

Credit Risk, Financial Inclusion and Microfinance Performance in Pakistan: An Empirical Analysis

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Abstract

This study examines the impact of credit risk and financial inclusion on the performance of microfinance institutions (MFIs) in Pakistan, using a pooled OLS regression approach. The analysis is based on balanced panel data (2012–2021) for 19 MFIs obtained from the Pakistan Microfinance Network (PMN). The study employs portfolio at risk (PAR) and non-performing loans (NPL) as proxies for credit risk, while operational efficiency (OPREFF) and annual percentage rate (APR) represent financial inclusion. The dependent variable, MFI performance, is measured using return on assets (ROA), return on equity (ROE), and operational self-sufficiency (OSS). Additionally, firm size (FSIZE), firm age (FAGE), capital intensity (CAPINT), and leverage (LEV) are incorporated as control variables. The findings indicate that PAR has a significant negative effect on ROA, ROE, and OSS, highlighting the detrimental impact of rising credit risk on MFI performance. However, NPL does not exhibit a significant impact, suggesting that non-performing loans alone may not immediately affect financial stability. In contrast, OPREFF positively influences all three performance indicators, confirming that operational efficiency plays a critical role in enhancing MFI profitability and sustainability. APR negatively affects performance, suggesting that higher interest rates may reduce borrower repayment capacity and increase financial distress. Among the control variables, FSIZE and FAGE positively contribute to MFI performance, while CAPINT and LEV remain statistically insignificant. These results underscore the importance of effective credit risk management, cost efficiency, and balanced interest rate policies in ensuring the sustainability of MFIs. The study provides valuable insights for policymakers, MFI managers, and stakeholders in designing strategies that promote financial inclusion while maintaining institutional stability. Future research may explore the role of macroeconomic factors and regulatory policies in shaping MFI performance.

Keywords: Microfinance Institutions, Credit Risk, Financial Inclusion, MFI Performance, Portfolio at Risk, Operational Efficiency, Pakistan

Introduction

Microfinance Institutions (MFIs) play a crucial role in promoting financial inclusion by providing credit and other financial services to low-income individuals and small businesses. In developing economies like Pakistan, where access to traditional banking services is limited,

MFIs serve as an essential bridge between formal financial institutions and underserved populations (Cull, Demirgüç-Kunt, & Morduch, 2018). However, despite their growing importance, MFIs face significant challenges in maintaining financial sustainability. One of the most critical concerns is credit risk, which arises from loan defaults and non-performing assets (Gonzalez, 2007; Louis, Seret, & Baesens, 2013). At the same time, financial inclusion is increasingly being recognized as a key factor that can enhance the efficiency and profitability of these institutions (Beck, Demirgüç-Kunt, & Honohan, 2009; Aduda & Kalunda, 2012). This study aims to examine the impact of credit risk and financial inclusion on the performance of MFIs in Pakistan.

The financial performance of MFIs is often measured using key indicators such as Return on Assets (ROA), Return on Equity (ROE), and Operational Self-Sufficiency (OSS) (Hermes, Lensink, & Meesters, 2011). While credit risk negatively affects financial performance by increasing default rates and impairing profitability (Mersland & Strøm, 2009; Biekpe, 2011), financial inclusion is believed to improve the overall efficiency of MFIs by expanding their client base, optimizing operational costs, and increasing revenue streams (Adams & Pischke, 1992; Afzal, 2020). Given these dynamics, an important research question arises: How do credit risk and financial inclusion influence the performance of MFIs in Pakistan?

Existing literature suggests that high credit risk, reflected in Portfolio at Risk (PAR) and Non-Performing Loans (NPL), can severely impact MFI sustainability (Gutiérrez-Nieto, Serrano-Cinca, & Molinero, 2007; Louis et al., 2013). Poor risk management practices often lead to financial distress, reducing investor confidence and limiting the growth potential of MFIs (Tchuigoua, 2016). On the other hand, financial inclusion measured through operational efficiency (OPREFF) and the Annual Percentage Rate (APR) can influence MFI performance in different ways. OPREFF represents cost efficiency in delivering financial services (Hermes & Meesters, 2015), while APR, as the cost of borrowing, can affect loan affordability and repayment behavior (Rosenberg, Gonzalez, & Narain, 2009). However, empirical evidence on the combined effect of credit risk and financial inclusion on MFI performance remains scarce, particularly in the context of Pakistan (Churchill & Marr, 2021; Shaikh, 2021).

