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Does funding diversification enhance the dual mission of microfinance institutions under climate change?

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ABSTRACT

This study examines the effect of funding diversification on the dual mission of 165 microfinance institutions (MFIs) operating in 34 countries between 2008 and 2018 – a period marked by heightened climate risks. Drawing on Mix Market data, this study aims to bring some contributions to the study of microfinance institutions, exploring how funding diversification affects the balance between financial performance and social outreach (the two core objectives of microfinance institutions), under conditions of climate vulnerability. Interestingly, the findings indicate that funding diversification enhances financial performance but diminishes social outreach when analysed separately. There is no evidence that either financial performance or social outreach systematically varies with climate risk, except when social outreach is measured by Outreach Depth, in which case climate risk has a positive effect. In line with the previous results, no evidence is found of the mitigation impact of Diversification on the relationship between climate risks and financial performance, although it seems to amplify their adverse effect on social outreach when measured by Outreach Depth. When jointly considering MFIs' dual objectives, funding diversification aligns them both only when social outreach is not measured by Outreach Depth. Overall, diversification does not seem to support the dual mission in low-climate-risk contexts. By contrast, when social outreach is not measured by Outreach Depth and financial performance is measured by Return on Equity, a positive effect is observed exclusively in high-climate-risk contexts.

Keywords: microfinance, microfinance institutions, funding diversification, financial performance, social outreach, climate risk.

RESUMO

Este estudo examina o impacto da diversificação do financiamento na dupla missão de 165 instituições de microfinanciamento (IMFs) em 34 países, entre 2008 e 2018 – período marcado por elevados riscos climáticos. Ao usar dados do MIX Market, este estudo procura trazer alguns contributos ao estudo das IMFs, relativamente ao impacto da diversificação do financiamento no equilíbrio entre desempenho financeiro e o alcance social (os dois principais objetivos das instituições de microfinanciamento), em períodos de maior vulnerabilidade climática. Os resultados sugerem que a diversificação do financiamento melhora o desempenho financeiro, mas piora o alcance social quando analisados separadamente. Nenhuma evidência sugere que tanto o desempenho financeiro como o alcance social variam em países com diferentes níveis de riscos climáticos, exceto quando o alcance social é medido pela Profundidade do Alcance, já que os riscos climáticos afetam positivamente o alcance social. Similarmente, não há nenhuma evidência de que a diversificação do financiamento mitiga o impacto negativo dos riscos climáticos no desempenho financeiro, apesar de haver evidência do contrário quando o alcance social é medido pela Profundidade do Alcance. De seguida, quando a diversificação do financiamento é analisada com ambos os objetivos das instituições de microfinanciamento, os resultados sugerem que esta reconcilia a relação entre ambos, quando o alcance social não é medido pela Profundidade do Alcance. Por fim, a diversificação do financiamento não promove a dupla missão das instituições de microfinanciamento, em contextos de baixos riscos climáticos, o que é contrário aos resultados obtidos quando o alcance social não é medido pela Profundidade do Alcance e quando o desempenho financeiro é medido pela Rendibilidade dos Capitais Próprios, já que o efeito positive é observado apenas em contextos de elevados riscos climáticos.

Palavras-chave: microfinanciamento, instituições de microfinanciamento, diversificação do financiamento, desempenho financeiro, desempenho social, risco climático.

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1. INTRODUCTION

Funding diversification has the potential to influence the sustainability and outreach of microfinance institutions (MFIs), particularly under the growing pressures of climate change. This study investigates whether diversification enhances MFIs' ability to achieve their dual mission – financial sustainability and poverty alleviation – when operating in contexts of heightened climate vulnerability. Specifically, it addresses the research question (RQ): *Does funding diversification help to reconcile the financial performance and social outreach of MFIs under climate change?*

MFIs are designed to alleviate poverty by extending financial services to populations traditionally excluded from formal banking. These include low-income individuals, rural communities, women, and ethnic minorities (Blanco-Oliver et al., 2023). By facilitating access to credit, MFIs enable income generation, often through small-scale business activity, and contribute to improved living standards (Network, 2018).

However, MFIs operate in environments that are increasingly exposed to climate-related risks, which threaten both their stability and their capacity to serve vulnerable groups in low-income settings (Dorfleitner et al., 2025; Klomp, 2018). Climate change exacerbates the vulnerability of target populations (Heltberg et al., 2009), complicating MFIs' pursuit of their dual mission.

The inherent tension between these objectives is well documented. MFIs aim to achieve poverty outreach while maintaining financial self-sufficiency (Baltas & Liñares-Zegarra, 2025; Blanco-Oliver et al., 2023). This duality often leads to "mission drift," where the focus shifts from serving the poorest to targeting more financially secure clients in response to pressures for profitability and risk management (Ngo, 2015).

Seminal works – e.g., Morduch (2000) and Mosley and Hulme (1998) – emphasised the difficulty of reconciling these goals, even in socially oriented programs. Preventing mission drift is therefore critical for the creation of long-term social value (Klein et al., 2021).

Empirical evidence on the trade-off between outreach and performance remains mixed. Some studies support the trade-off hypothesis (Bos & Millone, 2015; Xu et al., 2024), while others report complementarities (Blanco-Oliver et al., 2023; Louis et al., 2013; Ponce et al., 2021). Ngo (2015) stresses the importance of aligning MFIs' business models with client profiles, especially in relation to funding structures.

Despite the extensive literature, the role of funding diversification in shaping the dual mission of MFIs remains underexplored. Diversification refers to securing funding from multiple sources – such as deposits, interbank borrowing, and capital markets (Duong, Tran, et al., 2023) – and has been shown in the banking sector to improve profitability and firm value by lowering leverage and the cost of equity (Elsas et al., 2010). Applying these insights to MFIs may reveal strategies that strengthen both outreach and financial sustainability.

Periods of political instability, economic downturns, and intensified climate risks can undermine both dimensions of MFIs' mission. Using an unbalanced panel of financial, operational, and social data from 165 MFIs in 34 countries between 2008 and 2018, this study examines whether funding diversification influences the balance between social outreach and financial performance under such conditions.

This research makes two contributions. First, it provides practitioners with evidence to design funding strategies that sustain social and financial outcomes during adverse climate conditions, while highlighting the potential role of insurance provision for sector resilience. Second, it advances academic understanding of strategies to mitigate mission drift, extending the literature by focusing on the interaction between funding diversification and climate risk.

The remainder of the paper is organised as follows: Section *2* reviews the literature; Section *3* outlines the methodology; Section *4* presents the results; Section *5* discusses robustness checks; Section *6* concludes, providing the main implications and limitations of the study.

2. LITERATURE REVIEW

2.1. MFI's funding sources

Microfinance Institutions (MFIs) rely on a diverse range of funding sources, including debt (interest-bearing liabilities), client deposits, and equity, to finance their operations and maintain financial sustainability. Each source shapes the MFI business model and performance, with effects varying by profit status (for-profit or non-profit) and legal form (banks and rural banks, cooperatives and credit unions, non-bank financial institutions, and non-governmental organisations). Credit unions and NGOs, as non-profit MFIs, primarily serve poor households and start-ups. Commercial banks, as for-profit entities, provide financial services to socially oriented clients (N'Guessan & Hartarska, 2021). Non-bank financial institutions (NBFIs) adopt hybrid models.

Debt is a common funding source for MFIs, supporting portfolio growth and refinancing existing obligations (World Bank, 2013), scaling operations in the long or short term. Borrowings, as a form of debt, involve fixed-term funding that must be repaid, typically with interest. A multi-tier debt structure is available (Luk & Zheng, 2022): secured debt, backed by collateral and less used due to extra costs (Vig, 2013), or unsecured debt, as a complement and an insurance (François & Naqvi, 2023), relying solely on the borrower's creditworthiness (World Bank, 2013). According to Myers and Majluf (1984), external debt financing often provides advantages over internal equity funding, particularly in maintaining operational flexibility.

Deposits serve as a stable and impactful funding source, particularly for boosting local development, economic growth and inclusion. They usually exhibit resilience to external macroeconomic shocks and provide MFIs with a reliable and consistent liquidity management during periods of crisis (CGAP, 2009). This resilience might be undermined when facing a wider financial system instability (for example, a run on bank deposits), increasing the MFIs' exposure to unexpected liquidity constraints (Diamond & Dybvig, 1983). Nevertheless, by pooling funds for productive investments, deposits enable MFIs to extend financial services to underserved communities (Baltas & Liñares-Zegarra, 2025). Those groups tend to transact more frequently than wealthier ones, as they exhibit moderate risk aversion and a low experience in financing (Simion & Rigoni, 2025), primarily relying on deposit-based services, given their heightened vulnerability to income disruptions (Heltberg et al., 2009).

A nuanced relationship exists between deposits and borrowings (debt), acting more as substitutes than complements. The Deposit-Borrowing Substitutability Theory (Shettima & Dzolkarnaini, 2024) posits that a greater reliance on deposits reduces the need for borrowings, and vice versa, as "the decision to mobilise deposits is not independent of the decision to borrow by MFIs" (Shettima & Dzolkarnaini, 2024, p. 1). This interdependence balances MFIs' funding mix to respond to market conditions (Gatev et al., 2007), enhancing their adaptability and financial sustainability. For instance, an increase in deposits may reduce the reliance on borrowings, allowing institutions to optimise their funding structure and lower costs (Cull et al., 2009). Conversely, greater reliance on borrowings may occur in scenarios where deposit mobilisation is constrained, ensuring that MFIs maintain adequate liquidity to meet their operational and growth objectives (Bogan, 2012).

Equity plays a smaller role in microfinance than debt or deposits (Galema et al., 2011). In for-profit MFIs, equity means shareholder ownership, allowing for potential returns via dividends or share sales (World Bank, 2013). For NGOs and other non-profits, equity often comes from donations by private or public funders, which may be converted into ownership if the MFI shifts to a for-profit structure (Galema et al., 2011). Although equity's involvement is limited, it is essential for certain regulatory standards and for allowing additional borrowing. MFIs use equity funding when they reach a mature stage, noted for reduced operating costs and improved financial and social performance metrics (Annan et al., 2024).

NGOs present weak leverage and a lack of formality, funding themselves with grants and debt from development institutions or socially responsible investors (N'Guessan & Hartarska, 2021). They are not able to borrow commercially in capital markets (World Bank, 2013), so they tend to transform themselves into deposit-taking MFIs[1], offering savings services and access to additional capital (D'Espallier et al., 2017). Deposit-taking MFIs rely on a mix of debt and equity financing from both public and private sources (Mia et al., 2024), as they offer additional buffers to absorb financial shocks (Wang, 2024). Profit-oriented MFIs can receive deposits and market-based capital and be subject to a strong governance structure and professional management (Mia et al., 2024).

2.2. Funding diversification

[1] This process is prohibited by certain governing authorities (banking law, financial law, and specific microfinance law) (Mia et al., 2024), due to the usual transference of private savings as public benefits as a primary purpose, bringing some concerns related to the asset security (World Bank, 2013).

Funding diversification refers to the ability of financial institutions, including MFIs, to access multiple capital sources, such as deposits, loans, and capital markets, thereby strengthening balance sheets, improving operational stability, and enhancing financial flexibility (Duong, Le, et al., 2023). By reducing reliance on a single funding stream, diversification can help ensure continuity of operations during periods of economic instability (Fahlenbrach et al., 2020) and increase resilience to external shocks and uncertain environments.

For MFIs, understanding the effects of funding diversification is particularly relevant given their dual objectives of financial sustainability and social outreach. Louis et al. (2013) argue that these two dimensions are interdependent and cannot be fully separated. While diversification of client portfolios has been linked to improvements in financial performance (Kendo & Tchakounte, 2022), shifts in funding structures, such as moving from credit-only to deposit-taking models, can lead to greater profit orientation, sometimes at the expense of the social mission (Wagner & Winkler, 2013).

