

Digital Finance and Microfinance Risk Level

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ABSTRACT

Digital Finance is the government's solution to save the economy's future and accelerate economic recovery. Microfinance institutions (MFIs) can survive by leveraging technology to achieve large-scale operations and services because of cost-effective technology solutions that meet their data management and customer needs. The study examines the impact of digital finance on MFIs' risk level using two indexes, namely the supply side index and the demand side index. The supply side index (access) measured by FINTECH_A indicates the number of e-money accounts and Accumulated Creditors. Meanwhile, the demand side index (Usage), namely FINTECH_B, includes two indicators volume of digital money transactions and the value of digital transactions. We used the Z-score as a proxy MFIs' risk-taking, which indicates financial stability. The research sample is Microfinance Institutions registered with the Indonesian Financial Service Authority (OJK), totaling 227 conventional and sharia Microfinance units. The data were analyzed descriptively, and the panel data regression was used for testing the hypotheses. We also did a robustness check to test the strength of the research model. The results showed that the supply side index significantly affects the microfinance risk level. It means that the accumulated number of Creditors and the number of accounts could lead to a high level of MFIs risk that occurs from bad credit. The finding implies that microfinance should manage its digital finance policy well through the continuing analysis of the value of the Z-score.

Keywords: Digital finance, Financial technology, Microfinance, Risk level, Z-Score

1. INTRODUCTION

Implementing new technology can benefit microfinance institutions and their clients, but it is often costly, risky, and disruptive to the institution. Challenge challenges occur every time a new technology is introduced in financial intermediation. The presence of an opportunity will follow challenges, likewise with risks that will always bring rewards along with new strategies to support the sustainability of an institution, including MFIs.

Risk always exists in every organization or company. If the organization cannot manage these risks properly, then the organization can face substantial negative consequences. The potential loss from this risk will be even more significant if the people in the organization (or the whole) do not have prudent behavior. If an organization can manage risk well, then it can maximize its value, and the welfare of society, in general, will increase.

Micro-financial institutions, as collectors of public funds, clearly have a much higher level of risk than business institutions whose core businesses are not directly related to the financial sector. Therefore, the financial industry is the most regulated and supervised industry (highly regulated and supervised industry).

The microfinance industry has undergone rapid evolution with significant changes in technology. The Financial Services Authority (OJK) noted 227 microfinance institutions (LKM) in Indonesia in 2020. This number increased by 10.13% from the previous year's 204 MFIs.

Because risks cannot be avoided, microfinance institutions must be able to identify every risk that is happening and will be faced by referring to the risks that have been experienced. By identifying risks earlier, Microfinance Institutions can minimize existing risks to achieve the predetermined income.

Microfinance Institutions usually face seven main areas of risk: Credit Risk, Liquidity Risk, Market Risk, Operational Risk, Interest rate Risk, Foreign exchange rate Risk, and Environmental Regulatory and Compliance Risk. Handling risk properly is one way, and effort is taken to maintain the MFI's sustainability. On the other hand, excessive and poorly managed risks can result in losses that endanger the health and safety of microfinance institutions' depositors (Manan & Shafiai, 2015).

It has been predicted that Financial Technology (financial technology) or fintech could play an essential role in saving the future of the global economy from its existing catastrophic status. Technological developments force companies to continue to adapt, one of which is through digital transformation. Digital transformation is part of the process of business transformation. Modern information and communication technology development allows banks to rely on mobile banking as an essential distribution channel in their business. Applied technology can differentiate between a larger market share or a gradual decline in fast-evolving financial markets.

The Financial Services Authority (OJK) encourages Micro Finance Institutions (LKM) to immediately adopt digital technology for their business development to help the government provide access to financing for microbusinesses that banks do not facilitate. Apart from that, the regional digital financial ecosystem is also said to facilitate supervision by the OJK on BPRs and microfinance institutions. This ecosystem is claimed to make financing consolidation faster and more accurate. The entry of BPRs and microfinance institutions will further complement the regional digital financial ecosystem designed by the OJK, where the two institutions will enter the financing stage.