This research employs a balanced panel dataset covering 19 MFIs in Pakistan from 2012 to 2021. Using pooled Ordinary Least Squares (OLS) regression, the study provides a comprehensive analysis of how credit risk and financial inclusion interact to influence MFI performance. The findings will contribute to the existing body of knowledge by offering empirical evidence on the relationship between these variables and guiding policymakers in formulating strategies for sustainable microfinance operations (Armendáriz & Morduch, 2010; Churchill & Marr, 2021; Alam & Karim, 2021).

The significance of this study extends beyond academic research. The insights gained from this analysis will help MFI managers develop better risk management strategies while enhancing financial inclusion efforts. Furthermore, regulators and policymakers can use the findings to design policies that balance financial sustainability with the social mission of microfinance. By addressing both credit risk concerns and financial inclusion initiatives, this study aims to provide a framework for strengthening the microfinance sector in Pakistan and ensuring its long-term viability (Hermes et al., 2011; Churchill & Marr, 2021; Nawaz, 2022).

This study is motivated by the increasing relevance of microfinance institutions (MFIs) in promoting financial inclusion and reducing poverty in developing countries like Pakistan. Despite their importance, MFIs face challenges related to credit risk, which can threaten their sustainability and performance. By examining the dual impact of credit risk and financial inclusion on MFI performance, this study contributes to the limited empirical literature in this area, especially in the context of Pakistan. It provides new insights for policymakers and practitioners to balance financial inclusion goals with effective risk management, ensuring the long-term viability of MFIs.

Literature Review

The relationship between credit risk, financial inclusion, and the performance of microfinance institutions (MFIs) has been extensively studied in the literature. Researchers have explored the impact of credit risk on financial performance, the role of financial inclusion in improving MFI efficiency, and the combined effect of these factors on MFI sustainability. This section reviews the most relevant studies to provide a comprehensive understanding of the existing knowledge and identify research gaps.

Credit risk is a fundamental challenge for MFIs, as it directly affects their financial sustainability. Hermes, Lensink, and Meesters (2018) argue that MFIs with higher exposure to credit risk experience lower financial performance due to increased default rates and higher provisioning costs. Similarly, Boukari and Djalil (2020) found that credit risk, measured through Portfolio at Risk (PAR) and Non-Performing Loans (NPL), negatively impacts MFIs' return on assets (ROA) and operational self-sufficiency (OSS). Their study suggests that inadequate risk management practices can lead to financial distress, affecting the long-term viability of MFIs. In a related study, Ayayi and Tchakoute-Tchuigoua (2019) emphasize the role of governance in mitigating credit risk, noting that well-managed MFIs with robust risk assessment frameworks tend to perform better financially.

In addition, several studies have examined how different risk management strategies influence MFIs' financial health. Cull, Demirgüç-Kunt, and Morduch (2018) highlight that MFIs with higher capitalization and diversified funding sources are more resilient to credit risk shocks. Similarly, Daher and Le Saout (2015) assert that institutions adopting strict credit scoring mechanisms and robust monitoring systems experience lower default rates, leading to improved financial stability. Moreover, Tchuigoua (2016) suggests that while firm age contributes to institutional learning, its effect on financial performance remains inconclusive, indicating that additional institutional factors may shape financial outcomes.

Financial inclusion is considered a key driver of MFI performance. Beck, Demirgüç-Kunt, and Honohan (2009) highlight that financial inclusion enhances institutional outreach, leading to economies of scale and increased revenue streams. Cull et al. (2018) provide evidence that MFIs focusing on financial inclusion, particularly through lower interest rates (APR) and improved operational efficiency (OPREFF), tend to achieve better financial performance. Their findings suggest that increasing access to financial services can stabilize cash flows and improve loan repayment rates. Similarly, Churchill and Marr (2021) argue that financial inclusion initiatives, such as digital lending and financial literacy programs, enhance MFIs' sustainability by reducing information asymmetry and improving client creditworthiness.

