

Financial Sector Development and Microloans to Small Firms: Does Country Legal Enforcement Matter?*

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Abstract

This article explores the relationship between the level of financial sector development and the allocations of loans by microfinance institutions (MFIs) to micro, small, and medium-sized enterprises (MSMEs), as well as the mediating effect of institutional quality. Analyzing a global sample of 7,675 MFI-year observations, our results show a significant increase in the proportion of MFI loans allocated to MSMEs following improvements in financial development. The increase in MFI lending to MSMEs is notably stronger in countries with weak institutional enforcement, supporting our market failure hypothesis. Generally, the social finance sector and the traditional banking sector have different goals: banks tend to target clients for whom screening, monitoring, and loan enforcement are less costly, while MFIs focus on lending to clients outside the banking system, such as the unbanked MSMEs.

Keywords: Microfinance, MSME lending, credit constraint, credit allocation, financial sector development

JEL Classification: G21, G23

1. Introduction

Thanks to their close ties with clients and the use of proximity-based lending methods for screening and monitoring loans, microfinance—also known as the social finance sector—has emerged as a practical solution to the financial barriers faced by excluded economic actors. Given their double bottom-line missions, microfinance institutions (MFIs) are expected to provide financial services to poor and vulnerable households, as well as to micro and small enterprises that are excluded from traditional financial systems.

The existing literature on the relationship between financial sector development and financial inclusion falls into at least two categories. One category views the relationship as competitive (Cull et al., 2015), while the other views it as complementary (Allen et al., 2025; Vanroose & D’Espallier, 2013). The latter group considers MFIs to be successful in attracting clients, particularly micro, small, and medium-sized enterprises (MSMEs), that traditional banks often deem too risky. However, it remains unclear to what extent legal enforcement at the country level shapes the relationship between financial sector development and microfinance loan allocation to MSMEs in developing economies. This is a critical gap in the current literature.

Our paper addresses this gap by examining whether the quality of legal enforcement influences MFIs' ability to allocate a larger share of their lending portfolios to MSMEs, particularly in countries with large or relatively developed banking sectors. We argue that legal enforcement acts as a moderating factor that shapes how MFIs respond to financial sector development in their lending decisions.

Previous studies primarily focused on how the size of a country’s banking sector determines access to credit (breadth or outreach) (e.g., Cull et al., 2014; Vanroose and d’Espallier, 2013). Cull et al. (2014) provide evidence that greater bank penetration in the overall economy is associated with microbanks pushing toward poorer markets. Vanroose and d’Espallier (2013) similarly find that MFIs reach more clients and are more profitable in countries where access to the traditional financial system is low. The main issue addressed by these authors is whether banks and MFIs are complementary or substitutable.

Another stream of the literature focuses on the vulnerability of MFI lending activity to economic and financial turmoil. For instance, Wagner and Winkler (2013) document a decline in MFI lending growth during the 2007–2009 global financial crisis, with the impact being more

severe among institutions that had been active in tapping domestic and international financial markets for funds. Similarly, Castellani and Afonso (2021) find that during the 2008 crisis in Nicaragua, lenders (MFIs) reduced overall credit provision but to a lesser extent to those geographic areas that contributed most to geographic diversification in the boom period (Dec. 05 – Dec. 07). Tchakouté Tchuigoua et al. (2020) analyze the cyclicity of MFI lending and break down the lending to account for MFI loan liability structure (joint liability lending versus individual lending). They find evidence that the cyclical behavior of MFI lending documented in previous literature is not homogeneous across MFI regulation status and lending categories. Their evidence suggests that regulated MFIs, (mostly privately owned), drive the cyclical behavior of lending in the microfinance industry.

None of the existing studies discuss specifically the direct impact of financial sector development (FSD) on MFI lending to MSMEs, except for a recent paper by Kanga et al. (2024). This latter paper investigates the impact of FSD on the amount of loans extended to MSMEs by microfinance institutions. This project aims to focus exclusively on MSMEs by first exploring whether operating in a country with a more developed financial system influences the volume of loans allocated to this category of potentially financially excluded firms.

Furthermore, prior studies have paid less attention to the legal and institutional framework within which financial institutions operate. As emphasized by Iwasaki et al. (2022), a country's ability to enforce loan repayment through its rules and regulations is critical to credit allocation to MSMEs. Another objective of this study is therefore to investigate whether a country's legal and institutional environment strengthens or weakens the effect of financial development on microfinance lending to micro and small firms. One might expect microfinance loan allocation to micro and small firms to be lower in a well-enforced environment.

Our study complements prior research that have emphasized the relationship between financial sector development and microfinance outreach (Vanroose & d'Espallier, 2013; Kanga et al., 2024), but without explicitly accounting for the moderating role of the legal enforcement environment.

Our study is rooted in the market failure hypothesis (Vanroose and d'Espallier, 2013), which postulates that microfinance institutions fill a need that banks do not and thrive where the formal financial sector fails. MFIs and banks have different targets. Banks target lower-risk clients for

whom screening and monitoring costs are minimal, whereas MFIs focus on lending to clients who are excluded from the banking system (unbanked poor). From this information asymmetry perspective, the country's legal enforcement quality may contribute to overcoming information asymmetries between lenders and borrowers. Weak enforcement environments heighten the risk of strategic default, reduce repayment incentives, and increase the overall probability of loan failure. The ability of financial institutions to extend credit to micro and small enterprises depends critically on the quality of the institutional environment and the capacity of that environment to enforce contracts.

Empirical evidence supports the critical role of institutional quality, suggesting that better institutional frameworks should improve access to finance and firm performance. For instance, Iwasaki et al. (2022) show that while institutional quality positively affects firm survival, its impact is less pronounced for smaller firms. Similarly, Baumöhl et al. (2019) report that institutional quality significantly enhances firm survival, but with diminishing returns—the effect is strongest in countries with low institutional quality and weakest in high-quality institutional environments.

To the best of our knowledge, few studies have explicitly examined the impact of institutional quality on microfinance institutions' (MFIs) lending outcomes. Notably, Tchuigoua (2014) highlights the institutional environment as a key determinant of MFIs' capital structures; Barry and Tacneng (2014) link institutional quality to the financial and social performances of MFIs in sub-Saharan Africa; and, more recently, Tchuigoua (2025) investigates how legal enforcement environments affect MFI financial reporting quality. Following Andrianova et al. (2015), we assume that when contract enforcement is strong, banks are more willing and able to lend to small firms. Conversely, in weak legal environments, banks may tend to ration credit to small and medium-sized enterprises (SMEs) due to the high probability of default and weak enforcement. In such cases, microfinance institutions often step in to fill the financing gap, providing liquidity and credit to segments of the market underserved by commercial banks.

Using an international sample of 7,675 MFI-year observations covering the period of 2005 to 2018, our findings reveal a strong positive relationship between financial sector development and the share of MFI loan portfolios extended to MSMEs. In other words, improvement in financial development, defined as a combination of depth, access, and efficiency of financial institutions, enhances MFI loan allocation to MSMEs. Moreover, we find that MFIs allocate an even larger

share of their loan portfolio to MSMEs following an improvement in financial sector development indicators in countries where the institutional quality is weak, confirming our market failure hypothesis. As emphasized by Vanroose and d'Espallier (2013) and others, the social finance sector and the traditional banking sector have different targets. Banks generally targeting less risky clients, whom screening and monitoring costs are lower, whereas MFIs focus on lending to clients who are excluded from formal banking system (unbanked poor). In a weak law enforcement environment, loan contracts are too costly to manage and enforce, which pushes banks to exit the MSMEs market segment, with MFIs filling the vacuum left by banks.

The remainder of the article is organized as follows. Section 2 presents the research methodology; Section 3 presents and discusses the empirical results, while Section 4 discusses further robustness results. We conclude in Section 5.

2. Research Design

2.1 Sample

The microfinance level data used in this study comes from the Microfinance Information eXchange (MIX) Market database, now available on the World Bank's website. Although not fully representative¹ of the microfinance sector, the MIX Market data are certainly, to date, the only available comparable international data on MFIs and have been used in several studies (e.g., d'Espallier et al., 2017; Kanga et al., 2024; Tchakouté Tchuigoua et al., 2020; Vanroose & d'Espallier, 2013, among many others).

This database contains data voluntarily disclosed or self-reported by approximately 2,995 MFIs over the period 1999–2019. We exclude the year 2019 for which only two observations are available. Data on the structure of the credit portfolio of MFIs are only available from the year 2005, which led us to restrict our sample to the period 2005–2018. The final unbalanced sample of 7,675 MFI-year observations spanning 96 countries, distributed across regions as follows: sub-Saharan Africa (907 MFI-year observations; 11.8% of the sample), East Asia and the Pacific (838 MFI-year observations; 10.9% of the sample), Eastern Europe and Central Asia (1,292 MFI-year

¹ The MIX Market database is far from being fully representative of the microfinance sector. Indeed, the data are biased toward bigger MFIs, which in some countries are a very small part of MFIs operating in those countries.

observations; 16.8% of the sample), Latin America and the Caribbean (3,237 MFI-year observations; 42.2% of the sample), Middle East and North Africa (303 MFI-year observations; 3.9% of the sample), and South Asia (1,098 MFI-year observations; 14.3% of the sample).

The financial sector development (FSD) indicators are drawn from the International Monetary Fund (Svirydzenka, 2016). Macroeconomic and business environment data come from the World Bank's World Development Indicators Database (WDI) and Global Financial Development Database (GFDD). Governance indicators are obtained from the Worldwide Governance Indicators Database (WGI) and the International Country Risk Guide (ICRG).

2.2 Empirical Model

The aim of this study is to examine the contribution of the financial sector development (FSD) to the allocation of the loan portfolio of MFIs toward MSMEs (loan portfolio structure), and the mediating role of the institutional quality environment. To achieve our goals, we regress the share of MFIs' outstanding loan portfolio allocated to MSMEs (as a percentage of gross loan) on the country's FSD indicators and governance indicators, and control for MFI-specific variables and country-level factors.

The estimated model is as follows:

$$\text{LOAN}_{ij,t} = \alpha + \beta_1 \text{FSD}_{j,t-1} + \beta_2 \text{Gov}_{j,t-1} + \beta_3 \text{FSD}_{j,t-1} \times \text{Gov}_{j,t-1} + \beta_4 \text{Green}_{ij,t} + \sum_{k=1}^N \gamma_k X_{k,ij,t-1} + \sum_{l=1}^M \lambda_l Y_{l,j,t-1} + \delta_i + \varepsilon_{ij,t} \quad (1)$$

where i indexes the microfinance institution, j indexes the country, and t indexes the year. $\text{LOAN}_{ij,t}$ is the share of the outstanding loan portfolio allocated to MSMEs by MFI i located in country j during the year t . $\text{FSD}_{j,t-1}$ is the financial sector development indicator of country j in year $t-1$. $\text{Gov}_{j,t-1}$ is the quality of institutions in country j in year $t-1$. Green is the greenfield status of the MFI. $\{X_{k,ij,t-1}, k = 1, \dots, N\}$ is the vector of MFI-level control variables that are likely to be associated with microfinance lending, $\{Y_{l,j,t-1}, l = 1, \dots, M\}$ includes country-level factors which we use to disentangle the demand from the offer side of lending. δ_i are random variables that follow

a $N(0, \sigma_\delta^2)$ distribution and $\varepsilon_{ij,t}$ is the error term.