The literature on the link between funding diversification and financial performance offers mixed findings. On one side, funding diversification can increase profit efficiency by expanding access to cost-effective capital (Nguyen, 2018). On the other hand, managing a diversified funding portfolio may involve higher financial expenses, potentially reducing profitability (Duong, Le, et al., 2023). Moreover, high levels of diversification have been associated with lower technical efficiency during crises (Curi et al., 2015).

Theoretical perspectives also diverge. Diversification Theory (Markowitz, 1952) suggests that broadening funding sources enhances financial performance by improving resource access and operational capacity (Duong, Le, et al., 2023). Pecking Order Theory (Myers & Majluf, 1984) posits that institutions prioritise funding sources based on cost and convenience, often favouring debt and equity without actively diversifying. Trade-Off Theory (Kraus & Litzenberger, 1973) emphasises the costs of balancing multiple funding sources, as institutions weigh flexibility and inclusiveness against efficiency losses (Campbell & Kelly, 1994).

Given these opposing theoretical perspectives and empirical findings, two alternative hypotheses are proposed:

H1a: *Funding diversification positively impacts MFIs' financial performance.*
H1b: *Funding diversification negatively impacts MFIs' financial performance.*

2.3. Funding diversification and MFIs' dual mission

Funding diversification may influence MFIs' social outreach, a key goal when targeting low-income households (Bibi et al., 2018). Outreach is typically assessed in terms of breadth – the level of borrower inclusion – and depth – the socioeconomic characteristics of the population served (Bibi et al., 2018; Blanco-Oliver & Irimia-Diéguez, 2021; Bos & Millone, 2015; Louis et al., 2013; Xu et al., 2024).

Socially oriented MFIs often combine donations, loans, and equity to expand operations and reach underserved communities (Baltas & Liñares-Zegarra, 2025). By diversifying the funding sources, these institutions can access more resources, enabling them to address operational costs and improve outreach to marginalised populations (Li et al., 2019). However, greater reliance on private funding may heighten the risk of mission drift, as donors typically prioritise social objectives over financial performance (Annan et al., 2024).

Blanco-Oliver and Irimia-Diéguez (2021) show that non-profit MFIs can improve financial performance and outreach, though a focus on financially sustainable clients may undermine their core mission. NGOs are known as being the most economically and socially efficient MFIs (Mia et al., 2024), as they are better equipped to minimise mission drift by strategically balancing funding sources to support both outreach and financial performance (Bos & Millone, 2015). In contrast, profit-oriented MFIs tend to prioritise financial returns over outreach, with banks showing the lowest efficiency values (Blanco-Oliver & Irimia-Diéguez, 2021; Gutierrez-Goiria et al., 2017).

MFIs that successfully diversify funding sources may expand loan portfolios, thereby enhancing financial sustainability and profitability (Zamore, 2018). This diversification can enhance local development and outreach while managing financial risks (Baltas & Liñares-Zegarra, 2025). Access to commercial sources of capital can also incentivise MFIs to balance financial and social objectives (Annan et al., 2024). These arguments highlight the importance of exploring whether, and how, funding diversification impacts MFIs' ability to reconcile their dual mission. Based on these insights, the following hypotheses are proposed:

H2a: *Funding diversification positively impacts MFIs' social outreach.*

H2b: *Funding diversification negatively impacts MFIs' social outreach.*

H3: *Funding diversification positively moderates the relationship between financial performance on social outreach, promoting MFI's dual mission.*

2.4. Climate Risks and Funding Diversification

MFIs operate in environments where climate-related risks increasingly threaten their stability and ability to serve vulnerable populations. Established to provide financial services to underserved and economically fragile communities, often in rural or low-income areas (Céu & Gaspar, 2024; Scheyvens, 2015), MFIs now face target populations that are disproportionately vulnerable to climate change impacts (Scheyvens, 2015).

Physical climate risks, such as extreme weather events, floods, and droughts, directly affect the economic stability of low-income households, which depend on predictable income streams for survival (D'Orazio, 2023). These risks disrupt local economies, destroy livelihoods, and deepen poverty cycles by reducing access to essential financial services (Leichenko & Silva, 2014). For MFIs, the challenge is therefore twofold: ensuring their operational continuity while maintaining their commitment to providing financial services to communities at the frontline of climate impacts (Hammill et al., 2008).

Climate crises offer a unique laboratory to examine the role of funding diversification in achieving MFIs' dual goals. Diversification can mitigate risks associated with dependence on a single funding stream, ensuring liquidity and operational flexibility during periods of heightened demand (Duong, Le, et al., 2023). However, firms' capacity to leverage funding diversification is constrained by the unique pressures associated with climate risks (Huang et al., 2022). Disasters increase the likelihood of loan defaults, create liquidity stress, and challenge financial viability, even for diversified institutions (Fahlenbrach et al., 2020).

Nonetheless, diversified funding may enable MFIs to meet increased financing needs during and after climate events, supporting recovery and preventing long-term economic displacement. The ability to adapt funding strategies and product offerings to climate realities is vital for institutional survival and for sustaining outreach to the most vulnerable.

Based on these considerations, the following hypotheses are proposed:

H4: *Climate risks harm MFIs' financial performance.*

H5: *Climate risks harm MFIs' social outreach.*

H6: *Funding diversification mitigates the negative relationships in H4.*

H7: *Funding diversification mitigates the negative relationships in H5.*

H8: *Funding diversification strengthens MFIs' dual mission (in H3), particularly in high climate risk contexts.*

3. METHODOLOGY

3.1. Data description

Data on MFI's characteristics were collected from Mix Market. The analysis integrates three datasets on MFIs' financial performance, social performance, and metadata. Upon merging the three datasets, the resulting database comprises 483 variables and 42,585 observations, corresponding to 3,155 MFIs operating across 123 countries, over the period 2000 to 2019. The dataset includes not only granular information on income statements and balance sheets but also data on social impact indicators, making it a valuable resource for assessing both the financial and social dimensions of microfinance institutions worldwide.

A rigorous data cleaning process was undertaken to ensure the reliability of the findings and minimise potential biases (**See Figure 1**). First, all missing values on *Deposits* were replaced by zero, following the guidance provided in the MIX report on MFI financial performance (Mix, 2018). Second, all observations with missing values on *Assets* were removed, in line with Baltas and Liñares-Zegarra (2025). This decision was motivated by the sensitivity of financial ratios to outliers and missing values in key financial variables, which could otherwise lead to under- or overestimation of results. This step deleted 8,035 observations.

Third, all observations corresponding to years prior to 2005 and after 2019 were excluded, resulting in the removal of 2,963 observations. This decision was based on the observation that these periods exhibit the highest levels of missing data, and their exclusion aims to ensure temporal consistency and completeness of the dataset (Baltas & Liñares-Zegarra, 2025; Shettima & Dzolkarnaini, 2024; Xu et al., 2024). Fourth, to standardise the temporal dimension of the data, all quarterly records were eliminated – 15,492 observations in total – to retain only annual data. Despite reducing data granularity, this procedure ensures alignment across reporting periods (Shettima & Dzolkarnaini, 2024). Fifth, all remaining observations with missing values in any of the covariates selected for empirical analysis were dropped to prevent bias in the regression estimates, which resulted in a further 14,877 deletions (Xu et al., 2024).

Sixth, to address potential inconsistencies in capital structure metrics, all observations with a Debt-to-Equity Ratio below 0 were also excluded (i.e., 9 observations). These were removed due to the possibility of negative equity, which could yield misleading or undefined ratio values. Furthermore, to ensure a robust longitudinal analysis, all MFIs with less than two

years of available financial data were excluded, leading to an additional 534 observations being dropped (Shettima & Dzolkarnaini, 2024; Xu et al., 2024). This last step resulted in a decrease in observations for the period of 2008 to 2018.

Following all these data processing steps, the final cleaned dataset includes 171 MFIs from 36 countries, observed between 2008 and 2018. Of these, 68 were for-profit and 104 were non-profit institutions. In terms of legal status, the sample comprises 25 banks, 17 credit unions/cooperatives, 62 non-bank financial institutions (NBFIs), and 67 non-governmental organisations (NGOs). Finally, after merging this refined MFI dataset with supplementary macroeconomic indicators – including the Climate Risk Index, GDP, and Unemployment Rate databases – the final analytical sample consists of an unbalanced panel dataset with 165 MFIs from 34 countries, corresponding to 646 observations covering the period 2008 to 2018.[2]

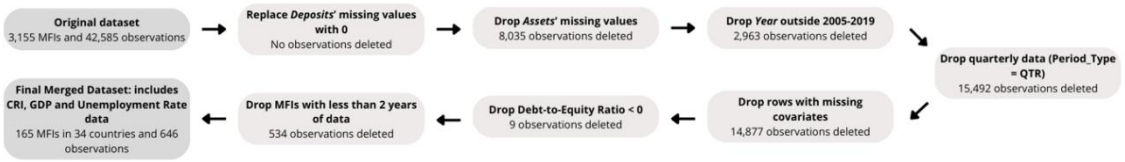


Figure 1: *Data Treatment Diagram*

3.2. Variables

3.2.1. Dependent variables

Table *1* presents the variables' definitions.

a) Financial Performance

MFIs' financial performance is measured using three standard indicators: return on assets (*ROA*), return on equity (*ROE*), and operational self-sufficiency (*OSS*).

ROA and *ROE* capture the institution's efficiency in generating financial returns from its resources. *ROA* relates net operating income to total assets, thus reflecting how effectively MFIs transform resources into profits. *ROE* relates net income to shareholders' equity, indicating how efficiently equity capital is used to generate returns (Fitri & Innes, 2016). While both are standard in banking and microfinance literature, they may not fully reflect the long-term viability of MFIs, particularly those operating in vulnerable markets.

[2] After merging these three datasets, 26 observations were eliminated due to the resulting missing data from the merge.

Table 1: *Variables' Definitions.*

Variables	Definitions	Sources
Dependent variables		
Financial Performance		
ROA	[(Net Operating Income – Taxes) / Average Total Assets]	(Fitri & Innes, 2016)
ROE	[(Net Operating Income – Taxes) / Average Total Equity]	(Fitri & Innes, 2016)
OSS	[Financial Revenue / (Financial Expense + Net Impairment Loss + Operating Expense)] OSS ≥ 1 = operational sustainability; OSS ≥ 1.1 = financial sustainability	(Bogan, 2012; Serrano-Cinca et al., 2023)
Social Outreach		
OutreachBreadth	log(Number of active borrowers)	(Group, 2023)
OutreachBreadth_Female	log(Number of female borrowers)	(Group, 2023)
OutreachBreadth_Rural	log(Number of rural borrowers)	(Group, 2023)
OutreachDepth	log[(Gross Loan Portfolio / Number of Loans) × (PPP / Exchange Rate)]; smaller values = deeper outreach	(Bos & Millone, 2015)
Main covariates		
Funding Diversification		
DIV	$\left[1-\left(\left(\frac{Debt\ Funding}{Fund}\right)^2+\left(\frac{Equity\ Funding}{Fund}\right)^2+\left(\frac{Deposits\ FD}{Fund}\right)^2\right)\right]$	(Curi et al., 2015; Duong, Le, et al., 2023; Nguyen, 2018)
Climate Risk		
CRI	$[(Rank\ Fatalities\ x\ 1/6)+(Rank\ Fatalities\ per\ 100K\ x\ 1/3)+(Rank\ Losses\ x\ 1/6)+(Rank\ Losses/GDP\ x\ 1/3)]$	(Eckstein et al., 2021)
Control variables		
LegalStatus		
Bank	Binary; 1 = licensed, regulated financial intermediary; offers deposits, lending, payments, transfers; 0 = otherwise	(Group, 2023; Kendo & Tchakounte, 2022) (*EMN/MFC proposal for a revised EU definition of microfinance and microcredit*, 2018)
CreditUnion	Binary: 1 = non-profit intermediary; offers lending and deposits; not state-regulated; 0 = otherwise	
NBFI	Binary: 1= licensed institution with lower capital requirements; 0 = otherwise	
NGO	Binary: 1= non-profit organisation; no deposit-taking; not banking-supervised; 0 = otherwise	
Product & Services		
SMEsLoans	Binary: 1 = loans to SMEs; 0 = otherwise	(Group, 2023)
Governance & HR Policies		
SocialGoals	Binary: 1 = board orientation to social mission; 0 = otherwise	(Group, 2023)
SocialProtection	Binary: 1 = social protection policies; 0 = otherwise	(Group, 2023)
SafetyProtection	Categorical: 2 = safety & anti-harassment policies; 1 = anti-harassment only; 0 = safety only	(Group, 2023)
Client Protection		
ClientProtection	Binary: 1 = internal audits to prevent over-indebtedness; 0 = otherwise	(Group, 2023)
Macroeconomic Context		
GDP	Gross domestic product at market prices	(Van den Bergh, 2009)
UnemploymentRate	National unemployment rate (%)	(Hall, 1979)

OSS provides a broader perspective, measuring the extent to which MFIs can cover their total costs – financial, operational, and loan-loss provisions – through operating revenues (Bos & Millone, 2015; Kendo & Tchakounte, 2022). *OSS* values above 1 indicate operational sustainability, while values above 1.1 suggest financial sustainability (Bogan, 2012; Serrano-Cinca et al., 2023). Given its comprehensive nature, *OSS* is often used to assess resilience in challenging contexts.

b) Social Outreach

Social outreach is analysed through two complementary dimensions: *breadth* and *depth*.