Several studies have explored how financial inclusion interacts with credit risk management to influence MFI performance. Gonzalez (2007) notes that while financial inclusion can mitigate some aspects of credit risk by diversifying the client base, excessive lending without proper risk assessment can lead to increased default rates. This is supported by Adams and Pischke (1992), who caution that rapid financial inclusion, if not backed by sound risk management strategies, can expose MFIs to significant financial vulnerabilities. More recent studies by Churchill and Marr (2021) and Cull et al. (2018) emphasize the importance of balancing credit expansion with robust risk assessment frameworks. Their findings suggest that while financial inclusion promotes institutional growth, it must be complemented by strong credit risk management practices to ensure financial sustainability.

Despite the extensive research on credit risk and financial inclusion, there remains a gap in understanding their combined effect on MFI performance in the context of Pakistan. Most studies focus on global or regional perspectives, with limited empirical evidence specific to Pakistan's microfinance sector. Given the unique challenges faced by MFIs in Pakistan, including regulatory constraints, socio-economic factors, and varying levels of financial literacy among borrowers, further research is needed to examine how credit risk and financial inclusion interact to influence institutional performance. This study aims to fill this gap by providing empirical evidence on the relationship between credit risk, financial inclusion, and MFI performance using a balanced panel dataset from the Pakistan Microfinance Network (PMN) covering the period from 2012 to 2021.

Theoretical Framework and Hypothesis Development

This section outlines the theoretical foundations of the study and develops hypotheses based on prior literature and empirical evidence. The research is grounded in Credit Risk Theory and Stakeholder Theory to examine the impact of credit risk and financial inclusion on the performance of Microfinance Institutions (MFIs). Credit Risk Theory suggests that financial institutions face asymmetric information problems, leading to adverse selection and moral hazard, which increase credit risk (Stiglitz & Weiss, 1981). Effective credit risk management is critical for institutional stability, particularly for MFIs that serve financially vulnerable populations. High levels of Portfolio at Risk (PAR) and Non-Performing Loans (NPLs) are indicators of poor credit risk management, which can negatively impact profitability and sustainability (Hermes, Lensink, & Meesters, 2011). When MFIs fail to mitigate credit risk, they experience declining financial performance due to higher loan default rates and increased provisioning costs (Louis, Seret, & Baesens, 2013). Therefore, the study hypothesizes:

- **H1a:** Higher Portfolio at Risk (PAR) negatively affects the performance of MFIs (measured through ROA, ROE, and OSS).
- **H1b:** Higher Non-Performing Loans (NPL) negatively affect the performance of MFIs (measured through ROA, ROE, and OSS).

Stakeholder Theory emphasizes that MFIs must address the interests of multiple stakeholders, including borrowers, investors, and regulators, to achieve long-term sustainability (Freeman, 1984). Financial inclusion, which refers to expanding access to financial services, is often regarded as a means to enhance institutional performance while fulfilling stakeholder expectations. Improved Operational Efficiency (OPREFF) enables MFIs to

optimize costs and increase profitability, contributing positively to their financial performance (Cull, Demirgüç-Kunt, & Morduch, 2009). However, Annual Percentage Rate (APR), which represents the cost of borrowing, can have an adverse impact on financial performance, as excessively high interest rates may lead to client over-indebtedness and increased default rates (Shaikh, 2021). Therefore, the study proposes the following hypotheses:

- **H2a:** Higher Operational Efficiency (OPREFF) positively affects the performance of MFIs (measured through ROA, ROE, and OSS).
- **H2b:** Higher Annual Percentage Rate (APR) negatively affects the performance of MFIs (measured through ROA, ROE, and OSS).

Research Methodology

This study employs a quantitative research approach to examine the impact of credit risk and financial inclusion on the performance of microfinance institutions (MFIs) in Pakistan. A causal research design is adopted, using panel data regression analysis to test the formulated hypotheses. The research relies on secondary data sourced from the Pakistan Microfinance Network (PMN), covering 19 MFIs over the period 2012–2021. The selection of these MFIs is based on the availability of complete financial data for the entire study period, ensuring consistency and minimizing biases due to missing information.

The study's conceptual framework is built around credit risk and financial inclusion as independent variables and MFI performance as the dependent variable. Credit risk is measured using Portfolio at Risk (PAR) and Non-Performing Loans (NPL), while financial inclusion is assessed through Operational Efficiency (OPREFF) and Annual Percentage Rate (APR). MFI performance is evaluated using Return on Assets (ROA), Return on Equity (ROE), and Operational Self-Sufficiency (OSS). Additionally, control variables such as Firm Size (FSIZE), Firm Age (FAGE), Capital Intensity (CAPINT), and Leverage (LEV) are incorporated to account for variations in institutional characteristics that may influence performance.