In equation (1), we capture the mediating effect of the quality of the country's governance on the relationship between financial sector development and MFI's loan allocated to MSMEs using the cross product of *FSD* and *Gov*. The rationale for doing so is that in countries with a weak legal enforcement environment, the cost of monitoring and enforcing loan contract terms could be much higher, which can potentially crowd out traditional banks from the small firms' market segment, considered to be too risky for them. We expect the vacuum left by banks to be filled by the social finance sector, driven by its double bottom line mission of profitability and outreach

2.3 Variables

2.3.1 Dependent Variable

The dependent variable is the ratio of total microloans granted to MSMEs to total loans outstanding. The variable is calculated by using the MIX Market database.

2.3.2 Interest Variables

We have two main test variables. The first is Financial Sector Development (FSD) which is proxied by several variables: the size of the banking sector measured by *Domestic credit to private sector by banks over GDP*, *Financial Development Index* (FD), *Financial Institutions Index* (FI), and its three dimensions, namely, depth captured by *Financial Institutions Depth* (FID), access captured by *Financial Institutions Access* (FIA), and efficiency captured by *Financial Institutions Efficiency* (FIE).

The second variable is legal enforcement, which is measured by "Law and Order" from ICRG. This indicator measures the strength and impartiality of the legal system and assesses public compliance with the law. The higher the score of this indicator, the better the quality of the system and the overall compliance with the law. We also consider the "Rule of Law" from the WGI as an alternative indicator of governance. This indicator measures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. The higher the score, the better the quality of the legal institutions.

2.3.3 Control Variables

In addition to the variables of interest discussed above, we consider two groups of controls as in Kanga et al (2024): MFI-specific control variables and other macroeconomic factors to account for additional supply-side and demand-side effects. Following Kanga et al. (2024), our *MFI-specific* control variables are the following:

- **The Number of borrowers per loan officer:** Measures the loan officer's effectiveness in terms of screening and monitoring (see Soumaré et al. (2020)). A higher ratio indicates lower efficiency of the loan officer and the higher the risk of the loan portfolio. As a result, MFIs may decide to limit their credit expansion to micro and small firms.
- **The Size of the MFI:** Measured by the natural logarithm of the number of offices. This variable captures the proximity between MFIs and their customers.
- **Borrowings-to-assets ratio:** Indicates an MFI's financing source. The higher this ratio, the more dependent the microfinance institution is on external sources of funding for its lending activity.
- **The Portfolio at Risk at 30 days (PAR30):** Captures the risk of the loan portfolio. It is measured by the share of the portfolio affected by outstanding payments when there is a risk that they will not be repaid within 30 days. We expect MFIs to reduce their lending as risk increases.
- **Profitability:** Measured by the return on assets (ROA). Some studies have shown that profitability is positively associated with capital ratio (e.g., Tchakoute Tchuigoua, 2016). Higher capital provides a buffer against risk, it may be positively associated with lending. Therefore, we expect a positive relationship between profitability and lending.
- **Greenfield (Green):** In accordance with established literature (Earne et al., 2014; Cull et al., 2015; Tchakoute Tchuigoua, 2022), we define greenfield microfinance institutions (MFIs) based on at least two criteria: they are microfinance service providers established by a central organizing entity (such as a holding company) and do not possess any preexisting infrastructure, staff, client base, or loan portfolio. Greenfield status is indicated by a dummy variable: one for greenfield MFIs, zero otherwise.

Other Macroeconomic Factors:

- **Growth rate.** The real GDP growth rate is included to capture the macroeconomic environment. Following the lending literature (e.g., Ibrahim, 2016; Kanga et al., 2024; Tchakoute Tchuigoua et al., 2020), we control the GDP growth. Assuming competition between banks and

microfinance institutions, MSMEs' cash flows rise in favorable macroeconomic conditions, and their default risk decreases. During economic booms, banks find MSMEs more appealing, leading to reduced demand for microcredits. Additionally, MSMEs may prefer internal financing, reinvesting profits instead of seeking external loans. We expect a negative relationship between economic booms and MSME lending.

- ***Informality.*** The level of informality is an estimate of informal output (% of GDP) measured by the multiple indicators multiple causes model (MIMIC) as suggested by Elgin et al. (2022). In a country with a large informal sector, we can expect high demand for microcredit, as MFIs primary target those excluded from the formal financial sector.
- ***Unemployment rate.*** Measured as total unemployment scaled by the total labor force. This is used to understand how the performance of the macroeconomy influences lending to MSMEs. It partly reflects the lack of job opportunities in the economy, which can increase microfinance loans (as the unemployed can be potential micro-entrepreneurs) or reduce them (as it will be difficult for them to repay their loan). Ahlin et al. (2011) found that higher workforce participation is associated with slower growth in MFI outreach, and Churchill (2019) found that the unemployment rate is positively associated with the total number of borrowers and negatively with average loan size.

Table 1 below presents the variables, their sources, and their descriptive statistics.

2.4 Empirical Strategy

We first run the regression using the full sample. Secondly, we estimate the model by subgroup based on the level of governance in the country where the MFI operates. We examine whether micro-credit to MSMEs is affected by the level of governance in the country where the MFI operates, and if the effect of financial sector development varies with that governance quality. The level of governance in each country is classified as low or high relative to the median of the distribution (e.g., Andrianova et al., 2015).

Given our panel data structure, we apply random-effect panel estimations to control for unobserved heterogeneity that may be correlated with MFI-level covariates such as profitability and borrowings. We use the random-effect model for identification purposes, since one of our

variables, “greenfield”, is a dummy that cannot be identified using the fixed-effects technique. We also lag all our explanatory variables by one year to mitigate endogeneity problems arising from reverse causality bias.

In estimating the model, our coefficient of interest is β_1 , which measures the sensitivity of MFIs’ loan portfolio structure (share of loans to MSMEs) to FSD indicators. Based on the market failure hypothesis previously discussed, we expect a positive sign for β_1 . The full effect of financial development depends on the quality of the country’s governance, measured by the ‘law and order’ or ‘rule of law’ indicator, that effect is captured by $\beta_1 + \beta_3 Gov_{j,t-1}$. We formally test the significance of this effect at each level of governance (low versus high governance environment).

We also address potential endogeneity concerns related to financial development² following Breitung et al. (2024), who developed an instrument-free approach to solving endogeneity. The identification strategy in Breitung et al. (2024) is based on the non-normality of the endogenous variable, and the approach is as follows. Firstly, the endogenous variable is regressed on all exogenous control variables, and we extract the residuals ($\hat{\varepsilon}_{it}$) from this regression. Secondly, we calculate an augmented regressor $\hat{\eta}_{it} = \Phi^{-1}(\hat{F}_{\hat{\varepsilon}_{it}}(\hat{\varepsilon}_{it}))$, where $\hat{F}_{\hat{\varepsilon}_{it}}(\hat{\varepsilon}_{it})$ is the (rescaled) empirical distribution function of $\hat{\varepsilon}_{it}$ and $\Phi^{-1}(\cdot)$ is the inverse of the standard normal cumulative distribution function. Thirdly, we re-estimate our main equation by adding $\hat{\eta}_{it}$ as a new regressor and report bootstrap standard errors. If the parameter associated with $\hat{\eta}_{it}$ is statistically significant, it is reasonable to assume that the regressor is endogenous.

As additional robustness checks, we control for time effects, limit the sample to MFIs with high quality of financial information (that is, earning at least four diamonds), conduct multilevel analysis, apply random effects Tobit regression, and use the entropy balancing matching technique.

The multilevel analysis considers the nested grouping of our data, given that microfinance institutions operate in countries that are grouped into regions. The setup of the multilevel analysis allows us to control for unobserved country or region effects and within-country/region MFI effects using a nested error component model. In this regard, we run a three-level model to account for country and region effects, the first level being the microfinance institutions, the second level being

² One potential concern is that loans to MSMEs can affect financial development, creating simultaneous bias and identification problems, although the financial development variables are lagged, since credit may have a lagged structure.

the countries where the microfinance institutions operate, and the third level being the regions to which the countries belong. We fit a model with random coefficients on financial sector development at the region level and assume that all residuals be *i.i.d.* Gaussian with one common variance. Tobit regression is used to account for left censoring in our dependent variable. Finally, the matching technique is used to address potential biases arising from differences between greenfield MFIs and non-greenfield MFIs.

3. Empirical Results

3.1 Univariate and Correlation Analysis

Descriptive statistics presented in Table 1 show that loans granted to MSMEs represent, on average, 57% of the overall MFI's credit portfolio, with the remaining share consisting mainly of loans to households. The ratio between credit to households and credit to MSMEs is unevenly distributed. Approximately one-third of the MFIs (MFI-year) do not lend to MSMEs. The median ratio of credit to MSMEs to gross loan portfolio is 75.6%, which means that for half of the MFIs-year, credit to MSMEs represents approximately three-quarters of the total gross loan portfolio.

(Insert Table 1 here)

The correlation matrix table (Table 2) shows a positive and significant correlation between micro-credit to MSMEs and financial development indicators, suggesting that, as the financial sector deepens, microfinance institutions allocate more of their loan portfolio to micro and small businesses (see also Figure 1). For the correlation between the governance indicators and the proportion of loans allocated to MSMEs, the result is not clear-cut. Although low, we find a negative correlation between an improvement in 'law and order' and micro-credit to MSMEs, but a positive correlation between micro-credit and the 'rule of law', which is another indicator of governance. We will check whether the regression analysis confirms these prior findings.

Overall, MFI-level variables exhibit lower correlations among themselves. It also appears that the financial sector development (FSD) metrics are strongly correlated. To avoid multicollinearity bias, we introduce these FSD indicators separately in the regressions.