Viable microfinance institutions (MFIs) can leverage technology to achieve large-scale operations and offer services to tens of thousands, if not millions, of clients. With cost-effective technology solutions that meet the needs of data management and match the needs of their customers, MFIs can cover their operational and financial costs and the risk of loan losses without needing work efficiency subsidies to become expensive to optimize income. The COVID-19 pandemic has broadly impacted the global health and economic crisis since 2020. Governments of countries worldwide have taken various steps to overcome and accelerate economic recovery. In 2021 global economic performance is expected to grow positively.

According to the NDRC (National et al. Centre), financial technology is a term used to refer to innovation in financial services. The fintech concept adapts technological developments that are integrated with the financial sector with banking institutions so that it is expected to be able to facilitate all financial transaction processes that are more practical, safe, and modern, including digital-based financial services that are currently developing in Indonesia, namely payment channel systems, digital banking, online digital insurance, peer to peer (P2P), lending, and crowdfunding. The potential use of fintech in Indonesia is supported by a good reception from the public and the use of mobile phones in Indonesia. Based on research conducted by Davis, Maddock, and Foo, although only 34 percent of Indonesia's population actively uses the Internet, 85 percent of Indonesia's total population owns mobile phones, and there are 1.36 SIM cards per capita.

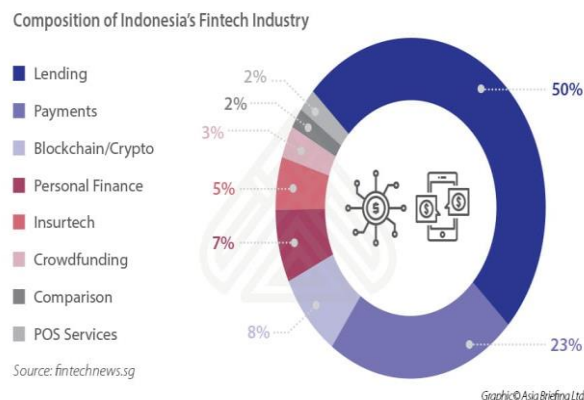


Figure 1: Composition of Indonesia Fintech Industry

The Indonesian fintech industry is one of the most competitive and dynamic in ASEAN, as evidenced by the emergence of four unicorns and one decacorn. Fintech in Indonesia is dominated by P2P lending (50%) and payment (23%).

Morgan and Pontines (2014) found that increasing SME loans increases financial stability by achieving lower NPLs and the risk of default. Moreover, they expand on the findings by observing that financial inclusion through more digital accounts and payments reduces default, leverage, and bank portfolio risks. The explanation is that more digital accounts and payments encourage banks to provide loans to more individuals and businesses, leading to diversification benefits (Khan, 2011). There is also an increase in savings with more accounts, reducing the risk of procyclicality in banking (Han & Melecky, 2013; Hannig & Jansen, 2010).

Finance and technology have long been linked, but the link has become especially strong with the invention of the Internet and the rapid adoption of smartphones. Financial technology and digitization impact all business models and processes of the financial sector, including microfinance. In microfinance, which is often referred to as a labor-intensive and labor-intensive industry, however, microfinance institutions as collectors of public funds have a much higher level of risk than business institutions whose core business is not directly related to the financial sector. Digital solutions can enable fast loan decision-making and loan disbursement, giving loan officers time to serve more clients in more places than ever before. Equipping MFIs with technology allow institutions to work more efficiently, cost-effectively, agile, and responsive to client needs.

Successfully managing a technology implementation program requires careful planning, and many factors must be considered. Management needs to determine the specific objectives of a technology project to assess the variables that will affect costs and benefits and to evaluate whether the project will be worth it. In addition to hardware and software costs, training, maintenance, and upgrade costs must be included in the plan.

Based on previous studies regarding fintech, there are pros and cons regarding its effect on the bank risk/health level. In previous research, Malhotra and Singh (2009) researched banks in India. They proved that banks with Internet banking had better performance than those who did not implement Internet banking. However, there was no significant correlation between the application of Internet banking technology and bank profitability. In addition, there is a negative and significant influence between implementing Internet banking and risk. It proves that Internet banking can reduce the level of bank credit risk.

Another study on mobile banking on banking performance conducted (Bagudu & Roslan, 2017) which examined 22 commercial banks in Nigeria, said that mobile banking had a positive effect on bank financial performance because customer impatience had increased significantly with more prior knowledge and stated that the banking industry still had to adopt and use mobile banking services in its operations as seen from the use of the Internet and gadgets increasing every day. According to research (Kamil, 2018), electronic money positively affects LDR and GCG but hurts ROA, NPL, and CAR. It is because, at the beginning of electronic money, it increased operational costs compared to before the existence of electronic money.