To estimate the relationship between credit risk, financial inclusion, and MFI performance, the study employs Pooled Ordinary Least Squares (Pooled OLS) regression. The general regression model is specified as follows:

$$MFIs\ Performance_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 FI_{it} + \beta_3 Controls_{it} + \epsilon_{it}$$

where $MFIs\ Performance_{it}$ represents either ROA, ROE, or OSS for MFIs in Pakistan. The term CR_{it} captures credit risk proxies, including PAR and NPL, while FI_{it} represents financial inclusion indicators, which are OPREFF and APR. The model also includes firm-specific control variables, and ϵ_{it} represents the error term.

The Pooled OLS method is chosen due to its simplicity and efficiency in estimating relationships within panel data. Unlike Fixed Effects (FE) or Random Effects (RE) models, Pooled OLS assumes that unobserved individual effects are not correlated with explanatory variables, making it suitable for datasets where heterogeneity across MFIs is not a major concern. However, diagnostic tests are conducted to verify model assumptions and ensure result reliability. These include tests for heteroskedasticity, autocorrelation, and multicollinearity. If necessary, robust standard errors are applied to correct for

heteroskedasticity. By using Pooled OLS, this study provides a clear and straightforward analysis of how credit risk and financial inclusion influence MFI performance.

Result and Discussion

Table 1

Descriptive Analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	190	6.17	5.129	-8.44	17.95
ROE	190	6.787	5.568	-10.92	17.98
OSS	190	104.846	87.653	-95.4	289.45
OPREFF	190	0.677	35.697	-45.045	67.745
APR	190	-0.011	11.521	-21.408	31.752
PAR	190	-0.011	2.799	-4.158	11.282
NPL	190	-0.003	2.084	-1.881	7.449
FISZE	190	18.208	1.392	13.882	20.245
FAGE	190	12.5	4.763	1	23
CAPINT	190	0.058	0.038	0.013	0.207
LEV	190	0.552	0.333	0.029	0.976

Table I The descriptive statistics provide an overview of the dataset, which includes 190 observations for each variable. The performance indicators show that return on assets (ROA) has a mean of 6.17% with a standard deviation of 5.13, ranging from -8.44% to 17.95%. Return on equity (ROE) has a mean of 6.79% and a standard deviation of 5.57, while operational self-sufficiency (OSS) averages 104.85% with a wide dispersion, indicating variations in MFI sustainability. Among the financial inclusion indicators, operational efficiency (OPREFF) has a mean of 0.68 and a standard deviation of 35.70, reflecting significant variability in efficiency. The annual percentage rate (APR) has an average of -0.01 and a standard deviation of 11.52, indicating fluctuations in lending rates across MFIs. For credit risk measures, portfolio at risk (PAR) and non-performing loans (NPL) have low mean values of -0.011 and -0.003, respectively, but their maximum values of 11.28 and 7.45 suggest that some MFIs face substantial credit risk. Among the control variables, firm size (FISZE) has a mean of 18.21, while firm age (FAGE) averages 12.5 years. Capital intensity (CAPINT) and leverage (LEV) have mean values of 0.058 and 0.55, respectively, indicating varying capital structures across MFIs.

Table 2

Diagnostic Test

Test	ROA	ROE	OSS	Decision
Normality (Jarque-Bera test, p-value)	0.370	0.147	0.061	Residuals are normally distributed
Multicollinearity (Mean VIF)	9	1	4	No severe multicollinearity
Autocorrelation (Wooldridge test, p-value)	1.89	1.89	1.89	No serial correlation
Heteroskedasticity (Breusch-Pagan test, p-value)	0.324	0.292	0.065	No significant heteroskedasticity
	5	5	7	
	0.132	0.334	0.063	
	5	8	4	