(Insert Table 2 here)

(Insert Figure 1 here)

3.2 Baseline Results

The results of our baseline regressions are reported in Table 3. Financial Sector Development (FSD) is measured successively by *domestic credit to the private sector divided by GDP* (column 1), *Financial development index* (column 2), and *Financial institutions index*, which assesses the degree of the bank-based financial system (column 3). The results for the sub-components of financial institutions development are provided in columns 4 to 6, respectively, for depth, access, and efficiency. The coefficients for all FSD indicators are positive and significant. These results suggest that when the financial sector is relatively well developed, the share of loans granted to MSMEs increases in the overall MFI loan portfolio. This finding aligns with the market failure hypothesis (e.g., Cull et al., 2014; Vanroose and D'Espallier, 2013), indicating that MFIs substitute for bank lending in reaching vulnerable MSMEs in the small firms lending segment. This substitution effect happens because MFIs are close to their clients, and their lending is based on relationship. MFIs may then have an advantage over banks in overcoming information asymmetries in lending to MSMEs, which are costly for banks to screen and monitor. In addition, the positive and significant sign of the variable *Borrowings-to-assets ratio* suggests that borrowing positively affects the credit allocation to MSMEs. In other words, as the financial sector develops, MFIs have access to more external funds from the existing financial institutions and are therefore able to have more financial resources available to lend to MSMEs, which are off the radar of formal banks.

(Insert Table 3 here)

To test whether the level of governance plays a role in the relationship between financial sector development and micro-loans to small businesses, we control for the level of governance in the country where the microfinance institutions operate. Our main governance indicator is “law and order”. We redo the same analysis with the “rule of law” indicator in Table 6. As shown in Table 3, we find a direct negative effect of governance on credit to MSMEs. This result implies that the better the quality of the governance environment and the overall compliance with the law, the fewer microloans are allocated to small businesses. This is consistent with Andrianova et al. (2015), who show that bank lending increases as the level of governance improves. This may be because banks are more confident in lending to small businesses when the contract enforcement environment is strong, and hence MFIs do not need to substitute them.

Next, we examine the extent to which legal enforcement plays a role in the effect of financial sector development on micro-credit allocated to MSMEs. To achieve this objective, we compute the full effect of financial sector development, which is $\beta_1 + \beta_3 Gov_{i,t-1}$, and shown in Figure 2. The graphs show that the sensitivity of credit to MSMEs to financial sector development decreases as the level of governance improves and becomes ultimately non-statistically significant with a very high level of governance. This result suggests a heterogeneous effect of financial development at different levels of governance.

(Insert Figure 2 here)

To better highlight this heterogeneous effect, we split our sample into two groups based on the quality of the legal enforcement environment (also called governance) in countries where MFIs operate. The first group (“low governance”) has a level of governance below the median governance value, while the second group (“high governance”) has a level of governance above the median governance value. The mean micro-credit to MSMEs is higher in countries with a low level of governance (58.3%) than in countries with a high level of governance (55.6%). We also rerun the equation (1) by subsample defined by the level of governance (low versus high). The results reported in Table 4 show that the effect of financial development is, on average, higher in countries with a low level of governance, but the difference is not statistically significant when financial development is measured by the financial institutions index (FI) or financial institution depth (FID). Moreover, the direct negative effect of governance on lending is more pronounced in countries with a high level of governance than in countries with a low level of governance. Intuitively, microfinance institutions need to compete fiercely with banks in countries with a high level of governance and where the financial sector is developed (Andrianova et al., 2015), which reduces the room for maneuver for microfinance institutions.

(Insert Table 4 here)

Overall, the findings confirm the market failure hypothesis that the social finance sector substitutes the banking sector in a low institutional quality environment and obtains funding from banks to do so as the financial sector develops.

Finally, our findings suggest that greenfield MFIs lend more to MSMEs than households, which

seems to contrast with existing literature suggesting these institutions primarily target women borrowers. This new result implies that greenfield MFIs exhibit characteristics similar to those of commercial microfinance banks, as noted by Cull et al. (2009).

4. Robustness Checks

In this section, we will run additional regressions to check the robustness of our results. First, we will check whether our results are robust to endogeneity issues, especially from the measurement of financial sector development (section 4.1). Second, we will consider an alternative measure of governance – the rule of law (section 4.2). Third, we restrict our sample to MFIs with four and five diamonds (section 4.3). We also control for year effects. Finally, we consider alternative regression techniques and control for selection bias (section 4.4).

4.1 Endogeneity

As with all empirical studies, this study is not exempt from endogeneity risks. To limit these risks, we apply the method proposed in Breitung et al. (2024) to test whether the financial sector development indicators remain endogenous, even when we use their lagged value in the regressions. Table 5 reports the new estimates. The additional regressor is significant for three measures of financial sector development, (credit to GDP, Financial Development index, and Financial Institutions index), indicating that these variables are endogenous. The new results confirm our previous findings.

(Insert Table 5 here)

Though this approach is useful, we admit that there may still be endogeneity due to omitted variables or measurement errors. Therefore, we interpret all our results in terms of correlation and not causality.

4.2 Alternative Measure of Governance

We consider the Kaufman et al.'s (2010) “rule of law” indicator as an alternative measure of governance and rerun equation (1) to check whether our results are sensitive to the indicator used to proxy law enforcement or governance quality. Tables 6 and 7 report the results of the estimates. As before, we find a negative relationship between the rule of law indicator and microcredit to

MSMEs. This negative relationship is much more pronounced in countries with low levels of governance, while it is either non-significant or positive in countries with high levels of governance. Financial sector development is also positively associated with microcredit to MSMEs, as before. Overall, using another indicator of governance confirms our main findings.

(Insert Tables 6 and 7 here)

4.3 Sensitivity to Additional Controls and Sample Distribution

In this section, we control our previous estimates by year effects to account for global factors that can affect all MFIs. Table 8 reports the results. Governance, as measured by law and order, is negatively and significantly associated with microcredit granted to MSMEs by MFIs. For the rule of law used as an indicator of governance, the coefficients are not significant. Finally, financial sector development – as measured by financial development index, financial institution index and financial institution depth – is positively associated with credit to MSMEs.

(Insert Table 8 here)

As additional robustness, we consider only microfinance institutions with sound financial statements, that is, MFIs with four and five diamonds. Table 9 reports the results of the estimates. The new estimates confirm our previous findings related to the positive effects of financial sector development on MFI lending to MSMEs, and the mediating role of the quality of governance.

(Insert Table 9 here)

4.4 Alternative Regression Techniques and Selection Bias

We employ two alternative regression methods and use matching techniques to assess the robustness of our findings.

Multilevel Analysis: Given the structure of our data, we perform multilevel analysis to check whether our results are sensitive to the model specification. Table 10 reports the results of a three-level model to account for the effects of country and region, as explained above.³ The results

³ We also consider two variants of the three-level model. First, we fit a three-level mixed model with random intercepts at both the region and the country-within-region levels without any additional control variables. Second, we fit a model with random coefficients on FSD at the region level, estimated by the residual maximum likelihood technique. The results of the estimates do not change our main findings and are available on request.

confirm that financial development is positively associated with micro-lending toward MSMEs. In addition, governance is negatively associated with microloan allocation to MSMEs. Moreover, greenfield MFIs are positively associated with micro-lending to MSMEs.

(Insert Table 10 here)

Tobit Regression: One-third of MFIs in our sample do not provide loans to MSMEs, suggesting that there is an underlying decision process regarding microcredit for small businesses. As a result, the variable is left-censored. We address this censoring by applying a Tobit model. The new results corroborate our earlier findings regarding the effect of financial sector development, governance, and greenfield (Table 11).

(Insert Table 11 here)

Entropy balancing: One focus of this analysis is to highlight the behavior of greenfield MFIs. Table 12 shows that greenfield MFIs, on average, lend more to MSMEs, have lower portfolio risk due to better screening and monitoring, and are more prevalent than non-greenfield MFIs. They also operate in countries with underdeveloped financial sectors. Our baseline results may reflect existing differences and selection biases. To mitigate these issues, we use entropy balancing (Hainmueller, 2012), which reweights units so that treatment (greenfield) and control (non-greenfield) groups match on specified moments—mean, variance, and skewness. Table 13 reports the balancing results when financial sector development is measured by credit to GDP ratio⁴. Based on the new weights, we run weighted least squares regressions, as the random effect model requires constant weights within each panel – a condition not satisfied in our case. The results reported in Table 14 are consistent with our main findings, except that the indicator of financial institutions' depth is no longer significant.

(Insert Tables 12, 13 and 14 here)

5. Conclusion

Our study aims to fill the empirical research gap on the effect of financial sector development (FSD) on microfinance institutions (MFIs) lending to micro-small-and-medium-sized enterprises

⁴ Balancing results with other financial sector development indicators are available upon request.

(MSMEs), and the mediating effect of the quality of the legal enforcement environment. We use a worldwide sample of 7,675 MFI-year observations spanning 96 countries over the period 2005–2018. We apply a fixed effects panel estimation technique that enables us to control for unobserved heterogeneity. We also lag all explanatory variables by one year to reduce endogeneity concerns that may result from reverse causality. We find supportive evidence for the market failure/substitution hypothesis between the social finance sector and the banking sector insofar as the relationship between FSD and MFIs' loan portfolio allocation to MSMEs is positive and significant, and the proportion of microloans extended to MSMEs following an improvement in financial development is much larger in countries where the institutional quality is weak. Intuitively, the social finance sector and the traditional banking sector have different targets (e.g., Vanroose and d'Espallier (2013), among others), with banks targeting less risky clients for whom screening and monitoring costs are lower, whereas MFIs focus on lending to clients who are unbanked: MSMEs perceived as risky. In a weak law enforcement environment, loan contracts are too costly to manage and enforce, which pushes banks to exit the small business market segment, with MFIs filling the vacuum left by banks.

The positive relationship between FSD and MFIs' loan allocation to MSMEs remains valid whichever FSD indicator we use, and to an alternative indicator of governance quality. For further robustness checks, we address potential endogeneity related to financial development following Breitung et al. (2024) instrument-free approach. We also control for time effects and for sample quality by limiting our sample to MFIs with high-quality financial information (i.e., MFIs with at least four diamonds). We also perform multilevel analysis by considering the nested grouping of our data, given that microfinance institutions operate in countries that are grouped into regions. The setup of the multilevel analysis allows us to control for unobserved country or region effects and within-country/region MFI effects using a nested error component model. Our results remain valid for these alternative estimations, which reinforces our confidence in our findings

The objective of our study was to test the substitution hypothesis, but it may well be that banks and MFIs compete fiercely in the small business market segment as the financial sector gets more developed, either because of the upscaling of MFIs or because of banks' downscaling. Studying the consequences of bank downscaling on credit expansion to MSMEs is a promising avenue for future research.