Sathye (2005) examined the impact of Internet transactional banking on the profit performance and risk of major credit unions in Australia. Similar to Sullivan's research (2000) results, internet banking variables do not significantly affect performance and operational risk. Thus, internet banking does not prove to be a tool to improve banking performance. Research by Furst et al. (2000a, 2000b, 2002a, and 200b) produced different conclusions from previous studies (England, 1998). The research proves that banks adopting Internet banking services are more profitable than non-internet banks. There are exceptions for banks that are new and in the stage of adjusting to the Internet, which makes them less profitable and less efficient than non-internet banks.

Based on the research results by Susilo (2013), it is known that differences in regulation and supervision in the two Islamic microfinance institutions impact the application of risk management. Bank Indonesia has regulated and carried out financial risk management regulations at BPRS Madina in detail. In contrast, regulations governing the application of risk management at BMT have not been regulated in detail, and the implementation of supervision carried out by the Ministry of Cooperatives and SMEs is still fragile, so BMT Beringharjo in implementation of financing risk management is more to make self-regulation (self-regulation).

This research tests the relationship between the Effects of Digital Finance on the Risk Level of microfinance financial institutions. This research can determine the level of risk of microfinance institutions in using digital finance and provide fintech solutions to minimize the risk of microfinance financial institutions.

2. LITERATURE REVIEW

Fund Management or Funding is funds management, namely managing own funds or external funds obtained from other institutions to maximize profit (Profit) while maintaining adequate liquidity and security in investment.

Digital Finance

Based on Hsueh (2017), Financial Technology, or FinTech, is a new financial service model developed through information technology innovation. So according to the author, Financial Technology is a service that combines technology and finance, providing innovation to businesses. According to the National Digital Research Center (NDRC), fintech is a term to refer to technological innovation and digitization of financial services. According to the OJK, several FinTech types currently developing and providing financial solutions for the people of Indonesia are Microfinancing, P2P lending, Digital Payments, Risk and Investment Management, Equity crowdfunding, and Market Comparison.

Risk Level

The definition of risk according to Hanafi (2006), the risk is the magnitude of the deviation between the expected return (ER) and the actual rate of return (actual return). According to Al Bahar and Crandall (1990), risk analysis is defined as a process that combines uncertainty in quantitative form, using probability theory, to evaluate the potential impact of a risk. Risk is the uncertainty of a decision in carrying out the company's operational activities, especially in the banking sector. Risk is one aspect of assessing the soundness of a bank. When a bank can minimize risk, it will have an impact on the health of the bank. The risks taken by the bank impact the formation of market discipline. The level of risk / Bank Soundness Level is the result of an assessment of the bank's condition, which is carried out on the risk and performance of the bank (Bank et al. Number: 13/1/PBI/2011).

Risk management has become increasingly important lately, triggered by failure to manage risk properly, which can result in substantial losses for organizations (profit and non-profit) and even individuals. Microfinance Institutions usually face seven main areas of risk: Credit Risk, Liquidity Risk, Market Risk, Operational Risk, Interest rate Risk, Foreign Exchange Rate Risk, and Regulatory and Compliance Environment Risk.

The method that can be used at the risk level is the Z Score Analysis. Z Score analysis is a tool used to predict a company's risk level by calculating the value of several ratios and then entering it into a discriminant equation. Z-score analysis was developed by (Altman, 1968) to detect whether a company is on the verge of bankruptcy, financial distress, or bank unhealthy.

The risk management process includes identifying, evaluating, and controlling risks that may threaten the continuity of the company's business or activities. A structured approach/methodology in managing the uncertainty related to threats; a series of human activities including Risk assessment, development of strategies to manage it, and risk mitigation using resource empowerment/management (Djohanputro, 2006)

Microfinance

Microfinance is a financial institution specifically established to provide services in business development and community empowerment by providing loans or financing to micro-business members and the MFI community, savings management, or consulting services in business development that are carried out not solely for profit.