To ensure the validity and reliability of the regression models, several diagnostic tests were conducted, including normality, multicollinearity, heteroskedasticity, and serial correlation tests. The Jarque-Bera normality test was used to check whether the residuals of the

dependent variables follow a normal distribution. The test results showed p-values of 0.3709 for ROA, 0.1471 for ROE, and 0.0614 for OSS. Since all p-values are greater than the 0.05 significance level, the null hypothesis of normality cannot be rejected, indicating that the residuals are normally distributed. The Variance Inflation Factor (VIF) test was used to assess multicollinearity among the independent variables. The mean VIF value was found to be 1.89, with individual VIF values ranging from 1.10 to 2.65. Since none of the values exceed the threshold of 10, multicollinearity is not a significant concern in this study. The Wooldridge test for autocorrelation was applied to check for serial correlation in the panel data. The results showed p-values of 0.3245 for ROA, 0.2925 for ROE, and 0.0657 for OSS. Since all p-values are above 0.05, the null hypothesis of no first-order autocorrelation cannot be rejected, indicating that serial correlation is not a significant issue. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was conducted to check for constant variance in the residuals. The test results produced p-values of 0.1325 for ROA, 0.3348 for ROE, and 0.0634 for OSS. The results suggest that heteroskedasticity is not present in the ROA and ROE models, while the OSS model shows marginal evidence of heteroskedasticity, though not at a strongly significant level. Overall, the diagnostic tests confirm that the regression models are statistically reliable, with no severe violations of normality, multicollinearity, heteroskedasticity, or serial correlation.

Table 3

Regression Result

Variables	ROA		ROE		OSS	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
OPREFF	0.056	0	0.057	0	1.07	0
APR	-0.094	0	-0.102	0	-1.799	0
PAR	-0.461	0	-0.575	0	-6.828	0
NPL	-0.22	0.092	-0.261	0.075	-1.793	0.381
FISZE	0.598	0.001	0.559	0.004	9.801	0
FAGE	0.06	0.272	0.057	0.354	1.449	0.093
CAPINT	8.32	0.092	9.037	0.103	107.67	0.165
LEV	0.677	0.244	0.633	0.331	13.505	0.139
Constant	-6.371	0.026	-5.02	0.117	-106.29	0.018
R²	0.782		0.767		0.816	
R² (Adj.)	0.773		0.757		0.808	
F-Statistic	81.33		74.48		100.34	
Prob > F	0		0		0	

The regression analysis was conducted using pooled OLS to examine the impact of credit risk (PAR, NPL) and financial inclusion (OPREFF, APR) on the financial performance of microfinance institutions (ROA, ROE, OSS). Additionally, firm-specific control variables (FISZE, FAGE, CAPINT, and LEV) were included in the model. The results for Return on Assets (ROA) indicate that operational efficiency (OPREFF) has a positive and significant effect ($\beta = 0.056$, $p < 0.01$), suggesting that higher efficiency leads to improved profitability. Conversely, annual percentage rate (APR) and portfolio at risk (PAR) negatively affect ROA ($\beta = -0.093$, $p < 0.01$; $\beta = -0.460$, $p < 0.01$, respectively), implying that increased credit risk adversely impacts financial performance. Firm size (FISZE) also positively contributes to ROA ($\beta = 0.598$, $p < 0.01$), while non-performing loans (NPL), firm age (FAGE), capital intensity (CAPINT), and leverage (LEV) show no significant impact. The model explains 78.2% of the variation in ROA ($R^2 =$

0.7824). Similarly, for Return on Equity (ROE), operational efficiency remains positively significant ($\beta = 0.057$, $p < 0.01$), while APR ($\beta = -0.102$, $p < 0.01$) and PAR ($\beta = -0.575$, $p < 0.01$) exhibit a negative and significant influence. Firm size (FISZE) also positively affects ROE ($\beta = 0.559$, $p < 0.01$), while NPL, FAGE, CAPINT, and LEV remain statistically insignificant. The model explains 76.7% of the variation in ROE ($R^2 = 0.7670$).

For Operational Self-Sufficiency (OSS), the findings are consistent with the profitability models. OPREFF positively and significantly impacts OSS ($\beta = 1.070$, $p < 0.01$), reinforcing the importance of efficiency. APR ($\beta = -1.799$, $p < 0.01$) and PAR ($\beta = -6.828$, $p < 0.01$) negatively influence OSS, whereas firm size (FISZE) has a positive impact ($\beta = 9.801$, $p < 0.01$). The adjusted R^2 for the OSS model is 80.79%, indicating strong explanatory power. Overall, the results confirm that financial inclusion, particularly operational efficiency, enhances MFI performance, whereas credit risk, especially portfolio at risk, undermines profitability and sustainability. Firm size emerges as a crucial determinant, while other firm-specific factors exhibit no significant influence.