Breadth of outreach measures the scale of service provision. The base measure is the number of active borrowers (*OutreachBreadth*), complemented by indicators for female borrowers (*OutreachBreadth_Female*) and rural borrowers (*OutreachBreadth_Rural*). These disaggregated measures capture the extent to which MFIs serve traditionally excluded groups, aligning with literature that links gender inclusion and rural financing to poverty reduction (Blanco-Oliver & Irimia-Diéguez, 2021; Louis et al., 2013).

Depth of outreach reflects the poverty level of clients served and is proxied by the average loan size, adjusted for purchasing power parity (PPP). Smaller loans generally indicate targeting of poorer clients (Bos & Millone, 2015). PPP adjustments control for differences in local purchasing power, enabling cross-country comparability.

All outreach variables are log-transformed to address right-skewed distributions, particularly in borrower counts, thereby reducing heteroskedasticity and improving model stability (Bibi et al., 2018; Blanco-Oliver et al., 2023).

3.2.2. Main Covariates

a) Funding Diversification

Funding diversification (*DIV*) quantifies the extent to which an MFI's funding structure is distributed across multiple sources, thereby reducing dependence on any single source of capital. A more diversified funding base is associated with greater resilience to liquidity shocks, improved operational flexibility, and potentially enhanced financial performance (Curi et al., 2015; Duong, Le, et al., 2023; Nguyen, 2018).

In this study, *DIV* is computed as a modified Herfindahl-Hirschman Index (HHI) based on three broad funding categories: Debt Funding, Equity Funding, and Deposits. A higher *DIV* value indicates greater funding diversification.[3] The formula is:

$$DIV = 1 - \left(\left(\frac{Debt\ Funding}{Fund}\right)^2 + \left(\frac{Equity\ Funding}{Fund}\right)^2 + \left(\frac{Deposits\ FD}{Fund}\right)^2\right) \quad (3.1)$$

Equation 1: *Funding Diversification equation.*

where: **Debt Funding** represents borrowings, subordinated debt, and other liabilities; **Equity Funding** constitutes paid-in capital, donated equity, and retained earnings; **Deposits** act for all client and institutional deposits (demand, time, and compulsory), and **Fund** characterizes Debt Funding, Equity Funding, and Deposits.

b) Climate Risk

The Climate Risk Index (*CRI*) captures a country's exposure and vulnerability to severe climate-related weather events, including storms, floods, droughts, and heatwaves. It serves as a composite indicator of both the frequency and severity of such events, as well as their human and economic impacts, providing a macro-level measure of climate risk relevant to MFIs' operating environments.

Data for the *CRI* is sourced from the annual Global Climate Risk Index reports (Eckstein et al., 2021), which compile internationally standardised statistics for each country. For the period 2008–2018, four key indicators are provided annually: total fatalities caused by extreme weather events; fatalities per 100,000 inhabitants, controlling for population size; absolute economic losses (total monetary value of damages); and losses relative to GDP, controlling for national economic size.

These indicators are transformed into country-level ranks for each year. The *CRI* is then computed as a weighted sum of these ranks, assigning higher weights to variables that better reflect the relative scale of impacts:

[3] In certain MFIs, the sum of paid-in capital, donated equity, and retained earnings can be negative, primarily due to significantly negative retained earnings. Such situations often reflect structural financial management issues, including excessive dividend payouts, aggressive shareholder distributions, or other equity-depleting practices (Paulo, 2018). Negative retained earnings may also be linked to firm valuation considerations, such as dividend discount models and the net present value of growth opportunities. If these negative equity values were used directly, the DIV index could produce conceptually inconsistent negative results. To address this, Equity Funding is redefined as: Equity Funding=max(Paid-in Capital + Donated Equity + Retained Earnings, 0). This adjustment ensures that the diversification measure remains interpretable and aligned with its theoretical meaning, avoiding distortions in cases where retained earnings are substantially negative.

$$CRI = \left(Rank\ Fatalities\ x\frac{1}{6}\right) + \left(Rank\ Fatalities\ per\ 100K\ x\frac{1}{3}\right) + \left(Rank\ Losses\ x\frac{1}{6}\right) + \left(Rank\ Losses/GDP\ x\frac{1}{3}\right) \quad (3.2)$$

Equation 2: *Climate Risk Index equation.*

This weighting scheme places greater emphasis on per-capita and GDP-adjusted measures, thereby allowing for cross-country comparability between nations of different population sizes and economic scales.

A higher *CRI* score reflects greater climate risk exposure and, consequently, greater vulnerability of local populations and economic systems. In the context of microfinance, elevated *CRI* values are expected to exacerbate repayment risks, increase client default probabilities, and challenge the sustainability of outreach programmes, particularly in rural or low-income regions that are disproportionately affected by climate shocks.

In this study, *CRI* is used both as an independent contextual variable and in interaction terms with funding diversification, allowing the assessment of whether diversified funding structures can mitigate the adverse impacts of climate risk on MFIs' financial performance and social outreach.

3.2.3. Control variables

Control variables account for institutional, operational, and macroeconomic characteristics that may affect MFIs' outcomes.

Legal status accounts for four categories: *banks, cooperatives/credit unions, NBFIs,* and *NGOs*; they capture structural differences in objectives, governance, and regulatory environments (Mia et al., 2024; N'Guessan & Hartarska, 2021). NGOs, for example, often prioritise outreach over profitability.

Product offerings is a dummy for SME loans (*SMEsLoans*) that captures MFIs' engagement with small business financing, often linked to local economic development (Kennedy et al., 2014).

Governance & HR policies represent social goals orientation (*SocialGoals*), social protection policies (*SocialProtection*), and workplace safety/anti-harassment policies (*SafetyProtection*), capturing the institutional commitment to social responsibility (Banks et al., 2017; Group, 2023; Jilcha & Kitaw, 2016). *Client protection* includes internal audits to prevent over-indebtedness (*ClientProtection*), reflecting risk management practices.

Macroeconomic context is based on GDP and unemployment rate control for national economic conditions, influencing both MFIs' operations and clients' repayment capacity (Hall, 1979; Van den Bergh, 2009).

3.3. Methods

This study empirically tests the eight research hypotheses (H1a–H8) using an unbalanced panel dataset of MFIs over the period 2008–2018. The econometric analysis is conducted in StataSE 18.

3.3.1. Econometric Approach

A random effects (RE) panel model was adopted as the main estimation framework. The Hausman specification test indicated that RE was statistically preferable for the majority of the dependent variables, while also allowing the inclusion of time-invariant regressors such as an MFI's legal status, a feature that would be excluded under a fixed effects (FE) approach.[4]

Prior to model estimation, diagnostic checks were conducted to validate the specification. Multicollinearity was assessed via the correlation matrix and Variance Inflation Factors (VIFs) – section *0* –, heteroskedasticity was addressed by computing robust standard errors (vce(robust)), and autocorrelation was mitigated by clustering standard errors at the MFI level (vce(cluster MFI_ID)). Potential omitted variable bias is examined using the Ramsey RESET test (estat ovtest), with results indicating adequate specification for the *ROA*, *OSS*, and *OutreachBreadth_Rural* models, though some outreach measures display signs of unobserved factors.

3.3.2. Model Specifications

The empirical design tests eight hypotheses (H1a–H8), which encompass both direct and moderating effects of funding diversification (*DIV*) and climate risk (*CRI*) on MFIs' financial performance and social outreach, as well as the interaction between these two objectives.

The first empirical step jointly assesses the direct impacts of funding diversification (*DIV*) and climate risk (*CRI*) on MFIs' financial performance (*FP*) and social outreach (*SO*),

[4] Following Bell and Jones (2015), the RE specification captures both within- and between-entity variation and is more flexible for modelling variables defined at higher levels of aggregation. It is assumed that the error term is independently and identically distributed with zero mean and constant variance, and uncorrelated with the explanatory variables, ensuring unbiased and consistent estimates.

corresponding to Hypotheses H1a-H2b and H4 and H5. These relationships are tested using the following baseline specifications:

$$FP_{it} = \alpha + \beta_1 DIV_{it} + \beta_2 CRI_{it} + \gamma' X'_{it} + Country_FE_{c(i)} + u_i + \epsilon_{it} \quad \textbf{(3.3)}$$

Equation 3: *Hypotheses 1a, 1b and 4 regression equation.*

$$SO_{it} = \alpha + \beta_1 DIV_{it} + \beta_2 CRI_{it} + \gamma' X'_{it} + Country_FE_{c(i)} + u_i + \epsilon_{it} \quad \textbf{(3.4)}$$

Equation 4: *Hypotheses 2a, 2b and 5 regression equation.*

Where $\boldsymbol{FP_{it}}$ is proxied by *ROA*, *ROE*, and *OSS*; $\boldsymbol{SO_{it}}$ is proxied by *OutreachBreadth*, *OutreachBreadth_Female*, *OutreachBreadth_Rural*, and *OutreachDepth;* $\mathbf{X_{it}}$ is the set of control variables; $\mathbf{Country_FE_{c(i)}}$ denotes country fixed effects; $\boldsymbol{u_i}$ is the MFI-specific random effect; ϵ_{it} is the idiosyncratic error term. β_1 measures the direct effect of funding diversification and social outreach (testing H1a, H1b, H2a, H2b), while β_2 captures the direct effect of climate risk (testing H4 and H5).

The second step examines whether funding diversification attenuates the negative effects of climate risk on MFIs' financial performance and social outreach, which corresponds to Hypotheses H6 and H7. This is tested by introducing an interaction term between *DIV* and *CRI* into the baseline model:

$$FP_{it} = \alpha + \beta_1 DIV_{it} + \beta_2 CRI_{it} + \beta_3 (DIV_{it} \times CRI_{it}) + \gamma' X'_{it} + Country_FE_{c(i)} + u_i + \epsilon_{it} \quad \textbf{(3.5)}$$

Equation 5: *Hypothesis 6 regression equation.*

$$SO_{it} = \alpha + \beta_1 DIV_{it} + \beta_2 CRI_{it} + \beta_3 (DIV_{it} \times CRI_{it}) + \gamma' X'_{it} + Country_FE_{c(i)} + u_i + \epsilon_{it} \quad \textbf{(3.6)}$$

Equation 6: *Hypothesis 7 regression equation.*

In these equations, β_3 measures the extent to which funding diversification moderates the impact of climate risk on *FP* and *SO*. A positive and significant coefficient would indicate that diversification mitigates the adverse effects of climate risk, supporting H6 and H7.