Types of microfinance institutions are divided into non-banks and banks, either in the form of village-owned enterprises or city/district government. Non-bank microfinance financial institutions include Baitul Maal wat Tamwil (BMT), Islamic Financial Services Cooperatives (KJKS) / Islamic Financial Services Units (UJKS), Savings and Loans Cooperatives/Savings and Loans Businesses, Pawnshops, and Insurance. Meanwhile, microfinance financial institutions in the form of banks include Commercial Banks, Islamic Banks, Rural Banks, Sharia Rural Banks, Village Banks, Market Banks, and Micro Waqf Banks.

Microfinance plays a role in facilitating access to micro-scale funding for underprivileged communities, increasing economic empowerment and community productivity, and increasing people's income and welfare, especially for the lower-middle class and low-income groups. In addition, microfinance also functions as a consulting service for the development of small or micro-scale businesses that manage middle to lower-class

public funds and provides education on business activities that can be carried out conventionally or based on sharia principles and improves the intellectual abilities of the community or the quality of human resources through Entrepreneurship training.

Financial Technology or fintech can play an essential role in saving the future of the global economy from the existing disaster status. Implementing new technologies will be very beneficial because they have many advantages when implementing digitalization. However, digital has regulations and may impact the level of risk/health of microfinance institutions. Microfinance institutions as public fund collectors have a much higher level of risk than business institutions whose core business is not directly related to the financial sector. Because risks cannot be avoided, microfinance institutions must be able to identify every risk that is happening and will be faced by referring to the risks that have been experienced. Therefore an analysis of the effect of digital finance is needed to see whether it influences the risk level of microfinance institutions.

The Influence of Digital Finance on Microfinance Risk Levels

The development of forms of money has evolved into virtual or digital money. The presence of a transaction tool with a new model means that financial services will develop using digital facilities. However, this can create a risk or a challenge that must be faced. Risk management can be managed in various ways according to the required costs and efficiency in risk management.

Morgan and Pontines (2014) found that increasing SME loans increases financial stability by achieving lower NPLs and the risk of default. Furthermore, they expand on the findings by observing that financial inclusion through more digital accounts and payments reduces default, leverage, and bank portfolio risks.

In the banking sector, the implementation of electronic-based payment systems is associated with increasing bank efficiency in providing financial services (Yang et al., 2018) in terms of increasing customer satisfaction and personal relationships with customers, more accessible documentation and transaction tracking, reduction of transfer/processing fees, increasing transaction processing time, offering multiple payment options and providing direct notification of all transactions on the part of the customer (Ugwueze & Nwezeaku, 2016), convenience, transfer speed (Oyetayo & Fatokun, 2015), risk reduction, and cost control on the part of the banking community.

In its implementation, FinTech, besides having various positive sides and great opportunities to be implemented and developed, still has risk factors that should be considered. Operational risk caused by moral hazard for both FinTech industry players and customers is one thing that needs serious attention. Otherwise, FinTech can become a medium of fraud. In addition, the risk of the security system used must also be considered so that security between the two parties can be maintained. Therefore, it is necessary to have strict regulations and policies from the government to support and protect them. So that the risks posed can be mitigated and the FinTech industry continues to provide a symbiotic mutualism impact for the actors

MFIs need to anticipate new risks that will emerge. For example, an institution or its terminal agents may not maintain adequate liquidity if customers make substantial withdrawals in certain areas. In the case of distributed payment systems, MFIs must maintain transaction security and know how to identify and stop illicit funds transfers.

H1a: It is suspected that FINTECH_A affects the level of risk of microfinance

H1b; It is suspected that FINTECH_B affects the level of microfinance risk

H1c; It is suspected that FINTECH_J affects the level of microfinance risk

3. METHODOLOGY

This study aims to test the relationship of digital finance and risk with sample Microfinance companies registered in Indonesian Financial Services Authority (OJK) for the 2020-2021 period in Microfinance companies. The data collection technique used is a literature study by collecting information from documentation of microfinance financial reports, financial institution statistics, and statistics on the number of digital finance transactions and fintech developments. The total sample used 227 units both conventional and sharia microfinance.

Digital Finance uses 2 (two) indexes, namely the supply-side index and demand-side index, following previous research from Hasanul Banna et al (2021). Index (access) stated by FINTECH_A, using 2 indicators: the number of e-money accounts and the Accumulation of Creditors. Meanwhile, the side index (Usage) stated by FINTECH_B uses 2 indicators: digital money transaction volume and digital transaction value. Finally, combine the two indexes (FINTECH_A & FINTECH_B), and create an overall index (FINTECH_J) using the Principal Component Analysis technique.