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Table 1: Variable descriptions, source of data, and summary statistics

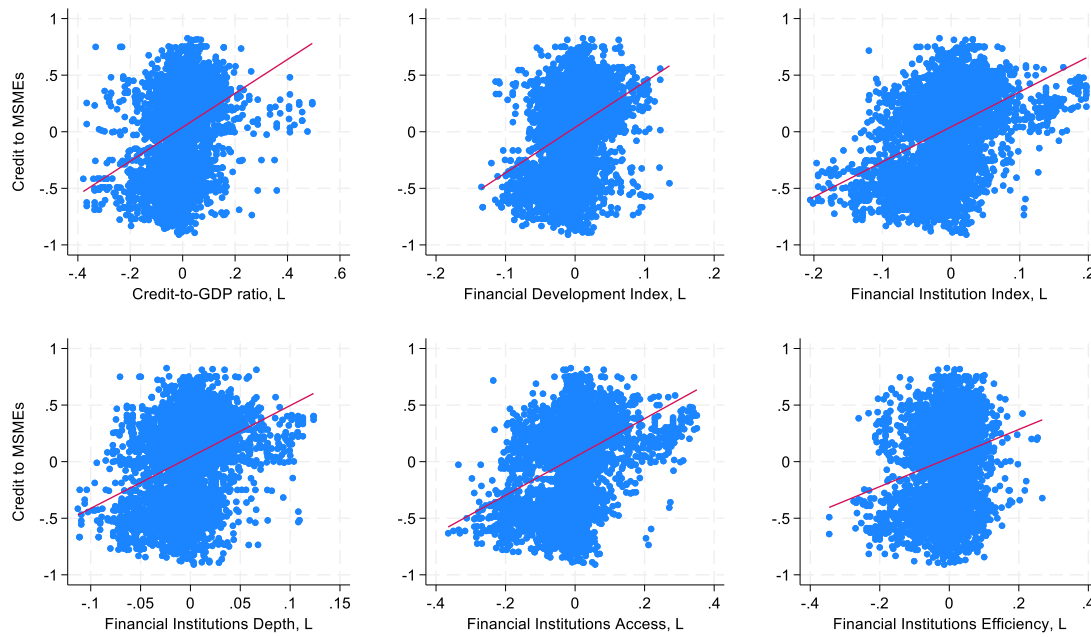
Variable	Description	Source	Obs.	Mean	Std. dev.	Min	Max
Loan ratio	Credit to micro, small, and medium enterprises to gross loan	Mix Market	7675	0.57	0.43	0	1
# borrowers per loan officer	Number of borrowers per loan officer	Mix Market	6695	5.49	0.66	1.39	7.28
# offices (log)	Log of the number of offices	Mix Market	6990	2.83	1.47	0	8.11
PAR30	(Outstanding balance on arrears over 30 days + Total gross outstanding refinanced (restructured) portfolio)/Total gross portfolio. This is a measurement of portfolio quality that shows the share of the portfolio affected by outstanding payments, which indicates a risk that they might not be repaid.	Mix Market	7137	0.06	0.07	0.00	0.50
ROA	Return on assets, which is the net operating income divided by average assets	Mix Market	7314	0.02	0.09	-1.40	0.20
Borrowings to assets ratio	Total borrowing divided by total assets	Mix Market	7183	0.39	0.27	0	0.93
GDP growth	Real GDP growth (annual)	WDI	7644	0.05	0.04	-0.28	0.35
Unemployment	Unemployment, total (% of total labor force)	WDI	7608	0.06	0.05	0.00	0.33
Credit to GDP ratio	Domestic credit to the private sector by banks (% of GDP)	GFDD	7567	0.35	0.19	0.01	1.58
FD	Financial Development index that combines depth (size and liquidity of markets), access (ability of individuals and companies to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets).	Svirydzhenka (2016)	7517	0.25	0.13	0.04	0.64
FI	Financial Institutions Index measures the overall level of development of financial institutions.	Svirydzhenka (2016)	7517	0.32	0.11	0.07	0.74
FID	Financial Institution Depth index is used to assess the depth of financial institutions. It adds to the standard measure of depth in the banking literature (bank credit to the private sector) indicators for other financial institutions, namely mutual fund and pension fund assets, and the size of life and non-life insurance premiums.	Svirydzhenka (2016)	7517	0.17	0.11	0.01	0.89
FIA	Financial Institutions' Access measures the ability of individuals and firms to access financial services provided by financial institutions.	Svirydzhenka (2016)	7517	0.26	0.19	0.00	0.98
FIE	Financial Institutions' Efficiency relies on three aspects of bank efficiency: (i) efficiency in intermediating savings to investment; (ii) operational efficiency measures; and (iii) profitability measures.	Svirydzhenka (2016)	7517	0.56	0.10	0.07	0.86
Informality	Size of the informal sector estimated by the multiple indicators multiple causes (MIMIC) approach (as a ratio of the GDP).	Elgin et al. (2022)	7407	0.39	0.12	0.11	0.69
Law and order	“Law and Order” helps to assess the strength and impartiality of the legal system, and the popular observance of the law. The higher the score, the better the quality of the system and the overall compliance with the law.	ICRG	6655	2.91	0.91	1.00	6.00
Rule of law	Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	WGI	7452	-0.60	0.44	-2.27	1.35
Greenfield	A dummy which takes 1 for a greenfield MFI and 0 otherwise.	Mix Market	7675	0.12	0.33	0	1

Table 2: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Credit ratio	1																	
(2) # borrowers per loan officer	0.025**	1																
(3) # offices	0.055***	0.160***	1															
(4) PAR30	-0.027**	-0.076***	-0.069***	1														
(5) ROA	-0.014	0.148***	0.089***	-0.189***	1													
(6) Borrowings to assets ratio	0.142***	0.043***	0.093***	-0.129***	-0.056***	1												
(7) Credit to GDP ratio	0.162***	0.051***	0.128***	-0.051***	0.057***	0.147***	1											
(8) FD	0.158***	0.045***	0.125***	-0.034***	0.0134	0.138***	0.586***	1										
(9) FI	0.249***	-0.057***	0.009	0.006	0.027**	0.119***	0.622***	0.756***	1									
(10) FID	0.177***	0.101***	0.121***	-0.012	-0.002	0.142***	0.671***	0.772***	0.761***	1								
(11) FIA	0.200***	-0.169***	-0.119***	0.024**	0.036***	0.055***	0.369***	0.492***	0.866***	0.411***	1							
(12) FIE	0.152***	0.094***	0.194***	-0.026**	0.008	0.093***	0.374***	0.394***	0.331***	0.262***	-0.021*	1						
(13) GDP growth	-0.116***	0.025**	0.053***	-0.175***	0.067***	0.053***	-0.052***	-0.045***	-0.195***	-0.100***	-0.241***	0.065***	1					
(14) Unemployment	-0.073***	-0.094***	-0.017	-0.037***	0.033***	0.135***	0.054***	0.058***	0.193***	0.085***	0.272***	-0.141***	-0.128***	1				
(15) Informality	-0.075***	-0.192***	-0.093***	0.047***	0.063***	-0.110***	-0.320***	-0.391***	-0.165***	-0.265***	0.002	-0.252***	0.006	-0.095***	1			
(16) Greenfield	0.038***	-0.094***	0.033***	-0.049***	-0.088***	0.007	-0.131***	-0.145***	-0.120***	-0.079***	-0.104***	-0.058***	0.004	0.005	0.097***	1		
(17) Rule of law	0.054***	0.165***	0.076***	-0.017	-0.032***	0.182***	0.424***	0.522***	0.418***	0.526***	0.202***	0.242***	-0.005	0.219***	-0.441***	-0.042***	1	
(18) Law and Order	-0.071***	0.093***	0.099***	-0.126***	-0.030**	0.216***	0.308***	0.187***	0.008	0.116***	-0.117***	0.182***	0.226***	0.039***	-0.255***	-0.000	0.448***	1

Notes: This table presents the correlation matrix. For the definition of the variables, see Table 1. ***p < 0.01, **p < 0.05, *p < 0.1.

Figure 1: Credit to MSMEs and financial development index



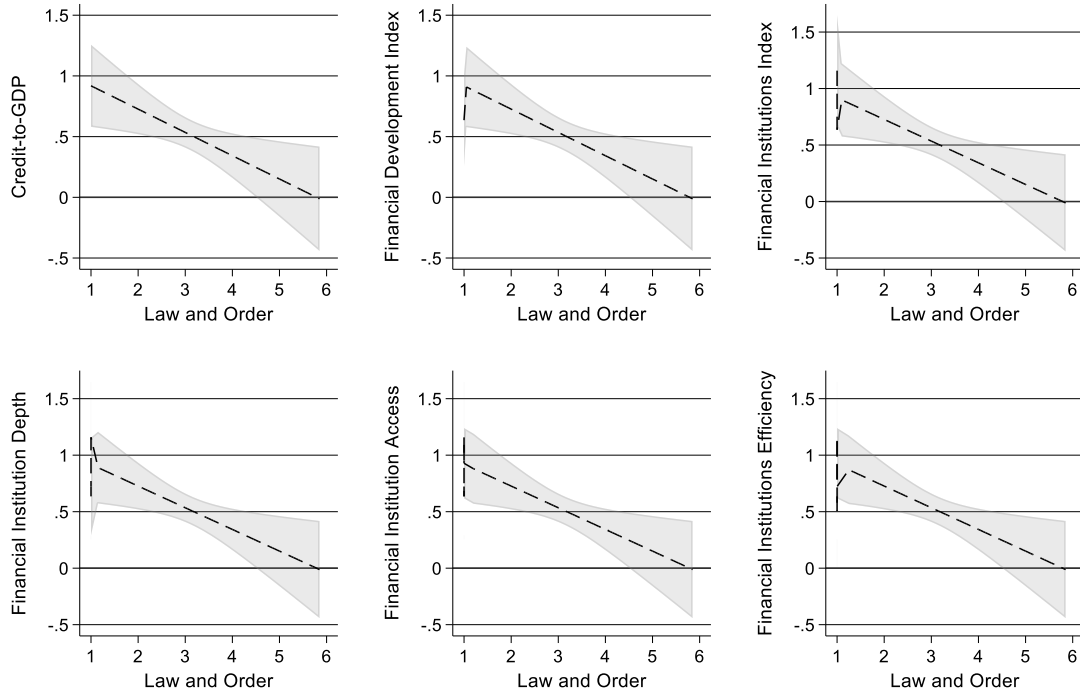
Notes: Each chart displays a scatterplot of MSME credit versus financial sector development indicators. The red line shows the linear fit. Variable definitions are in Table 1.