The third step addresses Hypothesis H3, which posits that funding diversification strengthens the positive relationship between financial performance and social outreach (or mitigates a negative relationship), thereby reinforcing MFIs' dual mission (or mitigating mission drift). This is captured by interacting *FP* with *DIV* in the outreach equation:

$$SO_{it} = \alpha + \beta_1 DIV_{it} + \beta_2 CRI_{it} + \beta_3 FP_{it} + \beta_4 (DIV_{it} \times FP_{it}) + \gamma' X'_{it} + Country_FE_{c(i)} + u_i + \epsilon_{it} \quad (3.7)$$

Equation 7: *Hypothesis 3 regression equation.*

In this context, β_4 captures the moderating effect of funding diversification on the FP and SO relationship. A positive and significant coefficient supports the notion that diversification facilitates alignment between financial sustainability and social objectives, mitigating potential mission drift.

Finally, Hypothesis H8 examines whether the moderating effect identified in Step 3 is stronger in high climate risk environments. The model for H3 is re-estimated separately for MFIs in the top and bottom quartiles of the *CRI* distribution. The high-CRI subsample includes MFIs in the 43 most climate-vulnerable countries, while the low-CRI subsample covers MFIs in the 43 least vulnerable countries. Comparing **β4** across subsamples allows testing whether the dual-mission reinforcement effect of diversification is amplified under elevated climate risk.

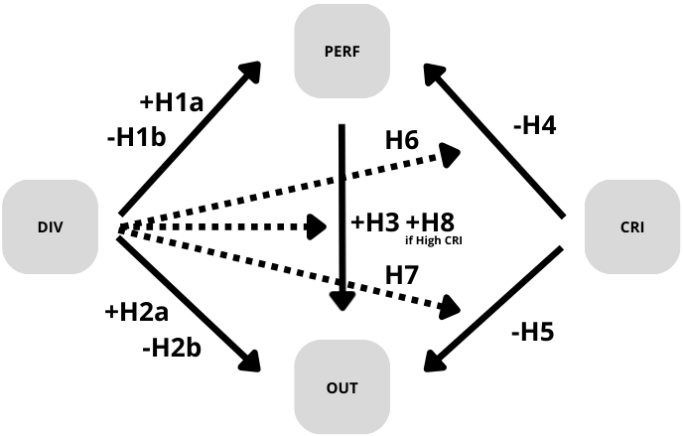


Figure 2: *Hypotheses Diagram*

3.4. Descriptive statistics

Table 2 presents the descriptive statistics of both the non-binary and binary variables being used in the empirical analysis.

The dataset comprises 646 observations. Regarding the indicators of Financial Performance, the variables *ROA* and *ROE* exhibit mean values of 0.025 and 0.084, respectively, with standard deviations of 0.052 and 0.332. These values indicate consistent returns across MFIs, although the high standard deviation of *ROE* suggests volatility in MFIs' profitability. The *OSS* mean is 1.161, and the standard deviation is 0.280, presenting evidence that MFIs might have financial sustainability, as they can generate enough revenue to cover expenses.

Although *ROE* presents high dispersion, the relatively low dispersion of the other two dimensions confirms the stability of these indicators.

Concerning the Social Outreach, the variable *OutreachBreadth* has a mean of 10.029 and a standard deviation of 1.734. *OutreachBreadth_Female* presents a mean of 9.506 and a standard deviation of 1.847, while *OutreachBreadth_Rural* has a lower mean of 8.803, accompanied by a higher standard deviation of 2.759. This higher variation in rural outreach reflects more substantial differences across MFIs regarding their ability to reach clients in rural areas, compared to the previous two. The mean value of *OutreachDepth* is 5.980 with a standard deviation of 1.073, suggesting considerable heterogeneity in the depth of social outreach across the institutions in the sample.

Table 2: *Variables Summary Statistics.*

	Nr. Obs.	Mean	Std. Dev.	Min.	Max.
Panel A: Summary Statistics for Non-Binary Variables					
ROA	646	0.025	0.052	-0.357	0.184
ROE	646	0.084	0.332	-5.859	1.150
OSS	646	1.161	0.280	0.120	5.495
OutreachBreadth	646	10.029	1.734	5.832	14.761
OutreachBreadth_Female	646	9.506	1.847	3.584	14.690
OutreachBreadth_Rural	646	8.803	2.759	0	14.151
OutreachDepth	646	5.980	1.073	3.265	9.289
DIV	646	0.387	0.158	0	0.665
CRI	646	52.165	29.693	2.170	126.170
GDP	646	4.479	2.758	-5.919	17.291
UnemploymentRate	646	5.776	4.575	0.130	28.010
Panel B: Summary Statistics for Binary Variables					
Bank	646	0.135	0.342	0	1
CreditUnion	646	0.0960	0.298	0	1
NBFI	646	0.376	0.485	0	1
NGO	646	0.393	0.489	0	1
SMEsLoans	646	0.489	0.500	0	1
SocialGoals	646	0.650	0.477	0	1
SocialProtection	646	0.684	0.465	0	1
SafetyProtection	646	0.245	0.617	0	2
ClientProtection	646	0.584	0.493	0	1

Among the independent variables, *DIV* shows a mean of 0.387 and a standard deviation of 0.158, indicating a moderate level of diversification with relatively low dispersion. *CRI* has a mean of 52.165 and a standard deviation of 29.693, reflecting substantial variation in climate risk exposure across countries and, consequently, across MFIs.

Related to the macroeconomic indicators, the *GDP* variable presents a mean of 4.479 and a standard deviation of 2.758, indicating a wide dispersion among the countries. The

UnemploymentRate has a higher mean of 5.776 and a higher standard deviation of 4.575, also demonstrating variations in the labour market conditions across the different countries.

The summary statistics of the binary variables reveal that only 13.5% of the MFIs are Banks, while 9.60% are Credit Unions/Cooperatives, the less frequent MFI type. The NBFIs and NGOs represent approximately 40% of the MFIs, both being the most frequent types. About 50% of the income-generating loans are given to SMEs, showing a high focus on enterprise lending. The orientation of the board toward social goals exists in 65% of the MFIs, around 68% of the MFIs employ social protection policies, and only about 25% use safety protection policies. Finally, the implementation of internal audits is done in approximately 58% of the MFIs, indicating a high presence of client protection worries.

As reported in Table *A1* (Annexe), the pairwise correlation matrix indicates no evidence of problematic multicollinearity among the variables. A commonly used rule of thumb suggests that absolute correlation coefficients above 0.8 may signal potential collinearity issues. In this case, all pairwise correlations are below that threshold. Complementarily, the Variance Inflation Factors (VIFs) reported in Table *A2* (Annexe) range between 1 and 3, well below the conventional cut-off value of 10, further supporting the absence of multicollinearity concerns in the dataset.

4. FINDINGS

This section presents the empirical results of testing the eight research hypotheses (H1a–H8) using the random effects model with robust standard errors clustered at the MFI level. The dependent variables comprise alternative measures of Financial Performance (*FP*) — return on assets (*ROA*), return on equity (*ROE*), and operational self-sufficiency (*OSS*) — and Social Outreach (*SO*) — outreach breadth, outreach breadth to female borrowers, outreach breadth in rural areas, and outreach depth.

4.1. Direct Effects of Funding Diversification and Climate Risk (H1a–H2b; H4–H5; H6-H7)

The first set of estimations corresponds to the baseline specifications (**Equation *3*** and **Equation *4***) and the extended models, including the interaction between funding diversification (*DIV*) and climate risk (*CRI*) (**Equation *5*** and **Equation *6***). Results are reported in **Table *3***, where Column I and Column II reflect the results on the Baseline Model and the Interactions, respectively.[5]

For Financial Performance, in Column I, the *DIV* coefficients are strongly significant for all measures, validating H1a as there is a positive direct impact of *DIV* on *FP*, supporting the results of Elsas et al. (2010), Duong, Le, et al. (2023), Kendo and Tchakounte (2022), Nguyen (2018), and Zamore (2018), and rejecting H1b. These results are consistent in Column II, for both *ROA* and *ROE*, but no conclusion is taken for *OSS*. For Social Performance, in both columns, the results are not statistically significant, not supporting both H2a and H2b. In II.7, the Outreach Depth coefficient is moderately significant, rejecting H2a as there is a negative direct impact of *DIV* on *SO*, and validating H2b, which rejects the results of Bibi et al. (2018) and Li et al. (2019). For both dependent variables, the *CRI* coefficients are not statistically significant, not supporting H4 and H5, unless *SO* is measured by Outreach Depth, as in I.7, the coefficient is strongly significant, suggesting there is a positive direct impact of *CRI* on *SO*, which rejects H5. When *DIV* is combined with *CRI*, H6 and H7 are not supported, as all coefficients are not statistically significant, unless *SO* is measured by Outreach Depth, as in II.7, the coefficient is weakly significant, suggesting there is a positive direct impact of *DIV* on the impact of *CRI* on both *FP* and *SO*, which verifies H7.

[5] The estimation tables do not report the estimated coefficients for the control variables due to space constraints. This information is available from the authors upon request.

Table 3: *Direct and Moderating Effects of Funding Diversification and Climate Risk on both Financial Performance and Social Outreach. (Random Effects Model. See Table 1 for Variable Definition.)*

	Baseline Model							Interactions						
	Column I							**Column II**						
Dependent Variables	**Financial Performance**			**Social Outreach**				**Financial Performance**			**Social Outreach**			
	ROA	ROE	OSS	Outreach Breadth	Outreach Breadth_Female	Outreach Breadth_Rural	Outreach Depth	ROA	ROE	OSS	Outreach Breadth	Outreach Breadth_Female	Outreach Breadth_Rural	Outreach Depth
	I.1	**I.2**	**I.3**	**I.4**	**I.5**	**I.6**	**I.7**	**II.1**	**II.2**	**II.3**	**II.4**	**II.5**	**II.6**	**II.7**
Main Covariates														
DIV	0.065***	0.416***	0.245***	-0.264	-0.274	-0.427	-0.200	0.071***	0.439***	0.190	-0.340	-0.336	-0.681	-0.426**
	(0.015)	(0.106)	(0.085)	(0.193)	(0.206)	(0.695)	(0.153)	(0.022)	(0.165)	(0.121)	(0.257)	(0.274)	(0.972)	(0.203)
CRI	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001	0.002***	-0.000	0.000	-0.001	-0.001	-0.001	-0.003	-0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.006)	(0.001)
Interaction														
DIV x CRI								-0.000	-0.001	0.001	0.002	0.001	0.006	0.005*
								(0.000)	(0.003)	(0.002)	(0.004)	(0.004)	(0.015)	(0.003)
Controls														
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-0.003	-0.102	1.090***	11.465***	10.802***	8.486***	6.294***	-0.005	-0.112	1.111***	11.494***	10.825***	8.581***	6.380***
	(0.014)	(0.090)	(0.080)	(0.338)	(0.363)	(0.694)	(0.221)	(0.015)	(0.101)	(0.086)	(0.343)	(0.369)	(0.740)	(0.227)
Observations	646	646	646	646	646	646	646	646	646	646	646	646	646	646
Number of MFI_ID	165	165	165	165	165	165	165	165	165	165	165	165	165	165

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

4.2. Moderating role of funding diversification in MFIs' dual mission (H3)

The second set of estimations corresponds to the baseline specifications of Social Outreach (**Equation *4***) and the extended model, with the introduction of Financial Performance as an independent variable, including the interaction between funding diversification and financial performance (**Equation *7***). Results are reported in **Table *4*** and **Table *5***, where the results present the Baseline Model and the Interactions, respectively.