Microfinance Financial Institution (MFI) risk-taking is not directly provided in the data set, so this research uses conventional techniques to calculate it. In other words, the Z score serves as a proxy for measuring Microfinance risk-taking (also used to indicate a bank's financial stability), which aligns with the existing banking literature (Danisman & Tarazi, 2020). Laeven and Levine (2009) and Houston et al. (2010) calculate the standard deviation of ROA over the entire sample and combine this with the average annual ROA and equity-to-assets ratio over the same period.

The following formula is used to calculate the z-score as below:

$$Z Skor = \frac{ROA + CTA}{\sigma ROA}$$

Where ROA and CTA return on assets, the ratio of capital to assets, and the standard deviation of ROA. Based on the financial ratio analysis of the Z score analysis that has been set so that it can be used to determine the level of soundness:

1. Z Score > 2.6 (Safe Zone) that means that the level of risk is low, meaning that the company does not experience problems with a safe zone or healthy financial condition.
2. Z Score < 2.6, >1.6 (Grey Zone) is the grey area that means the company will experience financial problems if it significantly improves its management and financial structure.
3. Z Score < 1.6 (Distress Zones) that means that a high-risk level indicates that the company is experiencing severe financial problems, or in this zone, most companies have experienced bankruptcy.

This study examines the effect of Digital Finance on the MFI's risk level with the basic regression model as follows:

$$Y = a + X_{\text{fintech_A}} + X_{\text{fintech_B}} + X_{\text{fintech_J}} + e$$

Description:

Y = MFI's Risk Level, measured by Z-score

a = Constanta

X_{fintech_A} = Accumulation of Creditors & Number of Accounts

X_{fintech_B} = Digital Transaction Volume and Digital Transaction Value

X_{fintech_J} = Combined index of fintech_a and fintech_b with Principal Component Analysis (PCA) technique

e = error

4. EMPIRICAL RESULTS

4.1 Descriptive Analysis of Digital Finance and Risk Level

Based on Hsueh (2017), Financial Technology, or FinTech, is a new financial service model developed through information technology innovation. So according to the author, Financial Technology is a service that combines technology and finance, providing innovation to businesses. The following are digital financial statistics or electronic money for 2020-2021; only transaction volume, transaction value, accumulated creditors, and number of accounts are taken.

Digital Finance is a term used to refer to innovation in financial services. The fintech concept adapts technological developments with the financial sector and banking institutions. It is expected to facilitate all financial transaction processes that are more practical, safe, and modern, including digital-based financial services.

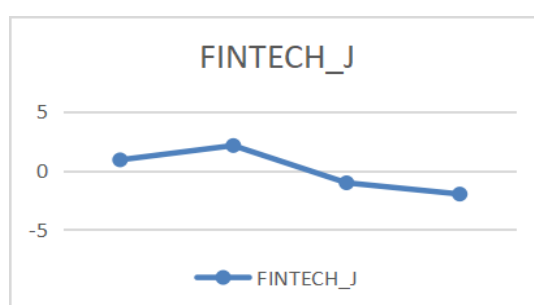


Figure 2: FINTECH_J index of Indonesia Microfinance in 2020-2021
 Source: Researcher Data, 2022

Microfinance institutions as public fund collectors have a much higher level of risk than business institutions whose core business is not directly related to the financial sector. Therefore, the financial industry is the most regulated and supervised (highly regulated and supervised industry). Because risks cannot be avoided, microfinance institutions must be able to identify every risk that is being and will be faced by referring to risks that have been experienced, recognizing risks earlier, and measuring the level of risk from the profile of Microfinance Institutions. Moreover, it is expected to be able to minimize existing risks and see several aspects that can affect the level of risk so that the predetermined income can be achieved and the company's financial management or risk profile remains healthy.

