights the importance of developing more collaborative relationships with customers. Many MSMEs remain at an early stage of digital transformation and possess varying levels of digital and financial literacy. In this context, financial institutions and fintech providers should not be viewed merely as service providers. They also play an important role as trusted partners that help MSMEs understand both the opportunities and the risks associated with digital financial services.

The study also underscores the strategic importance of robust data governance. As data are increasingly used for credit assessment, customer engagement, and AI-enabled financial services, institutions assume greater responsibility for ensuring that such data are managed ethically, securely, and transparently. Data protection is therefore no longer solely a matter of regulatory compliance. It has become a critical determinant of institutional legitimacy, reputation, and long-term competitiveness.

Furthermore, the nature of contemporary digital risks requires greater cross-industry collaboration. Digital fraud, cyberattacks, and identity misuse frequently involve multiple platforms, institutions, and service providers simultaneously. Effective risk mitigation therefore depends on the industry's ability to exchange information, develop shared detection mechanisms, and coordinate responses to emerging threats across organizational boundaries.

For fintech companies in particular, the findings suggest that user growth should not be regarded as the sole indicator of success. Rapid expansion without adequate governance and risk management may create vulnerabilities that ultimately harm both customers and the business itself. Over the long term, institutional resilience will depend more on maintaining an appropriate balance between innovation, consumer protection, and effective risk management than on pursuing growth alone.

Ultimately, this study argues that trust is no longer simply an outcome of high-quality service; it has become a fundamental component of digital business infrastructure. Financial institutions and fintech firms that place trust at the centre of their business strategy will be better positioned to support sustainable MSME scaling while contributing to the development of a trusted and risk-resilient digital financial ecosystem in Indonesia.

6. CONCLUSION

Digital transformation has created significant opportunities for the development of Micro, Small, and Medium-sized Enterprises (MSMEs) in Indonesia. Through an increasingly integrated digital financial ecosystem, MSMEs have gained broader access to digital payment services, alternative financing, digital banking, and data-driven financial solutions that were previously difficult to obtain. Beyond improving transaction efficiency, digitalization has expanded market opportunities, enhanced productivity, and enabled MSMEs to become more deeply integrated into the digital economy.

However, this study shows that the success of MSME digitalization cannot be explained solely by greater access to digital financial services. Alongside the opportunities created by digital transformation, a range of new risks has emerged that may undermine sustainable business growth. Digital fraud, cyber threats, misuse of personal data, platform dependency, and

risks associated with artificial intelligence all demonstrate that digital access alone does not automatically translate into sustainable MSME development.

Drawing on the literature review and conceptual analysis, this study argues that trust and risk resilience are two critical factors that determine the successful participation of MSMEs in the digital financial ecosystem. Trust encourages business owners to adopt digital financial services, conduct online transactions, share data, and engage confidently in increasingly digitalized economic activities. Risk resilience, in turn, enables both MSMEs and the broader ecosystem to continue operating, adapt to disruption, and sustain economic activity when confronted with cyber threats, fraud, and other emerging digital risks.

The study's principal conceptual finding is that governance serves as the institutional mechanism linking digital transformation with the development of trust and ecosystem resilience. Within a digital financial ecosystem that involves regulators, financial institutions, fintech companies, technology providers, digital platforms, and MSMEs, effective governance is essential for creating an environment that is secure, transparent, accountable, and capable of managing risks over time. Governance should therefore be viewed not merely as a regulatory function, but as the institutional foundation that enables trust and resilience to emerge across the digital ecosystem.

As its main conceptual contribution, the study proposes the Trusted and Risk-Resilient Digital Financial Ecosystem Governance Framework (TRR-DFEG Framework). The framework identifies five interrelated governance pillars: digital trust governance; cyber and operational resilience governance; data governance and responsible AI; consumer protection and capability governance; and collaborative ecosystem governance. Together, these pillars provide a more comprehensive perspective than approaches that focus primarily on financial inclusion or technology adoption.

The findings further suggest that building a trusted and risk-resilient digital financial ecosystem has implications that extend well beyond MSME development. Higher levels of trust encourage broader economic participation, accelerate the adoption of financial innovation, and strengthen the effectiveness of financial intermediation. Conversely, poorly managed digital risks can erode public confidence, discourage business participation, and ultimately undermine financial system stability.

Accordingly, promoting MSME development in the digital era should no longer be viewed simply as a matter of expanding financial access or accelerating technology adoption. The more fundamental challenge is to build a digital financial ecosystem that fosters trust, manages risks effectively, and strengthens the resilience of all participants. Ultimately, the success of Indonesia's digital transformation will depend on its ability to develop a digital financial ecosystem that is trusted, resilient to evolving risks, and capable of supporting both sustainable MSME growth and long-term financial system stability.

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