In **Table *4***, the *DIV* coefficients are weakly significant for *ROA* and *ROE* when *SO* is measured by Outreach Breadth, indicating a negative direct impact of *DIV* on *SO*. All the other *DIV* coefficients are statistically insignificant, as are all CRI coefficients, indicating no impact of *CRI* on *SO*. The *CRI* coefficients are only statistically significant when SO is measured by Outreach Depth, suggesting a positive direct impact of *CRI* on *SO*. For *ROA* coefficients, the results are all statistically significant, suggesting there is a positive direct impact of *ROA* on *SO*. Simultaneously, the *ROE* coefficients are moderately significant, proposing the same negative impact between *ROE* and *SO*. When *SO* is measured by Outreach Breadth in Rural areas, the *ROE* coefficient is not statistically significant, while the *OSS* coefficient is weakly significant, indicating a positive direct impact of *OSS* on *SO*. For all other *OSS* coefficients, the results are not statistically significant.

In **Table *5***, the *DIV* coefficients are statistically significant in II.1 and II.2, alongside sub-columns II.3.3 and II.4.2, indicating a negative direct impact of *DIV* on *FP*, which is partially in line with the baseline results. All the other *DIV* coefficients are statistically insignificant, as also happens with all *CRI* coefficients, suggesting there is no direct impact of *CRI* on *SO* (in line with the baseline model), unless *SO* is measured by Outreach Depth, where a positive direct impact is detected. For *ROA* coefficients, the results are statistically significant when *SO* is measured by Outreach Breadth in Rural areas and Outreach Depth, where there is a negative and a positive direct impact of *ROA* on *SO*, respectively. Simultaneously, when *SO* is measured by all Outreach Breadth measures, *OSS* positively impacts *SO* directly, and when measured by Outreach Depth, *OSS* negatively impacts *SO* directly. For all *ROE* coefficients, the results are not statistically significant. When *DIV* is combined with *FP*, H3 is verified by the different *FP* coefficients following the results found by Bos and Millone (2015), Baltas and Liñares-Zegarra (2025), and Annan et al. (2024) when *SO* is measured by all Outreach Breadth measures, suggesting the dual mission is detected. The opposite occurs if *SO* is measured by Outreach Depth, as the coefficients suggest there is a negative direct impact of

DIV on the relationship between *FP* and *SO*, which rejects H3, which is line with the results obtained by Wagner and Winkler (2013) when *FP* is measured by *ROA* and *OSS*.

Table 4: *Direct effect of funding diversification in MFIs' dual mission. (Random Effects Model. See Table 1 for Variable Definition.)*

	Baseline Model											
	Column I											
Measures of Social Outreach (Dependent Variable)	OutreachBreadth			OutreachBreadth_ Female			OutreachBreadth_Rural			OutreachDepth		
	I.1.1	**I.1.2**	**I.1.3**	**I.2.1**	**I.2.2**	**I.2.3**	**I.3.1**	**I.3.2**	**I.3.3**	**I.4.1**	**I.4.2**	**I.4.3**
Main Covariates												
DIV	-0.328*	-0.330*	-0.292	-0.345	-0.339	-0.301	-0.621	-0.540	-0.579	-0.246	-0.243	-0.210
	(0.197)	(0.195)	(0.194)	(0.210)	(0.208)	(0.207)	(0.704)	(0.703)	(0.698)	(0.154)	(0.154)	(0.154)
CRI	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001	0.002***	0.002***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
ROA	0.905**			1.002**			2.906*			0.662*		
	(0.460)			(0.490)			(1.731)			(0.363)		
ROE		0.136**			0.133**			0.250			0.091**	
		(0.056)			(0.060)			(0.222)			(0.045)	
OSS			0.113			0.106			0.620*			0.043
			(0.086)			(0.092)			(0.322)			(0.069)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	11.453***	11.469***	11.338***	10.791***	10.807***	10.682***	8.483***	8.499***	7.805***	6.289***	6.299***	6.245***
	(0.332)	(0.334)	(0.351)	(0.357)	(0.360)	(0.378)	(0.691)	(0.690)	(0.777)	(0.221)	(0.221)	(0.234)
Observations	646	646	646	646	646	646	646	646	646	646	646	646
Number of MFI_ID	165	165	165	165	165	165	165	165	165	165	165	165

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 5: *Direct and Moderating role of funding diversification in MFIs' dual mission. (Random Effects Model. See Table 1 for Variable Definition.)*

	Interactions											
	Column II											
Measures of Social Outreach (Dependent Variable)	OutreachBreadth			OutreachBreadth_ Female			OutreachBreadth_Rural			OutreachDepth		
	II.1.1	**II.1.2**	**II.1.3**	**II.2.1**	**II.2.2**	**II.2.3**	**II.3.1**	**II.3.2**	**II.3.3**	**II.4.1**	**II.4.2**	**II.4.3**
Main Covariates												
DIV	-0.393**	-0.411**	-2.418***	-0.405*	-0.420**	-2.108**	-1.122	-1.001	-10.600***	-0.168	-0.270*	0.964
	(0.200)	(0.200)	(0.790)	(0.214)	(0.213)	(0.845)	(0.722)	(0.710)	(3.047)	(0.156)	(0.156)	(0.631)
CRI	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001	0.002***	0.002***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
ROA	-0.898			-0.673			-8.296*			2.740***		
	(1.118)			(1.192)			(4.298)			(0.879)		
ROE		0.055			0.052			-0.201			0.064	
		(0.066)			(0.071)			(0.259)			(0.052)	
OSS			-0.565**			-0.471*			-2.574***			0.417**
			(0.259)			(0.277)			(0.998)			(0.207)
Interactions												
DIV x ROA	4.866*			4.524			29.984***			-5.598***		
	(2.746)			(2.929)			(10.536)			(2.158)		
DIV x ROE		0.835**			0.832**			4.515***			0.270	
		(0.345)			(0.367)			(1.319)			(0.271)	
DIV x OSS			1.901***			1.617**			8.882***			-1.048*
			(0.685)			(0.732)			(2.630)			(0.546)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	11.473***	11.446***	12.090***	10.809***	10.786***	11.323***	8.610***	8.439***	11.349***	6.268***	6.293***	5.831***
	(0.330)	(0.324)	(0.441)	(0.356)	(0.351)	(0.473)	(0.688)	(0.677)	(1.302)	(0.221)	(0.221)	(0.318)
Observations	646	646	646	646	646	646	646	646	646	646	646	646
Number of MFI_ID	165	165	165	165	165	165	165	165	165	165	165	165

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

4.3. Dual mission under high climate risk (H8)

The final analysis re-estimates **Equation *7*** separately for MFIs in high- and low-CRI contexts (Table *6*, *Table 7*, *Table 8* and *Table 9*) to test H8. Each table presents the results of each measure of social outreach, with Column I and Column II representing the Baseline Model and the Interactions, respectively. The .a sub-columns present the results in the High CRI subsample, while the .b sub-columns present the ones in the Low CRI subsample.

For Outreach Breadth, in **Table *6***, in both columns, the *DIV* coefficients are only statistically significant for the High *CRI* Subsample, suggesting that *DIV* has a negative direct impact on *SO*, alongside when *FP* is measured by *OSS*, in the Low CRI subsample. For *CRI* and *ROE* coefficients, the results are all statistically insignificant, for both subsamples, while for *ROA* coefficients, the results are statistically significant in I.1.a and II.1.b, which suggests that *ROA* affects positively and negatively *SO* on the High and Low CRI subsamples, respectively. The *OSS* coefficient is only statistically significant in II.3.b, indicating there is a negative direct impact of *OSS* on *SO* in the Low CRI Subsample. When *DIV* is combined with *FP*, in the Low CRI subsample, there is evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, concluding there is no evidence to support H8. In the High CRI subsample, the only *FP* coefficient that is statistically significant is the *ROE* one, suggesting there is evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, when in high climate risk conditions, which verifies H8.

For Outreach Breadth in Female borrowers, in **Table *7***, in both columns, the *DIV* coefficients are only statistically significant for the High CRI Subsample, suggesting that *DIV* has a negative direct impact on *SO*. In II.3.b, the *DIV* coefficient suggests the same conclusion, but for the Low CRI subsample. For *CRI* coefficients, the results are statistically significant in II.1.a and II.2.a, which suggests that *CRI* affects *SO* negatively on the High CRI subsample. For *ROA* coefficients, the results are statistically significant in I.1.a and II.1.b, which suggests that *ROA* affects positively and negatively *SO* on the High and Low CRI subsample, respectively. The *OSS* coefficient is only statistically significant in II.3.b, indicating there is a negative direct impact of *OSS* on *SO* in the Low CRI Subsample. All the other *ROA* and *OSS* coefficients, alongside all the *ROE* coefficients, are statistically insignificant. When *DIV* is combined with *FP*, in the Low CRI subsample, there is evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, concluding there is no evidence to support H8. In the High CRI subsample, the only *FP* coefficient that

is statistically significant is the *ROE* one, suggesting there is evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, which verifies H8.

For Outreach Breadth in Rural areas, in **Table *8***, in both columns, the *DIV* coefficients are all statistically insignificant for both subsamples, unless in II.3.b, where there is evidence that *DIV* has a negative direct impact on *SO* in conditions of low climate risks. For *CRI* and *ROE* coefficients, the results are statistically insignificant in both subsamples. For *ROA* coefficients, the results are statistically significant in I.1.a, which suggests that *ROA* positively affects *SO* on the High CRI subsample. The *OSS* coefficients are only statistically significant in I.3.a and II.3.b, indicating there is a positive and a negative direct impact of *OSS* on *SO* in the High and Low CRI Subsamples, respectively. All the other *ROA* and *OSS* coefficients are statistically insignificant. When *DIV* is combined with *FP*, in the Low CRI subsample, there is evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, concluding there is no evidence to support H8. In the High CRI subsample, the only *FP* coefficient that is statistically significant is the *ROE* one, suggesting there is evidence that *FP* has a positive direct impact on the relationship between *FP* and *SO*, which verifies H8.

Finally, for Outreach Depth, **Table *9***, in both columns, the *DIV* coefficients are all statistically insignificant for both subsamples. For *CRI* coefficients, the results are all statistically significant for the Low CRI subsample, indicating there is evidence that *CRI* has a positive direct impact on *SO*. For *ROA* coefficients, the results are statistically significant in I.1.b, which suggests that *ROA* positively affects *SO* on the Low CRI subsample. The *ROE* coefficients are also statistically significant for I.2.a and II.2.a, indicating that *ROE* has a positive direct impact on *SO*, in the High CRI subsample. The *OSS* coefficient is only statistically significant in II.3.b, indicating there is a positive direct impact of *OSS* on *SO* in the Low CRI Subsample. All the other *FP* coefficients are statistically insignificant. When *DIV* is combined with *FP*, in the Low CRI subsample, there is evidence that *DIV* has a negative direct impact on the relationship between *FP* and *SO* (in II.1.b), concluding there is no evidence to support H8. In the High CRI subsample, there is no coefficient that is statistically significant, suggesting there is no evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, which does not support H8.