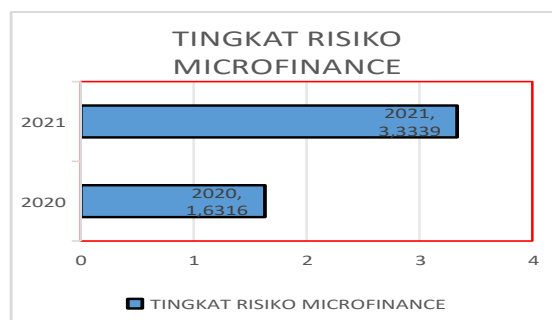


Figure 3: The Risk Level of Indonesia's Microfinance 2020-2021
Source: Researcher Data, 2022

The level of microfinance risk is obtained from the *Z score formula as a proxy for measuring MFI Microfinance Risk-taking. Based on the financial ratio analysis of the Z score analysis that has been set so that it can be used to determine the level of soundness and the level risk of microfinance in Indonesia during early pandemic have score 1,6316 as grey zone that means faced financial problem, but it increases in 2021 became 3,3339 as safe zone. Microfinance could manage its risk and have more healthy financial conditions.

4.2 Regression Results

The finding of study showed that the FINTECH_A variable significantly influences the Microfinance Risk Level. In comparison, FINTECH_B and FINTECH_J have no significant effect. From the test results (R2), the R-squared value is 0.614078, which means that the risk level of financial institutions is influenced by digital finance by 60%, and other factors influence the rest.

5. DISCUSSION

Digital Finance in microfinance financial institution companies. Regarding e-money statistics, the volume of transactions has decreased, and the value of digital transactions has increased. Likewise, seen from the accumulation of creditors and the number of accounts has increased. The number of microfinance assets increase from the previous year.

The risk level for microfinance financial institutions in the grey zone area that indicates the microfinance financial institutions are experiencing financial problems. In contrast, the risk level in 2021, its move to safe zone that indicates the microfinance financial institutions have made improvements so will not experience financial problems

Based on the results of the regression test shows that digital finance with the FINTECH_A index has a significant effect on the risk level of microfinance institutions. Still, digital finance with the FINTECH_B and FINTECH_J indexes has no impact on the risk level of microfinance institutions. Then hypothesis can be accepted that FINTECH_A affects the risk level of microfinance institutions which in line with Han & Melecky (2013) and Hannig & Jansen (2010). It increased savings and accumulation of creditors with more accounts, reducing the risk of procyclicality in banking. The explanation is that more digital accounts and payments encourage banks to provide loans to more individuals and businesses, leading to diversification benefits (Khan, 2011).

The results of this study also align with the research of Morgan and Pontines (2014), who found that an increase in SME loans/creditors increases financial stability by achieving lower NPLs and the risk of default. Furthermore, they expand on the findings by observing that financial inclusion through more accounts and digital payments reduces risk levels, default, leverage, and bank portfolio risks.

6. CONCLUSION

Digital Finance in microfinance financial institution companies In terms of e-money statistics, it has decreased, and the value of digital transactions has increased. As well as the accumulation and number of accounts have increased. As for the risk level of microfinance financial institutions, improvements have been made to the level of risk of financial institutions so that microfinance financial institutions will not experience problems with safe zone or healthy financial conditions.

From the results of the regression testing conducted, it can be concluded that digital finance with the FINTECH_A index significantly affects the risk level of microfinance institutions. Still, digital finance with the FINTECH_B and FINTECH_J indexes has no impact on the risk level of microfinance institutions. Then hypothesis 1a can be accepted that FINTECH_A affects the risk level of microfinance institutions. It shows that digital finance with the FINTECH_A index can reduce the level of risk for microfinance institutions. Therefore, the financial inclusion of microfinance institutions is through ways to increase further accounts or accounts, digital payments, and encourage microfinance to provide loans/creditors to more individuals and businesses and leading to diversification benefits and can also reduce risk levels, default risks, leverage risks, and bank portfolio risks.

This research implies that one of the digital finance indices from the FINTECH_A index (Accumulation of creditors and the number of accounts) affects the level of microfinance risk. Namely, it can reduce the level of microfinance risk. It is hoped that microfinance will continue to increase the number of accounts/accounts and loans to individuals or businesses.

The limitation of this study is that the data used is still general, namely financial reports not per microfinance but in their overall form. Apart from that, regarding digital finance data, the data is taken from digital financial statistics as a whole; there is no data regarding digital finance at microfinance financial institutions. For further research, the next researcher can expand the study by separating Islamic and conventional microfinance and using other risk measures to clarify further the relationship between digital finance and the level of risk in microfinance.

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