The empirical analysis of microfinance institutions (MFIs) reveals significant insights into the factors influencing their financial performance, particularly concerning Return on Assets (ROA), Return on Equity (ROE), and Operational Self-Sufficiency (OSS). Operational efficiency, as measured by operational efficiency (OPREFF), consistently exhibits a positive and significant impact across all performance metrics. This finding aligns with prior research emphasizing the critical role of operational efficiency in enhancing MFI performance (Daher & Le Saout, 2015). A study by Hermes et al. (2018) also highlights that higher operational efficiency leads to improved financial sustainability and reduced dependency on subsidies, making MFIs more self-sufficient.

Conversely, credit risk indicators, including Portfolio at Risk (PAR) and Non-Performing Loans (NPL), demonstrate a negative association with MFI performance. This observation is consistent with studies that have identified the detrimental effects of poor credit risk management on financial outcomes (Boukari & Djalil, 2020). Similarly, Ayayi & Tchakoute-Tchuigoua (2019) found that increasing non-performing loans negatively affects profitability and sustainability, ultimately constraining the ability of MFIs to expand financial inclusion. The analysis also indicates that the Average Loan per Borrower (APR) negatively influences performance metrics. This suggests that larger loan sizes may not necessarily translate into better financial outcomes for MFIs, possibly due to increased default risks associated with higher loan amounts. These findings are corroborated by Imai et al. (2015), who argue that higher loan sizes tend to increase repayment burdens on borrowers, leading to greater credit risk exposure for MFIs.

Institution-specific factors such as Firm Size (FISZE) positively correlate with performance, indicating that larger MFIs benefit from economies of scale, enhancing their financial metrics. This is in line with research by Cull et al. (2018), which found that larger MFIs tend to have better financial sustainability due to diversified revenue streams and lower operational costs per borrower.

While Capital Intensity (CAPINT) and Leverage (LEV) show positive coefficients, their statistical insignificance suggests a more nuanced relationship with performance that may require

further investigation. Similarly, Firm Age (FAGE) does not present a significant impact, indicating that the duration of an MFI's operation does not necessarily influence its financial outcomes. These results are consistent with the findings of Tchuigoua (2016), who observed that while firm age contributes to institutional learning, its effect on financial performance remains inconclusive.

These findings underscore the importance of efficient operations and robust credit risk management in bolstering the financial performance of MFIs. They also highlight the need for MFIs to carefully consider loan sizes and institutional growth strategies to optimize performance outcomes.

Conclusion and Recommendation

This study examined the impact of credit risk and financial inclusion on the performance of microfinance institutions (MFIs) in Pakistan using a balanced panel dataset from 2012 to 2021. The findings indicate that higher credit risk, measured by Portfolio at Risk (PAR) and Non-Performing Loans (NPL), negatively affects MFI performance, reducing profitability and operational self-sufficiency. This highlights the need for effective risk management strategies to mitigate loan defaults and enhance financial stability. In contrast, financial inclusion, proxied by Operational Efficiency (OPREFF), positively contributes to MFI performance, suggesting that improving efficiency enhances institutional sustainability. However, higher Annual Percentage Rate (APR) negatively affects performance, implying that excessively high interest rates may reduce borrower repayment capacity and financial viability.

To address these challenges, MFIs should strengthen credit risk management by implementing robust credit screening, monitoring systems, and data-driven risk assessment tools. Diversifying loan portfolios and maintaining an optimal balance between outreach and risk exposure can further enhance financial sustainability. Additionally, MFIs should focus on improving operational efficiency through cost reduction strategies, digital financial services, and technology-driven lending models. Ensuring affordable lending rates and expanding financial literacy programs can enhance borrower repayment behavior and promote sustainable financial inclusion.

From a policy perspective, regulators should establish clear credit risk guidelines and enforce risk management frameworks to safeguard the stability of the microfinance sector. Government-backed credit guarantees and subsidized lending programs can also help reduce default risks and support MFIs in achieving their social and financial objectives. Future research could extend this analysis by incorporating macroeconomic variables, borrower characteristics, and alternative estimation techniques to provide deeper insights into the dynamics of credit risk and financial inclusion in the microfinance sector.

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