Table 6: *Dual mission under high vs low climate risk. (Random Effects Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable:	OutreachBreadth											
Subsample:	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.a**	**I.3.a**	**I.3.a**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.a**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	-0.728**	0.166	-0.708**	0.165	-0.711**	0.218	-0.735**	-0.069	-0.851***	0.014	-1.697	-3.654***
	(0.311)	(0.292)	(0.312)	(0.291)	(0.312)	(0.284)	(0.316)	(0.301)	(0.315)	(0.301)	(1.266)	(1.213)
CRI	-0.002	0.003	-0.001	0.003	-0.001	0.003	-0.002	0.003	-0.002	0.003	-0.002	0.002
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
ROA	1.765**	0.690					1.541	-4.096**				
	(0.704)	(0.789)					(1.749)	(1.838)				
ROE			0.164	0.109					-0.195	-0.115		
			(0.121)	(0.112)					(0.168)	(0.149)		
OSS					0.225	0.046					-0.091	-1.206***
					(0.145)	(0.188)					(0.419)	(0.423)
Interactions												
DIV x ROA							0.575	13.680***				
							(4.097)	(4.747)				
DIV x ROE									1.868***	1.604**		
									(0.613)	(0.685)		
DIV x OSS											0.868	3.474***
											(1.080)	(1.057)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	11.567***	11.164***	11.571***	11.178***	11.331***	11.113***	11.569***	11.186***	11.593***	11.131***	11.688***	12.483***
	(0.370)	(0.422)	(0.375)	(0.421)	(0.400)	(0.476)	(0.371)	(0.416)	(0.366)	(0.414)	(0.599)	(0.627)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 7: *Dual mission under high vs low climate risk (continuation). (Random Effects Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable:	OutreachBreadth_Female											
Subsample:	HigH CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.b**	**I.3.a**	**I.3.b**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.b**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	-0.672*	0.098	-0.637*	0.125	-0.640*	0.183	-0.709*	-0.126	-0.795**	-0.031	-1.661	-3.593***
	(0.356)	(0.302)	(0.357)	(0.301)	(0.357)	(0.295)	(0.362)	(0.312)	(0.361)	(0.311)	(1.460)	(1.257)
CRI	-0.003	0.002	-0.002	0.002	-0.002	0.002	-0.003*	0.002	-0.003*	0.002	-0.002	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
ROA	1.556*	1.096					0.461	-3.496*				
	(0.811)	(0.816)					(2.018)	(1.904)				
ROE			0.090	0.125					-0.299	-0.108		
			(0.138)	(0.116)					(0.187)	(0.153)		
OSS					0.131	0.067					-0.196	-1.157***
					(0.167)	(0.196)					(0.483)	(0.440)
Interactions												
DIV x ROA							2.807	13.133***				
							(4.725)	(4.917)				
DIV x ROE									2.087***	1.671**		
									(0.694)	(0.706)		
DIV x OSS											0.898	3.390***
											(1.246)	(1.096)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	10.827***	10.677***	10.824***	10.693***	10.684***	10.600***	10.838***	10.697***	10.853***	10.645***	11.054***	11.938***
	(0.409)	(0.449)	(0.413)	(0.449)	(0.444)	(0.506)	(0.409)	(0.444)	(0.404)	(0.442)	(0.679)	(0.659)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 8: *Dual mission under high vs low climate risk (continuation). (Random Effects Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable	OutreachBreadth_Rural											
Subsample:	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.b**	**I.3.a**	**I.3.b**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.b**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	-0.742	-0.487	-0.689	-0.465	-0.771	-0.404	-0.876	-1.182	-1.191	-0.926	-6.187	-12.823***
	(0.986)	(0.923)	(0.999)	(0.921)	(0.990)	(0.902)	(1.011)	(0.973)	(0.996)	(0.948)	(4.350)	(4.182)
CRI	-0.001	0.003	-0.001	0.003	-0.001	0.003	-0.001	0.004	-0.003	0.004	-0.002	0.002
	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)	(0.007)
ROA	5.856**	2.642					2.466	-9.714				
	(2.362)	(2.568)					(6.096)	(6.275)				
ROE			0.427	0.404					-0.356	-0.282		
			(0.345)	(0.393)					(0.404)	(0.528)		
OSS					1.060**	0.599					-0.699	-3.352**
					(0.487)	(0.481)					(1.462)	(1.382)
Interactions												
DIV x ROA							8.656	34.835**				
							(14.209)	(16.161)				
DIV x ROE									6.285***	4.598**		
									(1.807)	(2.332)		
DIV x OSS											4.766	11.020***
											(3.729)	(3.625)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	8.133***	8.139***	8.141***	8.158***	7.030***	7.431***	8.158***	8.301***	8.188***	8.145***	9.004***	11.881***
	(0.891)	(0.934)	(0.902)	(0.932)	(1.011)	(1.081)	(0.892)	(0.931)	(0.880)	(0.923)	(1.852)	(1.809)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 9: *Dual mission under high vs low climate risk (continuation). (Random Effects Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable	OutreachDepth											
Subsample:	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.b**	**I.3.a**	**I.3.b**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.b**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	-0.217	-0.147	-0.262	-0.138	-0.239	-0.109	-0.173	0.001	-0.212	-0.205	0.477	1.311
	(0.243)	(0.217)	(0.244)	(0.216)	(0.244)	(0.213)	(0.247)	(0.225)	(0.246)	(0.221)	(0.999)	(0.928)
CRI	-0.000	0.004***	-0.000	0.004***	-0.000	0.004***	-0.000	0.004***	-0.000	0.004***	-0.000	0.004***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
ROA	0.351	0.896					1.647	3.816***				
	(0.555)	(0.590)					(1.381)	(1.386)				
ROE			0.166*	0.125					0.285**	0.025		
			(0.093)	(0.085)					(0.126)	(0.111)		
OSS					0.138	0.183					0.367	0.639**
					(0.114)	(0.133)					(0.331)	(0.319)
Interactions												
DIV x ROA							-3.315	-8.312**				
							(3.232)	(3.578)				
DIV x ROE									-0.658	0.702		
									(0.471)	(0.507)		
DIV x OSS											-0.630	-1.270
											(0.853)	(0.809)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	6.753***	6.002***	6.764***	6.016***	6.612***	5.787***	6.740***	5.982***	6.753***	6.004***	6.352***	5.284***
	(0.273)	(0.276)	(0.271)	(0.276)	(0.294)	(0.314)	(0.273)	(0.274)	(0.271)	(0.276)	(0.459)	(0.449)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

5. ROBUSTNESS CHECKS

In this section, the GMM model is employed as a robustness check to verify the consistency of the previously reported results. This estimator addresses potential endogeneity issues, offering a valuable comparative benchmark and reinforcing the credibility of the main model's findings.

5.1. Direct Effects of Funding Diversification and Climate Risk (H1a–H2b; H4–H5; H6–H7)

The first set of estimations corresponds to the baseline specifications (**Equation *3*** and **Equation *4***) and the extended models, including the interaction between funding diversification (*DIV*) and climate risk (*CRI*) (**Equation *5*** and **Equation *6***). Results are reported in Table *A3* (Annexe), where Column I and Column II reflect the results on the Baseline Model and the Interactions, respectively.

For Financial Performance, in both columns, the *DIV* coefficients are statistically significant for all measures, validating H1a as there is a positive direct impact of *DIV* on *FP*, and rejecting H1b. For Social Performance, in both columns, the results are all statistically insignificant, not supporting both H2a and H2b. However, when SO is measured by Outreach Depth, the coefficient is statistically significant, verifying H2a as there is a positive direct impact of *DIV* on *SO*, and rejecting H2b. For both dependent variables, the *CRI* coefficients are not statistically significant, not supporting H4 and H5, unless *SO* is measured by Outreach Depth, as in I.7, the coefficient is strongly significant, suggesting there is a positive direct impact of *CRI* on *SO*, which rejects H5. When *DIV* is combined with *CRI*, H6 and H7 are not supported, as all coefficients are statistically insignificant. These results are partially consistent with the ones presented in section *4*.

5.2. Moderating role of funding diversification in MFIs' dual mission (H3)

The second set of estimations corresponds to the baseline specifications of Social Outreach (**Equation *4***) and the extended model, with the introduction of Financial Performance as an independent variable, including the interaction between funding diversification and financial performance (**Equation *7***). Results are reported in Tables *A4* and *A5* (Annexe), where the results present the Baseline Model and the Interactions, respectively.

In Table *A4*, the *DIV* coefficients are statistically significant when *SO* is measured by Outreach Depth, suggesting there is a positive direct impact of *DIV* on *SO*. All the other *DIV* coefficients are statistically insignificant, alongside all *CRI, ROA,* and *ROE* coefficients,

reflecting no impact on *SO*. The *OSS* coefficients are all statistically significant, indicating a negative direct impact of *OSS* on *SO*, unless it is measured by Outreach Depth, since *OSS* affects *SO* positively.

In Column II, the *DIV* coefficients are statistically significant when *SO* is measured by Outreach Depth (except in II.4.3), indicating a positive direct impact of *DIV* on *FP*, which is partially in line with the baseline results. All the other *DIV* coefficients are statistically insignificant, as also happens with the *CRI* coefficients, suggesting there is no direct impact of *CRI* on *SO* (in line with the baseline model), unless *SO* is measured by Outreach Depth, where a positive direct impact is detected when *FP* is measured by *ROE*. For all *FP* coefficients, the results are not statistically significant, so no impact of *FP* on *SO* is detected. When *DIV* is combined with *FP*, H3 is not supported by the different *FP* coefficients, suggesting that no dual mission premise is detected. These results are not consistent with the ones presented in the baseline model section *4*.

5.3. Dual mission under high climate risk (H8)

The final analysis re-estimates **Equation *7*** separately for MFIs in high- and low-CRI contexts (Tables *A6–A9*) to test H8. Each table presents the results of each measure of social outreach, with Column I and Column II representing the Baseline Model and the Interactions, respectively. The .a sub-columns present the results in the High CRI subsample, while the .b sub-columns present the ones in the Low CRI subsample.

For Outreach Breadth, in both columns, the *DIV* coefficient is only statistically significant when *FP* is measured by *OSS* (II.3.a), suggesting that *DIV* has a negative direct impact on *SO* when exposed to higher climate risks. For *CRI* and *ROA* coefficients, the results are all statistically insignificant, for both subsamples, while for *ROE* coefficients, the results are statistically significant in I.2.b, which suggests that *ROE* negatively affects *SO* in low climate risk conditions. The *OSS* coefficient is only statistically significant in II.3.a, indicating there is a negative direct impact of *OSS* on *SO* in the High CRI Subsample. When *DIV* is combined with *FP*, there is no evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, on elevated climate risk conditions, unless in II.3.a, where *DIV* has a positive direct impact on the MFIs' dual mission. Concluding, there is no evidence to support H8, unless *FP* is measured by *OSS*.

For Outreach Breadth in Female borrowers, in both columns, the *DIV* coefficient is only statistically significant in I.3.a, suggesting that *DIV* has a positive direct impact on *SO*. For *CRI* and *ROA* coefficients, the results are all statistically insignificant and do not support any

conclusion about their impact on *SO*. For *ROE* coefficients, the result is statistically significant in I.2.b, which suggests that *ROE* negatively affects *SO* on the Low CRI subsample. The *OSS* coefficient is only statistically significant in II.3.a, indicating there is a negative direct impact of *OSS* on *SO* in the High CRI Subsample. All the other *ROE* and *OSS* coefficients are statistically insignificant. When *DIV* is combined with *FP*, there is no evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, on elevated climate risk conditions (not supporting H8), unless when *DIV* has an interaction with *OSS*, where there is evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, in high climate risks conditions, validating H8.

For Outreach Breadth in Rural areas, in both columns, the *DIV* coefficients are all statistically insignificant for both subsamples, unless in II.3.a, where there is evidence that *DIV* has a negative direct impact on *SO*, in the High CRI subsample. For *CRI*, ROA, and *ROE* coefficients, the results are statistically insignificant in both subsamples. For *OSS* coefficients, the results are statistically significant in II.3.a, which suggests that *OSS* affects *SO* negatively, on the High CRI subsample. When *DIV* is combined with *FP*, there is no evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, on elevated climate risk conditions (not supporting H8), unless when *DIV* has an interaction with *OSS* (sub-column II.3.a), where there is evidence that *DIV* has a positive direct impact on the relationship between *FP* and *SO*, in high climate risks conditions, validating H8.