Table 3: Baseline results

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.112*** (0.032)	0.120*** (0.031)	0.148*** (0.032)	0.106*** (0.033)	0.142*** (0.031)	0.091*** (0.030)
# borrowers per loan officer	0.018 (0.015)	0.018 (0.015)	0.031** (0.014)	0.011 (0.015)	0.033** (0.014)	0.011 (0.015)
# offices	0.055*** (0.007)	0.057*** (0.007)	0.054*** (0.007)	0.055*** (0.007)	0.061*** (0.007)	0.056*** (0.008)
PAR30	-0.155 (0.104)	-0.106 (0.105)	-0.117 (0.105)	-0.125 (0.105)	-0.124 (0.103)	-0.108 (0.106)
ROA	-0.335*** (0.099)	-0.272*** (0.101)	-0.331*** (0.099)	-0.271*** (0.098)	-0.320*** (0.097)	-0.270*** (0.100)
Borrowings to assets ratio	0.175*** (0.039)	0.180*** (0.040)	0.148*** (0.038)	0.177*** (0.040)	0.165*** (0.038)	0.204*** (0.039)
Law and Order	-0.110*** (0.012)	-0.098*** (0.013)	-0.078*** (0.012)	-0.094*** (0.012)	-0.071*** (0.013)	-0.097*** (0.013)
Credit to GDP ratio	0.516*** (0.065)					
FD		0.592*** (0.091)				
FI			1.316*** (0.099)			
FID				0.771*** (0.092)		
FIA					0.735*** (0.066)	
FIE						0.472*** (0.109)
GDP growth	-1.424*** (0.144)	-1.480*** (0.148)	-1.145*** (0.138)	-1.438*** (0.145)	-1.085*** (0.138)	-1.580*** (0.150)
Unemployment	-1.241*** (0.320)	-1.392*** (0.331)	-1.742*** (0.343)	-1.400*** (0.353)	-1.795*** (0.323)	-1.179*** (0.312)
Informality	-0.317*** (0.087)	-0.341*** (0.087)	-0.320*** (0.083)	-0.392*** (0.084)	-0.491*** (0.081)	-0.499*** (0.081)
Constant	0.736*** (0.106)	0.726*** (0.110)	0.335*** (0.111)	0.801*** (0.106)	0.587*** (0.106)	0.704*** (0.126)
Observations	5,004	5,018	5,018	5,018	5,018	5,018
Number of MFIID	715	714	714	714	714	714
R2-overall	0.082	0.073	0.095	0.080	0.088	0.073
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the regression results of credit to MSMEs on FSD indicators and additional explanatory variables. Governance is measured by law and order. All variables are defined in Table 1, and the control variables are lagged by 1 year, excluding Greenfield. The estimations are performed using random effects. Robust standard errors are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1. ***p < 0.01, **p < 0.05, *p < 0.1.

Figure 2: Marginal effect of financial development on credit to MSMEs



Notes: These graphs plot the marginal effects of financial sector development on micro-loan to MSMEs depending on the quality of governance, i.e., This figure represents the marginal effect of financial sector development is $\frac{\partial \text{LOAN}_{ij,t}}{\partial \text{FSD}_{j,t-1}} = \beta_1 + \beta_3 \text{Gov}_{i,t-1}$, where β_1 and β_3 are from the equation 1. The shaded area is the 95% confidence interval, and the dashed line is the estimated mean.

Table 4: Results by sub-sample defined by governance level

	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)	Low (9)	High (10)	Low (11)	High (12)
Greenfield	0.106** (0.042)	0.149*** (0.049)	0.101** (0.040)	0.163*** (0.050)	0.124*** (0.041)	0.184*** (0.049)	0.066 (0.042)	0.180*** (0.050)	0.127*** (0.039)	0.165*** (0.049)	0.059 (0.036)	0.149*** (0.050)
# borrowers per loan officer	-0.006 (0.019)	0.066*** (0.021)	0.005 (0.020)	0.058*** (0.021)	0.010 (0.019)	0.075*** (0.021)	-0.008 (0.019)	0.053** (0.021)	0.010 (0.019)	0.071*** (0.021)	-0.011 (0.019)	0.055** (0.021)
# offices	0.049*** (0.009)	0.058*** (0.012)	0.058*** (0.009)	0.058*** (0.013)	0.056*** (0.009)	0.052*** (0.012)	0.056*** (0.009)	0.049*** (0.012)	0.066*** (0.009)	0.058*** (0.012)	0.050*** (0.010)	0.061*** (0.012)
PAR30	-0.457*** (0.132)	0.078 (0.147)	-0.398*** (0.130)	0.179 (0.147)	-0.365*** (0.128)	0.111 (0.152)	-0.426*** (0.132)	0.152 (0.148)	-0.318** (0.129)	0.116 (0.149)	-0.416*** (0.131)	0.164 (0.146)
ROA	-0.272** (0.116)	-0.439*** (0.143)	-0.237* (0.121)	-0.325** (0.151)	-0.285** (0.118)	-0.401*** (0.150)	-0.232** (0.118)	-0.322** (0.150)	-0.289** (0.116)	-0.365** (0.149)	-0.221* (0.119)	-0.309** (0.149)
Borrowings to assets ratio	0.156*** (0.051)	0.170*** (0.060)	0.163*** (0.054)	0.169*** (0.060)	0.126** (0.049)	0.149** (0.059)	0.172*** (0.053)	0.149** (0.059)	0.138*** (0.050)	0.162*** (0.060)	0.195*** (0.053)	0.172*** (0.060)
Law and order	-0.083*** (0.025)	-0.231*** (0.037)	-0.077*** (0.027)	-0.246*** (0.037)	-0.062** (0.026)	-0.230*** (0.038)	-0.065** (0.026)	-0.237*** (0.037)	-0.067*** (0.026)	-0.242*** (0.037)	-0.090*** (0.027)	-0.253*** (0.037)
Credit to GDP ratio	0.935*** (0.088)	0.397*** (0.100)										
FD			0.973*** (0.115)	0.269* (0.147)								
FI					1.498*** (0.121)	1.194*** (0.223)						
FID							0.975*** (0.133)	1.073*** (0.181)				
FIA									0.882*** (0.074)	0.390*** (0.123)		
FIE											0.698*** (0.122)	-0.125 (0.189)
GDP growth	-1.175*** (0.194)	-1.348*** (0.190)	-1.376*** (0.200)	-1.353*** (0.193)	-0.930*** (0.195)	-1.190*** (0.180)	-1.397*** (0.200)	-1.335*** (0.187)	-0.837*** (0.196)	-1.216*** (0.186)	-1.657*** (0.209)	-1.340*** (0.194)
Unemployment	-1.713*** (0.399)	-0.952 (0.745)	-1.647*** (0.428)	-1.042 (0.727)	-1.910*** (0.433)	-1.471** (0.731)	-1.600*** (0.454)	-1.249* (0.737)	-1.915*** (0.400)	-1.321* (0.712)	-1.377*** (0.367)	-0.970 (0.711)
Informality	-0.984*** (0.118)	0.028 (0.177)	-0.718*** (0.116)	-0.298** (0.151)	-0.783*** (0.116)	-0.031 (0.149)	-0.886*** (0.117)	0.045 (0.153)	-0.754*** (0.113)	-0.372*** (0.128)	-0.794*** (0.107)	-0.489*** (0.139)

Constant	0.993*** (0.140)	0.863*** (0.227)	0.825*** (0.149)	1.158*** (0.208)	0.544*** (0.146)	0.640*** (0.220)	1.026*** (0.146)	0.946*** (0.198)	0.759*** (0.142)	1.103*** (0.199)	0.838*** (0.158)	1.411*** (0.241)
Difference in												
Law and order		0.148		0.169		0.169		0.171		0.175		0.163
<i>t-stat</i>		3.285		3.689		3.682		3.790		3.844		3.575
<i>p-value</i>		0.007		0.004		0.004		0.003		0.003		0.004
Financial sector development		0.539		0.705		0.304		-0.099		0.492		0.824
<i>t-stat</i>		4.035		3.780		1.202		-0.439		3.418		3.664
<i>p-value</i>		0.002		0.003		0.255		0.669		0.006		0.004
Greenfield		-0.042		-0.062		-0.061		-0.114		-0.038		-0.090
<i>t-stat</i>		-0.657		-0.979		-0.949		-1.746		-0.610		-1.455
<i>p-value</i>		0.525		0.349		0.363		0.109		0.554		0.173
Observations	3,269	1,735	3,272	1,746	3,272	1,746	3,272	1,746	3,272	1,746	3,272	1,746
Number of MFIID	506	289	505	289	505	289	505	289	505	289	505	289
R2-overall	0.088	0.116	0.063	0.107	0.097	0.124	0.067	0.137	0.096	0.103	0.071	0.101
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates by sub-sample of countries defined by governance level. Governance is measured by law and order. “Low” (“high”) indicates low (high) level of governance relative to the sample median. The difference between the two groups is computed using the following statistics (from Equation (4) in Paternoster et al. (1998)) $Z = (\beta_l - \beta_h) / \sqrt{se(\beta_l)^2 + se(\beta_h)^2}$, where β_l and β_h are the parameters (of law and order, financial sector development or greenfield) estimated in the low and high governance level, respectively; and *se*’s are their respective standard errors. Bold indicates a statistical difference from zero. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. The variables are described in Table 1.

Table 5: Results after controlling for endogeneity issue using the nonparametric control function estimator (npCF) by Breitung et al. (2024).

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.135*** (0.037)	0.197*** (0.038)	0.194*** (0.038)	0.122*** (0.037)	0.162*** (0.037)	0.102*** (0.033)
# borrowers per loan officer	0.030* (0.017)	0.029* (0.017)	0.045*** (0.017)	0.020 (0.017)	0.044** (0.017)	0.017 (0.017)
# offices	0.067*** (0.011)	0.069*** (0.010)	0.061*** (0.012)	0.071*** (0.012)	0.086*** (0.012)	0.074*** (0.011)
PAR30	-0.120 (0.119)	-0.074 (0.116)	-0.063 (0.115)	-0.079 (0.113)	-0.068 (0.118)	-0.064 (0.123)
ROA	-0.347*** (0.121)	-0.276** (0.123)	-0.346*** (0.117)	-0.302*** (0.116)	-0.349*** (0.113)	-0.310** (0.121)
Borrowings to assets ratio	0.200*** (0.047)	0.211*** (0.047)	0.179*** (0.045)	0.213*** (0.047)	0.189*** (0.046)	0.243*** (0.046)
Law and Order	-0.110*** (0.015)	-0.095*** (0.015)	-0.059*** (0.015)	-0.096*** (0.015)	-0.070*** (0.017)	-0.103*** (0.015)
Credit to GDP ratio	0.861*** (0.192)					
FD		1.680*** (0.286)				
FI			2.127*** (0.226)			
FID				1.056*** (0.292)		
FIA					0.885*** (0.148)	
FIE						0.555*** (0.129)
GDP growth	-1.315*** (0.166)	-1.470*** (0.157)	-1.085*** (0.144)	-1.452*** (0.150)	-1.091*** (0.154)	-1.591*** (0.157)
Unemployment	-1.337*** (0.366)	-1.651*** (0.382)	-1.980*** (0.378)	-1.585*** (0.391)	-2.131*** (0.378)	-1.312*** (0.352)
Informality	-0.127 (0.210)	0.171 (0.190)	-0.119 (0.146)	-0.433** (0.173)	-0.640*** (0.136)	-0.624*** (0.092)
ρ_{FSD}	-0.057* (0.033)	-0.125*** (0.035)	-0.074** (0.029)	-0.020 (0.033)	0.007 (0.032)	-0.005 (0.013)
Constant	0.457** (0.183)	0.158 (0.185)	-0.137 (0.174)	0.702*** (0.174)	0.513*** (0.154)	0.658*** (0.138)
Observations	4,450	4,471	4,471	4,471	4,471	4,471
Number of MFIID	684	685	685	685	685	685
P-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates of the baseline regression after controlling for endogeneity using the nonparametric control function estimator (npCF) by Breitung et al. (2024). ρ_{FSD} is the coefficient associated with the distribution of the residual of FSD indicator on the existing control variables (see section 2.4). The estimated are performed using maximum likelihood technique and standard errors, reported in parentheses, are computed based on 1,000 bootstrap replications. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The variables are described in Table 1.