Finally, for Outreach Depth, in both columns, the *DIV* coefficients are statistically significant for the Low CRI subsample, suggesting that there is a positive direct impact of *DIV* on *SO*. For *CRI*, *ROA*, and *OSS* coefficients, the results are all statistically insignificant for both subsamples, indicating there is no evidence of their direct impact on *SO*. For *ROE* coefficients, the result is statistically significant in I.2.b, which suggests that *ROE* positively affects *SO* on the Low CRI subsample. When *DIV* is combined with *FP*, for both subsamples, no coefficient is statistically significant, suggesting there is no evidence that *FP* has a positive direct impact on the relationship between *FP* and *SO*, which does not support H8. These results are partially consistent with the ones presented in section *4*.

6. CONCLUSIONS

Understanding how Microfinance Institutions (MFIs) operate and how they have addressed financial sustainability and social outreach to low-income households has been extensively studied over the years. Many conclusions have been drawn, some proving that these two objectives are being achieved, others proving the opposite. The study's main core involves understanding MFIs' commitment towards those target households when facing higher climate risks, mainly when considering funding diversification. The focus of this study is on 165 MFIs from 34 countries from 2008 to 2018 on a panel database using the random effects model.

The findings of Hypothesis 1 reveal that when funding diversification (*DIV*) is analysed against MFIs' financial performance (*FP*), we found that if an MFI applies diversified funding sources, then its financial performance will increase. However, when *DIV* is analysed against MFIs' social outreach (*SO*), a contradictory result was found since when an MFI adopts more than one single funding stream, then the social outreach will decrease. Moreover, Hypothesis 4's insignificant results suggest that there is no evidence that MFIs based in countries with a certain level of climate risk tend to have better *FP* and *SO*. However, if an MFI is based in a country with a certain level of climate risk, then it may have better *SO* by increasing the average loan size (Outreach Depth). Similarly, when *DIV* is analysed with *CRI*, no evidence was found, unless MFIs adopt diversified financing in countries with certain levels of climate risk, since the positive impact found previously between *CRI* and *SO* is exacerbated.

Therefore, it is possible to verify the expected positive relationship between *DIV* and *FP*, and the negative relationship between *DIV* and *SO*. At the same time, it is not possible to prove or contradict the relationship between *CRI* and FP, while the positive impact of *CRI* on *SO* is found. Lastly, when *DIV* interacts with *CRI*, there is no effect of *DIV* on the relationship between *CRI* and *FP*, and there is evidence that *DIV* exacerbates the effects of *CRI* on MFIs' *SO*.

Additionally, the findings of Hypothesis 3 reveal that when funding diversification is analysed against MFIs' *FP*, the results suggest that, when an MFI adopts funding diversification, then there will be an increase in its dual mission, especially in terms of the number of borrowers served, including both female and rural (Outreach Breadth). However, the opposite was found in terms of the MFI's average loan size (Outreach Depth), mainly decreasing the *ROA* and *ROE* of the MFI. Therefore, it is possible to verify the impact of funding diversification

on the relationship between financial performance and social outreach, unless social outreach is measured by Outreach Depth.

Finally, Hypothesis 8 results show that when an MFI has diversified funding, then the MFI will have an increase in its dual mission, but only in countries where there are lower climate risks, increasing the number of borrowers served. However, when facing higher climate risk conditions, the results suggest that funding diversification adopted by an MFI can increase its dual mission, in terms of ROE and number of borrowers served.

Nonetheless, to assess robustness, the GMM Model is employed. For H1 hypotheses, the earlier results are confirmed. Hence, the conclusion drawn regarding the increase in MFIs' financial performance when adopting more than one funding stream is supported. The opposite occurs for H2 hypotheses, when the earlier results are contradictory to the GMM ones. Therefore, opposite conclusions were drawn about the relationship between adopting funding diversification and its impact on social outreach. For H4 and H5, the results are consistent with the RE Model ones: while MFIs in countries with certain levels of climate risk don't have better / worse financial performance, they can have better social outreach. No model makes it possible to analyse the use of diversified financing in countries with certain levels of climate risk, and its impact on both financial performance and social outreach, separately, although previously it was proven in terms of social outreach.

Moreover, for hypothesis H3, the GMM Model does not yield any statistically significant results, and no conclusions are drawn regarding the use of funding diversification to reconcile both MFIs' social outreach and financial performance, which is not in line with the results provided by the RE Model.

Ultimately, hypothesis H8 results were also not supported by the GMM Model when analysing the Low CRI subsample, although in this case, applying diversified funding makes MFIs' dual mission more achievable in elevated climate risk conditions, especially increasing the number of borrowers served, including both female and rural (Outreach Breadth). In terms of average loan size, no conclusion is taken. These results are partially aligned with the ones presented by the RE Model.

6.1. Implications and Limitations

These results bring some insights and implications for future researchers and academics. First, MFIs managers might be able to draw funding strategies to promote long-term social outreach and financial sustainability, while focusing on the climate risk factor and its impact

on the mission drift problem that most MFIs suffer. Simultaneously, they should consider financial performance measures and their impact on all aspects mentioned. Second, regulators and governments need to establish and provide certain insurance policies for countries with certain levels of climate risk. This will ensure that the institutions will be able to continue developing their business activity, while reaching the most vulnerable households, especially those that face climate risk events.

Third, for the academics, the introduction of funding diversification and climate risk index factors into the study of the dual objectives of MFIs brought some insights for future research. Although climate risks might be seen as a negative influence on MFIs' financial and social objectives by several authors, the results obtained reveal no significant relationship between the two. This might be due to some external factors that are not considered, such as some external regulations or insurance provisions, or even some internal accounting policies established by the MFIs, which might require further future research.

To conclude, several limitations in this study might be useful to point out for future knowledge when using, for example, the same database, which is the main source of problems. The database used contains many missing values, with no information regarding their treatment (whether they should be viewed as zeros or as missing values). Given that several variables are included, it is essential to ensure that these missing values are eliminated. Consequently, several observations are lost, which could bias the results and render these findings inadequately applicable to a global analysis of MFIs. Finally, not all MFIs are analysed for the same number of years, making this database an unbalanced panel. The use of time-invariant variables in the analysis, such as the legal status, makes the decision-making process of choosing the models to use somewhat time-consuming.

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8. ANNEXES [SUPPLEMENTARY MATERIAL]

Table A1: *Pairwise Correlation Matrix (Within brackets, it is possible to recognise the p-values related to the correlation coefficients).*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) DIV	1.000												
(2) CRI	0.070	1.000											
	(0.076)												
(3) Bank	0.237	0.075	1.000										
	(0.000)	(0.057)											
(4) CreditUnion	0.121	0.106	-0.129	1.000									
	(0.002)	(0.007)	(0.001)										
(5) NBFI	-0.071	-0.106	-0.306	-0.253	1.000								
	(0.072)	(0.007)	(0.000)	(0.000)									
(6) NGO	-0.168	-0.011	-0.318	-0.262	-0.625	1.000							
	(0.000)	(0.779)	(0.000)	(0.000)	(0.000)								
(7) SMEsLoans	0.103	0.089	0.140	-0.067	0.141	-0.198	1.000						
	(0.009)	(0.023)	(0.000)	(0.091)	(0.000)	(0.000)							
(8) SocialGoals	0.006	-0.011	-0.043	-0.014	0.020	0.019	0.133	1.000					
	(0.879)	(0.773)	(0.271)	(0.714)	(0.609)	(0.630)	(0.001)						
(9) SocialProtection	0.040	-0.037	0.083	-0.084	-0.050	0.042	0.138	0.333	1.000				
	(0.311)	(0.352)	(0.036)	(0.033)	(0.205)	(0.283)	(0.000)	(0.000)					
(10) SafetyProtection	0.027	0.094	0.064	-0.078	0.101	-0.098	0.159	0.181	0.145	1.000			
	(0.496)	(0.017)	(0.103)	(0.047)	(0.010)	(0.012)	(0.000)	(0.000)	(0.000)				
(11) ClientProtection	-0.005	0.067	0.002	-0.034	0.047	-0.027	0.161	0.328	0.480	0.315	1.000		
	(0.896)	(0.088)	(0.958)	(0.389)	(0.237)	(0.490)	(0.000)	(0.000)	(0.000)	(0.000)			
(12) GDP	-0.031	-0.067	0.047	0.014	0.062	-0.102	-0.020	0.055	0.339	0.135	0.314	1.000	
	(0.430)	(0.088)	(0.236)	(0.726)	(0.116)	(0.009)	(0.605)	(0.161)	(0.000)	(0.001)	(0.000)		
(13) UnemploymentRate	-0.070	0.098	-0.052	-0.046	0.086	-0.021	-0.031	-0.035	-0.158	-0.124	-0.106	-0.256	1.000
	(0.073)	(0.013)	(0.186)	(0.246)	(0.029)	(0.594)	(0.438)	(0.374)	(0.000)	(0.002)	(0.007)	(0.000)	

Table A2. *Variance Inflation Factors (VIFs).*

Variables	**VIF**	**1/VIF**
NGO	2.68	0.373
NBFI	2.56	0.390
CreditUnion	1.62	0.617
ClientProtection	1.53	0.652
SocialProtection	1.51	0.662
GDP	1.29	0.777
SocialGoals	1.21	0.826
SafetyProtection	1.18	0.851
SMEsLoans	1.14	0.880
UnemploymentRate	1.12	0.893
DIV	1.11	0.904
CRI	1.07	0.931
Mean VIF	1.50	

Table A3: *Direct and Moderating Effects of Funding Diversification and Climate Risk on both Financial Performance and Social Outreach. (GMM Model. See Table 1 for Variable Definition.)*

	Baseline Model							Interactions						
	Column I							**Column II**						
Dependent Variables:	**Financial Performance**			**Social Outreach**				**Financial Performance**			**Social Outreach**			
	ROA	ROE	OSS	OutreachBreadth	OutreachBreadth_Female	OutreachBreadth_Rural	OutreachDepth	ROA	ROE	OSS	OutreachBreadth	OutreachBreadth_Female	OutreachBreadth_Rural	OutreachDepth
	I.1	**I.2**	**I.3**	**I.4**	**I.5**	**I.6**	**I.7**	**II.1**	**II.2**	**II.3**	**II.4**	**II.5**	**II.6**	**II.7**
Main Covariates														
DIV	0.088**	0.448*	0.586***	-0.005	-0.432	3.354	4.344***	0.117**	0.548**	0.815***	-0.669	-0.923	0.192	3.648**
	(0.045)	(0.229)	(0.214)	(2.227)	(2.412)	(3.817)	(1.183)	(0.051)	(0.261)	(0.310)	(3.024)	(3.310)	(4.315)	(1.607)
CRI	0.000	0.000	0.001	-0.008	-0.010	-0.001	0.005*	0.000	0.002	0.003	-0.015	-0.015	-0.034	-0.003
	(0.000)	(0.001)	(0.001)	(0.006)	(0.006)	(0.008)	(0.003)	(0.000)	(0.002)	(0.002)	(0.017)	(0.019)	(0.033)	(0.010)
Interaction														
DIV x CRI								-0.001	-0.003	-0.007	0.019	0.014	0.091	0.020
								(0.001)	(0.004)	(0.006)	(0.035)	(0.038)	(0.084)	(0.024)
Controls														
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-0.013	0.057	1.063***	12.188***	11.977***	7.746***	4.702***	-0.024	0.019	0.976***	12.438***	12.162***	8.936***	4.964***
	(0.032)	(0.183)	(0.150)	(1.569)	(1.656)	(2.586)	(1.027)	(0.035)	(0.196)	(0.168)	(1.853)	(1.959)	(2.787)	(1.198)
Observations	646	646	646	646	646	646	646	646	646	646	646	646	646	646
Number of MFI_ID	165	165	165	165	165	165	165	165	165	165	165	165	165	165

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A4: *Direct effect of funding diversification in MFIs' dual mission. (GMM Model. See Table 1 for Variable Definition.)*

	Baseline Model											
	Column I											
Measures of Social Outreach (Dependent Variable)	OutreachBreadth			OutreachBreadth_ Female			OutreachBreadth_Rural			OutreachDepth		
	I.1.1	**I.1.2**	**I.1.3**	**I.2.1**	**I.2.2**	**I.2.3**	**I.3.1**	**I.3.2**	**I.3.3**	**I.4.1**	**I.4.2**	**I.4.3**
Main Covariates												
DIV	1.147	1.833	3.192	0.717	1.577	3.086	4.821	5.621	7.309	3.826***	3.303**	2.535**
	(2.263)	(2.954)	(3.113)	(2.361)	(3.033)	(3.292)	(3.985)	(4.823)	(5.399)	(1.266)	(1.457)	(1.229)
CRI	-0.006	-0.006	-0.005	-0.008	-0.008	-0.006	0.002	0.002	0.004	0.004	0.004	0.003
	(0.005)	(0.006)	(0.006)	(0.005)	(0.006)	(0.007)	(0.008)	(0.009)	(0.010)	(0.002)	(0.003)	(0.003)
ROA	-13.038			-13.000			-16.595			5.864		
	(8.607)			(10.092)			(13.826)			(5.070)		
ROE		-4.107			-4.488			-5.063			2.327	
		(3.210)			(3.588)			(4.402)			(1.587)	
OSS			-5.460**			-6.008**			-6.753*			3.090**
			(2.728)			(2.933)			(3.722)			(1.235)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	12.016***	12.422***	17.990***	11.805***	12.232***	18.361***	7.527***	8.034***	14.922***	4.779***	4.570***	1.419
	(1.647)	(1.899)	(3.410)	(1.721)	(2.023)	(3.691)	(2.597)	(2.793)	(4.286)	(1.092)	(1.191)	(1.676)
Observations	646	646	646	646	646	646	646	646	646	646	646	646
Number of MFI_ID	165	165	165	165	165	165	165	165	165	165	165	165

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A5: *Direct and Moderating role of funding diversification in MFIs' dual mission. (GMM Model. See Table 1 for Variable Definition.)*

	Interactions											
	Column II											
Measures of Social Outreach (Dependent Variable)	OutreachBreadth			OutreachBreadth_ Female			OutreachBreadth_Rural			OutreachDepth		
	II.1.1	**II.1.2**	**II.1.3**	**II.2.1**	**II.2.2**	**II.2.3.**	**II.3.1.**	**II.3.2.**	**II.3.3**	**II.4.1.**	**II.4.2.**	**II.4.3**
Main Covariates												
DIV	0.950	1.516	-16.893	0.527	1.329	-18.716	4.407	4.558	-41.765	3.799***	2.785*	4.344
	(2.890)	(3.543)	(26.326)	(2.944)	(3.556)	(28.050)	(5.015)	(5.691)	(42.137)	(1.332)	(1.624)	(9.570)
CRI	-0.006	-0.006	-0.004	-0.007	-0.007	-0.004	0.003	0.003	0.007	0.004	0.004*	0.003
	(0.005)	(0.006)	(0.007)	(0.005)	(0.006)	(0.007)	(0.009)	(0.010)	(0.012)	(0.002)	(0.002)	(0.003)
ROA	-38.167			-37.212			-69.249			2.455		
	(42.030)			(44.381)			(62.799)			(16.848)		
ROE		-6.693			-6.509			-13.724			-1.892	
		(6.511)			(6.845)			(10.763)			(3.105)	
OSS			-13.715			-14.968			-26.923			3.833
			(9.259)			(10.009)			(17.083)			(3.814)
Interactions												
DIV x ROA	60.820			58.603			127.442			8.250		
	(94.488)			(96.772)			(139.216)			(38.693)		
DIV x ROE		7.154			5.591			23.957			11.670	
		(16.853)			(16.974)			(27.807)			(8.533)	
DIV x OSS			18.661			20.256			45.594			-1.681
			(22.312)			(23.801)			(38.532)			(8.597)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	12.380***	12.686***	27.531**	12.156***	12.439***	28.717**	8.289**	8.921***	38.234**	4.829***	5.002***	0.559
	(2.290)	(2.371)	(11.720)	(2.336)	(2.447)	(12.608)	(3.413)	(3.410)	(19.445)	(1.186)	(1.169)	(4.657)
Observations	646	646	646	646	646	646	646	646	646	646	646	646
Number of MFI_ID	165	165	165	165	165	165	165	165	165	165	165	165

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A6: *Dual mission under high vs low climate risk. (GMM Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable:	OutreachBreadth											
Subsample:	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.b**	**I.3.a**	**I.3.b**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.b**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	9.360	-0.002	7.749	0.213	8.601	-0.298	-6.377	-0.889	2.542	0.050	-41.091*	-13.448
	(8.699)	(2.526)	(9.581)	(2.501)	(5.256)	(2.442)	(9.993)	(1.775)	(8.267)	(1.782)	(23.191)	(11.211)
CRI	-0.003	0.011	-0.003	0.011	-0.002	0.010	-0.006	0.007	-0.006	0.010	-0.017	0.008
	(0.010)	(0.008)	(0.012)	(0.009)	(0.011)	(0.008)	(0.012)	(0.008)	(0.013)	(0.010)	(0.012)	(0.007)
ROA	4.332	-5.616					-104.023	-27.955				
	(25.188)	(9.175)					(69.871)	(18.489)				
ROE			-0.942	-6.433**					-5.535	-7.191		
			(5.669)	(2.862)					(6.702)	(4.486)		
OSS					0.425	-0.782					-15.657**	-5.751
					(1.050)	(2.600)					(7.637)	(3.948)
Interactions												
DIV x ROA							216.058	53.940				
							(142.793)	(50.548)				
DIV x ROE									11.006	2.111		
									(12.526)	(16.076)		
DIV x OSS											40.315*	12.074
											(21.190)	(11.308)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	6.037	11.818***	6.535	12.625***	5.749	12.939***	13.369***	12.192***	8.955*	12.746***	27.018***	18.569***
	(4.282)	(1.678)	(5.501)	(2.167)	(4.142)	(3.857)	(4.520)	(1.401)	(5.188)	(1.788)	(8.572)	(3.995)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A7: *Dual mission under high vs low climate risk (continuation). (GMM Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable:	OutreachBreadth_Female											
Subsample:	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.b**	**I.3.a**	**I.3.b**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.b**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	11.917	-0.532	10.102	-0.220	10.966*	-0.739	-4.472	-1.126	3.715	-0.123	-39.710	-10.491
	(9.968)	(2.925)	(10.765)	(2.888)	(5.817)	(2.836)	(10.551)	(2.107)	(8.825)	(2.025)	(27.575)	(12.432)
CRI	-0.004	0.011	-0.004	0.011	-0.002	0.010	-0.007	0.009	-0.008	0.012	-0.018	0.009
	(0.012)	(0.009)	(0.015)	(0.010)	(0.013)	(0.009)	(0.012)	(0.010)	(0.014)	(0.010)	(0.012)	(0.008)
ROA	5.459	-5.213					-107.380	-20.165				
	(29.771)	(10.309)					(74.455)	(22.788)				
ROE			-0.966	-6.742**					-6.600	-6.289		
			(6.412)	(3.245)					(7.276)	(5.155)		
OSS					0.500	-0.848					-15.900*	-4.534
					(1.336)	(2.890)					(9.061)	(4.450)
Interactions												
DIV x ROA							224.997	36.102				
							(152.416)	(60.050)				
DIV x ROE									13.498	-1.263		
									(14.790)	(18.490)		
DIV x OSS											41.113*	8.954
											(24.954)	(12.696)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	4.101	11.779***	4.642	12.587***	3.773	12.946***	11.736**	12.029***	7.611	12.516***	25.463**	17.121***
	(4.762)	(1.971)	(6.078)	(2.455)	(4.650)	(4.311)	(4.836)	(1.679)	(5.562)	(1.950)	(10.325)	(4.439)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A8: *Dual mission under high vs low climate risk (continuation). (GMM Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable:	OutreachBreadth_Rural											
Subsample:	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.b**	**I.3.a**	**I.3.b**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.b**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	6.892	1.672	-0.485	2.858	0.360	0.963	-17.528	1.325	-0.537	3.755	-102.137**	-5.221
	(9.126)	(3.093)	(9.879)	(3.237)	(4.596)	(2.880)	(20.427)	(2.300)	(8.966)	(2.499)	(51.851)	(14.908)
CRI	0.004	0.007	0.011	0.010	0.014	0.007	-0.001	0.006	0.011	0.014	-0.019	0.006
	(0.023)	(0.011)	(0.027)	(0.012)	(0.029)	(0.011)	(0.024)	(0.011)	(0.026)	(0.012)	(0.022)	(0.010)
ROA	39.539	2.910					-128.594	-5.827				
	(32.655)	(11.636)					(126.872)	(30.708)				
ROE			-1.095	-5.562					-1.141	-1.374		
			(6.309)	(3.752)					(7.100)	(6.717)		
OSS					1.398	1.981					-31.772**	-0.356
					(1.177)	(3.099)					(15.624)	(5.812)
Interactions												
DIV x ROA							335.255	21.096				
							(288.860)	(74.304)				
DIV x ROE									0.110	-11.666		
									(10.010)	(21.434)		
DIV x OSS											83.154*	5.678
											(42.692)	(14.990)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	5.747	9.361***	7.367*	9.627***	5.564*	7.152	17.124*	9.507***	7.391**	8.963***	49.433**	9.799*
	(3.629)	(2.068)	(4.159)	(2.407)	(3.134)	(4.459)	(9.136)	(1.792)	(3.354)	(1.887)	(20.614)	(5.913)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A9: *Dual mission under high vs low climate risk (continuation). (GMM Model. See Table 1 for Variable Definition.)*

	Baseline Model						Interactions					
	Column I						**Column II**					
Dependent Variable:	OutreachDepth											
Subsample:	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI	High CRI	Low CRI
	I.1.a	**I.1.b**	**I.2.a**	**I.2.b**	**I.3.a**	**I.3.b**	**II.1.a**	**II.1.b**	**II.2.a**	**II.2.b**	**II.3.a**	**II.3.b**
Main Covariates												
DIV	-0.773	2.541*	1.344	2.649**	-5.408	2.762**	-4.259	2.341**	0.713	1.741**	-28.473	-1.893
	(6.394)	(1.305)	(6.589)	(1.142)	(4.731)	(1.304)	(9.005)	(1.040)	(4.095)	(0.831)	(28.923)	(7.088)
CRI	-0.006	-0.003	0.006	-0.003	0.001	-0.002	-0.007	-0.004	0.005	-0.007	-0.007	-0.003
	(0.010)	(0.005)	(0.015)	(0.004)	(0.011)	(0.005)	(0.010)	(0.006)	(0.013)	(0.006)	(0.010)	(0.005)
ROA	27.970	3.656					3.964	-1.388				
	(19.174)	(4.391)					(53.060)	(17.231)				
ROE			6.737	2.488*					6.180*	-1.753		
			(4.132)	(1.293)					(3.615)	(3.345)		
OSS					1.084	0.458					-6.380	-1.301
					(0.727)	(1.159)					(9.055)	(2.887)
Interactions												
DIV x ROA							47.869	12.180				
							(125.132)	(40.400)				
DIV x ROE									1.334	11.815		
									(11.824)	(9.086)		
DIV x OSS											18.712	4.274
											(25.260)	(7.023)
Controls												
Legal Status	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Product & Services	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Governance & HR Policies	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Client Protection	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Macroeconomic Context	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	8.633***	4.850***	6.853*	4.455***	8.409***	4.173**	10.257**	4.934***	7.146***	5.128***	18.281*	6.165**
	(3.150)	(1.253)	(3.553)	(1.335)	(2.836)	(1.774)	(4.389)	(1.201)	(2.681)	(1.155)	(10.634)	(3.031)
Observations	321	325	321	325	321	325	321	325	321	325	321	325
Number of MFI_ID	150	146	150	146	150	146	150	146	150	146	150	146

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1