Table 6: Results after controlling for the alternative governance measure ‘Rule of Law’

	(1)	(3)	(5)	(7)	(9)	(11)
Greenfield	0.101*** (0.030)	0.110*** (0.029)	0.141*** (0.031)	0.098*** (0.031)	0.132*** (0.030)	0.086*** (0.028)
# borrowers per loan officer	0.023 (0.014)	0.021 (0.014)	0.033** (0.014)	0.015 (0.014)	0.035*** (0.014)	0.011 (0.014)
# offices	0.052*** (0.007)	0.057*** (0.007)	0.051*** (0.007)	0.053*** (0.007)	0.059*** (0.007)	0.055*** (0.007)
PAR30	-0.087 (0.099)	-0.062 (0.101)	-0.077 (0.101)	-0.076 (0.101)	-0.097 (0.100)	-0.057 (0.101)
ROA	-0.281*** (0.092)	-0.221** (0.095)	-0.264*** (0.092)	-0.221** (0.093)	-0.260*** (0.090)	-0.216** (0.094)
Borrowings to assets ratio	0.193*** (0.037)	0.198*** (0.038)	0.178*** (0.036)	0.197*** (0.038)	0.188*** (0.036)	0.214*** (0.038)
Rule of Law	-0.092*** (0.029)	-0.106*** (0.034)	-0.157*** (0.028)	-0.128*** (0.032)	-0.095*** (0.026)	-0.043 (0.029)
Credit to GDP ratio	0.440*** (0.059)					
FD		0.670*** (0.102)				
FI			1.495*** (0.097)			
FID				0.915*** (0.100)		
FIA					0.813*** (0.064)	
FIE						0.473*** (0.098)
GDP growth	-1.672*** (0.142)	-1.644*** (0.149)	-1.199*** (0.138)	-1.577*** (0.145)	-1.161*** (0.138)	-1.770*** (0.149)
Unemployment	-0.942*** (0.221)	-0.993*** (0.213)	-1.340*** (0.225)	-0.978*** (0.232)	-1.644*** (0.214)	-0.954*** (0.221)
Informality	-0.267*** (0.096)	-0.251*** (0.091)	-0.330*** (0.091)	-0.324*** (0.095)	-0.472*** (0.087)	-0.360*** (0.089)
Constant	0.335*** (0.099)	0.296*** (0.109)	-0.059 (0.100)	0.367*** (0.098)	0.289*** (0.093)	0.335*** (0.114)
Observations	5,624	5,656	5,656	5,656	5,656	5,656
Number of MFIID	785	788	788	788	788	788
R2-overall	0.065	0.059	0.088	0.067	0.081	0.057
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates of the baseline regression using rule of law as measure of governance. All variables are defined in Table 1, and the control variables are lagged by 1 year, excluding Greenfield. The estimations are performed using random effects. Robust standard errors are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table 7: Results by sub-sample defined by the alternative governance (Rule of Law) level

	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Greenfield	0.126*** (0.041)	0.088** (0.035)	0.124*** (0.039)	0.114*** (0.037)	0.153*** (0.042)	0.124*** (0.037)	0.108** (0.042)	0.097** (0.039)	0.143*** (0.041)	0.116*** (0.035)	0.114*** (0.038)	0.079** (0.036)
# borrowers per loan officer	0.041* (0.021)	0.008 (0.018)	0.039* (0.022)	0.009 (0.018)	0.040** (0.020)	0.026 (0.018)	0.031 (0.021)	0.005 (0.018)	0.041** (0.020)	0.031* (0.018)	0.025 (0.021)	0.001 (0.018)
# offices	0.038*** (0.009)	0.052*** (0.009)	0.048*** (0.009)	0.051*** (0.009)	0.041*** (0.009)	0.050*** (0.010)	0.043*** (0.009)	0.050*** (0.009)	0.052*** (0.009)	0.054*** (0.010)	0.040*** (0.009)	0.055*** (0.009)
PAR30	-0.002 (0.156)	-0.171 (0.130)	0.032 (0.163)	-0.157 (0.133)	0.079 (0.152)	-0.233* (0.135)	0.010 (0.161)	-0.168 (0.134)	0.066 (0.149)	-0.262* (0.135)	0.008 (0.163)	-0.143 (0.132)
ROA	-0.302* (0.156)	-0.275** (0.111)	-0.147 (0.159)	-0.285*** (0.110)	-0.153 (0.150)	-0.339*** (0.111)	-0.155 (0.155)	-0.275** (0.111)	-0.182 (0.147)	-0.330*** (0.108)	-0.198 (0.159)	-0.244** (0.110)
Borrowings to assets ratio	0.267*** (0.048)	0.124** (0.052)	0.285*** (0.048)	0.114** (0.052)	0.257*** (0.046)	0.108** (0.050)	0.285*** (0.048)	0.117** (0.052)	0.274*** (0.047)	0.108** (0.050)	0.279*** (0.048)	0.141*** (0.052)
Rule of Law	-0.357*** (0.056)	0.023 (0.045)	-0.348*** (0.058)	0.036 (0.045)	-0.279*** (0.050)	-0.024 (0.046)	-0.344*** (0.056)	-0.011 (0.050)	-0.249*** (0.051)	-0.002 (0.042)	-0.314*** (0.058)	0.088** (0.043)
Credit to GDP ratio	0.463*** (0.086)	0.382*** (0.073)										
FD			0.814*** (0.208)	0.608*** (0.110)								
FI					1.713*** (0.156)	1.204*** (0.127)						
FID							0.998*** (0.164)	0.820*** (0.129)				
FIA									0.825*** (0.095)	0.687*** (0.086)		
FIE											0.511*** (0.131)	0.279* (0.145)
GDP growth	-1.314*** (0.187)	-1.993*** (0.227)	-1.301*** (0.196)	-1.888*** (0.239)	-0.900*** (0.180)	-1.490*** (0.221)	-1.222*** (0.192)	-1.833*** (0.232)	-0.893*** (0.181)	-1.512*** (0.221)	-1.431*** (0.200)	-2.096*** (0.231)
Unemployment	-1.816*** (0.495)	-0.936*** (0.241)	-2.552*** (0.512)	-0.694*** (0.234)	-1.795*** (0.545)	-1.207*** (0.231)	-2.185*** (0.505)	-0.787*** (0.261)	-2.273*** (0.538)	-1.500*** (0.223)	-2.211*** (0.494)	-0.850*** (0.238)
Informality	-0.689*** (0.114)	-0.002 (0.117)	-0.682*** (0.115)	-0.009 (0.110)	-0.785*** (0.117)	-0.068 (0.105)	-0.821*** (0.125)	-0.041 (0.109)	-0.713*** (0.114)	-0.269** (0.107)	-0.651*** (0.108)	-0.156 (0.111)

Constant	0.186 (0.153)	0.435*** (0.129)	0.176 (0.170)	0.380*** (0.129)	-0.080 (0.149)	0.071 (0.135)	0.314** (0.150)	0.427*** (0.127)	0.207 (0.144)	0.371*** (0.121)	0.166 (0.169)	0.520*** (0.157)
Difference in												
Rule of law		-0.381		-0.384		-0.254		-0.333		-0.248		-0.402
<i>t-stat</i>		-5.317		-5.204		-3.746		-4.409		-3.736		-5.536
<i>p-value</i>		0.000		0.000		0.003		0.001		0.003		0.000
Financial sector development		0.081		0.206		0.509		0.178		0.138		0.232
<i>t-stat</i>		0.719		0.876		2.530		0.854		1.080		1.185
<i>p-value</i>		0.487		0.400		0.028		0.411		0.303		0.261
Greenfield		0.038		0.010		0.029		0.011		0.027		0.034
<i>t-stat</i>		0.702		0.184		0.527		0.192		0.495		0.645
<i>p-value</i>		0.497		0.858		0.609		0.851		0.630		0.532
Observations	2,844	2,780	2,871	2,785	2,871	2,785	2,871	2,785	2,871	2,785	2,871	2,785
Number of MFIID	463	479	466	481	466	481	466	481	466	481	466	481
R2-overall	0.115	0.051	0.094	0.059	0.133	0.072	0.101	0.065	0.114	0.067	0.109	0.044
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates by sub-sample of countries defined by governance level. Governance is measured by rule of law. “Low” (“high”) indicates low (high) level of governance relative to the sample median. The difference between the two groups is computed using the following statistics (from Equation (4) in Paternoster et al. (1998)) $Z = (\beta_l - \beta_h) / \sqrt{se(\beta_l)^2 + se(\beta_h)^2}$, where β_l and β_h are the parameters (of rule of law, financial sector development or greenfield) estimated in the low and high governance level, respectively; and se ’s are their respective standard errors. Bold indicates a statistical difference from zero. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. The variables are described in Table 1.

Table 8: Results after controlling for year effects

Panel A. Governance is measured by Law and Order

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.091*** (0.021)	0.100*** (0.021)	0.097*** (0.021)	0.096*** (0.021)	0.092*** (0.021)	0.091*** (0.021)
# borrowers per loan officer	-0.020** (0.010)	-0.018* (0.010)	-0.017* (0.010)	-0.019* (0.010)	-0.019* (0.010)	-0.020** (0.010)
# offices	0.007 (0.006)	0.007 (0.006)	0.007 (0.006)	0.006 (0.006)	0.008 (0.006)	0.006 (0.006)
PAR30	-0.138* (0.084)	-0.124 (0.082)	-0.125 (0.082)	-0.128 (0.082)	-0.127 (0.082)	-0.125 (0.083)
ROA	-0.085 (0.060)	-0.076 (0.058)	-0.080 (0.058)	-0.077 (0.058)	-0.075 (0.058)	-0.077 (0.058)
Borrowings to assets ratio	0.082*** (0.025)	0.080*** (0.026)	0.081*** (0.025)	0.079*** (0.025)	0.085*** (0.025)	0.086*** (0.025)
Law and order	-0.036*** (0.009)	-0.036*** (0.009)	-0.034*** (0.009)	-0.036*** (0.009)	-0.035*** (0.009)	-0.036*** (0.009)
Credit to GDP ratio	0.024 (0.043)					
FD		0.165** (0.069)				
FI			0.153** (0.078)			
FID				0.228*** (0.070)		
FIA					0.027 (0.053)	
FIE						0.101 (0.072)
GDP growth	-0.118 (0.141)	-0.075 (0.134)	-0.059 (0.134)	-0.070 (0.134)	-0.068 (0.134)	-0.085 (0.134)
Unemployment	0.204 (0.273)	0.165 (0.271)	0.136 (0.274)	0.155 (0.272)	0.186 (0.275)	0.219 (0.273)
Informality	-0.066 (0.067)	-0.003 (0.070)	-0.049 (0.066)	-0.018 (0.065)	-0.069 (0.066)	-0.051 (0.066)
Constant	0.181** (0.079)	0.112 (0.081)	0.123 (0.082)	0.132* (0.076)	0.173** (0.079)	0.124 (0.087)
Observations	5,004	5,018	5,018	5,018	5,018	5,018
Number of MFIID	715	714	714	714	714	714
R2-overall	0.466	0.466	0.465	0.468	0.465	0.465
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates of the baseline regression after controlling for time effects. Governance is measured by law and order. All variables are defined in Table 1, and the control variables are lagged by 1 year, excluding Greenfield. The estimations are performed using random effects. Robust standard errors are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Panel B. Governance is measured by Rule of Law

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.088*** (0.020)	0.101*** (0.020)	0.100*** (0.020)	0.098*** (0.020)	0.095*** (0.020)	0.095*** (0.020)
# borrowers per loan officer	-0.011 (0.010)	-0.007 (0.010)	-0.007 (0.010)	-0.008 (0.010)	-0.008 (0.010)	-0.009 (0.010)
# offices	0.003 (0.005)	0.001 (0.005)	0.002 (0.005)	0.001 (0.005)	0.002 (0.005)	0.001 (0.005)
PAR30	-0.138 (0.085)	-0.122 (0.083)	-0.122 (0.083)	-0.124 (0.083)	-0.125 (0.083)	-0.119 (0.083)
ROA	-0.075 (0.056)	-0.064 (0.055)	-0.067 (0.055)	-0.064 (0.055)	-0.064 (0.055)	-0.066 (0.055)
Borrowings to assets ratio	0.080*** (0.024)	0.076*** (0.024)	0.077*** (0.024)	0.076*** (0.024)	0.079*** (0.024)	0.080*** (0.024)
Rule of Law	0.026 (0.018)	0.001 (0.019)	0.005 (0.018)	-0.002 (0.018)	0.015 (0.018)	0.014 (0.018)
Credit to GDP ratio	-0.061 (0.045)					
FD		0.157** (0.071)				
FI			0.169** (0.078)			
FID				0.210*** (0.073)		
FIA					0.033 (0.053)	
FIE						0.142** (0.068)
GDP growth	-0.166 (0.135)	-0.110 (0.129)	-0.093 (0.129)	-0.105 (0.129)	-0.105 (0.129)	-0.125 (0.129)
Unemployment	0.019 (0.164)	0.020 (0.164)	-0.044 (0.166)	0.015 (0.164)	-0.019 (0.172)	0.044 (0.167)
Informality	0.001 (0.067)	0.066 (0.068)	0.026 (0.066)	0.047 (0.065)	0.017 (0.066)	0.044 (0.066)
Constant	0.065 (0.069)	-0.044 (0.074)	-0.032 (0.071)	-0.026 (0.068)	0.020 (0.068)	-0.055 (0.078)
Observations	5,624	5,656	5,656	5,656	5,656	5,656
Number of MFIID	785	788	788	788	788	788
R2-overall	0.451	0.451	0.451	0.453	0.450	0.451
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates of the baseline regression after controlling for time effects and governance is measured by rule of law. All variables are defined in Table 1, and the control variables are lagged by 1 year, excluding Greenfield. The estimations are performed using random effects. Robust standard errors are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table 9: Results on MFIs with sound financial statements (at least four diamonds)

Panel A. Governance is measured by Law and Order

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.056 (0.040)	0.054 (0.038)	0.086** (0.039)	0.041 (0.040)	0.078** (0.037)	0.032 (0.037)
# borrowers per loan officer	0.036* (0.019)	0.040** (0.019)	0.050*** (0.019)	0.032 (0.019)	0.053*** (0.019)	0.041** (0.019)
# offices	0.053*** (0.009)	0.053*** (0.010)	0.057*** (0.009)	0.052*** (0.009)	0.070*** (0.010)	0.049*** (0.010)
PAR30	0.026 (0.148)	0.059 (0.154)	0.031 (0.156)	0.037 (0.154)	0.019 (0.150)	0.058 (0.153)
ROA	-0.482*** (0.124)	-0.416*** (0.126)	-0.475*** (0.134)	-0.412*** (0.125)	-0.467*** (0.127)	-0.436*** (0.121)
Borrowings to assets ratio	0.319*** (0.051)	0.331*** (0.051)	0.278*** (0.049)	0.321*** (0.051)	0.304*** (0.050)	0.346*** (0.050)
Law and Order	-0.123*** (0.016)	-0.109*** (0.016)	-0.079*** (0.016)	-0.105*** (0.015)	-0.061*** (0.017)	-0.108*** (0.016)
Credit to GDP ratio	0.673*** (0.086)					
FD		0.597*** (0.102)				
FI			1.778*** (0.148)			
FID				0.781*** (0.112)		
FIA					1.066*** (0.094)	
FIE						0.594*** (0.144)
GDP growth	-1.322*** (0.168)	-1.508*** (0.168)	-1.158*** (0.162)	-1.451*** (0.169)	-1.105*** (0.160)	-1.549*** (0.169)
Unemployment	-1.920*** (0.399)	-2.103*** (0.410)	-2.576*** (0.446)	-2.082*** (0.434)	-2.705*** (0.406)	-1.840*** (0.381)
Informality	-0.435*** (0.110)	-0.473*** (0.104)	-0.389*** (0.103)	-0.546*** (0.103)	-0.575*** (0.101)	-0.588*** (0.098)
Constant	0.639*** (0.141)	0.669*** (0.140)	0.098 (0.148)	0.755*** (0.138)	0.376*** (0.142)	0.515*** (0.161)
Observations	2,865	2,864	2,864	2,864	2,864	2,864
Number of MFIID	550	549	549	549	549	549
R2-overall	0.112	0.099	0.140	0.106	0.136	0.103
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates of the baseline regression using a sample of MFIs with four and five diamonds. Governance is measured by law and order. All variables are defined in Table 1, and the control variables are lagged by 1 year, excluding Greenfield. The estimations are performed using random effects. Robust standard errors are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Panel B. Governance is measured by Rule of law						
	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.041 (0.037)	0.035 (0.034)	0.068* (0.037)	0.024 (0.038)	0.058* (0.034)	0.015 (0.034)
# borrowers per loan officer	0.037** (0.018)	0.040** (0.018)	0.040** (0.018)	0.030 (0.018)	0.044** (0.018)	0.037** (0.018)
# offices	0.047*** (0.009)	0.049*** (0.009)	0.053*** (0.009)	0.048*** (0.009)	0.065*** (0.009)	0.046*** (0.009)
PAR30	0.145 (0.140)	0.147 (0.147)	0.087 (0.150)	0.127 (0.147)	0.058 (0.146)	0.152 (0.145)
ROA	-0.412*** (0.113)	-0.348*** (0.114)	-0.384*** (0.120)	-0.344*** (0.114)	-0.379*** (0.114)	-0.352*** (0.110)
Borrowings to assets ratio	0.345*** (0.048)	0.364*** (0.049)	0.328*** (0.046)	0.352*** (0.049)	0.346*** (0.046)	0.371*** (0.048)
Rule of Law	-0.188*** (0.036)	-0.177*** (0.043)	-0.250*** (0.035)	-0.214*** (0.041)	-0.145*** (0.030)	-0.101*** (0.036)
Credit to GDP ratio	0.754*** (0.093)					
FD		0.730*** (0.127)				
FI			2.056*** (0.141)			
FID				1.084*** (0.135)		
FIA					1.177*** (0.088)	
FIE						0.523*** (0.132)
GDP growth	-1.474*** (0.166)	-1.666*** (0.167)	-1.141*** (0.160)	-1.566*** (0.166)	-1.097*** (0.162)	-1.753*** (0.165)
Unemployment	-1.275*** (0.248)	-1.273*** (0.239)	-1.760*** (0.260)	-1.271*** (0.262)	-2.289*** (0.235)	-1.226*** (0.244)
Informality	-0.414*** (0.121)	-0.445*** (0.111)	-0.507*** (0.115)	-0.560*** (0.117)	-0.648*** (0.107)	-0.527*** (0.108)
Constant	0.103 (0.126)	0.170 (0.135)	-0.305** (0.129)	0.254** (0.126)	0.150 (0.121)	0.158 (0.147)
Observations	3,211	3,217	3,217	3,217	3,217	3,217
Number of MFIID	610	612	612	612	612	612
R2-overall	0.099	0.085	0.140	0.095	0.134	0.084
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the estimates of the baseline regression using a sample of MFIs with four and five diamonds. Governance is measured by rule of law. All variables are defined in Table 1, and the control variables are lagged by 1 year, excluding Greenfield. The estimations are performed using random effects. Robust standard errors are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table 10: Estimation results from the multilevel analysis

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.094*** (0.018)	0.092*** (0.018)	0.091*** (0.018)	0.094*** (0.018)	0.088*** (0.018)	0.095*** (0.018)
# borrowers per loan officer	0.001 (0.010)	0.003 (0.010)	0.002 (0.009)	0.006 (0.010)	0.003 (0.010)	0.001 (0.010)
# offices	-0.005 (0.004)	-0.006 (0.004)	-0.007 (0.004)	-0.007 (0.004)	-0.006 (0.004)	-0.004 (0.004)
PAR30	-0.341*** (0.076)	-0.259*** (0.075)	-0.289*** (0.075)	-0.299*** (0.076)	-0.298*** (0.075)	-0.252*** (0.076)
ROA	-0.117* (0.069)	-0.116* (0.067)	-0.147** (0.067)	-0.147** (0.067)	-0.146** (0.067)	-0.153** (0.068)
Borrowings to assets ratio	0.158*** (0.023)	0.165*** (0.023)	0.159*** (0.023)	0.163*** (0.023)	0.164*** (0.023)	0.159*** (0.023)
Law and Order	-0.133*** (0.020)	-0.131*** (0.020)	-0.110*** (0.020)	-0.121*** (0.020)	-0.104*** (0.020)	-0.162*** (0.020)
Credit to GDP ratio	1.599*** (0.171)					
FD		2.802*** (0.287)				
FI			3.208*** (0.277)			
FID				3.950*** (0.378)		
FIA					1.568*** (0.206)	
FIE						0.476*** (0.113)
GDP growth	-1.285*** (0.171)	-1.503*** (0.162)	-1.196*** (0.164)	-1.415*** (0.164)	-1.158*** (0.165)	-1.737*** (0.161)
Unemployment	0.514 (0.516)	0.062 (0.519)	-1.100** (0.494)	0.484 (0.517)	-1.556*** (0.480)	0.404 (0.523)
Informality	-8.449*** (0.562)	-9.116*** (0.564)	-4.654*** (0.505)	-9.671*** (0.580)	-4.051*** (0.437)	-11.962*** (0.539)
Constant	3.707*** (0.305)	4.027*** (0.299)	1.736*** (0.316)	4.234*** (0.293)	2.158*** (0.209)	4.866*** (0.513)
Random effects (log of standard deviation)						
Region						
Log(sd FSD)	-0.003 (0.318)	0.805*** (0.311)	0.461 (0.331)	0.814** (0.353)	0.428 (0.359)	0.007 (0.364)
Log(sd constant)	-1.006* (0.583)	-1.289 (0.826)	-0.722* (0.403)	-2.297 (4.198)	-2.169** (0.982)	0.034 (0.365)
Country						
Constant	-0.010 (0.118)	0.060 (0.109)	-0.471*** (0.155)	0.167 (0.110)	-0.664*** (0.202)	0.213** (0.102)
Residual						
Constant	-1.032*** (0.010)	-1.031*** (0.010)	-1.040*** (0.010)	-1.030*** (0.010)	-1.033*** (0.010)	-1.023*** (0.010)
Observations	4,994	5,018	5,018	5,018	5,018	5,018
Number of groups	6	6	6	6	6	6

Notes: This table presents the estimates from the multilevel regression. The estimations are performed using maximum likelihood technique. We report robust standard errors in parentheses. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Table 11: Estimation results from the Tobit model

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.133*** (0.039)	0.138*** (0.039)	0.187*** (0.041)	0.121*** (0.038)	0.181*** (0.041)	0.101*** (0.038)
# borrowers per loan officer	0.036** (0.015)	0.034** (0.015)	0.056*** (0.015)	0.025* (0.015)	0.060*** (0.015)	0.024 (0.015)
# offices	0.078*** (0.009)	0.078*** (0.009)	0.081*** (0.008)	0.075*** (0.009)	0.092*** (0.008)	0.074*** (0.009)
PAR30	-0.181 (0.111)	-0.123 (0.110)	-0.116 (0.108)	-0.147 (0.110)	-0.126 (0.108)	-0.134 (0.110)
ROA	-0.464*** (0.098)	-0.380*** (0.096)	-0.458*** (0.095)	-0.378*** (0.095)	-0.445*** (0.095)	-0.379*** (0.096)
Borrowings to assets ratio	0.211*** (0.037)	0.222*** (0.037)	0.171*** (0.038)	0.217*** (0.037)	0.193*** (0.038)	0.253*** (0.037)
Law and Order	-0.145*** (0.014)	-0.126*** (0.014)	-0.103*** (0.014)	-0.120*** (0.013)	-0.092*** (0.014)	-0.123*** (0.013)
Credit to GDP ratio	0.715*** (0.068)					
FD		0.745*** (0.107)				
FI			1.877*** (0.119)			
FID				0.973*** (0.120)		
FIA					1.067*** (0.068)	
FIE						0.617*** (0.105)
GDP growth	-2.060*** (0.216)	-2.135*** (0.210)	-1.637*** (0.206)	-2.083*** (0.210)	-1.538*** (0.207)	-2.272*** (0.211)
Unemployment	-1.733*** (0.368)	-1.879*** (0.367)	-2.460*** (0.378)	-1.888*** (0.363)	-2.553*** (0.380)	-1.588*** (0.360)
Informality	-0.369*** (0.110)	-0.421*** (0.112)	-0.390*** (0.112)	-0.481*** (0.107)	-0.637*** (0.112)	-0.608*** (0.105)
Constant	0.615*** (0.115)	0.636*** (0.120)	0.031 (0.126)	0.731*** (0.113)	0.384*** (0.117)	0.597*** (0.126)
Observations	5,004	5,018	5,018	5,018	5,018	5,018
Number of MFIID	715	714	714	714	714	714
# left-censored observations	1220	1220	1220	1220	1220	1220
P-value	0.000	0.000	0.000	0.000	0.000	0.000
σ_u	0.274*** (0.014)	0.268*** (0.014)	0.295*** (0.014)	0.263*** (0.014)	0.296*** (0.014)	0.259*** (0.014)
σ_e	0.434*** (0.006)	0.438*** (0.006)	0.422*** (0.006)	0.438*** (0.006)	0.423*** (0.006)	0.441*** (0.006)

Notes: This table presents the estimates from the random-effects Tobit regression. The estimations are performed using maximum likelihood technique, where the likelihood function is calculated by Gauss–Hermite quadrature. We report robust standard errors in parentheses. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Table 12. Test of Difference Results

	Non-greenfield MFIs		Greenfield MFIs		Difference	P-Value
	#	Mean	#	Mean		
Loan ratio	6751	0.564	924	0.614	-0.050	0.001
# borrowers per loan officer	5896	5.517	799	5.322	0.195	0.000
# offices (log)	6157	2.812	833	2.944	-0.132	0.008
PAR30	6290	0.056	847	0.047	0.009	0.001
ROA	6445	0.021	869	0.001	0.021	0.000
Borrowings to assets ratio	6312	0.393	871	0.398	-0.004	0.640
Law and order	5852	2.910	803	2.909	0.001	0.974
Credit to GDP ratio	6650	0.358	917	0.278	0.080	0.000
FD	6629	0.259	888	0.201	0.058	0.000
FI	6629	0.330	888	0.288	0.042	0.000
FID	6629	0.172	888	0.145	0.027	0.000
FIA	6629	0.266	888	0.205	0.061	0.000
FIE	6629	0.567	888	0.549	0.018	0.000
GDP growth	6720	0.048	924	0.048	0.000	0.934
Unemployment	6684	0.060	924	0.061	-0.001	0.490
Informality	6540	0.385	867	0.423	-0.037	0.000

Notes: This table compares the characteristics of greenfield and non-greenfield MFIs by performing a t-test. For the definition of the variables, see Table 1. ***p<0.01, **p<0.05, *p<0.1.

Table 13. Entropy Balancing Results – Credit to GDP ratio is the FSD indicator.

	Treat: Greenfield investment			Control: Non-Greenfield		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Before: without weighting						
# borrowers per loan officer	5.380	0.338	-0.379	5.554	0.418	-0.400
# offices (log)	3.014	1.908	1.172	2.787	2.281	0.237
PAR30	0.048	0.005	3.534	0.057	0.006	3.543
ROA	0.011	0.011	-3.275	0.021	0.006	-4.197
Borrowings to assets ratio	0.392	0.058	-0.012	0.395	0.075	0.053
Law and order	2.925	0.712	0.437	2.913	0.826	0.237
Credit to GDP ratio	0.295	0.052	2.920	0.367	0.033	1.515
GDP growth	0.047	0.002	0.429	0.048	0.001	1.401
Unemployment	0.055	0.002	2.473	0.055	0.001	1.724
Informality	0.420	0.013	-0.237	0.375	0.016	0.297
After: weighting variable applied						
# borrowers per loan officer	5.380	0.338	-0.379	5.380	0.339	-0.378
# offices (log)	3.014	1.908	1.172	3.012	1.913	1.165
PAR30	0.048	0.005	3.534	0.048	0.005	3.535
ROA	0.011	0.011	-3.275	0.011	0.011	-3.276
Borrowings to assets ratio	0.392	0.058	-0.012	0.392	0.058	-0.012
Law and order	2.925	0.712	0.437	2.926	0.712	0.436
Credit to GDP ratio	0.295	0.052	2.920	0.295	0.052	2.916
GDP growth	0.047	0.002	0.429	0.047	0.002	0.429
Unemployment	0.055	0.002	2.473	0.055	0.002	2.467
Informality	0.420	0.013	-0.237	0.420	0.013	-0.237

Notes: This table reports the entropy balancing results using greenfield as the treatment variable and credit to GDP ratio as the financial sector development variable. All variables are defined in Table 1.

Table 14: Results After the Entropy Balancing Technique – linear regression

	(1)	(2)	(3)	(4)	(5)	(6)
Greenfield	0.124*** (0.034)	0.124*** (0.032)	0.129*** (0.033)	0.112*** (0.032)	0.128*** (0.032)	0.117*** (0.031)
# borrowers per loan officer	-0.025 (0.032)	-0.017 (0.028)	-0.026 (0.029)	-0.043 (0.027)	-0.037 (0.029)	-0.032 (0.027)
# offices	0.032*** (0.012)	0.021** (0.011)	0.028** (0.011)	0.031*** (0.011)	0.040*** (0.012)	0.017 (0.011)
PAR30	-0.562** (0.277)	-0.338 (0.289)	-0.344 (0.291)	-0.392 (0.279)	-0.395 (0.268)	-0.305 (0.293)
ROA	-0.531*** (0.139)	-0.583*** (0.156)	-0.575*** (0.163)	-0.411*** (0.139)	-0.567*** (0.153)	-0.473*** (0.145)
Borrowings to assets ratio	0.217*** (0.069)	0.192*** (0.068)	0.153** (0.070)	0.228*** (0.068)	0.139** (0.068)	0.232*** (0.067)
Law and Order	-0.075*** (0.020)	-0.070*** (0.019)	-0.062*** (0.020)	-0.065*** (0.020)	-0.056*** (0.020)	-0.075*** (0.020)
Credit to GDP ratio	0.198** (0.078)					
FD		0.472*** (0.143)				
FI			0.709*** (0.164)			
FID				0.250 (0.160)		
FIA					0.541*** (0.102)	
FIE						0.554*** (0.187)
GDP growth	-1.054*** (0.369)	-0.924** (0.418)	-0.861** (0.420)	-0.986** (0.419)	-0.764* (0.431)	-1.107** (0.448)
Unemployment	-1.471*** (0.468)	-1.350*** (0.473)	-1.574*** (0.454)	-1.455*** (0.483)	-1.754*** (0.464)	-1.505*** (0.481)
Informality	-0.278* (0.159)	-0.216 (0.137)	-0.300** (0.140)	-0.403*** (0.139)	-0.419*** (0.135)	-0.328** (0.128)
Constant	0.992*** (0.227)	0.885*** (0.199)	0.842*** (0.205)	1.129*** (0.175)	1.006*** (0.192)	0.836*** (0.217)
Observations	4,450	4,471	4,471	4,471	4,471	4,471
R-squared	0.148	0.139	0.151	0.129	0.164	0.134
P-value	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table presents the results of the baseline regression after the matching using ordinary least square technique. All variables are defined in Table 1, and the control variables are lagged by 1 year. Standard errors, clustered at the MFI level, are presented in parentheses. ***p<0.01, **p<0.05, *p<0.1.